The use of Information Technology in Educational Management (ITEM) and different effects on Israeli Secondary Schools

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By

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"The implementation of computers in school contains all that is fascinating in educational change. It contains intuitive attraction and great uncertainty, excitement and hardship, enthusiasm and exhaustion" (Fullan, 1992, p.28).

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ABSTRACT

Information Technology (IT) created a revolution in data collection and analysis at first in business and industry and later in schools throughout the world and in Israel. This work analyzes the implications of using IT in 11 Israeli schools and the external authorities that supervise them.

The data was collected using: 1. A questionnaire distributed to a population of principals, subject coordinators, teachers and external authority staff (N=252); 2. A case study on semi-structured interviews in four schools and local councils (18 interviews). Supervision, the electronic dialogue, independence and autonomy, the involvement and intrusion of outside factors and teachers' class management were the areas examined.

The findings show that teachers are not full partners in Information Technology in educational Management (ITEM) but only participate in collecting data. ITEM creates transparency for the work done in schools, especially its products, and leads to two seemingly contradictory tendencies: the increase of both supervision and independence- which grow together and even complement each other. The division according to roles influences the respondents' attitudes with principals and external authorities tending to agree more than teachers about ITEM's influence over increased teacher supervision, the creation of a new communication an increase in school independence and more teacher cooperation in analyzing examinations and tracking achievement. In parallel, authorities have penetrated deeper into class management using statistical analysis of exam results and achievements. Males and females relate differently to ITEM with males tending more to agree with the attitudes of principals and external authorities and females being more hesitant and agreeing less.

Most participants agree that ITEM (MANBAS) contributes to an improvement in the collection and analysis of data on pupil achievement, improves pedagogical decision making and significantly helps to improve the coordination of different school departments while acting as a readily available up-to-date tool. Some of the expectations the literature had about ITEM have not yet been realized in Israeli schools.

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Abbreviation Dictionary:

CAAS= Computer Aided Administrative System.

CASA= Computer Assisted School Administration.

CASES=Computer Administrative System Environment in Schools.

CADM =Computer Assisted Decision Making.

DSS= Decision Support System.

EMIS=Education Management Information System.

EMS =Electronic Meeting System.

GSS=Group Support Systems.

HKSAS= Hong Kong School Administration System.

ICT= Information Communication Technology.

IS=Information Systems.

IT= Information Technology.

ITEM= Information Technology in Educational Management.

MIS=Management Information System.

MUSAC= Massey University School Administration by Computer.

MANBAS= Management of Schools – (in Hebrew).

SMIS= School Management Information System.

SAMS= School Administration Management System.

SAS= Schools Accounting System.

TESS =Timetabling Expert Support System.

VASS= Victoria Certificate of Education Administrative Software System.

CHAPTER 0NE: INTRODUCTION.

BACKGROUND:

Over the last three decades the aim of Information Systems (IS) has changed dramatically from being a passive tool of automation to becoming a strategic device that can transform structures of organizations and enable them to compete better. As the work of gathering information by IS has increased over recent years the computer's role as an information tool has grown and surpassed its role as an administrative tool. In fact, information has become so important that it has created both new kinds of information technology (IT) and new jobs (Synnot, 1987; Moss-Jones, 1990; Lee and Kim 1996).

This impact of IT on management and administration has developed gradually since the 1980s and new programmes, such as the Management of Information System (MIS), the School Management Information System (SMIS), and Information Technology in Educational Management (ITEM) have been introduced to assist managers in their work. (Eason, 1988; Benger 1993; O'Brien, 1997). The implementation of the Management Information System (MIS) in particular has become a major challenge for organizations since every organization requires complete, comprehensive and up-to-date information to run efficiently, and schools are no exception in this respect.

Current educational policies being carried out in the world are dominated by expansion and reform and changes are inevitable because of both external and internal pressures (Rosvik, 1995; Gev, 1995; Telem, 1996), and because computers have revolutionized

culture at large and promise to continue to do so in the foreseeable future (Maddux, 2001, p.5). Schools, which until recently have lagged behind in the implementation of IT, are now attempting to close the gap and there is immense pressure on them as the external authorities have steadily increased their demand to handle data effectively and produce up-to-date feedback (Wild et. al., 2001). In comparison to the situation in business, today's schools are still organized around yesterday's ideas and needs. This is because information in schools tends to be archived rather than data- based which means that the computer is primarily used to store information (Barta et, al., 1995; Schank and Cleary, 1995; Cortada, 1996). This, however, is not sufficient as it is one thing to store the data and another to process it as a source of information (Wild et. al., 2001). Even computerized schools still operate in an identical way to the original paper and pencil method- albeit in an automated mode, and mimic the previous manual system (Wild, 1995; Barta, 1995). IT is not only a tool, but also introduces a set of management practices that shape the administrative and pedagogical work of schools (Haughey, 2003, p.63).

The connection between the administration of educational organizations and the context of learning is still not well-understood. Indeed, there is a continuing debate over the relevance of management to education which shows that this vital connection needs to be clarified. There are many issues that still need to be explored concerning the link that should exist between a) the knowledge of teachers and their use of IT and b) the need for a paradigm shift to help us understand how to close the continuing gap that exists between the pace of constant innovations and the time it takes to implement them into educational practice (West-Burnham, 1994; Kennwell, 1997; Holmes and Russell, 1999).

The implementation of current IT policies ignores the teachers' position even though it is clear that teachers will carry on playing a key role in any development in this field. Teaching, for example, can never be supervised like labour on a production line because teachers are more independent and have sole responsibility for their work. Unfortunately, IT systems are not custom designed to the needs of each school or teachers. As a result, there are many teachers who are afraid that IS will reveal their work and show them up as incompetent (Dunn and Morgan, 1987; Helsby, 1999).

Information Technology (IT) is essential for all schools as there is an enormous amount of educational data generated by pupils, parents, teachers, and educational authorities and, while it is essential to have a tool to compile and analyze this valuable information, it is kept in the Senior Management Team (SMT) circle only. This approach creates a rigid structure and misses the main contribution IT can make to educational systems – making things more flexible and decentralized. This rigid structure needs to be overcome in order to make it possible for schools to react quickly to technological innovations (Child, 1988; Barta, 1995; Makela, 1997). Schools need to spend more money on information technology and understand that keeping their respective institutions updated is an ongoing task if one wishes to prevent a gap developing between education work and the environment in which it takes place (Wild et. al., 2001).

The integration of IS into schools takes much longer than its introduction into the community in general as it needs to overcome many problems related to the school's structure. Recently, for example, new policies have exposed schools to the pressures of the market (or at least the quasi-market). In addition school administration and management has become more complicated because of the decision to focus on quality aspects in education. At present educational organizations are equipped to handle mass

educational work but it is difficult for them to cope with the demands that arise for more quality of education and more flexibility. To function as an organization in a competitive world means to make use of marketing strategies and schools are not excluded from this (Rubinstein, 1995; Hsu, 1995; Van-Weert 1995; Underwood, 1997).

In contrast to the business world that has adopted high technology and has incorporated IT as a major tool in integrating innovations, schools are often not well oriented technologically. In contrast, industrial and commercial environments have gained valuable experience in operating information systems the educational community still needs to respond more effectively to technological change. In order to gain some advantage through using IT, schools and colleges need to exploit the experience of other institutions and analyze the issues in order to find which components meet their specific requirements (Synnot, 1987; Bush, 1995; Selwood, 1995; Crawford, 1997; Helsby, 1999). Although schools are not under the same pressures as industry, since they have different priorities, schools, nevertheless, cannot afford to allow big gaps to open up between them and the world around them. Schools already need to re- define what is good and bad practice in using Information Technology in Educational Management (ITEM) (Wild et. al., 2001).

As a result of the implementation of ITEM schools should expect changes to take place as has happened in industry where increasing sophistication has brought about both personnel and organizational changes. Industrial and commercial organizations, for example, have been forced to re-engineer Human Resources (HR) to support their personnel, and to develop evaluation tools in order to improve the quality of business performance. Schools and colleges cannot ignore the experience of business where the

big companies were the first to realize the advantages and disadvantages of IT to improve competitive potential, and should take advantage of this experience – albeit carefully. (Riches, 1994; Wild, 1995; Timms and Finn, 1996; Robinson, 1997).

The Educational Reform Act of 1988 in the United Kingdom (ERA, 1988) created a climate of massive change and competition among schools while the search for higher educational standards through the Local Management of Schools (LMS) has increased the financial responsibility of individual schools in the UK. Accordingly the Local Education Authorities (LEAs) have been compelled to delegate much of their managerial and financial power to schools and the schools, as a result, have been challenged to cope with this new situation (Wild et. al., 2001, p.99). The Act not only placed a legal requirement on schools to make the additional information available to parents, government and LEA's and increased the power of the Secretary of State (thus strengthening national control over the curriculum) but it gave governing bodies a better perspective on how to lead their schools.

These changes forced schools to consider better ways to manage their organizations effectively and, although the introduction of IT was not compulsory for schools, the extra demands placed upon them have made it sensible for schools to obtain tools to assist in the extra work of educational management. ERA (1988) was another trigger which has encouraged schools to consider the implementation of ITEM (Selwood, 1995; Wild, 1995; Bush, 1995; Scott and Robinson, 1996) since the legislation that introduced ERA in1988 intensified teacher work load. In England the pressure started as a result of the introduction of more school autonomy and financial accountability. However, there were other reasons as well such as the introduction of the National Curriculum and the

introduction of inspection by the Office for Standards in Education (OFSTED) (Bush and West-Burnham, 1994; Wild et. al., 2001). The use of computers was expected to enhance teaching and learning in the 1980s but the introduction of IT required a profound change to take place in teachers' work since their roles had been changed from being instructors to guides. Instead of the teacher being the main source of information, now the expectation was, and still is, that the teacher be a guide to the pupil in his/her exploration of different sources of information. As a result of the lack of success of the Israeli project 'Tomorrow 98' (see further on) teaching all subjects using IT has remained incomplete and thus still presents a challenge (Collis, 1995; Pieters, 1995).

Governments, it appears, have been ready to finance this new technology and in England, in the early 1980s, for instance, the government announced its intention to provide 25 million pounds sterling for Education Support Grants (ESG) over a three-year period. Since 1988 the British government has invested 325 millions pounds sterling in order to update and develop teachers' skills to help them face the challenges of the 21st century (Selwood, 1995; Leask, 1999; Wild et. al.2001). In Israel, the government advertised the availability of substantial assistance for secondary schools to adopt the Management Information System MIS. In its Hebrew translation the programme is called MANBAS (which means The Management of Schools) and it is parallel to the School Management Information System (SMIS). In addition the Israeli government invested more than IS200 million in a programme called 'Tomorrow 98'- which was a programme aimed at making it possible to teach all subjects in secondary schools with the use of computers (Gev, 1995). This will be discussed in more detail in the Context section of this chapter.

Technological developments that have taken place at the beginning of this new millennium have brought about changes that would have been unimaginable a few decades ago. At the present time, we are witnessing our transition from being an industrial society into becoming an informational society. Hence, schools need to recognize the essential bond that exists between education and the use of computers as a tool for the future informational society, otherwise education cannot act as the basis for preparing the next generation (Brown, 1995). The new millennium has challenged schools to consider creating an alternative future by adopting the potential that Information Technology (IT) offers and, if schools ignore this potential, they will find themselves lagging far behind and in danger of becoming antiquated (Lofthouse, 1994; Leask and Pachler, 1999).

In the age of globalization, schools cannot operate as isolated institutions and, since not all countries have yet reached the level of operating IT in schools; a collective effort is required to achieve this goal. There are some global changes that cannot be ignored: the globalization of capital, the restructuring of world economies, and the gradual increase in democracy in countries after the fall of the Iron Curtain, the increasing number of countries joining the European Common Market. In addition to these, there are the initiatives of different individual countries such as Sweden which, in 1998, encouraged the creation of the European School Net to support schools with pedagogical resources to exchange views and information. Information Technology (IT) makes it possible for education systems to operate on both on the global level and other levels such as; the school level, the district level, and the state level (Fung, 1995; Visscher, 1995; Helsby, 1999).

Today, a generation in technology has been reduced to only 3-5 years and this change has caused society to relate to innovation more openly (Rubinstein, 1995). This change has presented a challenge to administrators and creates a major difficulty for education since it is difficult to determine what the next cultural trend will be in society while such developments are still in progress. The basic problem, however, is not how to introduce computers into educational management, but how to construct an educational management system which is based on the presence and use of computers. A conference that took place in Jerusalem in1994 on the implications of the use of ITEM can serve as a model for many others on how to cope with this challenge. The conference in Jerusalem discussed the increasing interest of different countries in using ITEM and their readiness to invest more money in the implementation of this system in schools. This is an example of how ITEM has become a valuable new area of research but also shows that more research is required in order to assess its suitability for schools (Visscher, 1995).

Education is now in a better position to use Information Technology in Educational Management (ITEM) because of the following external influences:

1. The new millennium which emphasizes the impact of globalization.

2. The impact of the information era which emphasizes the importance of collecting data and analyzing it scientifically.

3. The post-modernism approach that mainly focuses on individual content and the fact that IT encourages individual input.

4. The involvement of governments in carrying out educational reform.

5. The need of schools for a tool that can assist them to respond to the extra demands made by external authorities.

In addition to this we must add all the changes that have taken place in recent years such as the 'open enrolment' policy, the marketing of schools, the computer's impact on organizations making them more flexible and, above all, the requirement to adjust the management of classrooms to the new technology. All of this has created a unique opportunity, a fundamental opportunity, to increase the use of ITEM in schools and, thus, make the practice of education more effective (Bjorn, 1986; Ruggles, 1997).

It is these factors that have led this thesis to examine the effects of IT on educational management including the management of classrooms. Based on the review of literature the 'Information Era' places its emphasis on the following effects brought about by Information Technology in Educational Management (ITEM):

1. The style of management in schools.

2. The effects on the flexible approach,

3. The communication and its effects on relationships in schools,

4. The decision- making process and its effects on the autonomy of the schools

5. The analyses of pupils' results and its effects on classroom management (Barta et, al., 1995; Cortada, 1996; Fung et, al., 1997).

HISTORY.

Today, at the beginning of the 21st century, the impact of computers on our daily lives cannot be ignored. However, it has taken almost half a century to reach our present sophisticated stage of computerization. The history of computers started about 60 years ago when the term used was 'calculator' and in the 1950s and 1960s, computers, as they were new called, were considered to be a direct development of office machine-like typewriters, calculating devices, punch cards and similar devices. By the middle of the 1970s these devices began to be called 'mainframe" and 'mini' computers whose uses were identified mainly for science, office work and military purposes. In the 1980s a huge impact was achieved with the development of 'microcomputers' and 'personal computers', the most popular being 'Macs' and 'PCs'. Computer technology has moved through five 'generations' up till the development of our current computers. Nowadays, it is no longer uncommon to hear such key words as database, input, output, network, programme, hardware, and software. There is no doubt that the worldwide community both recognizes and accepts the mushrooming computer -controlled revolutions taking place in almost everything. Indeed, this technology has managed to capture the imagination of people around the globe. There are areas of life where it is difficult to imagine how they can operate without computers e.g. airline companies cannot provide any service without using computer systems. In fact, computers have been able to answer humanity's historic need for technologies that decrease the amount of manual effort needed to do certain things and so have raised our standard of living (Radin and Greenberg, 1983).

As our world becomes more complex and there is a constant increase in the number of tasks to be performed, modern technology is expected to provide ways to replace the

manual processes that no longer prove adequate. Contemporary historians have been quite surprised that this era, which was previously defined as the" Nuclear Age", has, all of a sudden, become the 'Computer Age' and the 'Information Era'. This change has taken place because computer technology has made huge progress in the last twenty years and nothing has done more for computers than the 40 years of "cold war". As a result of the competition between 'East' and 'West', computer development became well -established in industry and, not only received national funding, but, in the private sector, also benefited greatly from improved manufacturing, sales, distribution, and marketing. The penetration of computers into the consumer market closely followed the same pattern of other technologies like radio, television, aircraft, and even electricity (Cortada, 1996).

The use of the personal computer (PC) increased enormously during the 1980s and, for example, in 1989 most paid workers in Sweden worked with personal computers (Green et al, 1993). The 1980s were a turning point in the usage of PCs and, in the U.S., more than one- third of American homes purchased personal computers. In 1964 the estimated software revenue in U.S.A (in millions of dollars) was 275 and by 1980 the total amount was 2,100. In 1982 more than one million PC's were sold in the USA (Cortada, 1996) and, according to the White House, since 1995 more than a third of all U.S. economic growth has resulted from IT enterprises. There are more than 13 million people in the United States holding IT related jobs and the rate of employment growth in IT is 6 times as fast as overall job growth (Maddux, 2001, p.6). When schools became connected to the Internet the number of computers in U.S. schools grew rapidly. In addition to this 50% of U.S. homes had a computer by the year 2000 and 700 new

households were being connected to the Internet each hour with 14 million of the users (about 25%) being school children (Maddux, 2001, p.7).

Probably, the biggest surprise in the history of information processing has been the speed and extent with which personal computing has burst onto the scene. The main reason for this has been the computer's capability to store and manipulate information and there is no doubt that the introduction of the PC influenced the speedy acceptance of computers. This profound change in the 1980s also took place thanks to new companies such as Microsoft which provided the Digital Operating System (DOS) –the operating system used by most PCs. The digital electronic computers with their new and enhanced graphic performance managed to overcome the obstacle whereby human beings think mostly in terms of words, numbers and pictures. Computers operate in terms of binary bits but the use of displays (like television screens) allows the computer to present information in a form that is readily understandable to human beings (Green and Parslow, 1970).

The 'Information Era' started about 20 years ago and it has had a different emphasis from that of the 'Computer Era'. If, in the computer era, the emphasis was on centralizing the organization, concentrating on the computer's hardware and letting the technicians lead the organization in this respect, then the emphasis of the 'Information Era' has been on the following areas: decentralizing the organization, concentrating on communication and data and encouraging managers to become leaders in the use of information technology (Anderson et, al., 1986; Cortada, 1996).

The growth of IT has been very impressive. The criterion for judging the importance of

IT for an argumentation is not how much money it can save in running a department, but how it can increase its financial activities and improve the quality of the services offered to the customers. At the beginning of the 1960s the term used for information was 'data', in the 1970s the term became 'information', in the 1980s it became 'information resources' while in the 1990s the term 'information weapon' began to be used. The view was that information technology could provide substantial advantages and power in the battle with competitors and thus it was seen as a weapon (Zaboff, 1988; Cortada, 1996).

The history of Management Information Systems (MIS) shows how it has had a direct influence on school management. If the terminology to describe the use of information in1950s and 1960s was 'Electronic Data Processing' (EDP), then by the mid 1970s the terminology was changed to a new popular term: 'Management Information System' (MIS). This reflected the upgrading from EDP to a higher phase which offered analysis and assistance in decision-making and, as a result, the implementation of MIS became an important task for organizations. Only in the latter part of the 1980s did educational administrators start to study the potential of MIS when the need for tools to assist them in pedagogical and management work became urgent due to the rapid changes taking place both in the way schools worked and the development of MIS in business (Telem, 1996).

In 1989 the Israeli Ministry of Education decided to introduce the Schools Management Information System (SMIS). A special government department, the 'National Operation Center', was formed whose purpose was to guide and monitor the implementation of SMIS. The focus was placed on developing a programme which would assist

in creating standardized files, preparing training courses, establishing professional guidance for principals and teachers, building a common educational network that could serve educational systems and providing information in real time to local and governmental authorities (Sagi et, al., 1995).

In England it took a while for schools to realize the potential of MIS. In the 1980s schools in England had little choice about working with their MIS as this was required for the convenience of the LEA, to assist them in running their financial affairs according to the LEA's expectations (Francis, 1994). The approach of the LEA did not use the full potential of MIS which was capable of assisting school management to both lead and provide them with an essential database of information (Leask and Pachler, 1999). There have been some changes made in recent years however. Until the early 1990s it was relatively easy to define who the users of IT were and who the indirect users were. In the early part of the 21st century it is more difficult to distinguish between them since the view of all users tends to be more positive towards the use of ITEM. Another change from the early 1990s is that, at that time, managers tended to rely on a computer expert to run the system. In contrast, at the beginning of the 21st century managers tend to use the systems directly themselves. In the early part of the 1990s the majority of direct users considered IT to be time consuming and people had difficulties making reports. However, at the early part of the 21st century, there is more satisfaction, for example, with the production of school end of term reports to the parents and general agreement that the system contributes to the administration and management of the schools (Wild et, al., 2001, pp.117-119).

History has revealed the power of certain technological innovations to transform the

mental life of an era, the perceptions people have and, above all, the possibilities that can define mankind in new ways and make the world a new place. 'Information Technology' (IT), which achieved its present shape in the 1990s, possesses this power to organize things anew. Of course, IT has only become an effective tool for organizations that have been ready to accept innovation (Synnot 1987) and schools that accept this can learn from the experience of leading companies that have gained great advantage by using 'smart machines' (Zaboff, 1988).

RATIONALE AND SIGNIFICANCE:

History has taught us that tools can increase our ability to control the environment. In fact, human cultures can be, and have been, defined by their use of tools (Ridgeway and Vygotsky, 1997). Thomas Carlyle in the 19th century wrote that man is a tool-using animal; without a tool he is nothing, with a tool he is all. Since organizations (including commercial companies) came to the conclusion that IT can advance them in their competition with each other the field of information systems has become a major research arena (O'Brien, 1997). After more than 20 years of experience in different organizations, however, there is now a need to examine how this tool also affects educational systems (Visscher and Wild, 1995). Since the world keeps changing all the time and information systems play an important part in this transformation schools need to explore the effects of IT on educational systems. In fact schools cannot exclude themselves from the effects Information Systems have since it not only touches upon many of the activities of organization but also links educational organizations with the continuous changes affecting the world. IS or IT opens up a new way of doing things better, faster, and cheaper as it opens a gate that leads into the 21st century (Synnot, 1987).

This study intends to analyze the effects the Information Technology in Educational Management (ITEM) systems has had on Israeli secondary schools from the point of view of four aspects that researchers have defined as emphasizing the 'Information Era' (Barta et, al., 1995; Cortada, 1996; Fung et, al., 1997).

The first aspect is to determine whether this technology does, in fact, lead towards more flexible and independent schools or whether, on the contrary, it leads to an increase in the control exercised over educational staff (Ridgeway, 1997; Telem et. al., 1997; Stoll, 1999). Today, in the 'information era' there is significant reason to investigate whether ITEM has had an impact on handling the massive amount of information that exists in schools and the relationships among people in education. Because of the massive amount of information and the openness of our world, schools require computerized information systems like ITEM in order to perform their jobs according to the expectation of the modern societies (Kenway, 1996; Maddux et. al., 2001).

Since the availability of information in real time affects people's life styles, (and some researchers refer to this change taking place as a result of using 'superhighway information systems'), life in today's 'information era', has changed (Kenway, 1996). The immediate change that has taken place has been the effect on the authority of leaders and adults who, now, cannot exercise their authority based on exclusive knowledge because information is shared equally among all people in the organization. This change in authority is one of the reasons why schools have to embark on a new way of handling things and why educational workers have to understand that there is no longer any one single narrative or truth that explains things. Contemporary society has opened up and now accepts a range of new narratives so that something that has happened

as a consequence of the information era which has made information available to all can not be controlled by any single authority (Ezrahi, 1994; Macdonald, 1998).

There is a need to research the impact of information technology on the relationship between educational leaders and staff. There is a need to clarify the characteristics of IT systems and how they affect authority in education and also to investigate where the main effect of IT is on the leaders' work in their schools. Such a focus and discussion can help identify areas that ITEM can improve in school administration and educational management (Visscher, 1995; Telem, 1996; Visscher and Wild, 1997). On the one hand, school organization suffers from a quite flat hierarchical structure. On the other hand, schools are quite complicated organizations since they are bureaucratic and professionally complex. Schools share the same complexity that exists in any medium sized organization and, in addition, they have the responsibility for teaching and learning. For a number of reasons schools need to be investigated to see if IT can help fix the problems involved. For example the school administrator's role is not always clear in relation to teaching since there is only a loose connection between administration and teaching; and, although there is interdependence in staff relations, the interpersonal ties are quite loose (Telem, 1996). Moreover, there is also a lack of standardization in the work done at school and this is another reason for research to explore whether ITEM can coordinate the work in schools and organize its tasks better (Semrau, 1990; Conger, 1992).

While there is a need to investigate the impact of ITEM on leaders there is also a need to research the reaction of teachers to the system. Teachers may feel threatened by the fact that the new technology provides information about the results of their work –

something that might create the impression that ITEM, in fact, has been brought in to assist the administrators. Should teachers, for example, feel apprehensive about letting the computers do the frustrating routine work of recording and distributing information? This is another reason why there is a need for a study to be undertaken which can assess whether this apprehension about the implementation of IT in educational settings is appropriate or not (Hall-Sheehy, 1988; Bruno, 1995). It would also be meaningful for such research to analyze whether ITEM, in fact, assists in devolving power to staff since they are expected to have more authority over the curriculum and to work more as colleagues than work according to the 'top down' style. Such research can determine whether IT does, in fact, reduce the hierarchical distance between senior managers and their employees (Moss-Jones, 1990; Zeffane, 1992).

The second aspect of the research should have a significant impact on creating a new way of dialogue - something that is needed in schools to reduce the conflict among those involved in the school's management, i.e. heads, teachers, students and parents (O' Mahony, 1997). Information Technology (IT) is accessible to everyone in the organization and it can give immediate feedback and answers to different questions and enquiries (Crawford, 1997). Thus one needs to research whether ITEM can establish a new way of communication in schools – one that will take place on the computer screens rather than through 'face to face' meetings (Kenway, 1996; Nolan, 1996). If such dialogue can take place in schools then the communication will not be limited by time or place (Gev, 1995; Wild, 1997). This new kind of a dialogue can create new and essential information for the organization and diffuse it among all the people in school. This can be an advantage for any organization that needs to rationalize its competitive tasks and improve coordination among all the departments (Buchanan and Boddy, 1983; Synnot, 1987; Zaboff, 1988).

The significance of IT is that, for the first time in human history, there is a tool that has become interactive. In fact, computers are no longer just useful tools but have turned into tools that humans can 'converse' with (Rudy and Ruggles, 1997). IS, as a modern tool, enables interaction with databases and responds to queries involving the different areas the schools' management is interested in (Visscher, 1995). Communication is a key resource in the management of education and is the reason why this study is seeking to find out whether ITEM can maximize dialogue in schools through the use of information systems (Hsu, 1994).

The third aspect to be investigated is the impact of ITEM on the ability of schools to improve the decision making process and become more independent of external authorities in making decisions. Decision-making is regarded as one of the most important practical activities of educational management (Bush, 1994) and school managements are particularly concerned with developing decision-making process as that can affect the learning environment (Wild, 1995). Therefore, there is need for research into whether ITEM can assist in all stages of the decision-making process i.e. problem identification, prioritizing of criteria, data organization, and evaluation of alternatives, 'what if' analysis, and implementing the school's plan. Decision Support Systems (DSS) play a central role in the existing literature on information technology (IT) and the Educational Decision Support System (EDSS) has been introduced to improve educational performance, strengthen educational leadership in decision-making and increase school independence (Telem, 1990; Telem, 1995).

Today, schools are under great pressure because of the policy of 'open enrolment' i.e. the establishment of a competitive market in education. To a large extent this is the reason

why they strive for a system which can provide 'error free performance' for routine work to maintain the school's prestige within the community (Venni, 1995). Every organization clearly has to clarify its strategic objectives and decide how to meet changing market conditions, and reduce waste of time. Schools need a tool that can improve the quality of their product and provide a better service. As a consequence of such an improvement taking place, the schools can be granted more independence from governmental authorities as they will have, hopefully, proved that they can handle their tasks with the additional autonomy they have been granted.

Information technology is a tool that is vital for schools wishing to gain more autonomy since IT allows heads to plan for the long term. This study wishes to investigate:

1. Whether directly budgeting the schools can increase their autonomy or
2. Whether there is a connection between the uses of ITEM for running the schools' budget and the government's intention to transfer the money directly to schools in order to allow them to spend the money according to their own priorities (Lowrie, 1989). This policy makes school heads responsible for expenditure on salaries, books, rates, cleaning and security. (Coulson, 1988). It is the reason why there is a need to investigate if there is a connection between the use of information systems and the fact that heads can assume this new role which includes responsibility for capital budgeting, financial forecasting, tax payments and financial planning. Running the budget autonomously is part and parcel of the policy to increase school independence (Fawcett, 1996).

Since the link between ITEM as a management tool and ITEM as a pedagogical tool is not completely clear (Fung and Pun, 1997; Telem et. al., 1997), research is needed to

determine whether ITEM allows schools to concentrate on the quality aspects of educational work and whether the system can evaluate classroom practice (Visscher, 1995). If ITEM can do these things then power should logically devolve to the staff since it is the teachers who need to assume more responsibility in order to be able to evaluate classroom practice (Visscher, 1995). So, the fourth aspect to be investigated is managing classrooms.

The significance of the information era is that schools cannot maintain the old traditional approach towards managing classrooms, an approach which is based on the frontal lesson (Fung and Pun, 1997). As a consequence, and under the impact of the information era, schools today need to adjust themselves to the current of 'information superhighway' approach and rely on IT to be the central tool to achieve this since it enables schools to manage their classrooms differently (Barta, 1997).

To whom is this system important? Information Technology in Educational Management (ITEM) is important to the leadership of any school or college. Information systems can assist the school leadership to revise their ideas, and transform the style of leadership into a more participative direction (Anderson et. al., 1986). It can also lead to a reconsideration of the structure of the school and so improve the schools' organization. Leaders can also get better information from the system instead of spending a lot of time collecting information on a 'face-to-face' basis. IT can reduce this dependence and enable managers to focus on other important tasks such as: planning, decision -making and marketing strategies (Masuch 1990). MIS can assist the school leadership to perceive themselves as a self-managing administration. IT can help the leadership control departmental structures and computers can affect the structure and hierarchy of the organization by reducing the numbers of

middle managers (Moss-Jones1990). Consequently these systems can help leaders to fulfill their main missions of improving their schools, controlling their budgets and creating an effective teaching and learning environment (Coleman, 1994; Bush, 1995).

ITEM is also important to teachers since it can help them improve pedagogical decision making. It can help them create a learning environment and assist them in building a new paradigm of teaching (Moonen, 1995). ITEM has the potential to encourage an 'open minded' approach and to a new way of handling teaching. The statistical bulletin DFE 1995 shows, however, that less than 10% of teachers make substantial use of IT (Watson, 1997). IT can allow teachers to produce better worksheets and follow up pupil performance and since the National Curriculum has intensified their workload and increased the demand for formal accountability this is important (Winter, 1998; Helsby, 1999). In addition to all the above IT is important for society because it demonstrates the importance of teaching technology for a future society (Wright, 1996).

IT is important to parents and pupils since it can provide access to the pupils' own information at any time (Burton, 1995). IT can also support the placement of pupils into educational frameworks that match their abilities (Barta, 1995). While the availability of on-line information can encourage parents and pupils to become more involved in school life the opportunity for communication is also very important since it can improve the relationships between schools and their clients (Riches, 1994; O'Mahony, 1997). While IT has become part of youth culture and there is a need to develop the skills of pupils in this area, it can also serve as a bridge between teachers and pupils in order to bridge the generation gap (Stoner, 1999).

ITEM is important for both the Ministry of Education and the local authorities since it can link the school information system directly to the Ministry of Education allowing the inspection and advisory service to be provided directly from the Ministry of Education. Due to the centralization of the government's efforts schools can gain access to a broad range of resources (Moonen, 1995), something that contributes to the development of an "informed citizen", one who can make his/her contribution to the economic and cultural life of the country and also help the country to compete internationally in a wide range of activities (Ridgeway, 1997). The involvement of government is important as the introduction of ITEM requires a heavy investment and the local education authorities cannot cope with this financial burden alone. The advantage of this system for governmental authority is that it allows for greater direct control over schools and obviates the need for assistance from the local and regional authorities (Tantall, 1995; Visscher, 1995).

CONTEXT.

It is not simple to clearly explain the meaning of School Information Systems (SIS) since the technology on which is based keeps continuously evolving and this is the reason why researchers prefer defining SIS in broad terms as:

"An information system based on one or more computers, consisting of a data bank and one or more computer applications which altogether enable the computer-supported storage, manipulation, retrieval and distribution of data to support school management"

(Visscher, 2001, p.4).

The field of SIS as a support system for education has grown considerably during the 1990s and one indication of the increased interest in SIS is the growing number of the World Conferences on the use of computers for school management. In Birmingham, twenty experts from ten different countries gathered to produce a report about the ongoing growth of IT in Educational Management (ITEM) and the first international conference on ITEM was held in Jerusalem in 1994. Since then a conference has been organized every two years (Nolan and Visscher, 1996; Visscher, 2001).

Since the context of this research is secondary schools, , from now on most references will be to them and the work will focus on the goal of using computers and information systems in secondary schools and how to manage education better faster and more accurately. The general view of the researcher is that ITEM can serve as a tool that will drive the efforts for improvement in managing education and administration (Barta, 1995; Nolan, 1995; Visscher, 1995; Tatnall, 1995; Wild, 1995; Telem, 1996; Fung, 1997). If, in the early1980s and 1990s, the main effort was expended on building and

implementing IT in schools, then today, in the early 21st century, the emphasis should be placed on evaluating the effects of ITEM on different aspects of school life (Wild et. al., 2001).

Different bodies have different interests for using ITEM in schools. For example the external authorities who have invested money in this technology want to know if the nation's investment is providing a return in terms of student achievement. The evaluation of ITEM is important as not all aspects that use technology are going to be successful - something that makes it essential to know what works and what does not work. It is essential to examine the effects of ITEM on secondary schools since

a) The technology is quite new and the cost of its implementation is enormous and

b) It is important to investigate in which direction ITEM is moving the existing schools.

The analysis of ITEM in secondary schools needs to take into consideration a variety of educational perceptions before any reasonable decision can be taken about it. ITEM contains a large amount of information that refers to different aspects of school activities and each group involved has different expectations from this tool. For example, the outlook and expectations of the external authorities is not automatically the same as the approach of the teachers and the outlook of the schools' leadership is not automatically the same as the parents or the external authorities. ITEM, as a result, will be evaluated differently by different groups.

Since the introduction of ITEM into schools involves the investment of a lot of money its implementation is beyond the ability of any single school to do alone which makes schools dependent on decisions made by their respective governments (Visscher, 1995). The decision of each government to invest money is not only dependent on the needs of

each school but also mainly on what the practice is on both the international and national levels. The international experience of ITEM and SMIS varies in each country but what is common to them all is that the main factor that has driven the development of this system ahead is the government of each country. For example, the U.S. government clearly took a pioneering role in this area in the1960s mainly for payroll and financial matters. Ten years later Mexico, The Netherlands, Hong-Kong and Great Britain also initiated a similar programme while countries like Australia and Israel joined the school administrative programme only in the 1980s (Visscher, 2001).

By the1980s only the U.S.A., Great Britain, Netherlands and Australia had managed to achieve this phase but not all countries have, even now, managed to reach the integration stage of this system. The main surprise was that Australia developed the programme called Computer Assist School Administration (CASA) even though their experience started, like Israel's, only in the 1980s and this was achieved thanks to the active involvement of the Australian government (Visscher, 1995). In Great Britain the report from the early 1990s of the Audit Commission for England and Wales showed that only 20% of institutions had managed to implement the system successfully while about 40% reported only partial success with IT. The Audit Commission for England and Wales also found that local governments had done little to carry out this task and had not checked whether the target objectives had been achieved (Wild, 1995). In Germany where there is no common approach to Computer Assist School Administration (CASA) and the budget is divided between 16 federal states each with its own laws, it is difficult to implement the system especially as there is no real uniformity in German schools. In Westphalia, for example, the (CASA) was introduced to assist schools during their peak work periods which were characterized by the following activities: writing reports,

preparing timetables, organizing students' matriculation papers and sending letters of acceptance to prospective pupils (Kuhlmann, 1995).

In New Zealand according to a survey carried out in 1994, 70% of the schools were either already using such a system or expressed their wish to do so. The programme used was prepared by Massey University and is called Massey University School Administration by Computer (MUSAC) (Nolan, 1995).

In Singapore the master plan for IT in Education is a blueprint for the integration of Information Technology (IT) in education as a strategy to meet the challenges of the 21st century. The underlying philosophy of the master plan is that education should continually anticipate the future needs of society, and work towards fulfilling those needs. The master plan is governed by four overall goals:

1. To enhance linkages between the school and its environs to expand and enrich the learning environment.

2. To encourage creative thinking and learning.

3. To generate innovative processes in education.

4. To promote administrative and management excellence in the system of education.

The aim of these goals of IT is to improve communication within the school, amongst schools and between The Ministry of Education (MOE) headquarters of Singapore and schools. Ready access to online data and information will also support decision- making at all levels. The master plan started in 1997 and the aim was to reach these goals by the year 2002. At that time the ratio of computers supplied by the government was 6.6:1 for pupils and 2: 1 for teachers and the aim of Singapore was

to reduce the pupil-computer ratio to 2.1:1. by 2002. The government of Singapore provides networking in every school in order to enable every classroom to have access to the Internet. Networking also allows the sharing of teaching resources and there is a scheme to help teachers purchase their own computers in which they receive between 20%-40% reimbursement for purchasing computers and notebooks.

The national attitude in Israel toward information systems and computers in schools is based on the decision made in 1989 when the Israeli Ministry of Education initiated the MANBAS project (a Hebrew acronym for Management of Schools). This programme is based on the programmes and technology of the School Management Information System (SMIS) and aimed to improve the Information Technology in Educational System (ITEM). The management of MANBAS is provided by the 'National Operation Centre' in Tel-Aviv (Sagi, 1995) and works with the software of 'Windows 95'. In 1994 more than 1400 schools joined the MANBAS project (about 50% of all schools in Israel) and some 60 schools were defined as "leading schools". In order to introduce MANBAS and assimilate the programme into schools the following preparations were made:

1. The establishment, development and maintenance of a standardized filing system.
2. The establishment of a common database.
3. The establishment of training courses for the school management staff (40 hours), and 20-hour courses for the secretarial staff.
4. Offering professional guidance. (a consultant for every school even before the installation of the system).

5. The establishment of communication with other educational systems.
6. The establishment of an information centre (Sagi et. al., 1995).

The national education system in Israel is now in the middle of a process of decentralization in which IT has been incorporated to help transform schools towards autonomy (Rubinstein 1995). There are many and varied Israeli users of this programme all with different purposes who characterize and constitute Israel's educational system: i.e. politicians who want to take decisions about education, inspectors who want to supervise schools, government officials who want to control the system, principals who want to run the schools effectively, teachers who want to handle the teaching process and parents who want to know what the educational progress of their children is in real time (Fitz-Gibbon, 1996; Hogenbirk, 1997; Underwood, 1997; Visscher and Bloemen, 1999).

The Ministry of Education in Israel prepared the programme of Information System in Education (ISE) in order to tackle the computerization process at three levels:

* Headquarters level. The center in Jerusalem has an I.B.M system which made it possible for two ways of communications to be established between schools and the Ministry of Education. The system is decentralized and this, of course, affects the level of control and inspection.

* The district level. The country is divided into seven districts and centres which provide technological services and training for the users of SMIS have been established in the main cities

* School level. The government has provided computers to each school through the local authorities and the most popular usage of MANBAS is: pupil data management, test marks recording, teacher data management, weekly lesson planning, and recording attendance (Gev 1995).

In order to make MANBAS into one of the most important information systems for Schools in Israel the Ministry of Education's undertook the following:

1. In 1991 five private firms won Ministry of Education tenders to assist schools to assimilate MANBAS as information system. Every school could freely connect up with any of these five companies.

2. In 1997 the Ministry of Education decided that the decentralization was too great and that five companies were too many-especially when one took into consideration that schools did not speak "one language' owing to the fact that each company used its own, different, software. As a result it was decided that only one company would be responsible for the content and three others companies would be responsible for installation and current maintenance. All of these companies were placed under the supervision of the Ministry of Education's Computerization and Information Authority in Jerusalem. The company that won the tender to provide the single content programme of information system was Tel-Dor a company in Petach Tikvah. This company implements the demands and requirements of the education system as stipulated by the Ministry of Education's Computerization and Information Authority in Jerusalem and there is a permanent representative of this authority who works closely with the Tel –Dor Company. The Tel-Dor company is assisted by 36 advisors spread out all over the country who help the school administration to assimilate the MANBAS as an Information System and also to guide the teachers in

using the MANBASON –a programme through which they feed information into MANBAS. Teachers are provided with the MANBASON programme which they download to their home computer where they can update details in their own time and copy the information onto discs so they can download them onto the school's computer. For those who cannot do this at home there are computers in the staff room and the school office that can be used for this purpose (MANBAS Bulletin, 2000, pp.1-13; MANBAS Bulletined, 2002, pp1-8).

In 2000 the MANBAS management initiated a new program which offered innovative options such as: alternative assessment-based not only on examinations but also on a pupil portfolio, interdisciplinary studies etc. The new MANBAS assisted in managing the matriculation results of every pupil and provided a variety of options to design school reports to parents in a way that would be more meaningful – containing not only the marks but also other details that help the parents better understand their children's achievements. In 2001 the programme began to work with Windows XP and not only was the new MANBAS connected to more than 1950 schools but, in addition, 827 schools were connected to the pedagogical network and 1158 schools were connected to the management network as well.

The introduction of information systems at the institutional level in Israel required asking certain fundamental questions about the key aspects of schools.

Information systems are more intensively used in secondary schools than in primary schools because of the nature of work in these schools which involves records of assessment, attendance, finances, etc. The continued use of computers at the high school level depends upon whether the system being used can significantly cut down time and

effort spent, for example, on data storage. Each secondary school in Israel was first required to determine its goals and objectives and, only after that, to establish how ITEM could be implemented in their particular school (Gev, 1995; Leask and Pachler, 1999).

Although, as indicated above, the initiative to implement IT has mainly come from governments, the actual operation of ITEM depends on each individual school. As a result the approach adopted by principals and teachers toward ITEM is crucial to its successful operation as is a decision about whether the different interests involved might lead to undesirable consequences in each school or not. As indicated in the first two sections of this chapter this study intends to analyze the different approaches taken towards ITEM in four main areas and will use the research literature to explore and analyze the different effects of ITEM on different groups and schools (Gev, 1995).

Secondary schools in Israel vary. The majority are made up of general schools most of which include an intermediate section (i.e. pupils age 13-15), but there are also vocational institutions, religious secondary schools and Yeshivas (orthodox – half-day religious studies combined with secondary school studies). Some of the secondary schools have three year formats and some have four. Some of the institutions are one track types offering general or technological studies, and there others that teach more comprehensively. In secondary schools both one-track and multi-track studies are held in the framework of a number of different types of educational frameworks such as general institutions, agricultural, technological, and vocational schools. In addition to this there are several school networks in which there are schools that, on the one hand, have their own unique nature. An example of this is the ORT network which emphasizes the importance of vocational-technological studies or the AMIT network that emphasizes

the religious Zionist value. The context of this research will focus on secondary schools in general in Israel but in order to present a panoramic view, the research will also include comprehensive, religious, non-religious, vocational, local and regional schools.

Although most of these institutions contain an intermediate section, there are some intermediate schools that are still independent since they have not made the transition to a six-year school model. For the purpose of this study the schools which will be included in the research are mainly from the Haifa district and the northern area of Israel because of the accessibility of these schools for this research and also because this region reflects the vast panorama of schools that exist in Israel. More details can be found in the chapter on Methodology.

PURPOSES.

This thesis examines the use of Information Technology in Educational Management (ITEM), with the aim of examining the effects of this technology on the educational management of Israeli secondary schools. The purpose of this research is to concentrate on the effects of ITEM on secondary schools in four areas:

1. The effects of ITEM on management style.

Does ITEM enhance the power of headteachers by tightening up their control over people at schools or, on the contrary, does it allow them to adopt a flexible approach

towards the staff and, in this way, become encouraged to devolve more power to staff members (Telem, 1997).

2. The effects of ITEM on communication within schools and the quality of the dialogues that take place among people in education.

Can ITEM provide a new way of communication that improves the dialogue at schools or will this technology lead towards unacceptable distant relationships (Kenway, 1966; Wild 1997; Reyes 1997).

3. The effects of ITEM on the quality of the decision- making process in schools.

Does making an improvement in the decision –making process through the use of ITEM cause the educational authorities to be prepared to increase the school's autonomy, or on the contrary, is ITEM, in fact, a 'weapon' in the hands of external authorities who want to increase their interference in school business by exploiting the decision- making process and cynically use ITEM to assist them to achieve this aim (Ezrahi 1994, Lumby, 2000; West et. al., 2000).

4. The effects of ITEM on the distribution of power in schools.

Does ITEM provide more power to teachers in managing their classrooms as a result of its providing better analyses of the pupil's results or do the external authorities take advantage of ITEM to interfere in the management of classrooms as a result of their

control of the data about the pupil's results (Fung et. al., 1997; Telem et.al., 1997).

These purposes are addressed in the following four research questions that refer to the effects of IT on secondary schools:

1. Does ITEM increase or decrease the control of leaders over schools?

2. Does ICT create a new way of dialogue in schools or does it, either, weaken or strengthen existing personal ties in schools?

3. Does ITEM increase or decrease a school's independence from the external authorities and thus its autonomy in the decision – making process? How?

4. Do analyses of schools' results by ITEM increase the teachers' involvement in managing the classroom or minimize it? How?

METHODOLOGY

This thesis is based on a questionnaire survey and multiple case studies using semi-structured interviews. The process included: designing a questionnaire based on the literature, writing the research questions, and running a pilot project in two schools. The research sample includes people in secondary schools and local- governmental authorities in Israel and the questionnaire was distributed in 11 secondary schools located

in Haifa district and the northern part of Israel. Each school received 20-25 forms of the questionnaire for the following people; the headteacher, principals, educational leaders (heads of department and co-coordinators), teachers and, people who represent the external authorities. These people supervise the work of the school and provide its budgets-such as inspectors, senior Ministry of Education officials, Heads of Education Departments in local councils, local council officers. All of these examine the school's activities from outside and have a direct or indirect influence on the school's work.

The headteacher of each school was asked to submit a list of teachers and heads who had had experience with ITEM since it was implemented in the school. Each respondent received a stamped envelope, upon which the address was clearly written so as to make it simple to return the questionnaire. The questionnaire was sent once again to those who did not return the first questionnaire. The expectation of this phase was to collect data about the effects of using various computerized information systems in educational settings, to assess the implication of the use of various strategies in relation to IT, and to identify good and bad consequences as a result of the implementation of IT in Israeli secondary schools.

The next stage included running a few case studies among secondary schools selected on the basis of the questionnaire survey results. Semi -structured interviews took place in four selected schools. The interviews were recorded on a tape- recorder. These interviews included four headteachers, 10 teachers and educational leaders, and four participants from the external authorities - altogether 18 interviews. The expectation of this phase was to collect data that would shed light upon the effects of ITEM on secondary schools and to give the participants an opportunity to express their views

about ITEM in a way that gave them more freedom and allowed them to examine the advantages and disadvantages accrued in Israeli secondary schools as a result of using ITEM as a tool. Four areas were examined:

a) The effects on choosing the leadership style.

b) The effects on the communication and information at schools.

c) The effects on the decision-making process at schools and consequently its implications on the school's autonomy.

d) The effects on the management of classrooms.

Categorizing the data and analyzing all the information concluded this process, which was based on the questionnaire survey, the case studies carried out using semi-structured interviews and the literature. More details can be found in the chapter on Methodology.

CHAPTER TWO: LITERATURE:

INFORMATION TECHNOLOGY IN EDUCATIONAL MANAGEMENT (ITEM):

The purpose of this research is to examine the effects of Information Technology in Educational Management (ITEM) systems on Israeli secondary schools. In Israel ITEM operates as an integral part of a network with other information systems such as: Information Technology (IT), School Information Systems (SIS), Management Information System (MIS), School Management Information System (SMIS), Decision Support Systems (DSS), Information Communication Technology (ICT), MANBAS – Management of Schools (in Hebrew), Computer Aided School Administration (CASA), Educational Management Information System (EMIS), and Computer Administrative System Environment in Schools (CASES) etc. (Telem, 1993, p.137; Tatnall, 1995, pp.99-103; Barta, 1995; Fung and Hau, 1997, p.155).

This research concentrates on the effects ITEM has had upon the following areas: school leadership, communication, decision-making process and classroom management. The focus in each area is based on the research questions which are re-stated here as follows:

1. Does ITEM increase or decrease the control of leaders over schools?
2. Does ICT create a new way of dialogue in schools or does it, either, weaken or strengthen existing personal ties among the staff?
3. Does ITEM increase or decrease a school's independence from external authorities and thus its autonomy in the decision -making process? How?
4. Do analyses of schools' results by ITEM increase the teachers' involvement in managing the classroom or minimize it? How?

The first area is 'school leadership' which area investigates whether ITEM enhances the power of school leaders to control and supervise different activities in school, or whether it encourages the leaders to adopt flexible approaches which decrease control and decentralize power? The second area is 'communication' which examines whether ITEM offers a new way of dialogue among people in schools, or whether it decreases the inter- personal relationships in schools and even creates a sort of distance. The third area explores the effects of decision- making processes on the school's autonomy through the use of ITEM. This area explores whether this modern tool increases the school's autonomy by making it possible for schools to make complicated and independent decisions, or, on the contrary, whether it makes it possible for external authorities to exploit ITEM to limit a schools' autonomy by interfering in the internal decisions of schools. The fourth area focuses on the effects ITEM has by providing a sophisticated analysis of a school's performance. The intention of this area is to investigate whether ITEM intensifies teachers' involvement in managing the classroom by allowing them to analyze each pupil's results and thus make better pedagogic decisions, or whether teachers are now exposed to more supervision by both internal and external authorities which can now, themselves, analyze the results of each class and compare the achievements. If this is so, then ITEM, in fact, reduces the teacher's autonomic space and invites interference by internal and external authorities into his/her management of the classroom.

These four areas indicate clearly that this research does not investigate ITEM itself as a technological tool, but examines its interaction with people in education and the effects of ITEM on people who are involved in schools.

" It would be very wrong to assume that providing the hardware and software of Information Technology (presupposes that it) can be implemented automatically... ".

(Fung, 1995 p.37).

ITEM as, a technological tool, cannot make any impact on schools by itself since values, norms, structure and culture in education also make an impact on the interaction between Information Technologies and schools.

" IT might contribute to these procedures but cannot in itself carry out educational reform"

(Rubinstein, 1995, p.218).

CONTROL OR FLEXIBILITY:

ITEM increases the tension that exists between the following approaches. While, on the one hand, the leadership needs to increase control over a school's activities, on the other hand they also need to intensify the flexibility of relationships between people in education. This tension can also be described as a conflict between the need to enhance the power of centralization while devolving power at the same time.

This conflict between the different approaches also depends on the perceptions leaders have of their roles in schools.

> *" In this perspective Information Technology can be perceived as a 'two edged sword'. On the one hand it may encourage centralized control by facilitating the availability of decisional information at the higher echelons. On the other hand it may act as an effective means of encouraging decentralization via its provision of easy access to information by lower echelons"*
>
> (Child, 1984,p.25).

These options are intensified in secondary schools as the leaders have a range of tasks waiting to be carried out.

> *"It is reasonable to assume that the further development and assimilation of SMIS, will result in more significant changes in the high school principal's role"*
>
> (Telem et al., 1995, p.293).

<u>ITEM increases the control</u>:

The view that ITEM increases control in schools is based on the view of leaders who regard the school as a 'loosely coupled system', which requires more stringent

operation and well-organized methods (Jackson and Humble, 1994, Telem et al., 1995, Telem and Avidov, 1995-6, Telem et.al., 1997). This approach argues that ITEM provides better coordination, harmonization and synchronization of systems while making all the departments in schools better organized. In schools each department usually works by itself and concentrates on its limited professional aims and, at the same time, ignores the needs of the other departments in the school (Eason, 1988 pp.260-278). Moreover, sometimes the different departments in schools ignore the school's mission as defined by the leaders because the teachers regard their own professional tasks to be more important. Thus, those who hold this view are convinced that the problem of 'departmentalism' can be reduced as a result of ITEM providing better control (Telem et.al., 1997). The control arises from the manner in which IT software packages insist that they be used in a specific way and encourages every user to perform any given task in the same way (Tatnall and Pitman, 2003, p.74).

> *" The informational potential of computer systems might be of greater value to organizations facing the problem of intense departmental differentiation and, thereby, requiring greater integration".*
>
> (Zeffane, 1992, p.27).

Principals expect all their teachers to produce their pupil reports in a similar format and, since the use of ITEM encourages a greater degree of standardization of administrative practice in schools, ITEM in this way controls the way that the administrative process takes place (Tatnall and Pitman, 2003, pp.80-81). This attitude

of schools being a 'loosely coupled system' encourages leaders to seek programmes, which can assist in tightening up the system. This is the reason why a good programme of timetabling is so essential for principals since there is a need to strengthen control over the attendance of both staff and pupils. A lack of knowledge about what is going on at any given time in school leaves the leaders of this approach with the impression that the school is now beyond their control and that, without significant control, the tasks are not going to be carried out. Although, there is, at yet, no perfect programme that can solve all the problems involved in preparing the timetable, there are several programmes, which can provide tighter control after the timetable is completed. For example Hong Kong's Timetabling Expert Support System (TESS) has been developed to resolve clashes and replacements (Ng, 1997, p.131). Another example is the Finnish Timetabling programme "PRIMUS", which was designed by the Star Soft Ky company and aims to follow up the attendance of each pupil in his/her lessons (Paturi, 1995, pp.225-229). Likewise, the Israeli programme Management of Schools MANBAS (in Hebrew) has also been designed to deepen control over absenteeism and discipline problems in school (Sagi, et. al., 1995).

Those leaders who want to tighten up the educational system through using an appropriate timetabling programme have realized that ITEM can help them make schools better organized. In additional ways this can be achieved because ITEM directs people to pay more attention to the flow of information in schools. The gathering and diffusion of information becomes a task carried out by many people at schools and the receiving of accurate and relevant information becomes a task which encourages schools to work even more closely with each other (Telem et al., 1995). The following figure (Figure 1) demonstrates how the flow of information has made people work more closely in schools. Before the implementation of the School Management Information Systems

(SMIS) the flow of information in schools was one directional i.e. from teachers and coordinators to the principal. The principals used to keep this information to themselves and ignored the need to share it with the rest of the people at school. The change that took place after the implementation of SMIS was the creation of an openness and the availability of information flowing in two directions from teachers and coordinators to the principal and vice versa. In this way the information provided is more accurate and much more accessible to the members of staff because the common database has made the organization more workable through its need to refer to the same information. SMIS encourages schools to refer to the same data when making decision, and, in this way, creates common and solid ground in schools.

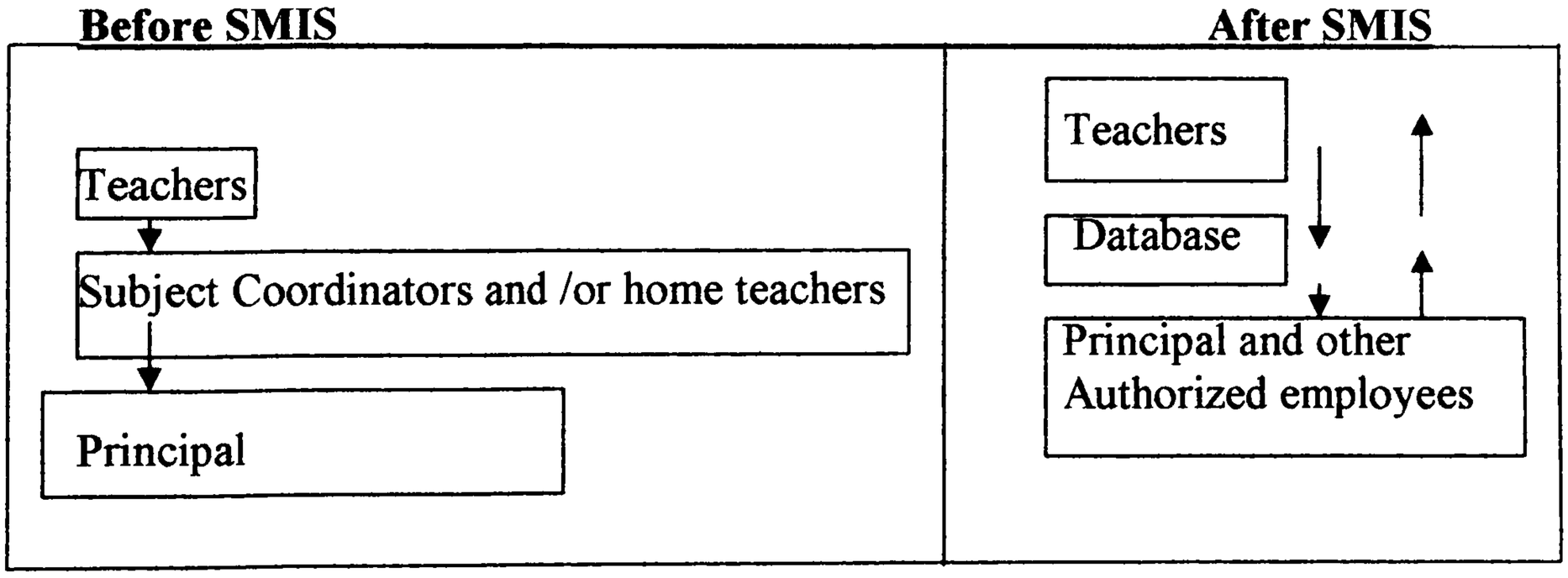

Figure 2.1: Channel of information flow in schools (Telem, 1995).

A study was carried out by Telem at the University of Tel Aviv in 1995, which included 7 high school principals. The aim was to determine to what extent the attitude of the school as a 'loosely coupled system' was overcome by the principals as a result of the implementation of the School Management Information System (SMIS). The research was based on interviews, a questionnaire and analysis of SMIS reports. All principals reported an improvement in coordination in their respective schools and that SMIS

enabled principals to tighten up their control over pupils and teachers. Thanks to SMIS the flow of information moved in two directions at the same time: from teachers to principal and from the principal to teachers. Managing a classroom became more institutionalized and the flow of information to parents became more accurate and direct. Finally, the contact with external authorities such as the local authority became even better (Telem et al., 1995, pp. 291-293).

Ravid carried out research in 1996-1997 whose aim was to examine whether the introduction of MIS had any impact on the communication process taking place within the upper level of one high school in Israel. The research was based on a case study method that included thirty interviews of the following professionals: subject teachers, counselors, subject coordinators, class coordinators, the overall school principal and the senior high school head teacher. In addition, there were sixteen observation sessions and documents. Although this research was limited to one case study alone, the findings indicate the following changes that have taken since MIS was introduced into that school: 1. The demand for reports on grades now comes directly from the principal (whereas before MIS the demand came from a homeroom teacher), MIS produces a higher quality report than previously, MIS increases the frequency of reporting and MIS has institutionalized the submission of grades and reporting to the parents; 2. The two main resources for information have become the MIS coordinator and the school professionals who use MIS in their ongoing work; 3. The information has become available and accessible to any authorized user; 4. Thank to MIS the information is available at any time even without the presence of the teachers. 5. MIS has made it easier to do the work on schedule; 6. MIS has strengthened the feedback process taking place in the school and MIS has strengthened the supervision and monitoring of work in school (Ravid, 2001, pp.2-6).

The determination to overcome the situation in which schools are seen as 'loosely coupled systems' has encouraged leaders to exploit the capability of ITEM to analyze the information gathered and form policies which lead everybody in schools to follow 'the same flag'. This has been made possible because ITEM has helped to set priorities, indicated where the weak sides of schools are, set objectives, allocated resources, controlled human resources, received feedback in real time, and controlled the performance of schools (Telem, et, al., 1997). Teachers who previously had been protected by the classroom walls have now been exposed to both the evaluation of their coordinators and the supervision of principals. Thanks to ITEM the control exercised by the administration has become more institutionalized, organized and tighter (Telem, and Avidov, 1995-6 p.264).

The literature, however, shows that the desire of leaders' to increase control over schools has not only come about as a result of the 'loosely coupled system' situation but also because of the leaders' desire to maintain their traditional power (Coleman, 1997, p.13). This view argues that the increase in information produced by the use of ITEM has provided the leaders with extra power over teachers and pupils (Warwick, 1997). These leaders consider ITEM to be a 'weapon' that exposes the behavior and performance of teachers and pupils and also supplies them with an advantage in their competition with other schools, something which has been intensified as a result of the 'open enrolment' policy. As a matter of fact, the idea of using ITEM as a 'weapon' was adopted from industry and commerce that developed it during the 1980s and 1990s (Moss-Jones, 1990; Yndestad, 1997, p.172).

Industry and commerce were the first to introduce IT into their systems, their immediate aim being to gain strategic advantages over competitors and increase income.

This turned IT into a 'powerful weapon' for business managers (Moss-Jones, 1990). Leaders in education who followed this approach of enhancing their power adapted IT into their educational settings as a tool which could preserve their power and even increase it. These leaders followed the commercial approach which was based on a 'top down' approach, close inspection and exposing the achievements of everybody in the system etc. (Makela et. al., 1997, pp.185-186; Visscher and Wild, 1997). Leaders in education who have adopted the commercial method have shown that they prefer enhancing their own power instead of being concerned with the unique needs of their schools (Miles, 1986; Child, 1988, pp.260-262; Wild, 1995; Reynolds, et. al., 2000, pp.212-.213).

These leaders are convinced that teachers are not keen about using ITEM on a daily basis mainly because they don't have strong technological backgrounds and as a consequence of this, ITEM has not yet been exploited enough in schools (Wild, 1997, p.106).

The current situation shows that schools lag far behind business in updating technology. Even schools in the USA lag 5-10 years behind the private sector and many governments all over the world have not yet managed to exploit IT in their respective educational systems (Reyes, 1997, p.74).

> *"Nobody in the country has studied the quality of the available Information System in a systematic way. This is a universal problem..."*
>
> (O'Mahony, 1997, p. 67).

Criticism of this view of the increase in the control and power of leaders in education has

only been developing gradually and the reason for this is that it has taken several years for schools to begin studying the potential of IT for educational purposes from an educational perspective. Nevertheless, there has been a gradual realization among leaders that it is impossible to run schools by using a 'top down' approach and an understanding has developed that demonstrates the difference between business and schools. Such criticism shows the importance of appointing educationalists to be in charge of IT in schools and not technologists (Makela, 1997,p.27). It also shows that ITEM needs to be used with much more sensitivity and requires more training (Reynolds, et.al., 2000, p.209). Schools have also realized that without the massive financial support of governmental resources it is extremely difficult to use ITEM successfully (Visscher, 1991, p.4).

The flexible approach:

Schools have gradually realized that IT should not only be used to increase the power and control of leaders. There are both internal and external factors involved in using ITEM and, without the cooperation of teachers, it is difficult to run ITEM successfully. This criticism leads us to the second part of the first research question which investigates whether ITEM encourages more flexibility and cooperation between people in education and the leaders. This question focuses on the need to combine and use the two styles of management i.e. 'top-down' and 'bottom –up' in order to get greater support from staff (Child, 1984; Synnot, 1987; Visscher, 1995; O'Brien, 1997; Makela et. al., 1997, pp.185-186).

This contrasting approach indicates that ITEM should encourage the cooperation of staff by both reducing the control of leaders and by increasing the credibility of teachers (Warwick, 1997, p.146). The criticism against the first view of increasing the control and power of leaders through the use of ITEM argues that this attitude threatens teachers who feel very exposed and controlled by the leadership and this causes the staff to act with less responsibility and commitment (Yndestad, 1997, p.172; Stoll and Mortimore, 1997, pp.13-14).

The above view disputes the idea that the aim of ITEM is to provide leaders with more power. It seems that managers prefer to rely on their intuitions and to react quickly rather than to rely on aggregated data that requires more consideration. (Selwood, et, al,. 1995, pp.235-6). Leaders should not use modern technology for their own advantage only since it needs to be used for the benefit of the staff as well; otherwise the situation in the 21st century will remain the same as it was in the previous century. Despite all the efforts of the 20th century to reform schooling this has not been achieved in this era of modern technology mainly because teachers have not been involved in all stages of the reforms (Ainscow, 1998). It is important to involve everyone in modern technology since, today, a generation in technology has been reduced, in many cases, to only 3-5 years and the effect of this trend has led us to accept modern technology as the rule rather than the exception.

" In many cases we don't have to explain why we need

to change, on the contrary we must apologize for routine"

(Rubinstein, 1995, p.215).

The 'decreasing control of leaders' approach argues that ITEM requires leaders to be both more flexible, and to decrease their power by devolving it to staff (Reynolds, et.al., 2000, pp.210-211; Gilley, 2000 p.118). While according to this approach, the leaders' attitudes toward both teachers and pupils have to be based on flexible ties and connections, ITEM also has to be used by teachers for their own purposes as well. The modern tool of ITEM reduces the need for face-to-face meetings between leaders and staff because information naturally flows in both directions (Visscher and Wild, 1997). Instead of devolving power to staff, however, many leaders prefer to use ITEM as a replacement of the old system of manual work i.e. correspondence, communications, reports on pupil progress and grades, test data, and discipline records (Fulmer and Frank, 1997, p.123; Visscher, 2001), and this is criticized by the above approach. According to the second view, leaders are expected to exploit ITEM to gain support for their decisions by involving the staff in the process (Selwood, et, al,. 1995). The attitude that needs to be adopted is one that bridges the gap between technical competence, and organizational skills as part of an organizational move towards ITEM being embraced by all instead of increasing the leaders control - which is what often happens (O'Connor and Smallman, 1995, p.20).

According to this view leaders have to be ready to introduce changes into the school's structure and culture.

> *"The opportunity to change the learning environment depends on a new culture and structure."*
>
> (Salomon, 2000,p.30).

Principals use e-mail and the Internet for direct correspondence and also publish weekly electronic bulletins encouraging staff to maintain direct communication for administrative proposes (Haughey, 2003, p. 70). As a consequence ITEM has shown that fewer and fewer middle managers are required. Under these circumstances middle managers need to take new directions. Instead of carrying out the traditional task of being channels of communication and control, they now need to become agents of change whose main job will be to translate new directions and strategies into behaviors (Jackson and Humble, 1994, p.21). Middle managers lose much of their power as mediators between leaders and staff as ITEM increasingly provides direct communication and reduces the number of meetings required (Visscher and Wild, 1997).

Another view supporting the 'decreasing control of leaders' approach of using ITEM argues that this is not just a matter of flexibility and structural change but that ITEM is a tool that concerns itself with causing change in the school's culture. This view claims that the real potential of ITEM lies in its ability to exploit the forces that exist inside the schools and not just in the leaders' hands (Stoll, 1999, p.47). Therefore, the system of 'top down' is not suitable for most schools and the right approach has to be based on a combination of 'top-down' and 'bottom –up' in order to maximize the potential of ITEM (Child, 1984; Synnot, 1987; O'Brien, 1997). Using ITEM in this way can create a culture which encourages the staff to adopt the values of 'ownership', responsiveness and collaboration (Visscher, 1995).

In addition to the above, ITEM can become a tool that assists in reshaping the school's culture by offering a new form of creating bonds that mainly arise out of the internal forces already present in schools (Fullan, 1992, p.86; Yndestad 1997, p.174).

"Shaping culture is a never-ending task, like a garden, which requires constant cultivation."

(DuFour and Eaker, 1998, p.148).

The reduction of the leaders' control over schools leads to an increase in the staff's involvement in operating ITEM. This move opens up a new dimension for cooperation between leaders and staff which is based on encouraging, listening, giving help, clarifying, checking, understanding and forming school policy (Ainscow, 1995b).

"Staff find it easier and are more likely to contribute when they are well informed"

(Hopkins and Ainscow, 1994, p. 187).

Reducing the leaders' control also requires that attention be paid to strengthening the social skills of the staff by using both vertical and horizontal communication (Hopkins, et. al., 1994, p.25). ITEM requires the building of a balance between two polar powers (vertical and horizontal). On the one hand the leaders need to lead the organization and, on the other hand, they need to work with the staff closely; but this balance has never been an easy thing to achieve. ITEM as a modern tool offers a mixed method which includes both coordination and flexibility. This view argues that the mixed method of coordination and flexibility can create a suitable culture in schools to maximize the

potential of ITEM (Moss-Jones, 1990). Leaders must be careful not to manipulate the school's culture since this is something which needs to be developed carefully and be based on both approaches of 'top down' and bottom up' (Stoll, 1999, pp.45-47). This culture can be developed by creating close cooperation and by paying more attention to people (Dalin, 1993, p.96).

"Culture is the 'glue' that holds everyone together "

(Stoll, 1999, p.34)

There is yet another view that supports the approach of the 'decreasing control of leaders' through the use of ITEM' but this approach agrees with neither of the above-mentioned approaches (i.e. the flexibility and structural changes), nor with change in the school's culture. This view argues that the main reason for the decrease in control over staff is the leaders' lack of ability of to lead schools without getting huge assistance from their teachers. This view claims that ITEM offers leaders assistance in leading schools by encouraging the staff to become an integral part of the school's leadership. The use of ITEM, however, consumes time and energy and leaders are usually short of time as they are under immense pressure because of their heavy obligations and responsibilities (Fung and Hau, 1997).

As a result of the Reform Act (ERA -1988), the performance expected from leaders has been raised considerably, and principals and governing bodies have been required

to lead their respective schools more independently and to carry out more activities- something that has significantly increased the load on the school's leaders (Bush and West-Burnham, 1994). This is the reason why leaders need their staffs to assist them in running their schools; otherwise the job becomes too heavy a burden for them (DuFour, et, al,. 1998).

This view claims that with the regular use of ITEM the staff can help leaders. The advantage of ITEM as a modern tool is its ability to store and deploy information in real time (Fullan, 1992 p.85). The involvement of both leaders and staff in the collection of information together increases the option that the collected information will be relevant to both administrative work and pedagogical performance (Child, 1988; Barta, et.al., 1995; Visscher and Wild, 1997; Salomon, 2000). Since they cannot run schools alone, leaders need to devolve both responsibility and power and ITEM is a suitable tool that makes the devolvement of responsibility much easier. In fact, ITEM offers a method by which responsibilities can not only be devolved to the staff but also to the pupils mainly through the collection of fundamental information. Information Systems (IS) offer varied types of information on many topics thus pupils can gather knowledge that is available on private computers at home or in the libraries accessed through the Internet and e-mail (Fung and Pun, 1997, pp. 17-18; Haughey, 2003,p.67). This view expects people in education to act with greater perspective when it comes to working with ITEM and the outlook of the staff should be one similar to:

"Town-planning for a city as opposed to individually designed houses".

(Fung, 1995, p.38.)

This view of the 'incapability of leaders' to run schools alone is also based on the changes that have taken place in the international experience and a view of the world as a 'global village'. It turns out that ITEM has become an integral part of this globalized outlook and the world wide use of these programmes has had an effect upon the administrative and pedagogical culture of schools throughout the world (Visscher, 1991b; Macdonald, 1998, pp.228-234; Power and Whitty, 1999, pp.28-29). This view argues that current leaders have gradually come to understand that they do not have all the wisdom, and that they can also draw upon the wisdom of other people (Visscher, 1995; Somekh, 1996, pp.133-134). Leaders have come to realize the great potential that exists in ITEM to change the individualistic work styles of principals into brainstorming processes in which the staff and people all over the world participate. ITEM enables leaders to hold conferences, meetings and consultations that involve people in different places and at different times by using the sophisticated technology IS offer (e-mails, Internet etc.). This collaboration and interaction with people can also lead to both cognitive and social benefits and peer reinforcement (Jessup, et, al., 1995-6, p.190; Lamby, 2001, p.108).

This view, which sees control over the staff decreasing and the flexibility of the organization increasing through the use of ITEM, can create tension because it seems to be an illusory move. One of the purposes of this study is to investigate whether this view of decreasing control while increasing the empowerment of people through the use of ITEM is only a theoretical approach and cannot yet be put into practice. The above view is based on a line of thought that argues that it is, in fact, those policies that seem to offer greater 'freedom' or seem to empower people that have a contradictory effect and show that the use of self-surveillance within the organization only leads to the

illusion of freedom. Self surveillance is used as a tool of governance and is not a tool offering liberation and growth to people in education. This view is reflected in the experience of the School of Education at the University of Leicester where the department explored the impact of Individual Action Planning (IAP) on the Postgraduate Certification of Education student teachers in terms of whether this could be seen as a process of empowerment or as a form of discipline. The idea was based on the attempt of IAP to introduce some flexibility into the training of student teachers. They discovered that the so-called flexibility offered to the students ended up with less empowerment and autonomy for them (Lawson and Harrison, 1999, p.90).

IAP enabled each student teacher to examine his/her strengths and weaknesses and, so, develop ways and means of dealing with the weaknesses to enable them to increase control over their own learning. This empowerment also included greater choice, adopting new skills, increasing the number of courses taken and allowing greater self-control over the student's life etc. (Lawson and Harrison, 1999, pp.90-93). The situation, however, is somewhat contradictory. The person who is in charge of the course and grants this 'gift' of flexibility intends to achieve specific goals and, in line with this, the course demands that each student fill in bureaucratic forms to make sure that they are on the right track. The empowerment, it turns out was, therefore, illusory since, on the one hand, IAP gave the students the feeling of freedom, personal effectiveness and autonomy while, on the other hand, there was a system of surveillance aimed at ensuring that each student teacher met the expected standards. In this way, student teachers were apparently both controlled and set free at one and the same time rather than being totally empowered to achieve real self-surveillance and growth (Lawson and Harrison, 1999, pp.96-102).

In summarizing this section the issue raised by this review of literature is that in a similar

way seeing ITEM as a flexible tool might also produce an illusory form of freedom since the involvement of the staff and the empowerment of teachers and pupils only creates a culture of more flexibility. Although the stated purpose of ITEM is to assist schools in managing their own affairs independently and in a more flexible mode, the overall control of the system is in the hands of leaders. Hence, there are two contradicting tendencies which come together with ITEM (Tatnall and Pitman,2003,p.77).

This work intends to examine whether the flexibility seemingly provided by ITEM is actually only an illusion.

A NEW DIALOGUE OR FEWER PERSONAL TIES:

The previous section of this chapter analyzed the dispute over the effects of ITEM upon schools and refers to two aspects of leadership style: the view that considers ITEM to be a tool that increases the leaders' control over schools and that which regards ITEM to be a tool that decreases their control and increases the flexibility of relationships in schools. The previous section shows that ITEM might increase the ability of heads to tighten their control over schools rather than increase the flexibility and 'freedom' of the staff, and that this increasing 'freedom' might be an illusion created by the leadership in order to mobilize the staff's support for the new technology.

This section raises the issue of whether ITEM can really open up new avenues of work and establish new, more flexible relationships between heads and their staffs. This issue, in fact, deals with the second research question of whether ITEM offers the opportunity to open up a new form of dialogue between people in schools, or whether it will lead to a decrease in the inter- personal relationships in schools and even create a

measure of distance between heads and staff.

The concept of 'a new dialogue' developed thanks to modern Information Communication Technology (ICT) and while communication technology is indeed important for all organizations, it is crucial for schools because communication acts like blood vessels supplying blood to the body of the educational organization (Riches, 1994).

"Communication in school and college management

is never a luxury but always an absolute necessity."

(Riches, 1994, p.262).

The need for a 'new dialogue' approach is based on modern Information Technology (IT) and the collection and diffusion of information has become an essential task for schools that wish to create a new dialogue. Over the last 20 years IT has become an important source of information and a foundation for different forms of communication (Maddux, et, al., 2001).

"Information, which is a crucial resource in any system

is of supreme importance to the educational system".

(Gev, 1995, p. 46).

The 'new dialogue' approach is also an outcome of the influence of the 'Information Era'. Thanks to ITEM this new era of information is distinguished both by its capability to store and manipulate huge amounts of information. Never before has mankind had such a tool that can analyze a massive amount of data and communicate it among so many participants (Visscher, 1995; Fung 1995; Kenway 1996; Cortada 1996; Barta 1997). Thanks to Information Communication Technology (ICT) the new expertise of communication has developed, and established itself. Using Internet, the World Wide Web (WWW), Cellular Phones, E-mail, Laptop Computers with wireless telephone links which can transmit pictures and news images directly to satellite dishes etc. As a result of this on-line information a new era of communication and information described as an 'information superhighway' has opened and has led to a new era in communication allowing people to move from face to face dialogue to screen-to-screen interaction (Kenway, 1996, p.218).

The 'information superhighway' era has reshaped the lifestyle of many organizations. Since fewer and fewer face–to-face meetings are required, middle managers are less and less necessary to act as mediators and people can work independently from home etc. (Kenway, 1996, pp.218-219). In schools teachers readily admit that the 'information superhighway' era has affected pupils and become another factor that influences adolescents (Lamby, 2001). Nowadays, however, the need to be more flexible and much more open to a variety of new channels of communication has grown. Consequently, the challenge of the current period is to respond to the new way of carrying on a dialogue through the use of ICT systems (Dalin, 1993, pp.102-114) and explains why IT systems have become the gate which has opened into the 21st century.

" An Information System is necessary for policy making... putting the education department in a better position to meet the challenges of the 21st century.

(Hsu, 1995, p.50).

The 'new dialogue' approach is not a monolithic view but can be looked at from different angles. The first angle of this approach argues that the new dialogue has to be developed from the perspective of the individual user of ITEM (Ein –Dor and Segev, 1988). Since only a few teachers and their subject coordinators are involved in running the different programmes of ITEM the new dialogue approach responds to the current problem of schools where only a small circle of people uses it (Barta, 1997). The new dialogue approach aims to broaden the circle of users (Makela, 1997, p.28; Reyes 1997, p.74) and this can be done by tailoring the programme to respond to the needs of each user (Makela, 1997, p.24). The intention is to create a new dialogue by encouraging leaders to negotiate with members of staff. In this way heads can learn to value the input of every individual user even though this new kind of a dialogue takes place on the computer screen rather than in face-to-face negotiations (Nolan, 1996, pp. 91-92).

Because this is a new kind of dialogue, training and in -service courses are needed to broaden the circle using IT as a communicative tool in schools (Kirby and Bogotch, 1996, p.20). Broadening the users' circle in schools is not a simple task since it demands both the design of special programmes for the educational environment and the need to overcome the apprehension about using programmes ' from off the shelf', which might have been initially prepared for business requirements (Dimmitt, 1995, pp.122-127).

This special attention paid to the user in education is the basic key to satisfying the needs of those who use the technology and are creating the new dialogue. The immediate effect of the new dialogue is to link each user to the system and allow interaction to take place on the computer screens. Each user not only learns to send and receive information and be updated on all the activities in school but also learns to treat the data on his/ her computer as ' Artificial Intelligence' (AI), which can advance the organization (Gatian, 1994)

Nowadays competition exists between schools as a result of the introduction of the 'open enrolment policy'. Using ICT systems provides an advantage in this 'war for survival' among schools since it can communicate the uniqueness of each school directly to the public (Kirby, 1995; Gray, 1996). The uniqueness of each school can be developed since every user of ITEM can categorize the school's database, analyze it and draw comparisons while manipulating the data. The 'artificial intelligence', which is created in each school by the individual user, thus becomes a new source for communication and dialogue (Buchanan and Boddy, 1983; O'Brien, 1997). The collected data, which is organized on the ITEM system:

> " *...enables one to pose questions regarding the data,*
>
> *to relate to it, and to manipulate the data...* ".
>
> (Merlyn and Parkinson, 1994, p.14).

Today's principals are going on-line for information and, although it is not their only source, it is becoming an important one. Hence, ICT changes the approach to dialogue both for the sender and the receiver. Now, both sender and receiver are equally active in

generating the information as they share the same data. This 'new dialogue' on the computer screen can be described as a better 'window' which allows one to look at any matter and solve the different problems of both senders and receivers.

"ICT can provide an 'access window' to multi-user domains."

(Holmes, and Russell, 1999, p.73).

The 'new dialogue' approach argues that ICT makes educational performance more professional -almost like treatment in an emergency room at any hospital where each doctor or nurse is responsible for his/her patients. Following the hospital model ICT enables every member of staff at school to assume more responsibility for each pupil. As doctors can save lives in a hospital every teacher can now, for example, 'save' the 'school year' of each pupil by using IT systems. Like in an emergency room these systems enable each teacher to 'converse' with the system and get relevant information such as: grades, medical records, pre -school admissions, testing results and to consult with colleges. Based on this information each teacher can decide what action is needed in order to, if necessary, save the 'school year' of the pupil (Fulmer, 1995).

This 'new dialogue', introduced by the use of ICT, not only opens up new options for quick action but also presents new challenges for every user. For example, in the U.S the drug corporations have managed to increase collaboration among pharmacies by using IT networks and, since this has been done, the provision of drugs has been tightened up and placed under better control as each pharmacist can share the

information he has about each patient's consumption of drugs (Zuboff, 1988,p.365). Similarly, pharmacies in Israel today can 'converse' using ICT since every pharmacist is connected to the main computer of the Ministry of Health and can see if there are any medical clashes between the medicines prescribed and other medicines that the patient takes regularly. In this way each pharmacist can prevent medical complications by refusing to provide a contra-indicated medical remedy unless a doctor approves it (Journal of Macabi, March 2002). In Japan this method has been implemented in industry where each worker can now stop the production line at any given time if he/she sees a malfunction. Following these examples the current expectation is that every teacher who uses ICT on a regular basis will demonstrate more responsibility and the expectation is that each teacher will be able to act immediately to save the 'school year' of each pupil just as this type of thing is done in hospitals, pharmacies and industry (Okamoto, et. al., 1997, pp.139-140).

This additional attention paid to each user has another advantage in that it demonstrates a better democratic approach. ICT enables each user to become both the producer and distributor of his/her own products and, as a result, he/she suffers less from censorship and over-supervision and has the freedom to criticize and offer opposing ideas (Kenway, 1996,pp. 220-221). The new dialogue not only contributes to the creation of a more democratic society of communicators but also to global dialogue. This can be done because the Internet and e-mail have turned the world into a 'global village' making it simple to communicate with colleagues all over the world while giving users the feeling that they are 'citizens of the world'. The new dialogue crosses borders and different cultures and can make the world more open to new ideas (O'Brien, 1997, p.367; Holmes, and Russell, 1999).

Up to now ICT has been examined in the way it interacts with the single user. Yet, the 'new dialogue' approach provides another angle through which to examine the interaction with ICT. This approach argues that the core of the 'new dialogue' depends on the participation of all the users of ITEM and consultation together with them. The effect of ITEM on schools can only be successful when the whole staff participates in the new dialogue and IT becomes a tool of interaction and consultation for all to use in common (Wild, 1997). The involvement of teachers in creating the new dialogue on their computer screens is a key principle of this approach and it is essential to involve the staff right from the earliest stage of implementing IT as a communicative tool in school. Teachers' remarks are important for establishing a particular school's unique way of operating ICT and the participation of teachers in establishing the method of operating ICT will lead to a new dialogue and greater awareness for the staff. The joint work with the staff is not only a good way to identify and correct problems right from an early stage but makes it easier to identify mistakes since now there are many people watching the computer screens and not only a small group of users as was the case previously.

"Wide communication of evaluation would help to ensure

that new systems learn from the mistakes of earlier systems"

(Wild, 1997, p.112).

The participation of teachers in establishing the new dialogue in schools requires a holistic approach to people. It requires not only a new culture that supports on-going training, but also must not impose the technology on the staff without consulting

them (Wild, 1995, p.28; Selwood, 1995, pp.98-99). Schools are required to generate workshops that explain the aims and methods of operating ICT as a tool of communication and teachers need to learn the meaning of this new staff collaboration taking place on the computer screens. Teachers need to be trained to hold 'brainstorming discussions' on their computer screens and to become partners in improving the quality of the school's decisions as they contribute their input to the discussion (Hsu, 1995, p.55). This on- going consultation with staff through the use of ICT virtually guarantees the on- going cooperation of teachers and prevents people from reverting to the old attitudes (Reyes, 1997, pp. 76-78). The success of ICT as a communicative tool can be achieved as a result of using the system on a regular basis and by using integrated IT as a form of routine work among all the teachers in schools (Nolan, 1996, pp.93-94).

A different angle to the new dialogue approach can be found in the Australian experience. This approach argues that IT cannot be restricted to internal use since the real examination of ICT is its ability to form a new dialogue among the four key groups: parents, administrators, children and teachers (the PACT-Model) as can be seen in the following figure (O'Mahony, 1997).

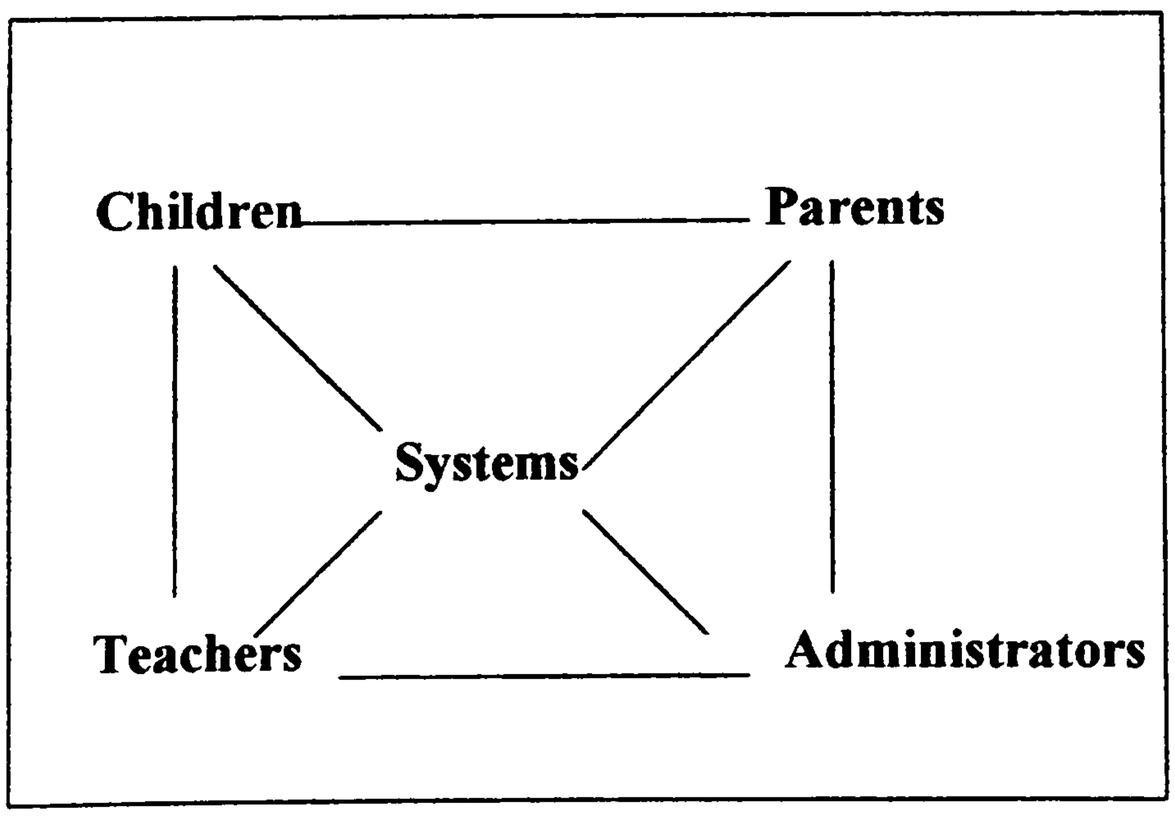

Figure 2.2 O' Mahony's PACT Model.

The PACT model examines the new dialogue that takes place among these four parties as a result of the improvement of communication and information throughout the school. This model shows how online communication and information helps resolve conflicts between teachers and administrators, teachers and children, and between parents and school because of the availability of the information in real time. The emphasis is placed on the accessibility of the information that supports the four groups of PACT at any given time. This view argues that only the model of PACT can create the new dialogue and the reason for this is that ITEM creates a new culture of satisfaction in schools. All problems that refer to administrative and pedagogic aspects can be communicated in real time between these four parties and, since ITEM offers an updated picture simultaneously to all and can provide the relevant information for PACT to each party, it allows for the contribution of its information and suggestions for the success of the school. ITEM, with the model of PACT, creates a true partnership among the four key parties of the school and so a new dialogue is created which takes place on the computer screens of the four parties of PACT. In this way, the PACT model becomes a source of new power for today's schools (O'Mahony, 1997, pp.69-70).

In contrast to the first view that wishes to establish a new dialogue, there is a school of thought that argues that ITEM decreases personal ties and creates distance between people. This approach claims that a dialogue requires face-to-face contact, that computer screens cannot substitute for this need (Lamby, 2001, p.114). This need is especially important for education as teachers believe in personal contact with pupils and parents in order to sort out pedagogical problems (Lamby, 2001). This is the reason why teachers prefer using the telephone for personal calls; they prefer hearing the person on the other side of the line rather than using the information systems. Teachers fear that the Internet and E-mail will reduce their ability to use their persuasiveness and

interpersonal skills (Lamby, 2001, pp.103-107). Teachers prefer to keep the information to themselves and to decide how to use it rather than to share the information with ITEM and lose their privilege to adopt, adapt or reject information (Visscher, 1995 p.233).

> *" IT can lead to unwanted organizational problems,*
>
> *or may be rejected because it does not match organization*
>
> *practice and custom... "*

(Eason, 1988,p.25).

This approach distrusts ITEM as a communicative tool because it threatens privacy. The new systems of information contain massive amounts of information about individuals and institutions and the problem is that this information is accessible to many people. Consequently, this problem has created a threat to the right to 'privacy' and 'ethical codes' and 'Human Rights' organizations have been trying to secure the privacy of every individual, in line with Article 12 of' the Universal Declaration of Human Rights' which proclaims that:

> *" No one shall be subjected to arbitrary interference*
>
> *with his privacy, family, home, or correspondence.*
>
> *Everyone has the right to the protection of the law*
>
> *against such interference or attack. "*

(Muthuchidambaram, 1988, p.193).

IT has not managed to close all breaches and there is a long way to go in order to solve all the ethical problems concerned with the use of ITEM as a means of communication. In the Alta Vista search engine alone10000 websites dealing with ethical issues can be found (http:/www. alta vista. com/).

> *" The ethical foundation of IT involves many ethical considerations, various ethical philosophies and models of ethical behavior"*
>
> (O'Brien, 1997,p.504*)*.

This task has, however, turned out to be more complicated as ITEM has become more accessible to different authorities and it is difficult to ensure that the information will not fall into the wrong hands. This could lead to the sending of unsolicited e-mails that sell products and various services or to the unauthorized use of computer networks including website vandalism (Maddux, 2001, p.6). The fact that different authorities share the information may create the 'Big Brother' effect where everyone fears they are being closely watched (Muthuchidambaram, 1988). This fear can create psychological barriers to ITEM and intensify public concern over the absence of a code of ethics and the necessity to establish one. This issue has also been intensified by the openness of an Internet that operates with only minimal supervision. In addition to the official authorities, people without any authorization unfortunately also manage to penetrate the systems and cause great damage. This phenomenon is known as a 'hacker's attack' on

the computer system and makes it difficult to create new forms of dialogue. This approach argues that ITEM even creates suspicion and a climate of alienation (Kahin, 1993; Maddux, 2001).

By basing itself on the discussion of this section this study intends to investigate whether the 'electronic relationships' made possible by the systems of ITEM can create a new dialogue. The doubt raised by this research about whether this is possible is based on the premise that it is impossible to impose a cold technology like ITEM on people in education. People in education apparently prefer warm and close relationships and teachers from the early stages of any programme not only expect to work through personal communications (Barta, 1997,p.8) but, in addition, are not technologically oriented and usually face many difficulties in operating any technology. As a result it is perhaps wrong to expect them to communicate through technology (Makela, 1997, p.28; Reyes 1997, p.74). Perhaps the psychological barriers of teachers to technology also exist because technology stresses the need for procedures rather than the development of personal relationships:

> *The danger in the education system is that there will be an emphasis on procedures and practices at the expense of personal growth and relationships"*
>
> (O'Neill, 1994, p.202).

To summarize, this section the issue raised by this review of literature: that ITEM might not be able to develop a new dialogue since it comes at the expense of developing personal contacts among people in education, has led this study to investigate whether ITEM can create a new form of dialogue in spite of the reservation (Lamby, 2001). This issue about the problem of the 'decreasing of personal ties' caused by the use of ITEM gets extra support from other situations that might create confusion among teachers:

1.While, in the past, people used to question the validity of written documentation, for some reason, data found on computer screens are not questioned in the same way and, as a result, there is a tendency to accept such information without question (Zaboff, 1988).

2. The quantity of information that ITEM provides is immense and, subsequently, it can be difficult to distinguish the forest from the trees (Tatnall, 1995, pp.99-100).

3. The increasing amount of information has increased the amount of 'junk mail' and this phenomenon might cause users to get lost in the deluge of information (Visscher and Wild, 1997, p.27).

4. The anxiety level of teachers might be raised as a result of the errors they make in handling the system and the lack of technical support (Wild, 1992).

5. A lack of training can also lead to a lack of trust in the new system (Dusick, 1998, pp.123-124).

In addition to the above, Spector enumerates the following 8 factors that might make adults feel uncomfortable about modern IT technology: a lack of the necessary computer skills, paradigm shifts, trust issues, time management, thinking about thinking, systematic inquiry, self-assurance and scientific discourse (Spector et.al., 2002, p.306). Another thing that can lead to this confusion is the physical effects of computer use upon

people that can possibly lead to harm. The prevalent injuries from this are: muscular-skeletal ailments that fall within the broad category of repetitive strain injury (RSI) and can create occasional discomfort in the back, neck and shoulders. Spending too much time in front of the screen can cause general eye fatigue and even damage, biological clocks can be disrupted, and physical fitness can decline (Crawford, 1997, p.85; Armstrong and Casement, 2000, pp. 143-159).

Conclusion.

The question this research wishes to investigate, as a result of this issue and the ensuing discussion, is whether ITEM can create the type of new dialogue that exists in commerce and business in the light of the fact that the study raises doubts about whether 'electronic relationships' can effectively fit into education. The issue might get extra support from the fact that schools still have a long way to go in both clarifying the goals of ITEM as a communicative tool (Visscher 1991; Visscher 1995), and in examining how to bridge the gap between this system and the general needs of education (Wild, 1995). The attempt to create a new dialogue through computer screens instead of fixing face-to-face meetings is, according to this issue, highly questionable since 'electronic relationships' do not seem to the familiar educational environment, tend to be quite artificial and only lead to the illusion that a true dialogue can take place.

ITEM and school autonomy:

The previous section focused on the questions of whether ITEM is capable of: a) creating a new dialogue, or b) generating fewer face-to-face meetings and consequently weakening personal ties in schools. This section concentrates on the third research question, which deals with the effect of ITEM on the school's autonomy. ITEM

is not only a resource for creating new communication but is also a tool that aims to improve the decision-making process in schools (Telem, 1995). The question that needs to be asked is whether improved decision- making at schools brought about by the use of ITEM increases or decreases a school's autonomy?

For those who consider ITEM to be a tool that increases a school's autonomy the common ground is its ability to select the best decision. The increasing autonomy of schools is a function of their ability to deal with problems successfully by making the right decisions since making the right decisions encourages the governmental authorities to devolve power to educational leaders and allow them to run their respective schools (Ezrahi, 1994). The advantage of ITEM is its ability to make people in schools focus on the decision-making process and prevent their often long, futile and irrelevant, search for information and educational material (Telem, 1995). The programmes of Decision Support System (DSS) and Computer Assisted Decision Making (CADM) can assist ITEM in this matter (Telem 1990).

As noted in the pervious section on- line information must be accurate and updated in order to obtain excellent results. The decision- making process is based on reviewing the validity of the data from time to time in order to be in the position to select the best alternatives (Telem, 1995). The key issue is how to increase the database of ITEM and, at the same time, ascertain the relevance of the information (Ezrahi, 1994). DSS can be a system that not only assists in making the appropriate decision from among alternative options, but also shows the consequences of each alternative (Telem, 1995). Moreover, Decision Support System (DSS) assists schools in choosing the best allocation of time for each subject, deciding about the priorities for every issue, formulating the schools' goals and preventing mistakes. In this way the system can

provide choice from a variety of accurate and analytical judgments so that the user can focus on the main issues instead of wasting time on validating information. In addition, the system can assist in implementing each stage of the decision –making process and coordinate them according to a fixed timetable (Hogenbirk et.al.1997, pp.182-184).

> *" Computer Assisted Decision Making (CADM) should support decision making at all levels of the school, managers and management teachers and teaching, students and learning".*
>
> (Hogenbirk, et.al. 1997, p.181)

This ability of DSS can increase the autonomy of schools since it makes the users more accountable for their decisions and matches the authorities' expectation of seeing the autonomous schools become more responsible for their decisions. As the educational system is too complicated to be handled by either a single person or a small group, DSS involves all teachers and brainstorming discussions which take place on the computer screen of each user are encouraged (Mansfield, et.al., 1983, p.13). The programme of Electronic Meeting System (EMS), for example, which was developed in the USA contains the technology suitable to make this goal achievable. This programme asks the participants to choose a group leader whose first task is to prepare an agenda. The meeting then starts with brainstorming ideas and the preparation of a list of key issues. After this the group has to prioritize the key issues and discuss the main ones. The advantages of this programme are:

1. More attention is paid to preparing the meeting.

2. More material is generated.

3. EMS saves time by focusing the participants on the matter under discussion.

4. EMS encourages the group to search for solutions rather than spending time on defending the solutions of each participant.

The group is encouraged to generate fresh ideas and the system can record the outcomes of the meeting. This system leads to the holding of short meetings that seek the best results and can also prevent the making of decisions that tend to be emotional, controversial or over-complicated (Spuck et al.1997, pp.44-49; Nunamker et al., 1997).

The autonomy of schools can increase since DSS encourages schools to work closely with scientists in search of new ways to sort out educational problems. The authorities are ready to devolve more power and autonomy to schools that demonstrate professional work (Wholeben, 1995). A good example of this attitude can be found in an Illinois vocational school which needed a scientific programme in order to improve preparations for integrating new pupils into their educational environment. The new pupils were sent to this school from other high schools in the district mainly because of continuing behavioral problems. To facilitate this a scientist was invited to prepare a programme for DSS with a team from the school that could, in advance, identify the difficulties that would arise from the coming enrollment (Wholeben, 1995, p.164). As can be seen in Figures 2.3 and 2.4 an interactive analytical programme was prepared which, for example, illustrates (in Figure 2.3) both the behavioral performance of pupils in several parameters of discipline and the action taken against them in their respective schools.

The action taken from light to serious and is signified as follows

: 1. IGS- In good standing,

2. VER- Verbal reprimand,

3. DET –Detention,

4. STS- Short -term suspension,

5. LTS- Long -term suspension,

6. EXP- Expulsion,

7. RET- Reinstatement.

The information in Figure 2.3 was calculated by DSS and presented in Figure 2.4. As can be seen Figure 2.4 illustrates the discipline record of all pupils selected to form the new class. Figure 2.4 is based on a 10 week inspection and shows the number of punishments given. In this way the degree of discipline problems expected from the new class could be assessed a long time in advance and allowed the Illinois vocational school to make suitable preparations in order to integrate the new pupils. If the schools decided to expel pupils who had reached the top punishment level these pupils could apply for reenrollment for the subsequent semester (Wholeben, 1995, pp.164-165).

Discipline Program Options	IGS	VER	DET	STS	LTS	EXP	RET
IGS- In good Standing VER- Verbal reprimand DET -Detention STS- Short -term suspension LTS- Long -term suspension EXP- Expulsion RET- Reinstatement							

Figure 2.3: Pupils conduct history.

An assessment of 10 weeks of graduated punishments provided the Illinois vocational school with the following information as can be seen in Figure 2.4:

Discipline Program Options	IGA	VER	DET	STS	LTS	EXP	RET
EQUILIBIRIUM	.38	.16	.06	.09	.11	.10	.10

Figure 2.4: Steady –state values for pupils' transition behavioral probabilities from 10 – week pilot.

Figure 2.4 provides a road map of the behavioral expectation from the new class in which 38% of all enrolled pupils will be in good standing at any given time, while 16% can be expected to receive a verbal reprimand, 6% of all enrolled pupils will be detained after school while 9% can be expected to be sent home for a short - term suspension and 11% of all enrolled pupils will probably be sent home for a long-term suspension. 10% can be expected to be expelled and this 10% can be expected to ask for reinstatement (Wholeben, 1995, pp.163-165). Of course, the Illinois vocational school could expect some changes since the environment was new and the pupils one year older and these factors could cause new pupils to behave differently than expected. Despite this the scientific preparation by the school did offer advantages in how to tackle the problems. This scientific work by the school has gained the respect of the community and eventually the school's autonomy was increased (Wholeben, 1995).

Another example of close cooperation between ITEM and scientists that improved decision-making processes and consequently increased a school's autonomy was the Israeli program 'SHESHET' (a decision support system named in Hebrew after Robinson Crusoe's servant Friday). The School of Education at Tel Aviv University designed this programme whose aim was to improve decision- making about the placement of new pupils. Like the example of the Illinois vocational school, SHESHET contributes to an

improvement in the professional work done at the school and consequently the autonomy of school was increased. Based on Decision Support System (DSS), "SHESHET" was developed to assist the principals and counselors to improve the placement process and integration of pupils in the school (Kaly and Chen, 1995, p.147).

The system contains:

a) the study streams that the school can offer i.e. (Mechanics, Electricity etc.),

b) the number of classes per programme,

c) the levels,

d) a list of school resources.

The programme also contains the pupils' files i.e. personal data, record of achievement, learning history, diagnostic tests taken, personal preferences, a socio-economic profile and psychometric data. Although the decision making team can classify the pupils according to an order of preference the ability to change the range of criteria enable the team to utilize a dialogue stage before the computer provides the final outcome. According to the findings of the research undertaken on schools implementing this programme, (Tel Aviv University 1992-3), the system managed to save time. Where the placement process usually took weeks it now only took a few hours, the output was more objective, the number of pupils who dropped-out was reduced and the transference from one level to another was also reduced (Kaly and Chen, 1995, pp.151-152).

This line of thought argues that ITEM with DSS programs not only improves the decision-making process but also that a co -product of this process is an increase in the school's autonomy. This is achievable as the improved decision-making process makes the school more accountable for its own resolutions. Moreover, this line of thought

regards managing finance as an integral part of the decision- making process that maximizes the school's autonomy (Lumby, 2000). Managing finances involves the making of decisions about where to maximize the support and where to minimize the cost, as well as making preparations for short and long term planning.

> "*Managers in future education... must use funds*
>
> *to meet the short term needs, to offer quality learning...*
>
> *but must also use it to meet the longer term...*"
>
> (Lumby, 2000, p.89).

The school's autonomy can be increased as the state allocates most of its financial support in a lump sum directly to schools (Odden, 1995). Funding schools directly matches the policies of increasing a school's independence and devolving power from local and governmental authorities to schools (Caldwell and Spinks, 1992). The rationale behind this policy of providing money directly to the school's account is to let these schools handle their budgets better in order to act independently according to their own judgments. The aim of allowing schools to manage their finances provides better conditions for improving classroom work through allocating money more wisely (Coleman, 2000). Furthermore, such a policy is in line with the current economic approach taken in those western democracies that believe in free market forces. The free market forces in education are the parents who can decide where to enroll their children. Governmental authorities subsequently have to supply money to schools in their district according to the number of pupils that have enrolled in each school (Conley and Odden, 1995).

An example of this policy of increasing autonomy in schools by managing finance independently can be found in England and Wales. In these areas the governmental authorities directly allocate most of the budget in a lump sum which is based upon the numbers of pupils in the school. This policy ensures that the bulk of the money intended for schools will be available for use in the individual schools and the experience of LEA's shows that between 89-93% of the potential budget to schools is, in fact, distributed directly to schools. While LMS increases both the authority and accountability of principals in managing a school's finances, principals still criticize the failure to pay teaching staff costs directly (West et. al., 2000, p. 67).

The most advanced approach even allows schools to "trade in" teachers or other types of staff for funds to be used for other purposes such as professional development, training, and computers. This approach has increased the school's autonomy:

a) by moving most of the financial management to the school itself and thus providing an adequate basis for funding it.

b) by providing support for public education.

c) by bridging over the regional differences.

d) by ensuring extra funding for children who need additional services.

e) by enabling schools to reward teachers for their performance and consequently improve the learning and teaching process (Odden, 1995; Lumby, 2000, p.82).

f) by reducing political intervention in the schools' life:

"There is a 'window of opportunity' to replace what is seen

by many to be a system that is open to political manipulation

by one that is fairer and more transparent"

(West et. al., 2000, p.79).

Yet, there is a clash between the expectations raised by increasing the school's autonomy through managing their finances independently and the current situation where the principals are not trained to handle finances. In fact, principals generally keep a distance from aspects concerning money in their schools as they are wary of the consequences i.e. defending the school's expenditures (Fawcett, 1996). The policy of Local Financial Management (LFM) expects schools to provide statistical reports and display the school's balanced budget. Thus the devolution of responsibility for financial matters demands the professional management of finances. This policy expects the school's leadership to be directly involved in managing the finances and not leave it to the financial officer of the school alone (Lowrie, 1989, pp.8-9). According to the flexible approach the financial officer can even work for a few schools or from home -something that both saves money and makes the sharing of experience among these schools possible (Coulson, 1988, pp.313-314). The main point of LFM is, however, to put the financial decisions into the hands of the heads and the heads need to assume responsibility for the schools' expenditures if they want to be more independent (Lowrie, 1989).

In order to increase the school's autonomy heads need tools to assist them in managing finances and the following examples can demonstrate how ITEM can be the appropriate tool for this mission. First, special training is required in order to use ITEM as a way of recording expenditure. Based on this financial recording ITEM also assists in preparing reports on the current balance of the school (Lumby, 2000, p.94). Since April 1999, the central government in the UK has adopted a new approach to the distribution of funds ('Fair Funding') according to which schools can expect to receive additional dedicated funds, which includes finance for building, transportation and meals. In order to get the additional funds a school is required to provide a long -term plan, but, heads are not yet prepared to submit financial reports and this is the reason why it is

essential to generate courses that will train heads to link the school's activities to their financial implications. This training should also include using ITEM as a tool for managing finance (West et. al., 2000, p.69).

Cornell University in New York initiated a course that aims to train all types of heads to manage finances confidently and to overcome the fear of budgeting. The method the course used was to link areas of managing an organization to their implications. Although the main goal at Cornell University was to train hotel managers, this course was opened up to all types of executives including principals. The student managers were asked to run a restaurant in a simulated learning situation and with the accounts and budgets using IT as a tool to develop their accountancy skills. The experience has shown that the simulation of restaurant learning had an effect on the participants and developed their confidence in handling accounts and budgets (Fawcett, 1996. pp.17-24). This course proves that heads can be trained to link decisions to their financial implications and also shows that IT can reduce the fear of running an organization's finances. The same expectation can apply to schools and the more heads use ITEM to manage their finances the more likely a better decision- making process can be achieved. Managing schools financially using ITEM can enable heads to achieve two things: on the one hand to limit the interference of non-professional authorities in the internal decisions of schools and, on the other hand, to increase the schools' autonomy (Lumby, 2000).

In contrast to the above view there is a line of thought that regards ITEM as a tool that limits a school's maneuverability and increases the interference of external authorities in the internal life of schools (Dixon, 1994; Wohlstetter & Smyer 1995; Mohrman et.al.1995). The local and national authorities can increase their interference in schools by using ITEM to control the school's expenditure and monitor the budget (Wohlstetter

and Smyer, 1995). This view opposes the goal of devolving more power to schools and the main objection is the refusal to change the long tradition of controlling schools by monitoring their budgets. Behind this assertion stands the belief that devolving budget decisions onto school sites will not only violate fiduciary responsibilities but will also provide opportunities for the fraudulent use of funds. Another reservation is the state's unwillingness to devolve spending decisions as it picks up a larger portion of the costs of public schools (Madden et.al., 1992; Mohrman et.al.1995).

ITEM has thus become a tool that allows both the external and local authorities to control their schools financially i.e. the accounts, budgets, and payments. Politicians have taken advantage of this situation to interfere in the distribution of funds especially at the local level where they use this interference to distribute funds which might help them at election time. These politicians are not ready to give up their influence over education as it gives them power in the eyes of the public (West et.al., 2000, pp.59-60). The control exercised over schools by these authorities is as a cynical manipulation of funds to achieve political goals rather than looking after the real needs of schools (Lumby, 2000, p.81). Controlling the financial aspects of schools through using ITEM makes it possible for the local and governmental authorities to maintain direct contact with educational expenditure in real time (Wohlstetter & Smyer, 1995). For example, the schools belonging to the LEA's have to report on their financial status and monetary situation on a regular basis via the IT systems and, in this way, it is easy for the external authorities to follow up and analyze the school's expenditure as can be seen in Figure 2.5 (Dixon, 1994, pp.14-15).

Type of the expenditure	Budget	Spent or committed	Estimate to year-end	Balance	Comments
Teachers	172,570	86,285	168,700	3,870	
Supply teachers	5,300	4,577	6,500	- 1200	Sick leave
Support staff	8,840	2,412	6,840	2000	
Caretaking staff	12,300	6,100	12,000	300	
Admin staff	8,200	4,130	8,200	0	
Equipment	9,400	4,600	9,000	400	Computers
Energy	7,600	7,600	7,600	0	Winter
Office cost	1,020	466	1,000	20	
Maintenance repairs	7,580	2,600	8,700	-1,120	Decoration
Other items	5,800	4,300	5,800	0	
Contingencies	3,000	0	0	3,000	
Income	4,700	4,400	7,400	2,700	Use of hall
Nett. expenditure	236,910	118,670	223,940		
Allocated this year	233,000				
Balance last year	3,910				
End of year balance	9,970				

Figure 2.5: Basic financial report for governors (Dixon, 1994, p.15).

Figure 2.5 provides data about the budget and current balance of each school. Monitoring becomes stricter when budget profiling is introduced and, in this way, ITEM makes it possible for the local and governmental authorities to monitor the current financial situation and tighten their supervision of each school. Analyzing expenditures in schools can help the authorities in long term planning (Dixon 1994). For example, Figure 2.5 shows that a school's heating bills might be quite high but also that this expenditure takes place only during winter. Thus a financial profile can be established to plan for long-term expenditures and, once profiling has been introduced, more accurate forecasts of the school's balance can be made by producing cash flow statements. ITEM can also be programmed to overcome the problem created by the fact that the financial

year begins in March while the school year begins in September and they do not coincide (Dixon, 1994).

In June 1993 the Audit Commission in the UK, for example, published the financial accounts each school was required to present including instructions on how to set up financial expenditure budgets. The report had a two-fold purpose: first, to monitor the school's expenditure and, second, to plan the schools' activities in advance. In this way, local authorities can monitor the type of expenditure, the budget and the yearly estimates of all school costs in their districts. Schools that use ITEM to manage their finances can rise to this challenge since the system assists them, first, to overcome the weakness schools typically have in managing finances and, second, to prepare the required financial reports (Dixon, 1994).

In the summary of the discussion of this section the question is raised concerning how the above financial monitoring affects the autonomy of the schools and the intention of this study is to investigate whether ITEM is a tool that reduces the autonomy of schools. The issue raised in this review of the literature is whether or not the governmental authorities cynically use ITEM in the decision-making process and in running the financial aspects of schools to give them more control over schools. This study intends to explore the potential of ITEM to increase, or alternatively decrease a school's autonomy through manipulation of the decision –making process. The question is whether the government authorities have financed the implementation of ITEM mainly as a tool to run the financial aspects of education in schools and to enable them to tighten their supervision of the different activities of each educational institution (Lumby, 2000). If this is the case and if it is exploited to achieve other goals then the expectation

that ITEM provides more autonomy to schools is probably an illusion, a move made by governmental authorities in order to increase their control over schools.

THE EFFECT OF ITEM ON CLASSROOM MANAGEMENT:

This section focuses on the fourth research question which investigates whether the analyses of a school's results by ITEM:

a) increases the teachers' involvement in managing the classroom

b) or reduces their autonomy and ability to exercise professional judgment.

As has been indicated in the previous sections the purpose of this research is to investigate the effects of ITEM on secondary schools and this section will discuss whether using ITEM as a tool to manage the classroom and analyze the achievements of pupils increases the power and independence of teachers or, on the contrary, whether IT systems encourage external authorities to intervene in the teacher's pedagogical work. This issue is central to the proper working of schools since it is simply wrong to separate the management of schools from its pedagogical work. Managing the classroom has become an integral part of ITEM but educational management cannot only focus on administrative aspects since the main goal of schools is pedagogical achievement.

> *" ITEM should no longer be confined to the scope of a school's administration alone; educational management is, after all, for the support of teaching and learning."*
>
> (Fung and Pun, 1997, p. 21).

ITEM provides new means for managing classrooms and when used properly these means can provide a sophisticated analyses of pupils' results and consequently improve the pedagogical decision- making process. In this way ITEM can combine the administrative decision- making process with the pedagogical.

" ITEM is an indispensable mechanism for both pedagogical and administrative decision making"

(Telem, et, al., 1997, p.35).

In the previous sections the discussion about involving teachers in all aspects of schools has shown how ITEM can assist in this direction and ITEM also needs to be examined in the same way as a tool that involves teachers in managing the classroom (Reynolds, et. al.,2000, p.208). The main goal here is to train the staff to analyze the pupils' results since, up till now, staffs have only been involved in collecting information. In this way the teachers become part of the process of improving the pedagogical decision -making process (Ainscow, et. al., 1994, pp.22-26; Wholeben, 1995, p.242). In fact, teachers have two options for using ITEM. The first allows them to carry on in the same ways as they always have but to use ITEM to make things quicker and more convenient, while the second allows them to use ITEM in a different way that increases intellectual involvement and creativity. The second option is preferable since it relates to teachers as the main force to create change in the management of classrooms (Maddux et. al., 2001, p.119).

" Managing pedagogy requires viewing the classroom teacher as a source of the solution not the root of the problem "

(Wholeben, 1995, p.244).

The Ben-Gurion Secondary School in Petach-Tikvah (a city located not far from Tel-Aviv) has embraced this attitude. In this school they have found that the pedagogical decision-making process has been improved thanks to the use of ITEM. The Ben-Gurion school has encouraged their teachers to be involved in collecting and storing relevant data into the ITEM systems (Rubinstein, 1995). Main data contains test results, quiz results, records about homework and assignments, absentee reports and late coming reports. This information is based on management information which includes lists of pupils and teachers, the distribution of classes, special groups etc. The staff of the Ben-Gurion school were trained to operate ITEM as a tool that can process the data and provide constant follow -up information. The teachers have been trained to retrieve meaningful information by providing cross -comparisons between different variables. Examples of these are comparisons made between the teaching of different subjects in the same class, comparisons between attendance and achievement, comparison between different class achievements and the socioeconomic position etc. Teachers can check these records and make decisions to introduce pedagogical solutions while the school councilor can intervene at the proper time and assist pupils with special needs where needed. Parents, furthermore, can receive accurate information at any given time since ITEM provides statistical information that makes the reports more meaningful (Rubinstein, 1995; Hogenbirk, 1997; Fung and Hau, 1997, p.156).

" IT can do a lot more to support educational management and teachers, besides operational administrative and managerial processes."

(Fung and Hau, 1997, p.156).

This approach argues that the main aim of pedagogical work at schools is the analysis of the pupils' results and, according to this line of thought, ITEM is the appropriate tool to perform this job. This is so because IT involves teachers in collecting and analyzing the pedagogical achievements that are also supported by the administrative information (Telem, and Avidov, 1995-6 p.264). By integrating data from a variety of sources ITEM can often discover 'hidden patterns' and this information can also provide teachers with better assessment data since they can see pupil data across a number of subjects and not just for their own courses (Haughey,2003,p.67).

At the moment, since there is great competition between schools as a result of the free enrolment policy, the teacher's role in assuring good management of the classroom is vital for securing a good reputation for the school. Better pedagogical analysis usually leads to better pedagogical resolve and this leads to improvement. Teachers don't usually like to be involved in school management but if teachers see the direct impact of managing the classroom on the improvement of pupils' results then they will willingly cooperate. In this way, as teachers appreciate the effects of ITEM on classroom practice, their involvement in the process will deepen (Ainscow, et.al., 1994, pp.22-26.)

"Schools are increasingly interested in the generation of information, which can be used to assess how the school is "working".

(Ainscow, et, al., 1994, p.12).

The position taken by this view is that teachers are valuable assets for improving pedagogical achievements in schools and, therefore, schools need to involve them more in analyzing the learning results based on the IS (Ainscow, 1995b).

"Staff find it easier and are more likely to contribute when they are well informed"

(Hopkins and Ainscow, 1994, p. 187).

This approach claims that pedagogical achievements can be significantly improved when the internal forces in schools are actively involved. It is a mistake to rely on external forces to analyze the internal needs of schools (Hopkins, et. al., 1994, p.25).

There is an urgent need to train teachers as the main internal resource of schools to analyze the pupils' results and consequently to improve the pedagogical decision-making process (Stoll, 1999, pp.32-33).

"Change is not a speedy process; the change must come from within even if outside change agents are involved in supporting the change. This requires people within the school to take charge of the change process."

(Stoll and Mortimore, 1997, pp.23-24).

The encouragement of teachers to be more active in managing the classroom by using ITEM to analyze the results in schools leads to a more scientific approach to the pedagogical decision-making process. Teachers learn to rely on relevant findings rather than on making decisions based on intuition (Wholeben, 1995, p.242). The example of the Ben-Gurion secondary school in Petach-Tikvah explicitly demonstrates this view. The Ben -Gurion School accepted the view that the major target of ITEM was to improve pedagogical decision- making and was one of the first in Israel to train staff in how to analyze the pupils' results with IT systems. This school realized that it was a mistake to restrict the staff's involvement to only collecting data (Rubinstein, 1995; Hassall, et. al., 1996, p.23; Hogenbirk, 1997, p.161).

MATANA ('gift'-in Hebrew) is another example of a programme, which has adopted this view. The programme was developed in 1994 by the Tel-Aviv College of Technology and its aim was to provide extra pedagogical support to the MANBAS (Hebrew acronym for SMIS). The aim of "MATANA" is to provide extra support for pedagogical decision-making through strengthening the cognitive process. 'MATANA' encourages the users not to rely on their intuitions and teachers are required to use cognitive methods based on findings and to detach the decisions they make from interpersonal relationships.

" Just as the technology of materials and energy can broaden a man's physical abilities, so information technology can broaden his cognitive abilities "

(Yahalom, 1995, pp.172-173)

The 'MATANA' programme surveys the pupil's achievements and identifies irregular learning situations through analyzing the teaching situation qualitatively. The system can answer questions like: "Does the problem arise in one or more classrooms?" or, "Does the problem exist among several teachers with the same pupils?" Based on this information the following pedagogical decision- making process can be used to manage the classroom better: to re-engineer the learning system, to develop new learning resources, to examine the learning atmosphere, to consider the classroom climate and to deal with any teacher –pupil relationship problems, etc (Yahalom, 1995, pp.170-176).

In addition to 'MATANA' Bar- Ilan University (in Israel) has developed another pedagogical decision- making programme called "ASSISTANT". A department in the Institute for the Advancement of Social Integration at Bar- Ilan University designed this programme in 1994 and the aim was to monitor classroom practice better. The 'ASSISTANT' programme quickly and objectively analyses all kinds of tests (oral tests, written tests, multiple-choice tests) by providing information with graphs, charts, and

statistics. The programme can refer to one class or several classes and includes average marks, standard deviations and the individual place of a pupil in his/her class. It can analyze the degree of difficulty of tasks or questions in the tests and divides the pupils' achievements into three columns: high achievement, medium achievement and low achievement (Netz, 1995).

In this way, the programme assists in managing classrooms quickly and objectively, and makes IT a better tool. It affects classroom management by scientifically analyzing the pupils' results (Netz, 1995) and integrating the single classroom into the rest of the school. This programme enables teachers to receive an objective assessment of their teaching and their pupils' learning and, in this way, every teacher can become more reflective about his/her own teaching. Thanks to 'ASSISTANT' teachers can analyze the need to manage their classrooms better and, thus, can reduce the psychological barriers that modern technology presents to them. It is easier to accept findings from IT systems since the staff itself is involved in the process of analysis and it does not come from external authorities (Netz, 1995, p.201).

There is, however, a line of thought that treats ITEM as a tool that limits the space of teachers in classroom management. This line of thought argues that ITEM was designed in order to assist heads and the external authorities to tighten up their control over teachers' pedagogical decisions (Telem, and Avidov, 1995-6). According to this line of thought teachers are now exposed to the public's evaluation and, therefore, cannot hide "behind the classroom walls" anymore (Telem, and Avidov, 1995-6, p.264). The reason for this is because teachers have not usually been trained in managing classrooms and few teachers have been trained for leadership roles. Too often the school becomes the sum of a large number of autonomous activities and

most teachers regard planning and group work as an extra activity burden. Teachers should open up the doors to the classroom, work with colleagues and reassess practices in order to improve their work (Dalin, 1993, pp.102-114). This need to reassess the practice of 'classroom management' has led to the use of ITEM as a tool that can reveal the pupils' results and can analyze the pedagogical decisions made in each school. This attitude takes into account the fact that ITEM can threaten teachers since they feel very exposed and controlled by the heads and external authorities. This is the inevitable cost of change in the age of information (Yndestad, 1997, p.172).

Bar-Ilan University has designed a programme called "HAMEAGED" (The Incorporator). 'HAMEAGED', which is linked to the ASSISTANT programme, can provide heads and governmental authorities with all the information they need regarding the management of classrooms in each district. 'HAMEAGED' enhances the concept that each class is a part of the school and each school has to be linked to a centre of governmental authority. 'HAMEAGED' can receive information from all over the country as it links up to the 'ASSISTANT' system. 'HAMEAGED' analyzes the pupils' results by drawing a comparison between schools and classes and provides a profile for each school in a district, the status of their achievements and which school is below average and in what areas. It can identify if there is any problem with the type of school and it can analyze on the class level to show if there is any problem in a specific school. This programme enhances the concept that IT provides the public with the opportunity to obtain objective information. This technology enables inspectors and other educational authorities to question schools in relation to their pedagogical decision-making and the results the pupils achieve (Netz, 1995, pp.201-.208).

This line of thought claims that the exposure of the teachers' work in managing the

classroom through the use of ITEM is part and parcel of a change in the status of teachers. Teachers are not sufficiently aware of the change that has taken place in the role they play in the classroom as a result of the era of the 'information superhighway'. Teaching based on the previous concept that knowledge is transferred from the old generation to the new is passé (Rubinstein, 1995). Values and norms have changed, and, while the current younger generation is undergoing experiences relating to the impact of the digital and Internet systems, schools, in many aspects, have remained static. Several methods have continued to exist to one degree or another: Despite the massive increase in the number of pupils in a classroom and the differential approach to teaching the model of teaching has almost remained like that of Socrates whereby the master helps the disciples to find their own way towards wisdom (Duchateau, 1995, p.14), the pupils are still considered to be bottles that have to be filled up (Duchateau, 1995, p.17) and, currently, teachers are expected to act like cartographers who draw maps to explore the 'land of knowledge' (Duchateau, 1995, p.25). A re-engineering of school culture is required. ITEM operates in this direction as it assists in re-defining the teachers' practices in managing the classroom under the influence of the information and digital era (Underwood, 1997, Salomon, 2000).

Managing classrooms with ITEM opens up many other channels of information for the learning process and, in many cases, pupils have easier and better access to information than they can get in the classroom from their teachers. The role of teachers as the "owner" of knowledge is being reduced and more and more pupils seek studies of relevance rather than substance. This move also receives additional support from the constructivist approach that uses ITEM to increase flexible teaching without resorting to constant teacher-centered instruction and direction (Maddux, et, al,. 2001, p.174). The

behavioral approach, which for many years dominated and emphasized the need for teachers to break down complex subject matter into smaller bits and only later to combine it into larger and more understandable concepts, can be contrasted with the constructivist approach. This approach places more emphasis on interaction between learners and pays more attention to both the full picture and the meaning of the whole context since the constructivists prefer pupils to be independent rather than to depend on their teachers to provide them with information and explanation. This approach, thus, better suits the effect ITEM should have on teachers and moves them from their role of being the only sources of information to becoming facilitators of learning for the children (Maddux, et, al., 2001, pp.142-143).

The constructivist approach does not only see ITEM as a technological tool in itself but sees the use of computers as something that needs to merge together with all the other educational influences. According to this approach computers need to be subordinated to the philosophy of education and not the opposite (Salomon, 2000, p.23). The constructivist approach points out the importance of the process of constructing knowledge and not necessarily its outcomes. Knowledge is not the content stored in the memory but the activity involved in constructing it (Rorty, 1991). The social point of view of constructivism claims that there is conventional social knowledge that goes beyond the individual (for example what needs to be taught in History or what good Literature is). What is emphasized in this approach is that the learner sees knowledge as something that he/she constructs (Salomon, 2000, p.62). Although the computer does not solve social or educational problems, it can assist the teacher/instructor and facilitate the transformation of information into knowledge and so help people understand that knowledge is not acquired but constructed (Sfard, 1998).

If we wish our pupils to develop the values of democracy we need to allow them free access to ideas and information and teach them how to think logically, filter knowledge, construct ideas while interacting with tolerance to the ideas of others (Rubinstein, 1995).

"No more monopoly on truth and knowledge"

(Rubinstein, 1995, p. 216).

This approach of 'no more monopoly on knowledge' affects the boundaries of classroom management, and since public and governmental authorities have come to realize that this domain should not come under the exclusive jurisdiction of the teachers, the status of teachers in the classroom has become less clear (Rubinstein, 1995). Schools in our time can neither be the exclusive planners of curricula nor the gatekeepers of knowledge but should act as 'knowledge brokers' rather than 'knowledge distributors' (Fung and Pun, 1997, pp.18-19; Makela, 1997,pp.24-29). The main task of the current teachers should be to guide the pupils in how to turn available information into knowledge (Salomon, 2000). Managing classrooms by the use of ITEM allocates the time of pupil-teacher contact differently since, with the ready availability of information, teachers need fewer face-to-face meetings and can save the time, effort and money that they used to spent on transferring information and devote this time and resources to professional growth (Hassall, et. al., 1996, p.26; Fung and Hau, 1997, p.159).

Thanks to ITEM the emphasis has moved away from time spent on preparing and reporting manually to more time spent on guiding and directing. The challenge

is now, more than ever, to change the role of the teachers from distributors of information to tutors who guide their pupils and help them in their work (Visscher and Wild, 1997, pp.271- 272). Schools are not aware enough of how long the transition to the new kind of 'classroom management' will take and that the potential of IT cannot be ignored because of its effects in the information era upon social life and culture (Mioduser, et. al., 2000, pp. 72-74). The method of managing the classroom has not changed greatly since the industrial revolution and cannot continue like this. The information era makes it possible for learning to be based today on creating partnerships, using discussion groups and peer mentoring (Fung and Pun, 1997).

Consequently, this line of thought argues that the effects of the information era cannot stop at the school's gates and teachers should be forced to open up the classroom and accept the implications of the 'information era' (Fung and Pun, 1997, p.18).

The walls of the classrooms have been broken down because of the influence of Information Systems (IS) but new teaching and learning processes are required, based on a variety of activities such as exhibits, portfolios, and the pupils' involvement in their learning (Telem, et. al., 1997, pp.35-36). Teachers need to guide pupils in how to approach information resources, to use "chat" e-mail and the Internet (Selinger, 1999, pp.39-42).

This approach invites heads and external authorities to examine their involvement in managing the classroom and, under these circumstances, the pupils' results cannot remain in the teachers' domain alone. Different authorities such the inspectors, the district authorities, the Ministry of Education, parents and heads are equally interested in analyzing the pupils' results and, as a result teachers have lost their exclusive educational control over the achievements of their respective classes (Hogenbirk, 1997 p.161). As

pupils become more independent in collecting information this, consequently, affects the libraries since these are required to play a far more active role in supporting pupils, especially in creating IS network resources (Williams and Zald, 1997). Managing a classroom in the information era requires continuous negotiation between teachers and pupils and managing a classroom with ITEM encourages the teachers to utilize the fact that pupils are intrinsically motivated learners because of the computers (Kwok and Ma, 1997, p.166).

This line of thought claims that the change in the culture of the learning environment has created a new paradigm in classroom management (Salomon, 2000, pp.30-31). This change has mainly come about as the result of the influence of external forces since anthropologists tell us that, in general, education does not lead to a change in culture. The opposite, in fact, is more common and change usually comes about because of the introduction of new approaches from outside the educational frameworks into education. This is the case with ITEM. This technology has been well accepted in other cultural institutions in different countries and only lately has been introduced into schools (Maddox et. al., 2001, p.16). In this way, external authorities have influenced schools to treat pupils as more independent learners and to guide pupils in the collection of relevant information and its logical organization (Salomon, 2000, pp. 49-50). Nowadays pupils need to learn these new skills to enable them to turn general information into solid knowledge (Cohen, 1997; Salomon, 2000, pp.71-73).

Consequently this line of thought argues that teachers cannot simply close the classroom doors behind them and ignore the changes that have taken place in the 'information era' which have come to schools from external authorities. Teachers thus need to accept ITEM as a technology which will enable schools to enter the information era on the

same level as has happened in society in general. The gap that exists between general society and schools in this area must be closed. In a way ITEM can be described as key, which can open the locked doors of the classroom and let heads and external authorities take an active part in classroom management (Telem, and Avidov, 1995-6; Fitz-Gibbon, 1996). ITEM is not neutral, however, and the information which this tool provides can also be used negatively to stereotype pupils and to reduce the teachers' autonomy in pedagogical decisions (Haughey, 2003, pp.67-68).

ITEM intends to tighten the connection within schools between teachers and principals and also between schools and central education authorities by coercing schools into performing many of their administrative functions in the standard way determined by ITEM. In this way ITEM enables central education authorities to exercise a form of 'distant control' over schools without appearing to intervene directly (Tatnall and Pitman, 2003, p.81). This was the main motivation of the Israeli Ministry of Education in introducing the 'MANBAS' into schools as one of the major Israeli IS. The aim of the central government was to collect information about school achievement all over the country and government authorities have justified all the expenditure involved in installing MANBAS in schools because it assists schools to manage their own affairs. In actual fact, however, schools were asked to relay information back to the Education Department using reports incorporated into ITEM (Tatnall and Pitman, 2003, p.77). Thanks to ITEM the governmental authorities in Israel can now analyze pupils' results, draw comparisons between schools, analyze the achievements in each subject, look into schools that have been defined as below average, and praise schools for their special achievements etc (Gev, 1995; Barta, et. al., 1995).

The same process has taken place in the UK. The schools' achievements have been

published and are available on the Internet and thus the public can judge the achievements of each school. This information about the board results has, however, caused considerable debate as the schools have challenged the accuracy of the published figures. In spite of the schools' protests, however, there is a strong feeling in the public that the challenge of schools in the information era is to deal with the consequences of the comparisons made between pupil's results. The governmental authorities have justified this control over managing classrooms because, they claim, it assists in gathering valuable data (Warwick, 1997, p.148).

Thus the availability of information provides an important resource to assist in formulating policies, planning, and setting out strategies in order to improve schools (Warwick, 1997, p.149). This line of thought argues that the on –line connection between the governmental authorities using ITEM systems in every school has a twofold purpose. The first is to tighten its control over school management including the number of pupils in each class, teachers, workers, budgets, expenditures etc; and the second purpose is to tighten inspection over pupils' results and the pedagogical decision- making involved in managing the classrooms in each school (Telem et.al., 1997).

To summarize the discussion of this section, it is obvious why this study wishes to investigate the question of whether ITEM increases the teachers' involvement in managing their respective classes or whether it provides the authorities with more power to interfere in managing classrooms. This is a question that needs to be discussed since interference by the authorities in managing classrooms is a matter of concern that can seriously affect the autonomy of teachers. The question raised by this review of the literature is whether in these days when teacher-centered teaching might be gone, it

is right or not right to exploit this opportunity to increase the amount of centralized control over education (Cooper, 2004). This matter may, in turn, affect the recruiting and retaining of teachers in the system as a result of the dissatisfactions teachers may have due to a decrease in their professional autonomy and the simultaneous increase in the control over their professional judgments (Johnson and Hallgarten, 2002). It is, therefore, questionable whether ITEM systems can replace the close relationships that have always existed between teachers and pupils since

> *"Teachers provide a 'scaffold' that enables the learners to move from their current state of knowledge and understanding to a new state of knowledge and understanding and to do so teachers need considerable freedom of movement"*
>
> (Cooper, 2004, p.2).

The issue raised by this review of the literature is that there is a clash between the propensity of ITEM to tighten up inspection over the pupils' results and the line of thought that regards success in classroom management to be the creation of a culture of freedom for teachers; something which provides more autonomous professional space to determine the learning needs of the pupils and their own teaching strategies. The questions raised by this study become even more urgent since the increase in control over schools through ITEM does not allow the full potential of every individual teacher to be released and, without the empowerment of teachers, it is difficult to motivate their enthusiasm and involvement in the process of making educational decisions (Hand, 1995, pp. 36-40).

If ITEM increases control over teachers and tends to reduce their autonomy then it will subsequently affect their social status in such a way that they become like civil servants (Harris, 1990, p.171). The issue raised by this review of the literature is that liberal democratic governments, if they wish to be true to their principles, need to promote autonomous schools by creating the socio-economic conditions and an atmosphere of academic freedom that will eventually make teachers ready to take on more responsible roles in classroom management. If this is not done tension will arise between the two opposing tendencies. On the one hand teachers need to be empowered to manage their classes with more freedom- which suggests that everybody should have some input into decision-making and demonstrate higher levels of competence -while, on the other hand, the increase in control over teachers suggests that they will subsequently join a lower status of workers that can expect to have less and less autonomy (Cunningham et, al., 2001, pp.145-146, 149). If the intention of the liberal democratic governments is to cope with the dramatic increase in international competition then more flexibility and freedom is required for the staff -not less. The contribution of teachers will, otherwise, be poor since external control will affect their status in the eyes of the public and keep them away from the managerial circles where the real decisions are made (Cunningham et, al., 2001, pp.152-153).

The view that ITEM might also create an illusion of 'progress' can intensify the debate over the question of the degree of interference by the authorities that might take place in teachers' classrooms. Politicians enjoy using 'photo opportunities' at schools in poor areas to show them inspecting the IT system, that have been introduced into these schools -as if IT is the solution that is needed to help poor pupils ultimately close the educational gaps in some mysterious automatic process (Armstrong and Casement, 2000, p.1). A question that also needs to be asked is whether the experience with ITEM

is not going to end up like the experience with TV? Like TV, computers also encourage people to, more or less, sit motionless and it is questionable that IT, in its various forms can, alone, develop the essential skills needed for independent learning (Armstrong and Casement, 2000).

The issues raised by this review of the literature are also based upon an accumulation of experience with computers which illustrate some worrying aspects that cannot be ignored:

1. Speed and control achieved by pupils is emphasized at the expense of thoughtfulness and understanding.
2. IT as a visual medium deals with images and not actual things and, in this way, negatively affects verbal expressions skills and the development of thinking.
3. The extensive use of computers creates the illusion that the ability to think has been increased yet, the spending of so many hours in front of the computer actually decreases both the time available and the desire to read books.

The decrease in reading books negatively affects the development of verbal and thinking skills while the problematic use of language on computers can also be negative influences as well. Parents have in fact become partners to this tendency since they regard the electronic media as an electronic babysitter for their children when they are away from home (Armstrong and Casement, 2000, pp.8-18).

Although electronic databases promise new and better ways of acquiring information than traditional sources of information (Fung, 1995 ; Kenway, 1996; Wild, 1997), this study claims that it is still an illusion to believe that IT can create independent learners since;

1 It provides too much information and this makes it difficult for pupils to find their way, unaided among the mountains of information.

2. Computerized learning has little or nothing to do with learning in the formal sense but is more like playing games.

3. The search for information can be time-consuming and demands guidance from parents, teachers and librarians.

4. Many sites are full of factual errors, bad grammar and even worse spelling.

5. While searching the Internet for information the learner can land undesirable, on problematic sites (like Nazi sites or sex chats etc).

6. IT consumes a lot of money and comes at the expense of purchasing books and library services.

7. IT increases the phenomenon of plagiarism and pupils have even been known to submit works without reading them first, thinking that, because they are working on a computer, they don't have to read the material (Armstrong and Casement, 2000, pp. 113-126).

Consequently, the possibility that ITEM interferes with teachers' classroom management by allowing the authorities to get into the classroom has led this study to inquire into the effects of ITEM on managing the classroom. Specifically, the study sets out to find out whether ITEM can increase a teacher's independence in managing the classroom or whether, on the contrary, it, in fact, decreases independence by allowing the authorities into the classroom.

Summary of the chapter:

In conclusion, and as a summary of the discussion, this study proposes the notion that there are four areas of tensions relating to the use of ITEM which need to be examined and four issues involving these tensions form the conceptual framework for this study.

The first area is the tension that exists between the flexible relationships that this system is supposed to provide and the actual uses of ITEM. Conflict arises because the flexibility provided by ITEM is illusory as claimed by the first question raised by this review of the literature (in the first section) and the real intention behind the move to introduce it is to increase the control of the leadership over the school. This study intends to investigate the extent to which this issue reflects the actual situation in secondary schools and whether ITEM can, in fact, succeed in establishing new flexible relationships at schools?

The second area is tension which is caused by the intention to create a new form of electronic dialogue through the use of ITEM in schools. This tension arises since 'electronic relationships' do not fit into a proper educational environment as is claimed in the second section of this chapter. This study intends to investigate whether this is so and whether ITEM can really provide a new way of a dialogue and, perhaps, a new type of relationship between those involved in the educational process.

The third area is friction that arises as a result of the actual use of ITEM and the desire to increase the autonomy of schools through its use. The third section of this review claims that ITEM, in fact, reduces autonomy and that government financing for it is cynical in that it gives governmental authorities more control over schools than

they previously had. The research intends to test whether this is true and whether ITEM can, in fact, provide more autonomy through providing schools with a better decision-making process and helping them deal with their finances more wisely.

The final area studied are the contested ideas created through the use of ITEM as a tool to manage the classrooms. As claimed in the fourth section of this chapter, ITEM interferes with teachers' classroom management by allowing the authorities into the classroom while the opposing view is that ITEM is a tool that gives teachers more means to manage their respective classes more independently. The intention of this research is to investigate whether ITEM actually does provide more and better means for teachers to manage their classes more independently or whether, on the contrary, it provides the authorities with more and better means to interfere in classroom management.

These four tensions will be examined through the use of a questionnaire, the preparation of a survey and studying multiple cases of schools through semi-structured interviews. The next chapter of 'Methodology' explains how the information will be gathered from different sources and how the data will be analyzed. The chapter of 'Methodology' explains how the design of the questionnaire will, hopefully, help us able to answer the four research questions that the chapter of literature review has opened up. The following are the four research questions about which information needs to be gathered:

1. Does ITEM increase or decrease the control of leaders over schools?

2. Does ICT create a new way of dialogue in schools or does it, either, weaken or strengthen existing personal ties among the staff?

3. Does ITEM increase or decrease a school's independence from external authorities and thus its autonomy in the decision -making process? How?

4. Do analyses of schools' results by ITEM increase the teachers' involvement in managing the classroom or minimize it? How?

Chapter three - METHODOLOGY:

This study examines the four tensions mentioned in the conclusion of the literature review as a consequence of the use of ITEM in secondary schools by using a questionnaire to prepare a survey and study multiple cases through semi-structured interviews. The aim of the questionnaire is to collect quantitative data about these four tensions and the case study aims to provide qualitative data which includes detailed examination of the effects of ITEM on Israeli secondary schools (Wellington, 2000, p. 90). The mixed use of quantitative and qualitative methods will be explained in the section devoted to the study itself.

Structure of the chapter:

The structure of this chapter is divided into six sections and includes the following:

1. The purpose and aims of the study:

This section presents the key arguments of the study and its effects on those secondary schools which have decided to use Information Technology in Educational Management (ITEM) as a managerial tool. It focuses on four areas that ITEM affects in schools:

a) The degree of flexibility in the approach used in school.

b) The forming of new relationships.

c) The degree and status of the school's autonomy.

d) The effects ITEM has had on classroom management.

2. The methodological approach:

This section focuses on the research questions and presents the conceptual framework derived from the review of the literature on the use of ITEM in schools.

3. The methods of collecting data about the use of ITEM:

This section focuses on two research tools:

a) The survey questionnaire.

b) The case study based upon semi-structured interviews.

This section also defines the population participating in the research, presents the instruments used to collect the data and also explains the administration of the data collection and distribution.

4. Data-analysis:

This section contains the data analysis and an explanation of how the data concerning the use of ITEM in secondary schools can be tested statistically and how the research analyzes the different categories of the data.

5. Research credibility:

This section explains the validity of the research by using a multi- method approach in order to increase the reliability of the research.

6. Summary and key points:

The last section of this chapter explains the significance of the findings, and deals with the limitations of the research by demonstrating the

strengths and weaknesses of the study. It stresses the ethical problems and presents a summary of the key points about the use of ITEM in secondary schools in Israel.

Questions: The purposes and aims of the study:

The purpose of this study is to examine the effects that Information Technology in Educational Management (ITEM) has had on managing secondary schools in Israel. The key points of discussion refer to four areas in a school's management as follows:

1. The effect of ITEM on the leaders' control over schools:

The first contention of this study is that the flexibility provided by ITEM is illusory and that the real intention behind its introduction is to increase the control of the leadership over the schools (Telem, 1995; Sagi, et. al., 1995; Warwick, 1997; Yndestad, 1997). The first objective of the study was, thus, to investigate the extent to which this contention reflects the actual position in secondary schools and whether ITEM, in spite of the first issue raised in the review of the literature that flexibility is an illusion, does eventually, succeed in creating new, more flexible relationships among people at schools (Visscher and Wild, 1997; Makela et. al., 1997; Salomon, 2000).

2. The 'new dialogue' and its effect upon the inter-personal relations amongst the staff:

Two questions are addressed here:

a) Can ICT create a new kind of a dialogue in schools or does it, in fact, weaken

the existing personal ties among people in education?

b) Do 'electronic relationships' fit into a proper educational environment or not ?

There is a tendency to present ICT as a tool that creates a new kind of a dialogue thanks to the new possibilities provided by Information Communication Technology (ICT) (O'Neill, 1994; Lamby, 2001; Spector, 2002), but this kind of dialogue is not the regular form of conversation since it takes place on the computer screens of people in education and consequently involves fewer 'face to face' meetings which, in turn, reduces the human impact upon the dialogue process (Hsu, 1995; Nolan, 1996; Kenway1996). The claim of this study is that 'electronic relationships' cannot be a substitute for the nurturing educational relationships which develop as the result of the 'face –to-face' meetings that take place between teaching staff and pupils. These encounters make a great contribution to the personal growth of people in education and cannot be replaced by impersonal machines (Kahin,1993; Maddux, 2001).

3. <u>The effect of ITEM upon school's independence</u>:

There is a line of thought that claims that ITEM has become a sophisticated tool thanks to Decision Support System (DSS) and that, consequently, schools can make better decisions leading to better judgments. As a result, according to this line of thought, schools have become more reliable and are thus entitled to more autonomy from the external authorities (Kaly and Chen, 1995; Wholeben, 1995; Spuck et. al., 1997; West et. al., 2000). The third issue raised in the review of the literature was, however, that the external authorities use ITEM cynically and exploit the fact that it gives them more control over the finances and educational decisions of the schools (Dixon, 1994; Wohlstetter and Smyer, 1995; West et. al., 2000). This study's investigates whether the external authorities actually do regard ITEM as a tool that grants schools more

autonomy or, they use ITEM to intervene in the decision- making process of schools and, in this way, actually to increase their control over education.

4. The effect of analyses of schools' results by ITEM on the involvement of teachers:

There is an argument claiming that because ITEM provides teachers with statistical information, this can help them improve the pedagogical decision- making process so that they can manage their classes more independently and with more freedom (Netz, 1995; Yahalom, 1995; Hogenbirk, 1997; Fung and Pun, 1997). Yet, the fourth issue raised in the review of the literature disputes this and points out the propensity of ITEM to tighten up the inspection of teachers by the authorities by both allowing them into the classroom and using the analysis of pupils' results to interfere in managing pedagogy. If this is so then ITEM, in fact, limits the space of the teachers' freedom to manage their respective classes (Telem, et, al., 1997; Warwick, 1997; Cunningham et, al., 2001; Johnson and Hallgarten, 2002). Can these seemingly contradictory positions be resolved?

The Methodological approach:

This study uses the methodological tradition of the interpretive research approach. The four areas earlier referred to clearly show how this study concentrates on the social effects that may be created in schools by ITEM and also explains why this study has been carried out using the interpretive tradition. There are several reasons for this:

1. The study approaches the world as a social construct.

2. Science is seen as being driven by human interests.

3. The study focuses on understanding meanings rather than understanding causes.

4. The study attempts to understand what is actually happening and arrives at a picture illustrating the totality of the situation through using multiple methods examining different views (Easterby-Smith et. al., 1994, p.8o; Usher, 1996, p.18; Cohen and Manion, 1998, pp.36-39; Gough, 2004, p.46).

One of the key features of the interpretive tradition is that science is not 'value free' since it is driven by human interests. Thus it is difficult to be completely objective as one would be expected to be in the positivist approach. The task of a researcher following the interpretive tradition is not just to gather facts, but to appreciate the different meanings that people place upon their experiences and to understand the experience as nearly as possible as its participants feel it or live it (Easterby-Smith et. al., 1994, p.78; Wellington, 2000, p. 101; Sherman and Webb, 2001, p.7). Consequently, the interpretive tradition emphasizes the need to use qualitative methods that can build up a picture of social "reality", rather than to use the quantitative methods that are more often associated with the positivist view (Cohen and Manion, 1994).

Justification of the research:

In spite of the fact that this study chooses to work in the interpretive tradition, the intention is to minimize the possibility of subjectivity. With this in mind the study uses quantitative data i.e. it adopts mixed methods mainly quantitative but with some qualitative research as well. There is an obvious connection between gathering quantitative and qualitative data and, in practice, researchers often adopt this model of combining the quantitative and positivist approach with the qualitative and interpretive method. For example, the intention of this study is to use a postal questionnaire with

detailed interviews that will combine both approaches and the expectation is that this mixed approach will provide a significant amount of both quantitative and qualitative data (Cohen and Manion, 1994; Miles and Huberman, 1994).

> *"Social scientists have come to abandon the spurious choice between qualitative and quantitative data. They are concerned rather with the combination of both which makes use of the most valuable features of each"*
>
> (Cohen and Manion 1994, p.40).

Satisfying the four research questions of this study requires both qualitative and quantitative data and the reason for this is that the research questions refer to both. On the one hand we need to objectively examine the situation of the use of ITEM in schools and explain what is discovered objectively and is free of value judgments (Cohen and Manion 1994, p.8; Eastby-Smith et. al., 1994, p. 77). On the other hand, answering these questions demands that data be collected that can be used to classify, evaluate and interpret the personal judgments and feelings of people in education toward their experience with ITEM in schools (Eastby-Smith et. al., 1994, p.78).

For example the first research question of this study inquires into whether ITEM enhances the power of school leaders to control and supervise the different activities in schools (Telem, 1995), or whether it encourages the leaders to adopt flexible approaches which decrease their control over people in schools (Lamby, 2001). It seems that a questionnaire circulated in different secondary schools can provide quantitative data

about the current use of ITEM and discover its effects on the ways that schools are handled. The qualitative method (such as multiple case studies using semi-structured interviews) that this study will use can, however, hopefully provide data that evaluate the feelings and attitudes of people in education towards the use of ITEM by the schools' leadership. It should indicate whether such people feel more relaxed and perceive themselves to be working in a flexible culture in their day to day occupation or, whether on the contrary, they feel tenser and perceive themselves to be under the intensive supervision of the school's leaders -and that the flexibility provided by ITEM is illusory.

The second research question refers to the area of communication in schools and the intention is to examine whether ITEM offers a new manner of dialogue among people in schools (Makela, 1997), or whether it decreases the existing inter-personal relationships in schools- something that might lead to the creation of a sort of distance (Lamby, 2001). In this case a questionnaire can provide quantitative data about ITEM as a tool of communication and objectively reveal the quality of the dialogue that exists on the surface in schools. Only qualitative data, however, can penetrate deeper and evaluate the communicative relationships created by ITEM and judge whether these 'electronic relationships' do, in fact, create a new way of dialogue or, on the contrary, whether ITEM has managed to create distance and cold relationships in schools i.e. -'electronic relationships' that do not suit education. This is the reason why this study uses mixed methods of quantitative and qualitative approaches. The mixture can help to get a better picture and the use of both a questionnaires and interviews in this case, in fact, complement each other and thus, are not contradictory.

The autonomic status of schools is the third area that the third research question deals with. The intention is to explore whether ITEM is a tool that improves the decision-

making process and can lead schools into achieving more autonomy from the governmental authorities because of their ability to make complicated and independent decisions (Kaly and Chen, 1995; Wholeben, 1995; Spuk et. al., 1997), or whether the external authorities, in fact, exploit ITEM to limit a schools' autonomy and interfere in its decision- making processes (Dixon, 1994; Wohlstetter and Smyer, 1995; West et. al., 2000). A questionnaire can be used to collect quantitative data from secondary schools and present it in a 'value free' manner which will help us judge whether there is any connection between ITEM being used as a tool in the decision -making process and the extent of the autonomy the schools have managed to reach. This quantitative data can hopefully help us answer the question about whether ITEM increases or decreases a school's autonomy. Because autonomy and freedom, however, also depend on general feelings and the perceptions of people there is a chance that autonomy and freedom might be understood differently in different communities. Each school emphasizes its own values and since what is considered to be freedom in one school is not automatically applicable to every school. This question also needs to rely on qualitative data which will be provided by interviews and case studies. In this way the study can hopefully provide information about the degree of freedom and autonomy that schools have managed to reach thanks to the use of ITEM, and whether, on the contrary, ITEM has reduced the school's autonomy and increased the power of the external- central authorities to cynically interfere in the internal decisions of secondary schools in Israel.

The fourth research question focuses on the management of classrooms by teachers. The intention is, on the one hand, to investigate whether ITEM intensifies a teachers' involvement in managing the classroom by making it possible to analyze the pupils' results in a more sophisticated manner and, in this way, help teachers make better pedagogical decisions (Netz, 1995; Yahalom, 1995; Hogenbirk, 1997; Fung

and Pun, 1997). On the other hand, we need to investigate whether teachers will be exposed to more supervision by both internal and external authorities who will now be able to analyze each class' results and compare the achievements. If this is so then ITEM, in fact, reduces the teachers' autonomic space and limits the teachers' involvement in managing their respective classes (Telem, et, al., 1997; Warwick, 1997; Cunningham et, al., 2001; Johnson and Hallgarten, 2002).

To answer this question both quantitative and qualitative methods need to be used since the question refers both to the objective situation of ITEM existing in current schools and, at the same time, interprets the actual emotions involved. The circulation of a questionnaire in secondary schools in Israel can hopefully provide data that by using the positivist tradition can reveal the facts regarding the effects of ITEM on managing the classrooms while interviews with people in education, using the interpretive tradition, can highlight these facts and interpret the social implications of ITEM on teachers' management of classrooms. Using both methods makes it possible to overcome the obstacles that might come from the external authorities that prefer presenting ITEM as a tool that assists teachers to manage their classrooms rather than emphasizing their wish to interfere in the internal life of schools by entering the classroom (Telem, et, al., 1997)

To conclude the discussion on the methodological traditions used and the justification of the research methods of this study a clarification of the theoretical context of this research is needed. Based on the review of the literature this study proposes that there are four tensions relating to the use of ITEM that compose the conceptual framework of this research and these four tensions, of course, need to be examined.

Theoretical context:

The first area of tension of this study arises because of the line of thought in the literature that claims that ITEM has opened up a new era of flexible relationships between educational leaders and other people in education. Thanks to the ITEM systems, according to argument, leaders can now devolve more power to staff since they have a direct connection with them. Additionally, since leaders of today need a lot of assistance as they are under immense pressure and cannot do their jobs alone, the use of ITEM can encourage staff to take an active part in assisting the leaders to lead the schools. This is because ITEM is a modern tool that has the ability to store and deploy information in real time and so can be utilized to share the burden of administration work (Fullan, 1992; Jackson and Humble, 1994; Rubinstein 1995; Yndestad, 1997; Visscher and Wild, 1997; Fung and Hau, 1997; Salomon, 2000; Lamby, 2001).

This view, however, conflicts with the official standpoint which stated that ITEM is used to offer greater 'freedom' and empowerment to the staff and, in fact, has the opposite effect by tightening up supervision over people in education. This creates tension and as a result - as the issue raised by the review of the literature show, the flexibility provided by ITEM is illusory and the real intention behind this move to introduce ITEM is, in fact, to increase the control of the leadership over the schools and tighten up their surveillance over teachers (Jackson and Humble, 1994; Sagi, et. al., 1995; Telem and Avidov, 1995-6; Telem et.al., 1997; Visscher and Wild, 1997; Warwick, 1997; Lawson and Harrison, 1999; Ravid, 2001). This study intends to investigate the extent to which this issue reflects the actual situation in secondary schools, and whether ITEM can, perhaps,

succeed in establishing new flexible relationships in schools as the first line of thought claims it can.

The second aspect of this study is the area of tension that is created as the result of the intention to form a new kind of 'electronic relationship' through the use of ITEM. In the review of the literature there is a line of thought that claims that ITEM supports different forms of communication (Maddux, et, al., 2001) and that this has led to a new era in communications which is characterized by a change in negotiation positions- from face- to- face dialogue to screen- to -screen interaction (Kenway, 1996; Nolan, 1996). This new dialogue has been made possible since ICT provides an 'access window' to multi-user domains (Holmes and Russell, 1999) and, in this way, IT has become a tool of interaction and consultation among the parties involved in education (Wild, 1997; O'Mahony, 1997).

The conflict arises because the review of the literature reveals that there are studies demonstrating that 'electronic relationships' are not suited within a properly educational environment. According to this view screen-to-screen communication cannot substitute for face –to-face contact which is so important in the educational environment (Lamby, 2001). An educational environment based on 'electronic relationships' might create suspicion and a climate of alienation since people in education expect to communicate personally and establish close relationships (Kahin, 1993; Makela 1997; Maddux, 2001). This study intends to investigate whether ITEM can actually create a new kind of a dialogue in secondary school as claimed by some of the literature or whether this approach is not appropriate since 'electronic relationships' do not fit into educational environment as claimed by other studies (Lumby, 2001).

The third area of tension is that which arises as a result of the conflict between the use of ITEM and the desire to increase the autonomy of the schools through its use. Evidence from the literature argues that the increasing autonomy of schools is a function of their ability to deal with problems successfully by making the right decisions and that ITEM is an appropriate tool to assist in this direction (Ezrahi, 1994; Telem, 1995). ITEM, with the programme of DSS, can assist in setting priorities for every issue, since it provides an analytical system of judgments (Hogenbirk, et.al. 1997). The system utilizes the encounter by helping teachers choose the best alternatives (Spuck et.al., 1997), to concentrate on the problems, to prevent them from making emotional decisions (Wholeben, 1995; Nunamker, 1997), and to assist them in managing finances and carrying out long term planning (Odden, 1995; Lumby, 2000). The, making of right decisions by teachers and administrators, according to this view, encourages government authorities to devolve more power to educational leaders and allow them to run their respective schools more independently (Ezrahi, 1994; Kaly and Chen, 1995; Conley and Odden, 1995; West et.al., 2000; Lumby 2000).

Nevertheless, tension is created by the conflict existing between this view and another issues raised by the review of the literature claiming that ITEM, in fact, reduces autonomy and that government financing for it is cynical in that ITEM actually gives governmental authorities more control over schools than before its implementation (Wohlstetter and Smyer, 1995). Research shows that state authorities are, in fact, unwilling to devolve spending decisions to schools since they pick up a large portion of the cost of public schools (Madden et.al., 1992), and that local and national politicians are not ready to minimize their involvement and influence in educational decisions since it demonstrates their power to the public (Mohrman et.al., 1995; West et. al., 2000). The

intention of this study is to test whether ITEM can, in fact, grant more autonomy to schools through providing them with a better decision –making process or whether ITEM, in fact, assists the external authorities to intervene more in the internal decision – making process of schools and, in this way, increase their control over education.

The fourth aspect this study is the area of tension which is created through the use of ITEM as a tool to manage the classrooms. In the review of the literature there is a line of thought stressing the important role ITEM plays in managing classrooms claiming that it is an almost indispensable mechanism for making both pedagogical and administrative decisions (Telem et. al., 1997), as well as supporting educational management (Fung and Hau, 1997). It argues that, because staff are ready to contribute more owing to their being better informed (Hopkins and Ainscow, 1994), they are also ready to contribute more since they can analyze the pupils' results in a more sophisticated manner with ITEM and this consequently improves the pedagogical decision-making process (Yahalom, 1995; Nets, 1995; Hassal, et. al., 1996; Hogenbirk, 1997; Stoll, 1999),

The review of the literature, however, also discusses studies which show that ITEM, in fact, reduces the autonomy of the teachers and allows the external and the internal authorities to interfere with teachers' classroom management. These studies claim that the authorities want to expose the pupils' results to the public so that teachers cannot hide "behind the classroom walls" anymore (Telem and Avidov, 1995-6; Yndestad, 1997). According to this view the information era requires a re-definition of the teachers' practices in managing the classroom since nowadays teachers are not the only source of information available (Rubinstein, 1995; Selinger, 1999; Salomon, 2000; Maddux, et. al., 2001). The propensity of ITEM to tighten up inspection over the

pupils' results conflicts with the line of thought that regards the success of classroom management to be the creation of a culture of freedom for teachers (Hand, 1995; Cunningham et. al., 2001; Johnson and Hallgarten, 2002; Cooper, 2004). The intention of this study is to examine whether ITEM can, in fact, provide more freedom to teachers in managing their respective classes or whether ITEM, in fact, provides the authorities with more and better means to interfere in classroom management.

DATA COLLECTION:

The data collection method of this study is based on cross-references and consists of:

1. A questionnaire circulated by post to principals, educational leaders, teachers and people from external authorities in charge of secondary schools.
2. Multiple case studies using semi-structured interviews, the scope of which includes principals, educational leaders, teachers and people from external authorities who are in charge of secondary schools.

The reason for using a cross-reference approach is to avoid relying on a single source of evidence which can cause inaccuracies or be close to prejudice. This approach of cross-references can, hopefully, help map out the human behavioral reaction to ITEM by studying it from more than one standpoint i.e. the quantitative data can, hopefully, provide the information about the current existing condition of ITEM in secondary schools and the qualitative data can, hopefully, provide access to what is "inside a person's head" (Tuckman 1972). In addition, this approach allows us to

examine the issues raised in the review of the literature by going deeper into the motivations of the respondents (Cohen and Manion, 1994, p. 272).

> *"Exclusive reliance on one method, therefore, may bias or distort the researcher's picture...".*
>
> *(*Cohen and Manion 1994, p.233).

Research population and sampling:

The research sample includes people in secondary schools and local- government authorities in Israel while the data gathering focuses on people who work with ITEM and can represent the total population of this study. The research sample consists of 11 secondary schools in the northern part of Israel located within a 50 km radius of Haifa. These can act as a sufficient resource because all the types of secondary schools that exist in Israel are included in the research sample and are located in this district. The district also reflects the typical socio-economic structure of Israel while the local – governmental authorities operate according to the same pattern of behavior as in the other six districts in Israel (Bassey, 1999, p.12). The research sample includes 130 teachers, 32 Senior Management Team (11 principals, and 21 heads of junior high and deputies), 50 educational leaders (coordinators and heads of departments) and 40 people who work for the Ministry of Education and the local- government authorities i.e. inspectors, different education department managers, financial officers, etc. The use

of these 252 participants will, hopefully, minimize the possibility of sampling error because of the number of participants and the fact that the sample is based on a careful selection of participants. A list was provided by the principal of each school and the above participants taken from these lists had to be people with more than 10 years of experience because they had to comment on the situation in schools since the implementation of ITEM in recent years. Based on this list the sample participants were selected as follows: 1/3 from the top of the list, 1/3 from the middle of the list and 1/3 from the bottom of the list. Thus, hopefully, reduced the possibility of any lack of objectivity in the research process (Cohen and Manion, 1994, p.89; Drever, 1995, p.78 ; Wright, 1997, pp.7-8).

The above made it possible for the research sample to reflect the population and provide answers to the four research questions of the study. Moreover, the semi-structured interview included in the case studies were able to probe deeper and find out what the feelings, attitudes and reservations etc. of the participants were. The interviewees were selected according to the findings of the questionnaire and the interviews took place in four schools. The interviews included four principals, ten teachers and coordinators from the four schools and four people from the external authorities (2 local representatives and 2 governmental representatives). These 18 interviews, hopefully, provide further data about the four aspects of the conceptual framework of the study and will help us asses whether the four issues raised by the review of the literature reflect the actual situation that currently exists in Israeli secondary schools or not.

The research population was made up of people from different types of schools in Israel such as: comprehensive schools, vocational schools, regular religious schools, yeshiva type religious schools and general secular schools. Basically the structure of

all schools in Israel is almost the same although there are differences in their orientations and educational aims. All types of schools are under governmental inspection and obligatory subjects must be taught in order to obtain governmental financial support. The schools ultimately have to submit their pupils to the same governmental exams in order for them to obtain the matriculation certificate. All the above types of schools are entitled to governmental subsidies to purchase MANBAS (the Israeli version of SMIS) and so expose their schools to IT systems. Members of the research population were approached individually and those who filled in the questionnaire had to respond individually. The goal of the research was to explore the personal view of each respondent about ITEM and its effects on secondary schools in the four areas of tension that the literature of this study has suggested exist and to determine in what direction ITEM might lead the schools. The variety of the research sample enabled us to obtain different angles of vision and points of view about IT. There was no point in filling out the questionnaires in groups as respondents might have come under group pressure and their answers would thus not have reflected personal outlooks.

Case studies where information was supplied through interviews were conducted individually since the view of every interviewee might be different. The principal, for instance, might approach the system from the point of view of managing the whole school, while a head of department or a teacher might approach the system from the point of view of managing the individual classroom or teaching their subject. In addition to this method the research also used semi-structured interviews -a method that requires probing and follow up questions and which is difficult to do in groups (Cohen and Manion, 1994, p.287).

Instruments- questionnaire:

This research uses two instruments: a survey questionnaire and semi- structured interviews. The first instrument to gather data is a survey questionnaire the items of which probe the key issues presented in the literature and the research questions. The aim is to collect data which would reveal the effects of ITEM on Israeli secondary schools in four areas:

1) Control and flexibility of approach.

2) Communication i.e. the alternative of a new dialogue or fewer personal ties.

3) School autonomy.

4) Classroom management.

The survey questionnaire has been developed on the basis of the Davidson model from 1970 presented by Cohen and Manion (1994, p.84) and uses simple words to minimize errors made by respondents most of whom lack a technological background (Davidson, 1970). The questionnaire also avoids using leading questions, double questions, and hypothetical questions (Bell, 1987, pp.62-63). This questionnaire needed a pilot run and, for this, respondents were selected from two schools that were eligible to take part in the main study. From the experience gained in the pilot project experience the questionnaire was improved and amended before sending it out to the main research population accompanied by the following letter:

Dear Respondent,

This questionnaire is for the purposes of a research project that is being carried out at the University of Leicester. The goal of the research is to examine the effects of ITEM upon a range of subjects involving the working of your school. You are requested to answer

the questions to the best of your knowledge in a way that reflects your attitudes and thoughts about the subjects being asked about so that the findings of this research will be valid and will prove to be useful. The researchers are interested in your personal opinions and this is no exam with right or wrong answers. The questionnaires are anonymous and will be used only for research purposes. We thank you for being prepared to take part in this research and for your assistance.

With many thanks

The Research Team

The main amendments and changes made as a result of the pilot stage were as follows:

The questionnaire (translated from English into Hebrew) took into account the comments received and, as a result, the statements in four places were re-formulated so that the Hebrew reader could more clearly understand their intention. On the front page the term "seniority (years of experience) in the present position" has been added in addition to "seniority (years of experience) in teaching" in order to be able to assess the experience of the participant also in the light of his presently held position.

In question 11 a statement (f) has been changed since the school certificates and the improvements made with the help of ITEM do not attest to whether the supervision has increased or decreased at school. Instead a new statement has been introduced: "Has the number of instructions from the leaders increased?"

Questions 13-14 have been combined as question 13 since they both examine the effects of ITEM upon schools and there is no need to separate between them.

Questions 15-16 also have been combined as question 15 since they discuss two sides of

the effects ITEM has on the degree of a school's independence.

Question 15, statement (f) has been divided up into several statements since the statement on independent financial management is too broad and, in the light of the comments made on the pilot, needs to be divided into sub-groups that better reflect the situation in Israel: In place of "Do you think that ITEM increases government supervision over financial matters?" has been divided into:

f. Does ITEM increase government supervision over the exploitation of the hours of teaching budgeted for the school?

g. Does ITEM increase government supervision over payments made by parents?

h. Does ITEM increase government supervision over the school's day-to-day expenses?

The following statement has been added in question 18:

"The external authorities ignore the data base of the school when they analyze the pupils' results." This has been done as a result of the comment received in the pilot that the external authorities do not seriously relate to the information accumulated in school and prefer their own information bank.

In light of the fact that there were a number of participants (albeit small) who ignored one statement or another in the pilot a request has been added at the end of the questionnaire: "Please go back over the questionnaire and make sure you have not forgotten to answer any question. Thank you for your help. "

The revised questionnaire was distributed in 11 different secondary schools located in the Haifa district and in the northern part of Israel. Each school received 18-25 questionnaire forms to be filled in by the following people; the principal, vice principals and deputies, coordinators, head of departments, and teachers. In addition the

questionnaire was circulated to 20 educational administrators in the local authority and 20 people in the Ministry of Education. Postal questionnaires were distributed to the principals of each school to be personally given to the participants from his/her school and were also handed over to the local and government authorities personally.

The use of the questionnaire as a data-collecting instrument for the survey of this research developed over a few stages. The questionnaire was written taking the research questions and the conceptual framework of this study into consideration. Each participant was asked to circle the number that reflected his/her attitude on a scale of 1-4 in each part of the questionnaire as follows: 1) Strongly disagree 2) Disagree 3) Agree 4) Strongly agree. The reason for this is to prevent the participants from ticking the middle choice as a simple solution. Altogether, the questionnaire contains 19 items while the pilot questionnaire contained two extra questions to be commented upon. Because not everyone is an expert on the different systems of IT and its accessories installed in Israeli schools, there is a short explanation about IT systems in the letter attached to the questionnaire.

The first part of the questionnaire is divided into two sections. The first section requires all the respondents to provide personal details (questions 1-7): sex, age, total years of experience in teaching, the current job held, years of experience in the current job, the type of the school – (religious, secular, vocational, comprehensive school or a yeshiva-institute), and the technological use. The second section refers to the principal and requires the following details (questions 8-10b): number of pupils, number of teachers, data about the Information Systems that exist in the respective schools and who is running the IT systems. These details can identify whether there are factors in the characteristic features of the school that might influence the collected data. These

details can also demonstrate whether the respondent's background might have an effect on the relevance of the information.

Question 11 includes 8 statements to be circled and the intention of this section is to collect data that can demonstrate one of two things:

a) The degree of flexibility the school shows in the use of ITEM.

b) The degree of control over the school as a consequence of assimilating ITEM as a management tool.

Statements a, d, g-h, intend to find out whether flexibility in approach is increased while statements b-c, e-f, intend to find out whether control over the staff is increased as a result of the use of ITEM. Question 12 is an open ended question designed to let each participant express his/her view about the degree of flexibility in his/her school.

Question 13 includes 6 statements and the intention is to elicit data concerning the way ITEM affects the communicative relationships between people in education.

This question, furthermore, intends to determine whether 'electronic relationships' can be developed in an educational culture. As in the previous question each participant is asked to circle the number that reflects his/her attitude or perception on a scale of 1-4. Statements a-d attempt to discover whether ITEM with ICT systems do create new dialogues and bridge psychological barriers, while statements e-f intend to discover whether ITEM and ICT systems in general have little chance of success in educational settings in spite of all efforts maid. Question 14 is open-ended one since the intention is to collect data about undesired or desired aspects of the communication created by the use of ITEM.

Question 15 includes 9 statements and the intention of these statements is to elicit data about the degree of autonomy schools have when they use ITEM with DSS to improve

the decision- making process. Statements a-d and i aim to find out whether DSS has managed to increase school autonomy and whether there is a connection between the improvement in the decision- making process and an increase in the autonomic position of schools, while statements e -h intend to evaluate the power of the external authorities and leaders to interfere in the internal decision- making process of schools. Question 16 is open-ended and makes it possible for each participant to express his/her view on the connection between the decision- making process that employs ITEM and the increase or decrease in the autonomy of his/her respective school.

Questions 17 and 18 include 8 statements and refer to the existing classroom management situation of schools. Statements a-c in question 17 intend to investigate whether ITEM provides teachers with extra power to manage their respective classrooms with more freedom while statements a-e in question 18 aim to discover whether ITEM provides to external authorities with the extra power and means to penetrate into the pedagogical considerations of teachers, such a thing could limit the teachers' independence in managing their respective classes by analyzing the pupils' results and bringing this information to the attention of the public. The availability of classroom results to others has the potential to expose teachers to pressure from external authorities who wish to see more encouraging results than those published. Question 19 is open-ended one and makes it possible for each participant to express his/her view on the effect of ITEM on managing the classroom.

Questions 20 and 21 are only for the pilot stage. This part contains two open-ended questions, which aim to collect information about the questionnaire itself. The first question encourages the participants to criticize the questionnaire by indicating what they consider the strong and weak sides of this data collection instrument to be. The

intention of this question is to provide ideas about where and how to correct the questionnaire and to elicit feed back about the strong sides of the questionnaire. The second question encourages participants to add any question that they think might be missing from the questionnaire. As indicated above the questionnaire has been corrected based on the information which was collected from the pilot stage.

The administrative procedure for the distribution and collection of the questionnaire used in this study is as follows: After preparation, the first draft of the questionnaire required a pilot run and this pilot study was sent to two schools that were eligible to take part in the main study. As indicated above, thanks to pilot stage, the questionnaire was corrected and received its final format and content.

The questionnaire needs to be attractive to the respondents. At the end of the questionnaire there is a personal note asking the respondents to check that no answer has been inadvertently missed out and they are, once again, thanked for their participation. Good quality envelopes upon which the name and address of the respondent is typed are used to distribute the questionnaire and the envelope contains a stamped, addressed envelopes for the respondent's reply (Cohen and Manion, 1994, p.97). Every respondent also gets a covering letter which explains the aim of the survey and its importance and ensures confidentiality to every respondent.

As might be expected not all the respondents return the questionnaire so, in order to increase the response rate, follow up letters were sent which reemphasized the importance of the research. A new questionnaire was sent in a good quality envelope and a stamped, addressed envelope for its return was attached to the follow-up letter (Cohen and Manion, 1994, p.99). In order to minimize errors all questionnaires

were checked to make sure that all questions were answered and that the instructions were-well understood (Cohen and Manion, 1994, p.101).

Interviews:

The other instrument used to collect data is the semi- structure interview and it is used within the framework of multi -case studies. Although these interviews, as their name suggest, are not completely structured they still contain seven targeted questions that have been prepared in advance. Each question leaves room for a more flexible style of response which allows for the collection of information by probing the respondents' involvement (Cohen and Manion, 1994, p.277; Bassey, 1999, p.81; Wellington, 2000). The interviews were recorded on a tape- recorder and were carried out with four principals, ten teachers and coordinators and four people from the local and government authorities. Semi-structured interviews were used because they have a more flexible style and make the collection of qualitative data possible. The goal of this interview was to gain insight into the perceptions of the people who work with ITEM and the use of the semi-structured interview made it possible for the interviewee to be probed and involved since more freedom was given to express feelings, thoughts and perspectives (Powney and Watts, 1987; Cohen and Manion, 1994, p.273; Wellington, 2000). The interviews which were recorded on tape were carefully conducted and evaluated continuously while directions and guidance was kept to a minimum. Full written transcriptions and descriptions of the interviews assisted in the recording of the results since the transcriptions also note the body language of interviewees such as hesitations, pauses, sighs, etc. (Powney and Watts, 1987, p. 148; Drever, 1995, pp. 60-65). In order to provide accurate information the interviewer listened to the entire tape several times and also matched it with to the transcription a number of times (Cohen

and Manion, 1994,p. 293).

The first question aimed to get the interviewee's opinion about the way ITEM is used in his/her school and whether it has assisted in encouraging the leaders to work with a more flexible approach or whether it is used by the leaders to increase their control over the staff. The interviewee was encouraged to discuss his/her experience with the use of ITEM in this area.

The second questions intended to elicit information about the interviewee's experience with ITEM as a tool of communication and to find out whether he/she thinks that ITEM, together with ICT, can create a new form of dialogue between leaders and teachers through using the computer screen to establish 'electronic relationships'. The interviewee was encouraged to express his/her view about the possibility of creating such a dialogue in educational settings.

The third question intended to collect information about the most remarkable impacts of ITEM on the educational and administrative management in schools as the interviewee experienced it in his/her school.

The intention of the fourth question was to obtain the interviewee's opinion about the state of his/her school's autonomy since ITEM was first introduced in schools. It inquires into whether ITEM has granted schools more autonomy as a consequence of improving the DSS or whether the external authorities prefer to use the decision-making process systems in order to interfere in the internal decisions made in schools.

The fifth question asked the interviewees to express their views about the management

of classrooms and whether ITEM provides teachers with a better means to manage more independently as the consequence of an improvement in pedagogical decision-making and teachers getting better analyses of their pupils' results.

The administrative preparation for the semi-structured interviews included planning, recording conversations, transcribing, analysis and reporting (Powney and Watts, 1987,p.7). A question format was prepared for the interviewer containing questions to encourage the interviewee to provide facts and express his/her opinions freely. The interview took place while the focus was to establish a rapport with the interviewee by being positive – using a pleasant and business-like approach (Wellington, 2000, p.77). It was important to ensure the interviewees that their confidentiality was protected and that they were not going to be asked any question that could identify them (Frey and Oishi, 1995, p.32). Minimum instructions and maximum stimuli questions were also prepared, and the tape had to be checked before the interview and not put in front of the interviewee since it could have distracted them. Each question had its own coding which will be explained in more detail in the next section

ANALYSIS:

The first instrument to be analyzed is the questionnaire survey and this going to be done by analyzing the respondents' backgrounds and the responses. Similarities and differences reflect the different characteristics of each participant such as: the type of school they working, sex, age, years of experience the size of the school etc. (Kitwood, 1977). A determination has to be made to see if a connection exists between the use of ITEM and more flexibility and independence in schools by comparing the

different types of schools and different users such as the schools' leaders, teachers and external authorities (Fink, 1995). Statistical analyses were conducted using the Statistical Analysis System (SAS).

The second instrument to be analyzed was the case studies in four schools prepared by performing semi-structured interview and this was done by coding the collected data in this way. The intention was to collect qualitative data about ITEM which might explain more about the feelings and attitude towards the use of ITEM (Cohen and Manion, 1994, p.233). This study made a great effort not to influence the interviewee to express views that might suit the research and this should have increased the credibility of the collected data (Hycner, 1985). Conclusions from the recording were only made after listening several times to the entire tape and reading the transcript a number of times (Cohen and Manion, 1994, p.293). All questions in the semi-structured interview are open-ended and use coding system in order to form categories for the purpose of analysis (Kerlinger, 1970).

A: Do you think that ITEM affects the relationships between leaders and teachers in schools? How?

Coding:

1. Leaders adopt a flexible approach_____

2. Teachers are more involved in school's management_____

3. Leaders adopt a top down approach_____

4. Leaders adopt top down and bottom up approaches_____

5. The work is more coordinated_____

6. There are no effects at all_____

7. Other_____

B: How do you evaluate ITEM as a communicative tool?

Coding:

1. It has technical problems _____

2. Teachers suffer from lack of training_____

3. It creates a new dialogue_____

4. It develops 'electronic- relationships'_____

5. It presents ethical problems_____

6. It allows on -line communication_____

7. Other_____

C: What are the aspects of ITEM that you often use?

Coding:

1. Analysis of academic achievement_____

2. Communication_____

3. Decision-making_____

4. Managing finances_____

5. Managing classrooms_____

6. Timetabling_____

7. Absenteeism _____

8. Reports _____

9. Other_____

D: Do you feel that ITEM empowers your independence to perform your job better or whether it increases the control over you? How?

Coding:

1. It provides more autonomy in decision-making_____
2. It provides more autonomy in managing finances_____
3. It allows for more control by external authorities _____
4. It provides more control in managing finances_____
5. Other_____

E: What has been changed in managing the classroom since the implementation of ITEM in schools?

Coding:

1. Teachers are more involved in pedagogical decisions _____
2. Pupils' results are better analyzed_____
3. The records of teachers are exposed_____
4. More information is provided to external authorities_____
5. Nothing has been changed_____
6. Other_____

In conclusion a delineation list for both verbal and non-verbal gestures was prepared while the delineating units focused on the use of ITEM in secondary schools.

This list refers to ITEM's impacts on the style of leading the educational system, the functioning of ITEM as a communicative tool, the effects of ITEM on the independence of schools and the effects on managing the classroom through the use of ITEM. The relevant units were grouped according to common themes and this enabled the clustering of the data into relevant lists and also enabled organization into central themes (Cohen and Manion, 1994). The total common themes pattern was also able to display what was omitted in the interviews. These omissions can be highly significant for the research and thus, the absence of any anticipated topic should be explored in order to discover the explanation for the omission (Cohen and Manion, 1994, p.210). With this information the interviewee can be approached once again in order to check whether the summary correctly reflects the interview that took place. The second interview can modify the data if it is necessary. Finally, a composite summary of all interviews, which included noting the common experience, showing the differences and emphasizing the uniqueness of ITEM had to be written (Cohen and Manion, 1994, pp.293-296).

Procedure

This research places emphasis on the following procedures:

a) The connection of the conceptual framework (i.e. the existence of four areas of tension involved in the use of ITEM -which was analyzed in the review of the literature) to the two research instruments of this study i.e. the questionnaire and the semi- structured interviews.

b) The adoption of mixed research methods of both qualitative and quantitative natures.

c) The selection of a population sample which includes 252 participants (212

people from 11 schools and 40 people from the external authorities) (Gough, 2004, p. 51).

d) The explanation of the validity of the questionnaire which is based on the use of Statistical Analysis System (SAS)- Cronbach alpha coefficient as follows:

According to Cronbach alpha coefficient method the closer the value gets to 1 the higher its reliability is. If the details of the test are not homogeneous then the coefficient is too low. In the social sciences a value that is above 0.6 according to Cronbach's alpha coefficient is considered to have reasonable reliability.

Question	Items	Cronbach Alpha
11	a-g	0.78
13	a-f	0.76
15	a-f	0.78
17	a-c	0.67
18	a-d	0.89

Figure 3.1: Cronbach alpha coefficient.

Figure 3.1 shows that in the examination of the 8 items in question 11 after the pilot was done, the raw score that was received was 0.78. In the reliability test of 6 items in question 13 after the pilot was done the raw score received was 0.76. In the reliability

test of 6 items in question 15 after the pilot was done the raw score received was 0.78. In the reliability test of 3 items in question 17 after the pilot was done the raw score received was 0.67 and in the reliability test of 4 items in question 18 after the pilot was done the raw score received was 0.89.

Finally:

The data collected on people in secondary schools and local- governmental authorities in the northern part of Israel which located within a 50 km radius of Haifa is sufficient in order to generalize about the entire population of Israel because all the types of secondary schools that exist in Israel are included in the research sample and are located in this district. The district also reflects the typical socio-economic structure of Israel while the local –governmental authorities operate according to the same pattern of behavior as the other six districts in Israel (Bassey, 1999, p.12).

"One of the fundamental aspects of statistics is that information about an entire population can be inferred from the data collected from a small subset of the population."

(Wright, 1997, p.7).

The main limitation of this study is the fact that the research took place at the end of the

year 2004 and the beginning of year 2005 while it is impossible to compare it now to the situation which existed 10 years ago when ITEM made its first steps in schools. Lacking this, consequently, the research is based mainly on people who experienced those years and can asses the effects of ITEM from their own experience.

This study took ethical implications into consideration before beginning the research. As a result, all participants in the research were asked and freely agreed to take part (Frankfort-Nachmias and Nachmias, 1992). Official permission to access the secondary schools in Haifa and Northern District of Israel was also requested and granted. In a letter of explanation to the participants in the research this study has promised that all of them will remain anonymous and that the information will be treated with strictest confidentiality. The Ministry of Education has also received an assurance that they will receive a copy of the conclusions of this study (Bell, 1987), and all participants were assured that in the survey questionnaire an effort would be made to avoid wrong interpretations (Burgess, 1989). This was done in order to overcome any fear that might arisen from any invasion of privacy and to respect the dignity of every individual participant in the research (Cohen and Manion, 1994, p.360).

From an ethical standpoint it is important to point out that this study is independent and that no body is funding the research, it is not under the control of any governmental department and is also free from sponsor control (Bridges, 1998. pp. 593-600). This fact can prevent the sort of conflict that usually exists when there are different bodies that have their own interests in the research (Parson, 1990; Hodkinson, 1993, p.117). This research has only one obligation to perform the work in a scientific manner.

"A researcher has a special obligation to perform the work in as highly skilful, effective and successful a manner as is humanly possible"

(Friedman, 1990, p.196).

The ethical challenge for the social sciences is to find the correct balance between what researchers 'ought' to do and the needs of every human to maintain his/her privacy (Harrison, 1994, p.175). The ethical questions about privacy and research refer especially to the collected data and to whom it belongs - the interviewee or to the interviewer? In another words does the information belong to the participants or to the researchers. This 'conflict methodology' has divided researchers about what their obligations are and whether the first priority is to the interviewee or whether they have to publish what they discover (Hammersley, 1990, p. 131). This study adopts the principle of not identifying the schools or teachers since we must weigh the contribution of the research against the chances of any harm being done to the participants (Hammersley, 1990, pp.134-135). The researcher has a responsibility towards those being evaluated as they were assured before the research started that their privacy would be respected. If this is not done it can endanger other research because people will not trust any promise from the researchers in the future. To overcome this problem the emphasis of this research will be on issues and not on people (Parson, 1990, p.149). Since it is not simple to distinguish between the "public" domain and the and "private" domain in collecting data a researcher needs to be as fair as possible in his/her research.

"Since there are no fixed meanings in this world we must rely on values, remembering that these, too, are only provisional and are always in flux."

(Harrison, 1994, p.182).

This effort to focus on ethical problems is important in order to prevent harm and embarrassment when findings appear in print (Punch, 1995, p.176). In fact, ethical decisions are not just matters of personal preference but are basic philosophical issues in any social research since they concerns what is the 'right' thing to do (Strike et al., 1988, pp.2-3). The ethical consideration in ITEM is even more problematic since there is a noticeable lack of a set of clear and widely accepted guidelines and effective procedures. The information systems are accessible to many users and consequently demand the establishment of a set of guidelines about how to secure the information and respect privacy (Argyrous, 1997, pp.51-55).

In summarizing this chapter the key points of this research are: The effects of ITEM on;

a) The flexible approach, b) The 'electronic relationships', c) Autonomy and the independence, and d) Managing the classroom.

CHAPTER FOUR- FINDINGS:

As noted in the chapter on Methodology the first tool used for the collection of information in this piece of research was the survey questionnaire and all the data were collected and analysed by the SAS (Statistical Analysis System) programme. The questionnaires were distributed to principals, coordinators, school teachers, supervisors and people working in the local authorities and government offices. 252 (90%) of the 280 questionnaires distributed were collected and in the following table one can see the figures concerning the distribution of the respondents according to their functions, gender (male/female), experience in their present position , age, the extent of their use of ITEM and size and type of school.

I. General data concerning questionnaire respondents.

Characterization 1. Position/Role	Overall N	Overall %	Schools N	Schools %	External Authority N	External Authority %
School principal	11	4.3	11	5.19	-	-
Junior & Senior School (Heads and deputies)	21	8.33	21	9.91	-	-
Educational leaders(coordinators)	50	19.84	50	23.58	-	-
Teachers	130	51.59	130	61.32	-	-
External authorities	40	15.87	-	-	40	100

Characterization 2. Gender	Overall N	Overall %	Schools N	Schools %	External N	Authorities %
Male	97	36.81	67	33	24	60
Female	156	63.19	140	67	16	40
3. Experience in Current Position						
1-5 years	62	25.2	53	25.1	9	23.8
6-10 years	50	20.3	39	18.8	11	28.2
11-20 years	70	30.5	60	28.9	15	38.4
Above 20 years	59	24	55	26.5	4	10.2
4. Age						
Less than 40	67	27.5	62	30.5	5	12.5
41-50	81	33.4	71	35	10	25
More than 50	95	39.1	70	34.5	25	62.5
5-technological use.						
1 application (MANBAS/Inter	48	19.5	27	12.74	21	52
1+ application	204	80.95	185	87.26	19	47
6. Size of school						
Small (-400 pupils)			44	20.75		
Medium (400-1000 pupils.)			76	35.85		
Large (1000+ pupils.)			92	43.40		

Characterization 7. Type of School	Overall N	Overall %	Schools N	Schools %	External N	Authorities %
General studies (Secular)			42	19.8		
Religious			46	21.7		
Comprehensive			37	17.5		
Vocational			48	22.6		
Yeshiva			39	18.4		

Table 4.1: Distribution of all respondents according to characterization categories

From Table 4.1 one can learn about the questionnaire respondents. The column entitled "overall" which includes both schools and the external authorities relates to 252 people (212 from participants from schools). As pointed out in the Methodology section, schools in Israel are divided up into two sections with an overall general school principal and, as can be seen, 11 of these took part in the research together with 21 section heads and their deputies who were in charge of the two school sections (senior high school and junior high school). In addition 50 educational leaders also responded to the questionnaire, most of whom functioned as coordinators (grade level or subject), as did 130 teachers and another 40 people from the external authorities (supervisors, Ministry of Education staff, local council people etc.). One statistic that stands out is the fact that 51% of the respondents were teachers, followed (in descending order) by educational leaders (19.8%), external authorities' staff (15.87%) and administrative staff (12.7%).

One can also see from Table 4.1 that more women took part in the research than men in the schools while, in the external authorities, there were more men than women. This reflects the fact that the teaching profession is perceived to be a female profession while working in the external authorities is perceived as a career move and represents political advancement. 53% of the participants had more than 10 years of experience in working in schools while in the external authorities most of the participants had 6-20 years of work experience. One thing that especially stands out is the fact that for those with more than 20 years experience makes up 26% while those in the authorities only get to 10%. One possible explanation for this is that the careers of the supervisors and staff from the external authorities only developed after a number of years of work in schools – something that acted as a springboard to their positions. In regard to the ages of people in the schools there is an almost equal division into 3 age groups (young, middle age and older). In contrast, in the external authorities 62.5% of the participants belonged to the older group (50+ years). This seems to suggest that many have developed second careers after having worked in schools for years, but it is also possible that it attests to the fact that there is less "wear and tear" in these jobs and that people last longer here than teachers in schools do.

The data about the use of the ITEM technology came from an examination of who used one system as opposed to those who used more than one. For headteachers and teachers the first system was MANBAS while the first system for the external workers was the internet. 87% of the participants in schools claimed that they used more than two applications – that is MANBAS and the internet etc. In the external authorities, on the other hand, only 47% have knowledge of another system (MANBAS). This can be

explained by the fact that MANBAS is mainly found in schools and not in the offices of the external authorities.

We can also learn from Table 4.1 that 43% of the respondents to the questionnaire came from large schools and 35.85% came from medium size schools meaning that the majority (78.85%) came from large and medium sized systems. Another thing we can learn is that by far the largest number of participants from schools (in descending order) came from vocational schools (48 participants), next from religious schools (46), regular secular schools (42), yeshivas (39) and, last, from comprehensive schools (37). The following table relates to The Means Procedure concerning seniority and length of experience in the present job and age.

Overall

Variable	N	Mean	Std. Dev	Minimum	Maximum
1. experience in current position (years).	247	13.98	9.90	0.50	39
2. Age	252	46.32	9.96	24.50	66

Schools

Variable	N	Mean	Std. Dev	Minimum	Maximum
1. experience in current position (years).	207	14.51	10.24	1	39
2. Age	212	45.30	9.54	24	62

External authorities

Variable	N	Mean	Std. Dev	Minimum	Maximum
1. experience in current position (years)	40	11.25	7.42	0.50	30
2. Age	40	51.73	8.55	29	66

Table 4.2: Averages according to variables of age and seniority

From Table 4.2 we can see that the average of years of experience in the participants' present jobs in schools were 14.5 years and their average age was 45 years old. In contrast the average number of years of experience for the external authorities' staff was lower than that for schools (11 years) and the average age was higher (52 years).

II. Data about the questionnaire and an analysis of the indices

As noted in the chapter on methodology an examination of the reliability of the questionnaire is carried out using Cronbach's Alpha co-efficient test in the SAS programme and items that are greater than 0.6 (Alpha>0.6) are considered to be reliable. After the questionnaires were collected the items were examined in each question and for items that were formulated in such a way that the response to them pointed towards a direction opposite to the area the scale of responses were reversed. Other items that were within the area and were negative or smaller than 0.6 were deleted as is shown in the following table that deals with the research question about the level of influence

of ITEM in different content areas.

Content areas	Questionnaire items	Items Deleted	Alpha Cronbach after deletion
1. Management's level of supervision using ITEM. (Question 11).	1-8	1,7,8,	0.69
2. Alternative dialogue and its influence in school. (Question13).	1-6	5,6	0.8
3. School's level of independence(Que.15	1-9	5-8	0.72
4. Level of supervision over school management. (Question 15).	5-8	*5-8 (items which have moved from content area no.3).	0.8
5.Level of teacher involvement in school management. Qu.17.	1-3	_	0.8
6.Level of supervision over class management question 18.	1-5	_	0.82

Table 4.3: The Cronbach Alpha co-efficient.

Table 4.3 indicates the great reliability of the question in the questionnaire and this is after the deletion of items of low value (5 items in questions 11 and 13). Similarly the reliability of question 15 rose after it was divided into two with the first part receiving 0.72 and the second part receiving 0.8 (together the Cronbach Alpha score was below 0.6)

The following table will make the theoretical statistics more concrete and shows them as mean indices of the areas in which ITEM exercises influence using the following

indices. One should remember that the respondents could choose between 4 responses: 1.Strongly disagree; 2. Disagree; 3. Agree; 4. Strongly agree. The means in the following tables indicate the level of the response.

	Overall				Schools				External Authorities			
Content area	N	Mean	S.D	.Min/ Max	N	Mean	S.D	Min/ Max	N	Mean	S.D	Min Max
1.Supervision over school work. Question 11.	252	2.64	0.49	1-3.8	212	2.62	0.5	1-3.8	40	2.73	0.45	1.6-3.6
2.Electronic dialogue in school.Qu.13	252	2.61	0.6	1-4	212	2.59	0.6	1-4	40	2.73	0.59	1.5-4
3.Level of school's independence. Question 15	252	2.77	0.55	1-4	212	2.73	0.55	1-4	40	2.98	0.48	1.8-3.8
3. School's level of Independence(Que.15	246	2.53	0.66	1-4	206	2.49	0.66	1-4	40	2.71	0.59	1.5-3.75
5. Level of teachers' Involvement in class Management. Qu. 17.	252	3.11	0.65	1-4	212	3.08	0.66	1-4	40	3.31	0.61	2-4
6. Level of intrusion into teachers' work in class management. Qu. 18.	247	2.96	0.57	1-4	207	2.95	0.61	1-4	40	2.97	0.38	2-3.8

Table 4.4: Mean statistics for question indices – 1-6 content areas.

From Table 4.4 one can see that majority of the participants (in schools and external authorities) tends to agree that supervision over the teachers' work in school and coordination between the

different departments has increased. In the external authorities, however, the tendency to note that the information system has strengthened the management's supervision over their staff is clearer. With regard to the question of where the electronic dialogue is leading schools an average of the school staff has more reservations than that of the external authorities. While the staff of the external authorities think that they have a tendency to agree that the electronic dialogue makes a new system of dialogue possible an average of the school staff indicate a position between "agree" and "disagree".

In regard to the question of the independence of the school an average of the school staffs indicates even more clearly that the averages of the school staffs and those of the external authorities are different since the external authorities people tend to agree that ITEM moves the schools in the direction of more independent work while an average of the school respondents are more reserved about this process. There is also a similar process involving the question of the level of supervision over school management. There are teachers who chose not to answer all the questions about this since not all of them are familiar with the system that exists between the external supervisors and the school administration. Here, the school staff also indicates a position between "agree" and "disagree".

In contrast to what has been referred to above, in the next two sections of the questionnaire the tendency of the average response, both for school staff and staff from the external authorities, is clearer. For the question about the involvement of teachers in class management the general mean (3.11), the school mean (3.08) and the mean for the external authorities (3.31) clearly indicate a tendency towards ITEM allowing

better surveillance of pupils' progress, improved statistical analysis and more informed pedagogical decision making (between "agree" and "strongly agree"). There is also a similar process with regard to the last question about the level of the external authorities' penetration into class management. The average general response here also shows a tendency to agree that ITEM exposes the work of teachers to the watchful eye of the authorities and that the possibility for monitoring the school's achievements had increased (general mean of 2.96). The general mean reflects the position of the school staff members (mean of 2.95) and that of the external authorities (mean of 2.97). Despite the fact that the means of all the participants are close in value in the last two questions the fact stands out that the lowest responses begin with "disagree"" for the external authorities and with "strongly disagree" for the teachers and school administrators.

III. The level of influence of the characterization categories on the school respondents.

In the following tables the level of influence of the characterization categories noted in Table 1.1 upon six areas of knowledge that this study is dealing with will be examined. A general comment needs to be made about the missing data (not completed in the questionnaire) since its anonymity made it impossible to go back and identify who filled what in. 2.36% of the data is missing about gender variables and seniority in present position and 4.2% of the data is missing for age which are figures taken from the total number of questionnaires distributed (i.e. for 252 participants).

The first area of knowledge examined in the questionnaire was in question 11 which contains 5 sections that aimed at examining the level of ITEM's influence upon the

network of relationships in schools, the management approach and, especially, whether ITEM was leading the school in the direction of more coordination and supervision or in the direction of more decentralization and flexibility (see Table 4.4, section 1). Statistical examination of this question and the other questions and tables presented were carried out using the SAS programme and the ANOVA programme was used to analyse variation where the P value is lower than 0.05 ($P< 0.05$) which indicates a clear result that there is a level of influence between the characterization and the area of knowledge. In all the following tables, six areas of knowledge about the use of ITEM (see Table 4.4) and the degree to which the participants related to the way they were connected to the 7 characterizations are examined in the following way. The position held, gender, use of IT systems, type of school and size of school will be examined using the GLM procedure while the years of experience in the present position and age will be examined using the REG procedure (linear regression).

IV. The tables that examine the increase in supervision and school coordination by the administration.

The following table examines the school administration's supervision index and its influence on the five characterization categories such as: 1) Role, 2) Gender, 3) Technological use, 4) Type of school, 5) Size of school.

Characterizations	N	Mean	Std. Dev	P.Value	Duncan Group
1. Role:					
Principals & Head teachers	32	2.73	0.48		
Educational leaders	50	2.68	0.45	0.1415	
Teachers	130	2.57	0.51		
2. Gender					
Male	67	2.73	0.50		
Female	140	2.57	0.49	0.0287	
3. Technological Use.					
1 application	27	2.55	0.42		
More than 1 application	185	2.63	0.51	0.4612	
4. Type of School					
Secular	42	2.65	0.38		B
Religious	46	2.53	0.50		B
Comprehensive	37	2.43	0.44		B
Vocational	48	2.86	0.58		A
Yeshiva	39	2.58	0.43	0.0006	B
5. Size of School					
Small	44	2.49	0.46		
Medium	76	2.60	0.58		
Large	92	2.55	0.63	0.1483	

Table 4.5: Examination of the school administration's supervision index and its influence on the 5 characterization categories.

According to the analysis of variance (ANOVA) it was found that in Table no. 4.5 for the index of the area of content of increasing the coordination and supervision over the work of the school staff (see Table 4.4, section1) between;

1. Those that held different positions;

2. The level of use of IT;

3. The size of the school.

No differences or influences were found in all three of these characterization categories (P.V. > 0.05). In contrast to this, in regard to the characterization of gender and type of school it was found that there was a both a difference and influence. According to the analysis of gender variance it was found that the P value was 0.0287 and the difference was found to be in the males where there is a greater tendency to agree (mean 2.73) than in the females (mean 2.57) about the level of the increase in supervision and coordination brought about by using ITEM.

With regard to the type of school it was found that there was a difference and influence between the types of school about the question of the increase in supervision and coordination in schools (P value 0.0006). Using Duncan's Multiple Comparisons it was found that there was a difference between the behaviour of vocational schools (identified with the letter A) and the other schools (identified by the letter B). According to the means it seems that the vocational schools (mean of 2.86) have a greater tendency to agree that the school administration uses ITEM in order to increase the coordination of the school's work and to increase supervision over the work of the teachers through improving the collection of information in the school. As previously noted the examination of the characterizations of seniority in the present position, age and the level of influence on the index of supervision and coordination in school was carried out using the REG procedure as shown in Table no. 4.6.

Characterizations	Parameter -Estimate	Std. Dev.	t.v.	P value
1.Years of experience in the current position	0.00343	0.00337	-1.02	0.3096
2. Age	0.006	0.0036	1.66	0.0981

Table 4.6: The level of increase in supervision in school and the influence of the characterization categories of experience and age.

One can see in Table 4.6 that both the number of years of experience in a position and age have no influence on the way the questionnaire responses are distributed. In both these cases the P value is larger than 0.05 (P> 0.05).

The two following tables examine whether there is any clear influence arising from the analysis of the difference between question 13 and the question that examined whether ITEM creates a new electronic dialogue that weakens or strengthens the interpersonal relations in schools (see Table 4.4, section 2).

V. The dialogue in schools

According to an analysis of the variance (ANOVA) it was found (see Table 4.7) that there is a difference between the different holders of positions concerning the content area of the school dialogue (P value 0.00443). Using Duncan's Multiple Comparisons it was found that there is a significant difference between principals and head teachers, on the one hand, and the teachers, on the other.

Characterizations	N	Mean	Std. Dev	P.Value	Grouping
1. Role:					
Principals & Head teachers	32	2.76	0.66		A
Educational leaders	50	2.69	0.53	0.0443	A B
Teachers	130	2.51	0.60		B
2. Gender					
Male	67	2.81	0.62		
Female	140	2.48	0.57	0.0002	
3. Technological Use.					
1 application	27	2.55	0.60		
More than 1 application	185	2.59	0.60	0.7193	
4. Type of School					
Secular	42	2.41	0.61		B
Religious	46	2.62	0.60		A B
Comprehensive	37	2.39	0.48		B
Vocational	48	2.78	0.60		A
Yeshiva	39	2.69	0.62	0.0084	A
5. Size of School					
Small	44	2.65	0.59		
Medium	76	2.60	0.58		
Large	92	2.55	0.63	0.6001	

Table 4.7: The level of influence of 5 characterization categories on the dialogue

According to the findings one can see (Table 4.7) that attitudes towards ITEM as something that improves the dialogue in schools are higher among members of the management than among the teachers (mean of 2.76 as opposed to 2.51). Similarly, according to the analysis of variance it was found that gender exerts an influence (P value 0.0002) and, according to these findings, one can see that males in the schools tend to agree more than females that ICT has created a dialogue network that has improved the dialogue and consultation in schools. According to the analysis of the variance for the characterization of "type of school" it was found that it has influence (P value 0.0084). Using Duncan's Multiple Comparisons it was found that there is difference between general and comprehensive schools and vocational schools and Yeshivas. The vocational schools and yeshivas tended more to agree than the other types of schools that the electronic dialogue improves the dialogue and acts as readily available communications system. In regard to the characterization of the role of the use of IT and size of the school no influence was found (P value > 0.05).

The level of influence between the characterization categories of experience in the current position held and age, on the one hand, and the electronic dialogue in school, on the other, was carried out using linear regression (The REG procedure) as can be seen in the following table.

Characterizations	Parameter -Estimate	Std. Dev.	t.v.	P value
1. Years of experience in the current position	0.00778	0.00409	-1.90	0.0584
2. Age	0.00457	0.00435	1.05	0.2948

Table 4.8: Examination of the level of influence of the characterizations of age and experience.

From Table 4.8 we can see that it is only possible to draw conclusions carefully (P value 0.058 is very marginal). According to the parameter estimate one can see that there is a positive linear line that attests to the fact that when the years of experience are greater there is more skepticism about the potential of ICT to create a new dialogue while for those who have less years of experience (and who are apparently younger) there is a greater tendency to agree that there is a new electronic dialogue.

VI. The status of independence

The following variable examined is the level of independence of the school as a result of the use of ITEM. In the two following tables the level of influence of 5 different categories of question no. 15 in the questionnaire that examines the independence of schools grew or lessened according to the perceptions of the management staff and the teachers after using ITEM. (see Table 4.4, section 3).

According to the analysis of the variance (Table 4.9) it was found that there is influence on the role of the respondents (P value 0.0001). Using Duncan's Multiple Comparisons it was found that there was a difference between the principals and the rest of the school staff. The principals tended to agree that ITEM has the potential to increase their autonomy. It was also found that there is influence according to the distribution between females and males where the males tend to agree more that ITEM makes it possible to function more independently.

Characterizations	N	Mean	Std. Dev	P.Value	Duncan
1. Role:					
Principals & Head teachers	32	3.07	0.43		A
Educational leaders	50	2.82	0.58	<0.0001	B
Teachers	130	2.62	0.53		B
2. Sex					
Male	67	2.95	0.54		
Female	140	2.64	0.53	-0.0001	
3. Technological Use.					
1 application	27	2.81	0.49		
More than 1 application	185	2.72	0.56	0.4588	
4. Type of School					
Secular	42	2.66	0.45		A B
Religious	46	2.47	0.47		A
Comprehensive	37	2.63	0.63		B
Vocational	48	2.77	0.57		A B
Yeshiva	39	2.80	0.59	0.0555	A
5. Size of School					
Small	44	2.87	0.49		
Medium	76	2.73	0.48		
Large	92	2.66	0.62	0.1257	

Table 4.9: Examination of the level of influence of the five characterization categories of the schools' independence.

Another, albeit marginal, finding (P value 0.0555) was that the type of school also had influence (see Table 4.9). According to Duncan religious schools and the yeshivas relate differently from comprehensive schools. The mean scores show that the comprehensive schools tend less to agree that the independence of their schools has grown as a result of the use of ITEM. In contrast, religious schools and the yeshivas tend to agree that their independence has grown. There was no effect shown between the characterizations of the use of IT and the size of the school when the P value was greater than 0.05 (P> 0.05).

The following table examines the level of influence of experience on position held and age.

Characterizations	Parameter -Estimate	Std. Dev.	t.v.	P value
1.Years of experience in the current position	-0.00353	0.00374	-0.94	0.3469
2. Age	0.00984	0.00392	2.51	0.0128

Table 4.10: The level of independence of schools according to experience and age.

According to the Linear Regression model it was found that age influenced the perception of independence deriving from the use of ITEM (P value 0.0128). According to the Parameter Estimate connected to age one can see that what we have here is a positive linear connection meaning that the higher the age is the higher the level of independence is.

VII. Involvement of the external authorities in school management:

The two following tables examine the level of influence of the characterizations noted compared to the question of the level of increase in the involvement of the external authorities in the management of schools.

Characterization-categories.	N	Mean	Std. Dev	P.Value	Duncan Grouping
1. Role:					
Principals & Head teachers	32	2.45	0.71		
Educational leaders	50	2.35	0.71	0.1448	
Teachers	130	2.56	0.63		
2. Sex					
Male	66	2.43	0.73		
Female	135	2.53	0.62	0.3096	
3. Technological Use.					
1 application	27	3.07	0.71		
More than 1 application	180	2.50	0.67	0.7403	
4. Type of School					
Secular	39	2.44	0.51		B
Religious	46	2.53	0.50		A B
Comprehensive	36	2.80	0.55		A
Vocational	48	2.31	0.79		B
Yeshiva	37	2.44	0.81	0.0154	B
5. Size of School					
Small	44	2.36	0.64		
Medium	73	2.53	0.66		
Large	89	2.52	0.68	0.3271	

Table 4.11: The level of involvement of outside factors according to principals and teachers

According to the analysis of variance (in Table 4.11) an influence was found between the type of school and the measurement of the involvement of outside factors in the management of schools (P value 0.0154). Using Duncan's Multiple Comparisons it was found that comprehensive schools behaved differently from the other schools and tended more to agree that the involvement of outside factors grew as a result of the entry of ITEM into schools in matters of budget management and administration (mean response 2.8). The other characterizations did not exert influence on the level of involvement of outside factors since all were greater than P value 0.05.

The characterizations of experience in current position held and age also exerted no influence on the level of involvement by outside factors as one can see in Table 4.12.

Characterizations	Parameter -Estimate	Std. Dev.	t.v.	P value
1.Years of experience in the current position	0.00415	0.00458	0.91	0.3659
2. Age	-0.00493	0.00484	-1.02	0.3097

Table 4.12: The level of involvement of outside factors according to experience and age.

VIII. The level of involvement of teachers in class management

The two following tables analyse the responses to question 17 which examined whether the involvement of teachers grew in matters of class management following the use of ITEM. The first table analyses the variance between this issue and the characterization categories of role, gender, use of IT technology, type of school and its size according to school principals and teachers (see Table 4.4, section 5).

Characterizations	N	Mean	Std. Dev	P.Value	Duncan Grouping
1. Role:					
Principals & Head teachers	32	3.15	0.77		
Educational leaders	50	3.20	0.61	0.1867	
Teachers	130	3.01	0.64		
2. Sex					
Male	67	3.16	0.77		
Female	140	3.04	0.59	0.2045	
3. Technological Use.					
1 application	27	3.07	0.71		
More than 1 application	185	3.08	0.65	0.9800	
4. Type of School					
Secular	42	3.10	0.57		A B
Religious	46	3.10	0.57		A B
Comprehensive	37	2.84	0.60		B
Vocational	48	3.12	0.68		A B
Yeshiva	39	3.20	0.81	0.1624	A
5. Size of School					
Small	44	3.27	0.51		A
Medium	76	3.11	0.69		A B
Large	92	2.95	0.67	0.0234	B

Table 4.13: The level of involvement of teachers in class management

According to an analysis of the variance (Table 4.13) it was found that there was no clear influence exerted between the index of class management using ITEM and the characterizations of role, gender, use of technology and type of school. As opposed to this the size of the school was found to have some influence (P value 0.0234). Using Duncan's system it was found that there was a difference in the way the staffs of small schools (up to 400 pupils) and large schools (over 1000 pupils) related to things. In small schools there was a tendency (between "agree" and "strongly agree") to accept the proposition that the involvement of teachers in class management grew (mean of 3.27) while the staffs of large schools were less absolute about this (mean of 2.95).

The second table was analysed using linear regression (The REG. procedure) to show the level of involvement of teachers in class management following the use of ITEM according to the characterizations of role and age.

Characterizations	Parameter -Estimate	Std. Dev.	t.v.	P value
1. Years of experience in the current position	-0.00334	0.00440	-0.76	0.4489
2. Age	0.00137	0.00475	0.29	0.7740

Table 4.14: The level of involvement of teachers in class management according to experience and age.

According to analysis using linear regression it was found that there was no influence exerted between the index of more independence in class management by teachers and the characterizations of experience and age (P value > 0.05).

IX. Involvement of the external authorities in class management

The two following tables examine the level of influence of the aforementioned characterizations in regard to question 18 which examined the level of intervention into the work of teachers by factors outside the schools in matters of class management, according to the perceptions of the school staff members (see Table 4.4, section 6). Analysis of the variance suggests there is no influence exerted between the characterization categories of role, gender, use of technology, type of school, and size of school on the index of involvement of outside factors on class management ($P > 0.05$). A similar conclusion was drawn in regard to the characterizations categories of experience and age which were examined using the linear regression approach and it was found that there was no influence exerted between the index and these characterization categories.

Characterizations	Parameter -Estimate	Std. Dev.	t.v.	P value
1. Years of experience in the current position	-0.00015036	0.00421	-0.04	0.9716
2. Age	0.00701	0.00437	1.60	0.1102

Table 4.15: The level of involvement of outside factors.

Characterizations	N	Mean	Std. Dev	P.Value	Duncan Grouping
1. Role:					
Principals & Head teachers	32	2.86	0.67		
Educational leaders	50	3.02	0.53	0.5348	
Teachers	130	2.95	0.62		
2. Sex					
Male	67	2.94	0.72		
Female	135	2.97	0.55	0.7407	
3. Technological Use.					
1 application	26	2.96	0.77		
More than 1 application	181	2.95	0.58	0.9353	
4. Type of School					
Secular	41	2.96	0.46		
Religious	45	2.83	0.44		
Comprehensive	36	2.83	0.58		
Vocational	47	3.11	0.70		
Yeshiva	38	3.01	0.76	0.1392	
5. Size of School					
Small	44	2.97	0.60		
Medium	74	2.95	0.56		
Large	89	2.94	0.65	0.9569	

Table 4.16: The level of involvement of outside factors in class management.

X. Building models using the Stepwise model for School staffs

In the following summary tables the analysis is made by building a model of linear regression (The Reg. Procedure) using the Stepwise Selection method. For the purposes of building a model for the type of school 4 dummy variables were produced with the reference level being the general secular school. For gender the reference level was the males and two variables were produced to represent the role with the reference level being the teachers. The first table (Table 4.17) deals with the index of the level of coordination concerning the supervision of the school administration over the work of the school staff (see Table 4.4, section 1).

Variables	Parameter estimate	P. value	Partial R_2	R_2	N
1. Type of school					
*Dummy 2(religious)	-0.184	0.0784			
Dummy 3 (comprehensive)	-0.233	0.0333			
Dummy 4 (vocational)	0.215	0.0380			
Dummy 5 (yeshiva)	-0.157	0.1870	0.1010	0.1010	
2. **Gender	-0210	0.0114	0.0294	0.1304	
3. Role					
Dummy 1 -(Principal)	0.091	0.3654			
Dummy 2*** (Educational Leaders)	0.177	0.0295	0.0220	0.1524	
Intercept	2.773	<0.0001			202
General P.value<0.0001					

Table 4.17: The administration's supervision according to the linear regression model usin the Stepwise method.

*reference level = secular schools; ** reference level – male; *** reference level – teachers.

Information from Table 4.17 indicates that when one takes all the explanatory factors together after adjusting them to the multiple linear regression models using the Stepwise method it was found that the type of school, gender and role are three characterizations that are simultaneously found in the model and that they explain the variance in supervision and coordination of the school's administration using ITEM. No significant contribution was found beyond the explanation allowed by these characterizations which means that the use of more than one tool from ITEM, the size of the school, years of experience in the role and age were not included in the model. One must also note that three variables that were included (type of school, gender and role) reached 15.2% of the model – which explains the influence.

Variables	Parameter estimate	P. value	Partial R_2	R_2	N
1. *Gender)	-0.2925	0.0031	0.0727	0.0727	
2. Experience	-002029	0.0001	0.0405	0.1132	
3.Type of school					
**Dummy 2(religious)	0.20723	0.1078			
Dummy 3 (comprehensive)	-0.0363	0.7859			
Dummy 4 (vocational)	0.36433	0.0042	.	.	
Dummy 5 (yeshiva)	0.17813	0.2178	0.0473	0.1605	
3. Age	0.01299	0.0174	0.0242	0.1874	
Intercept	2.32867	<0.0001			202
General P.value<0.0001					

* reference level -male; ** reference level –secular schools

Table 4.18: Dialogue according to building the model using the Stepwise method.

The above model (Table 4.18) uses the Stepwise Selection method for the question that examines the dialogue in schools using ICT and the level of influence exerted by the variables on the response made (see Table 4.4, section2). The following groups of variables were included in Table 4.18: type of school, gender, experience and age. Those not included in the model were: size of school, use of technology and position/role. The characterizations that influenced the analysis of the question of dialogue in the school were on the level of 18.5% which explains the influence. According to this table vocational schools stand out in their tendency to agree that ICT leads to a new electronic dialogue that improves interpersonal communication. Males tend more to agree that ICT has the potential to improve interpersonal communication and the dialogue in schools. Those with more experience were less convinced that ICT brings about new communication compared to those that had less experience and who tended more to accept ICT as a new tool.

The following table examines the variables that influence the building of the model concerning the question about the level of independence of schools resulting from the use of ITEM (see Table 4.4. section 3)

Variables	Parameter estimate	P. value	Partial R_2	R_2	N
1. Role					
*Dummy 1 -(Principal)	0.39456	0.0003			
Dummy 2(Educational Leaders)	0.27427	0.0019	0.1050	0.1050	
**Gender	-0.28168	0.0005	0.0528	0.1579	
Intercept	2.81150	<0.0001			202
General P.value<0.0001					

* reference level – teachers. ** reference level male

Table 4.19: The level of schools' independence according to the Stepwise method.

When one takes all the explanatory factors together and after adjusting the model of linear regression it was found in Table 4.19 that the factors that influence the respondents in regard to the level of independence in the school were gender and role. The rest of the variables were not included in the model. It was found that males had a greater tendency than females to agree that ITEM influences the independence of the school and that people who held positions with the principals had a tendency to agree more than the teachers that the school's independence was greater. This model explains this phenomenon on the 16% level.

Variables	Parameter estimate	P. value	Partial R_2	R_2	N
1. Type of school*					
Dummy 2(religious)	0.1800	0.3151			
Dummy 3 (comprehensive)	0.3403	0.0345			
Dummy 4 (vocational)	-0.2019	0.1499			
Dummy 5 (yeshiva)	0.11083	0.5742	0.0532	0.0532	
1. Role**					
Dummy 1 -(Principal)	-0.1436	0.2815			
Dummy 2(Educational Lead	-0.2765	0.0123	0.0294	0.0826	
3. Size of school ***					
Size Dummy 2 (medium)	0.3467	0.0164			
Size Dummy 3 (large)	0.2361	0.2413	0.0307	0.1133	
Intercept	2.2737	<0.0001			196
General P.value 0.0036					

*Reference level – secular schools; **Reference level – Teachers; *** Reference level – small schools.

Table 4.20: The level of increase in supervision by outside factors over school management.

The above Table 4.20 examines the variables that influence the question of the increase in the level of supervision over the school principals as a result of using ITEM (see Table 4.4 section 4). By studying Table 4.20 one can learn, from an analysis of the data included in the model, that the size of the school, the type of school, and the role filled in the school influence the distribution of the respondents to the question that the level of supervision over the work of the school management by outside factors was on the level of 11%.

The following table relates to the variables that influence the level of involvement of teachers in class management according to the respondents in school (see Table 4.4, section 5).

Variables	Parameter estimate	P. value	Partial R_2	R_2	N
1. Size of school *					
Size Dummy 2 (medium)	-0.1476	0.2283			
Size Dummy 3 (large)	-0.2932	0.0149	0.0300	0.300	
2. Role**					
Dummy 1 -(Principal)	0.1659	0.1993			
Dummy 2(Educational Leaders)	0.2489	0.0216	0.285	0.0585	
Intercept	3.1908	<0.0001			202
General P.value 0.0179					

*Reference level – small schools; **Reference level – teachers.

Table 4.21: Teachers' involvement in class management.

By studying Table 4.21 one can learn, from an analysis of the data, that the variables which exert influence on the involvement of teachers in class management through the use of ITEM are the size of the school and the role filled in school – all on the level of 5.8%.

In regard to the question of the level of involvement of the external authorities in class management the general P value measured was 0.075 and there was a very low percentage of the level of influence by the variables so that there was no point in presenting a data table.

XI. Level of influence the characterization categories on the respondents from the external authorities: The level of the administration's supervision:

The following tables examine the level of the influence of the characterizations that, for people from the external authorities, defined the six areas of knowledge that this study is investigating (see Table 4.4). The characterizations that are relevant for those working in the external authorities are 1. Gender; 2. Age; 3. Experience in the current role; 4. The technological level of IT being used. The number of people from the external authorities was 40 and, like in the schools, the statistical examination was carried out using the GLM Procedure (ANOVA) to analyze the differences involving the characterizations of gender, and uses of IT systems while experience in the current role and age were examined using linear regression (the REG. Procedure).

The following Table 4.22 examines whether there is influence exerted between the respondents according to use of IT technologies in order to provide an answer to the question of whether ITEM increases the school administration's supervision over the staff (see Table 4.4, section1).

Characterizations	N	Mean	Std. Dev	P.Value
1. Gender				
Male	24	2.85	0.42	
Female	16	2.56	0.44	0.0463
2. Technological Use.				
1 application	21	2.69	0.43	
More than 1 application	19	2.79	0.47	0.4819

Table 4.22: The level of influence of variables on external authorities.

According to an analysis of the variance (ANOVA) it was found that, according to Table 4.22, the division of the respondents into male and female exerts an influence on the responses to the question of the level of supervision of the school administration over the staff as a result of the use of ITEM. According to the mean method the males in the external authorities have a greater tendency than the females to agree (mean 2.85) that ITEM has raised the level of the administration's supervision and coordination of work in the school. In contrast the characterization of one or more cases of "use of technology" was not found to influence the respondents to the questionnaire, (P value 0.4819).

In the following Table 4.23, as the continuation of the previous table, there is once again focus placed upon the level of the administration's supervision and it examines the level of influence exerted upon the respondents from the external authorities by experience and age. As noted this has been done using the REG procedure.

Characterizations	Parameter -Estimate	Std. Dev.	t.v.	P value
1.Years of experience in the current position	0.00911	0.0096	0.94	0.3514
2. Age	0.00457	0.0084	0.54	0.5919

Table 4.23: The level of influence exerted by experience and age.

Through an analysis of Table 4.23 one can see that there is no influence exerted between experience and age among staff of the external authorities and the distribution of their responses. (Both characterizations were found to be P. value >0.05).

XII. The electronic dialogue using ICT:

The following table examines the level of influence of the division according to gender and use of IT technology on the respondents from the external authorities in regard to the question of whether ICT created a new dialogue among the school staff (see Table 4.4, section 2).

Characterizations	N	Mean	Std. Dev	P.Value
1. Gender				
Male	24	2.78	0.49	
Female	16	2.70	0.74	0.6890
2. Technological Use.				
1 application	21	2.75	0.67	
More than 1 application	19	2.75	0.52	1.000

Table 4.24: The level of influence of the characterization categories of gender and technology.

There was no influencing connection found between the characterizations of division according to gender or the scope of use of ICT technology among people from the external authorities in regard to the question of creating a new electronic dialogue in school through using ICT. Both characterizations received P value >0.05.

The following table examines the level of influence among people from the external authorities of age and experience on the answers received about the creation of a new dialogue in schools.

Characterizations	Parameter -Estimate	Std. Dev.	t.v.	P value
1. Years of experience in the current position	-0.00268	0.01297	-0.21	0.8376
2. Age	-0.0047	0.01124	-0.40	0.6931

Table 4.25: The level of influence of the characterization categories on experience and age.

No influence was found to be exerted between the characterizations of experience and age among people of the external authorities and the distribution of the responses to the question about the creation of a new dialogue in school using ICT.

XIII. The independence of schools

The following Table 4.26 examines the level of influence of the characterizations of division according to gender and the level of use IT technologies among workers of the

external authorities upon the distribution of answers to the question of the level of independence of school management (see Table 4.4, section 3).

Characterizations	N	Mean	Std. Dev	P.Value
1.Gender				
Male	24	3.01	0.38	
Female	16	2.94	0.60	0.6217
2. Technological Use.				
1 application	21	2.98	0.54	
More than 1 application	19	2.99	0.40	0.9174

Table 4.26: The characterization categories of gender and the use of technology - the level of their influence.

Table 4.26 shows no influence visible between the division according to gender or the use of one or more IT technologies and the distribution of responses to the question of the level of increase in the involvement of the external authorities on school management using ITEM. The following Table 4.27 examines the same question but this time uses the characterizations of years of experience in the current position and age.

Characterizations	Parameter -Estimate	Std. Dev.	t.v.	P value
1.Years of experience in the current position	-0.00379	0.01038	-0.38	0.7170
2. Age	0.00008	0.0090	0.01	0.9932

Table 4.27: The characterization categories of experience and age and the level of influence they exert upon the answers of external authorities staff.

As one can see the characterizations of experience and age in Table 4.27 do not act as factors of influence upon the distribution of the responses of people from the external authorities (P. value > 0.05).

XIV. Increase in the involvement of external authorities in school management

The following table examines the characterizations among staff of the external authorities of gender and use of technology (The GLM Procedure) and the level of their influence upon the respondents in regard to the question of whether the external authorities increased their involvement in the management of schools in their area of influence (see Table 4.4, section 4).

Characterizations	N	Mean	Std. Dev	P.Value
1.Gender				
Male	24	2.68	0.52	
Female	16	2.75	0.71	0.7350
2. Technological Use.				
1 application	21	2.95	0.48	
More than 1 application	19	2.45	0.60	0.0059

Table 4.28: The characterization categories of gender and use of technology: the level of their influence on the external authorities.

Table 4.28 shows that the division according to gender had no influence upon the distribution of responses (P. value > 0.05) but that the level of use of IT technology did have an influence on the respondents in the context of the question of an increase in the level of supervision by the external authorities over school management both from the financial and administrative points of view.

The following table examines the characterizations of experience and age (using the REG Procedure) among staff of the external authorities and the level of influence this had on the distribution of the responses in regard to the issue of supervision over the management of schools through using ITEM.

Characterizations	Parameter -Estimate	Std. Dev.	t.v.	P value
1. Years of experience in the current position	0.0115	0.01283	0.87	0.3903
2. Age	0.00645	0.01119	0.58	0.5678

Table 4.29: The characterization categories of experience and age: the level of their influence on the responses of external authorities' staff.

In Table 4.29 one can see that experience and age have no influence upon people from the external authorities in regard to this question

XV. The level of involvement of teachers in class management

The following table presents data about the level of influence of the characterizations of gender and use of one or more technologies upon the respondents from the external

authorities in regard to the link between the level of teacher involvement in class management and the use of ITEM (see Table 4.4, section 5).

Characterizations	N	Mean	Std. Dev	P.Value
1.Gender				
Male	24	3.38	0.54	
Female	16	3.19	0.70	0.3091
2. Technological Use.				
1 application	21	3.24	0.62	
More than 1 application	19	3.39	0.59	0.4478

Table 4.30: The characterization categories of gender and use of technology: the level of their influence on the external authorities' respondents.

In Table 4.30 no influence on the respondents from the external authorities can be found between the characterizations of gender and use of IT in more than one technology and an increase in the involvement of teachers in class management. The two characterizations received a P value >0.05.

The following Table 4.31 examines the level of influence of the characterizations of experience and age using the REG Procedure in regard to the level of involvement of teachers in class management when they use ITEM.

Characterizations	Parameter -Estimate	Std. Dev.	t.v.	P value
1.Years of experience in the current position	-0.00827	0.01317	-0.63	0.5341
2. Age	-0.01073	0.01136	-0.94	0.3507

Table 4.31: The characterization categories of experience and age: their influence on the external authorities' respondents.

A study of Table 4.31 will clearly show that there is no influence exerted by the characterizations of experience and age on the respondents to the question of the level of increased involvement by teachers in class management after using ITEM.

XVI. The level of involvement of the external authorities in class management

Characterizations	N	Mean	Std. Dev	P.Value
1.Gender				
Male	24	3.06	0.37	
Female	16	2.84	0.38	0.0818
2. Technological Use.				
1 application	21	3.05	0.46	
More than 1 application	19	2.89	0.27	0.1951

Table 4.32: The characterization categories of gender and technology: the level of their influence on the external authorities' respondents.

Table 4.32 examines whether there is any influence exerted by the characterization categories of division according to gender or use of more than one technology upon the distribution of the responses among the staff of the external authorities in regard to the level of increased involvement in class management by external factors. Table no. 4.32 shows that there is no influence exerted between the characterizations indicated in the table and any influence on the distribution of the respondents. Both characterizations received P value > 0.05.

The following Table 4.33 examines the level of influence between the characterizations of experience and age in regard to the question of whether there is an increase in the involvement of the external authorities in class management through the use of ITEM.

Characterizations	Parameter -Estimate	Std. Dev.	t.v.	P value
1.Years of experience in the current position	-0.0131	0.00808	-1.62	0.1134
2. Age	-0.00403	0.00722	-0.56	0.5798

Table 4.33: The characterization categories of experience and age: the level of influence of the involvement of external authorities in class management.

Table 4.33 shows that there is no influence exerted among the external authorities on the distribution of the responses by those answering the question of whether the external authorities increased their influence on class management through the use of ITEM.

XVII. Construction of a model for the external authorities using the Stepwise method.

The following tables present the construction of models by the REG Procedure using the Stepwise method which examines which characterizations can be included in the model. In the following Table 4.34, which examines the administration's level of supervision over the school staff through the use of ITEM according to the perceptions of the external authorities, only the characterization of gender is included!

Variable	Parameter estimate	P. value	Partial R_2	R_2	N
*Gender	-0.2854	0.0463	0.10	0.10	40
Intercept	2.8479	<0.0001			
General P.value 0.0463					

*the reference level is-male

Table 4.34: Model for the administration's supervision over the staff.

Table 4.34 indicates that the variable "gender" influences the tendency for people of the external authorities to answer on the level of 10%. In the specific case the linear (parameter estimate) shows that women have less of a tendency to agree that the supervision over the work of the staff has grown following the use of ITEM. Nevertheless, no other variables met the significance level for entry into the model nor to which degree did the use of ITEM influence the level of independence of the school.

The following Table 4.35 shows that the only variable that can enter the model which deals with the level of supervision by the external authorities over the schools' administrative and financial work is the level of use of IS technology.

Variable	Parameter estimate	P. value	Partial R_2	R_2	N
*Technological use	-0.5010	0.0059	0.1829	0.1829	
Intercept	2.9484	<0.0001			40
General P.value 0.0059					

* Reference level -Internet

Table 4.35: Model of supervision of external authorities over school management.

Using Table 4.35 one can see that the use of the internet by outside factors exerts an influence on the level of 18% and explains the answers received from the respondents. The significance of this finding is that a majority of the respondents from the external authorities mostly uses the internet and, based on this, this variable exerts an influence of about 18% on the explanation of the variation. The examination (using the Stepwise method) of the issue of increased involvement of the teachers in class management through the use of ITEM found that no variable met the significance level for entry into the model. Neither was any linear links found between the variables and the level of increase in the supervision of the external authorities over class management through the use of ITEM.

XVII. A comparison between the participants according to their roles.

The following table compares all the respondents to the questionnaire from the schools and external authorities with the six content areas (see Table 4.4). The comparison includes the different position of the responders and the means that every group received. This table is presented separately because, in the chapter on Methodology, these was both

designated as one of the main investigation of this work and because not all the other parameters have been identified as relevant to the external authorities (like, for example, the size of the school and type of school). The means, as earlier explained, relate to four levels of responses to the questionnaire: 1. Strongly disagree; 2. Disagree; 3. Agree; 4. Strongly agree.

	N=32		N=50		N=130		N=40		
Six content Areas	Principals		Educational Leaders		Teachers		External Authorities		P.value
	Mean	S.Dev.	Mean	S.Dev	Mean	S.Dev	Mean	S.Dev	(Anova)
1.Supervision by the principals	2.73	0.48	2.68	0.45	2.57	0.51	2.73	0.45	0.1187
2. Electronic -dialogue	*A 2.76	0.66	*AB 2.69	0.53	*B 2.51	0.60	*A 2.75	0.59	0.0339
3. Schools' independence	**A 3.07	0.43	**BC 2.82	0.58	**C 2.62	0.53	**AB 2.98	0.48	<0.0001
4.Supervision over management by external authorities	**A 2.45	0.71	**B 2.35	0.71	**AB 2.56	0.63	**A 2.71	0.59	0.0526
5. Teachers' Involvement in class management	**AB 3.15	0.77	**AB 3.20	0.61	**B 3.01	0.64	**A 3.31	0.61	0.0538
6.Supervision over class management by external authorities	2.86	0.67	3.02	0.53	2.95	0.62	2.97	0.38	0.6988

* T tests (LSD) for dialogue. ** Duncan's Multiple Range Test for Independence and Supervision.

Table 4.36: Comparisons between all participants and the six indices.

Table 4.36 presents the following data received from an analysis of the variance (ANOVA) of the four groups that took part in the research (principals, educational leaders, teachers, external authorities):

1. Questions 11 and 18 in the questionnaire (see Table 4.4, sections 1 and 6) deal with the question of the use of ITEM and an increase in the school administration's supervision over the staff and the question of the level of penetration and supervision of teachers' work in class management by the external authorities. An analysis of the variance between the groups that took part in the research showed that no significant influence was found in regard to both these questions. (P value > 0.05)

2. Question 13 examines the degree to which an electronic dialogue was created in schools and the direction of its influence (see Table 4.4, section 2). Variance between the different groups was found (P. value 0.0339). Using the Multiple Comparison analysis (LSD) t tests revealed that teachers have a different attitude in comparison to the external authorities. The external authorities have a clearer tendency to agree that ITEM has created a new electronic dialogue in schools while the teachers are more doubtful in regard to this question. Similarly it was found that there was variance between the teachers and the principals where the principals tend more than the teachers to accept the fact that ITEM creates a new electronic dialogue in schools.

3. There is a similar situation with question 15, sections 9, 1-4 (see Tables 4.3 and 4. 4) which deals with the degree of ITEM's influence upon the increase in independence of schools. According to Table 4.36 variance was found to exist between the groups (p< 0.0001). Using a Multi Comparison analysis and Duncan's Multiple Range Test method it was found that principals have variance compared to teachers. While the principals are certain that ITEM has contributed to more administrative and managerial independence

for the schools (mean 3.07) the teachers are less convinced that this is the situation (mean 2.62). Similarly variance was found to exist between people from the external authorities and the teachers. The staff of the external authorities clearly tends to agree that ITEM provides more independence and autonomy to schools while the teachers are less convinced that this is the case.

4. In regard to question 15, sections 5-8 (see Tables 4.3+4.4) which deals with the issue of the degree of influence ITEM has upon an increase in supervision of the external authorities over the administrative work of the schools a P value of 0.0526 was received – which was really borderline. Using Duncan's multiple tests one can show that there is a fine variance between the educational leaders and the external authorities. The external authorities tend to agree more then the educational leaders that ITEM is a tool that makes it possible for them to supervise schools more efficiently.

5. Question 17 (see Table 4.4) deals with the discussion about whether ITEM has led to more involvement by teachers in class management, it was found, according to Table 4.36, that the P value was very borderline (P.value 0.0538). Together with this, according to Duncan's Multiple Range method; it was found that the external authorities had a different approach to that of the teachers. The position of the external authorities' people was between "Agree" and "Strongly agree" in regard to whether ITEM makes more teacher involvement possible in class management (mean of 3.31) while the teachers tended to agree but not to the same degree as the external authorities' staff.

6. With reference to the question of the involvement of the external authorities in class management the educational leaders are more unambiguous about whether their involvement grew after ITEM was used to provide information about the pupils' achievements (mean of 3.02). It is interesting to note that, of all the position holders, the principals tended to agree more but were not unambiguous.

Conclusion:

To summarize, this section presents seven findings that attest to a strong agreement with the statements connected with the use of ITEM and its certain influence on schools as shown by the answers of all the respondents. The people from the external authorities are absolute about another five statements concerning work done in school about which other staffs are not certain. All the respondents agree that ITEM is a tool that assists the school to collect and distribute information, make better decisions, enable closer surveillance over the pupils' achievements provides statistical analysis of achievements, provide information to the external authorities about the school's achievements and allow them to grade them according to their achievements.

The external authorities are more decisive about ITEM being something that improves coordination of work and provides available communication that solves problems, assists in the school's financial management and also improves the decision- making process.

ITEM also acts as tool in the hands of the authorities to increase their supervision over the exploitation of the school's hours of instruction.

Discussion of the open questions – from the questionnaire:

One can elicit the following information from an examination of the open questions (questions 12, 14, 16, 19 in the questionnaire): There is, for instance, the question of whether the tendency to use ITEM leans towards the direction of increasing supervision of the school administration or, in contrast, leans towards increasing flexible work patterns and the devolution of authority. There is a clear line (among responders who decided to answer this question) towards the direction of increasing supervision and coordination through ITEM to overcome the fact that schools are organizationally weak. Despite the fact that ITEM is a fairly neutral system there is a tendency to use it in the direction of more supervision. The supervision is only partially felt since the technology has not yet been fully utilized and has a great potential that is still waiting to be fully exploited. The question of the level of ICT's efficiency as a new form of communications medium based upon "electronic dialogue", the open questions show "the first inklings" that heralds this new type of communication. There is a growing tendency to transmit messages using e-mail and internet forums and there is also contact mainly within the circle of the administrative staff, but there are still comments made and doubts expressed about whether the "electronic dialogue" has a place in the exchange of the personal remarks and contacts that is so essential to the educational system.

The question of the school's level of independence and whether it has been empowered as a result of using ITEM and is becoming better at management and decision making was addressed. Indeed, remarks made by teachers about their lack of certainty in their answers stand out - and the reason for this is that they are not involved

and have no information about the school's financial funding, the budgeting of teaching hours nor their supervision. It is apparent that the administration neither updates nor involves the staff in this area and so there were teachers who explicitly noted this. According to the headteachers the independence of the school grows together with the increase in supervision by the authorities. The greater the active cooperation in the use of ITEM systems between the local councils and the Ministry of Education the greater the supervision will be over the schools. The headteachers would like to see transparency in matters concerning the school and the revelation of information about achievements to all government offices and local councils accompanied by a growth in transparency on the part of the local councils and government offices. According to the headteachers there is no symmetry in the level of exposure by schools and that of the external authorities. The transparency of the Ministry of Education and the local councils also needs to be increased to the level of the school's exposure and, in this way, the independence will be truer.

On the question of pedagogical management and whether teachers run things themselves more independently or whether their unique role and function as those who are responsible for the pupils' achievements has been lost, the headteachers claim that the great advantage of ITEM is that this system reveals the true state of each educational institution openly and, thus, has established a good basis for making comparisons and drawing conclusions. In this way ITEM acts as a catalyst for the constant improvement of schools' pedagogical achievements. According to the external authorities ITEM has led to the creation of a network of criteria for evaluation and measurement that can be quantified. Not all teachers are like this since some of them feel that their intuition is better than any scientific, statistical analysis. According to teachers ITEM has led to the

intervention of external authorities which has only created vagueness as they only emphasize what they are interested in and ignore real, more profound problems that need to be dealt with more seriously and have resources devoted to them (for example the number of students in each class and its influence on pedagogical achievement). This is a clear result of mixing politics and education. Teachers commented that ITEM has great potential and that this has not yet been fully exploited. There is considerable room for improvement in its use as a repository of data and information for the purposes of teaching, showing the students how to turn information into knowledge and for changing the role of the teacher. Together with this many commented on the fact that the analysis of the pupils' achievements is clearer today and provides a more exact picture and that the pedagogical reports - both to the teaching staff and the parents (as end-of-term report cards) are much better than the hand-written work that was done before the introduction of ITEM into the schools.

On the question who runs ITEM in Israeli schools? (This question was only referred to the principals) according to the responses received the following picture can be seen: in all 11 schools that the questionnaires were distributed (see page 140), the principals indicated that the school secretary was the main person responsible for operating MANBAS. Only in 5 schools did the principals indicate that they were also involved in operating MANBAS while in the rest of the schools one other teacher who was knowledgeable about computers assisted the secretary to operate the system.

The second research tool- Semi-structured interviews:

Introduction:

The results of 252 completed questionnaires (out of 280 distributed) were analyzed and these included 11 headteachers, 21 vice-principals and heads of junior high, 50 educational leaders (coordinators, head of departments), 130 teachers (from 11 schools in the Haifa area and a surrounding radius of 50 kilometers), and 40 staff members of external authorities (Ministry of Education and local councils). Four schools were chosen representing both religious and non-religious communities in Israel to participating in the interviews. Different people holding different posts were interviewed (since the questionnaires show different approaches held by them) in order to shed additional light on the findings from the questionnaires. As has been noted in the Methodology section this work combines the two research approaches (qualitative and quantitative).

On the basis of these four schools were chosen to carry out the interviews and included four headteachers, four people from external authorities and ten teachers and subject coordinators. As noted in the Methodology section the interviews were of the semi-structured type which allowed for the presentation of interim questions to assist in the clarification and precision of answers. By basing the work on a coding system the following generalisibility could be achieved.

Control or Flexibility? - based on the interviews:

The idea of transparency is the common thread that constantly reappears and connects all the interviewees in their working experience with ITEM. By transparency the interviewees mean that ITEM has raised the school's work to such a level of transparency that now all the school's products are exposed to everyone and this has led to new kinds of work and networks of relationships. From this point on, however, there is no uniformity about the implications that arise from the system's creation of the transparency and it is possible to identify changes in approach among groups and individuals.

Another point of broad agreement can be found in the idea that work in school is carried out with more coordination and standardization regarding the typing and entering of information into the ITEM system. Together with this it is possible to see all kinds of nuances expressed by the interviewees about the amount of flexibility that can be allowed within such a system that demands more coordination and standardization. The ITEM system in schools in Israel includes MANBAS, the Internet, Email as well as various data repositories that support the system. ICT also includes the use of ICQ, Messenger, forums and systems that support financial management construct teaching programmes (TALMASH) and assist in pedagogical decision making (DSS) and so on. All of these have led to transparency in the school's work that used be done behind closed doors far away from the public eye and which used to be more compartmentalized when SMT (Senior Management Teams) would make the decisions in schools.

Among the headteachers interviewed the emphasis was placed upon an open system that identifies weaknesses in schools, demands more order and cooperation from the staff and which supports pedagogy. One of the headmasters, (arms crossed on his chest), claimed:

'The fact that people come with real, up-to-date data necessarily affects the ability to have useful business- like relationships."

This transparency causes a certain amount of tension in the teaching staff since the surveillance on them is more efficient and it is easier to identify who has entered or updated material on time and who hasn't! This transparency is strongly felt in school despite the fact that access to the information system is not open to all teachers. The headteachers and educational counselors have access to all the data found in ITEM while teachers and subject coordinators only have access to the material that is relevant to them (mainly grades) and which they entered into MANBAS. One headteacher, (with his hand on his completely paperless desk and a slim screen computer in front of him), stated:

"Despite the fact that all the teachers know that all the information is available to the headteacher and that he is more aware about what is going on in the school, I do not see any teachers in panic over the fact that the headteacher knows what is happening in the school more quickly and accurately."

Another headteacher, (at his paper strewn desk and holding a diary containing the details of his meetings for that day), claims:

"The teachers are not in a panic about the school's transparency because they know that the headteacher only uses ITEM to create safeguards and control in case the school isn't working properly."

Transparency, however, does not solve personal problems. Fear of it is minor since it doesn't threaten the system of familiar, working relationships that have always existed in the school.

For the interviewees from the external authorities the transparency that ITEM introduces into schools is supposed to strengthen supervision and control over what is done in the schools. In their opinion, even if the system claims, on the declaratory level, that transparency should introduce more work flexibility and devolution of responsibility, on the practical level the intention is supposed to actually strengthen the tendency of increased control and supervision. In the opinion of one of those responsible for schools in his region, (who fixed a sharp, clever look at me), there is no point for the headteacher to make his work more flexible since:

"...all the operative decisions lead to decisions that demand financial support and the headteacher does not have the financial resources at his command to solve the problems...so what kind of motivation does a headteacher have to take more flexible positions?"

Another supervisor, (cleaning his spectacles), who claims that the transparency introduced by ITEM emphasizes the need to be more open to outside influences and for

the work in schools to be more exposed to the public eye, states:

> "The educational system is not the Ministry of Defense that has to operate secretly and confidentially... there are no secrets in educational work and everything is 'on the table'."

According to interviewees from external authorities, transparency neutralizes what is already known - that is those who were closest to the top knew more. Today everyone has the same level of knowledge and this has created a new structure in which the emphasis is not on who knows more but on what does one do with what one knows! In matters concerning the way work is carried out in schools the work method of "top down" needs to be adopted where the initiatives come from the top, the administration, but where there has to be feedback from below, from the teaching staff.

Among teachers interviewed the emphasis is on the transparency of the system suggesting ITEM is like a mirror in which one sees a reflection of the school's work, just like a person can see his/her face in the mirror. This is seen to be the main emphasis suggesting the system has no intention of making inter-relationships more flexible. Control over the teachers has grown and it is easier to see who does things on time. One of the teachers, (closing her bag), notes:

> "The administration determines that, up to a certain date, grades can be entered into the computer and, on this date, the window really closes in the system and it becomes impossible to ask the secretary do a favour and register the grades the way she used to during the period before ITEM"

The headteacher exploits the school's forum on the internet as well as the email to send messages, reminders and instructions. One of the teachers, (smiling sweetly), claimed:

"Today I can't claim that I didn't get it or I didn't know since
I have to confirm that I received the email before I open it."

Transparency in the work place has "tightened the belt" around the teachers and, in large schools, there is no other alternative to using ITEM to "tighten the belt". The transparency has created a situation in which the administration can closely examine every last teacher in school.

One of the teachers, who organizes the school timetable, stated, (with a broad grin on his face): that the computerized system is an aid to the construction of a more efficient, tighter lesson timetable. It can, at any given moment, show how any change in the timetable can simultaneously affect the whole timetable both horizontally and vertically. The computerized system also recommends that the timetable should be constructed starting with the most complex problem.

The whole subject of the efficiency of teaching in the school is much more closely controlled in the computerized timetable, provides solutions to the needs of teacher replacement and changes every day, tracks the absences of teachers, identifies personnel problems and, in general, leads to a school's improved functioning. It is true that it is less "personal" since there is less human contact with the results and, as one teacher, says:

"It is like letting an automatic machine prepare a meal."

Together with this there were a number of teachers who claimed that the transparency of the system misleads us and that we need to go in a different direction. The transparency of ITEM has not made the teacher's work more flexible because the teachers have not adapted the system and, according to one (angry) teacher's opinion of computers:

> "Information systems operate in schools today as a replacement for typewriters and not as knowledge building systems".

There is a large gap between the sporadic initiatives of teachers that have succeeded in making their work more flexible and those who have not. For instance a Biology teacher from a general state high school stated that one works at home and connects up to a forum that has been opened so that teachers can share exams for their classes. Another example is computer teachers who have succeeded in making their work with students on the solution of problems more flexible by opening a forum - but these teachers have not succeeded in making their work with their colleagues or the school administration more flexible. They rightly define this situation as frustrating.

Another point of broad agreement about the effect of the work done with ITEM, and especially in regard to MANBAS (one of the important information systems used in schools), that arises from the interviews is that the work is more standardized and

coordinated. The headteachers interviewed stressed that, although teachers do not have free access to the system's output, they do have free access to the system's input. The system makes the same demands from everybody in regard to reports, entering grades, disciplinary remarks, attendance data and information supplied to parents. All the teachers, with no exception, take part in entering information into the system. In this way, they learn to prepare their work according to the demands made by ITEM (which are uniform for everybody). The system teaches everybody according to one (enthusiastic) headteacher:

> "Everybody speaks the same language, using the same codes, and so the complaints in the past of -We didn't know! -We didn't understand! And- We never heard about that! - have completely disappeared and this is an enormous advantage".

Those interviewed from the external authorities note that the standardization and coordination in the work of schools that use ITEM is important because it prevents duplication and both teachers and headteachers are ready, at one and the same time, to provide answers to external demands. Even if a school demands special things for its information system, after the system is installed all the teachers have to conform to what has been designed for them. According to the authorities that operate MANBAS the teachers have to show flexibility towards the demands of the system in order to establish a consensus so that a teacher will not be able to decide that he/she will hand in his/her grades in a different way from the other teachers. The standardization and coordination of work obliges all the teachers to work uniformly in the form and method of presenting

their pedagogical evaluations.

"There can be variance between schools but,

within each school, there is uniformity in work methods".

The teachers interviewed believe that the demand for work coordination and standardization in the work with ITEM is not the problem since there is agreement that this is absolutely necessary. The problem is that the teachers are expected to be active in the input of information but not in the output and most schools do not allow free access to all the information, claiming that "privacy must be protected". As a result in regard to everything connected with output, the administration is the main beneficiary.

Teachers express criticism that the style of this work prevents them from cross-referencing and drawing conclusions from several sources leading to a situation where each teacher only works in his own area. There were teachers who noted things that were special only for their schools - for example the teacher who was very upset about the fact that her headteacher did not have a computer on her desk but only her deputy did. The teacher could not fathom how someone can work today without a computer.

There was also the one teacher who held the view that the standardized work, besides being more efficient and providing the possibility to report things according to the same codes (there were more than 400 codes in her school), also resulted in more attractive and clearer reports and that, all in all, the work came out a lot better. As a result she was quite happy about the standardization of work and was not frustrated about the fact that she had no free access to the system. This teacher was prepared to "pay the price" of less

freedom of activity and enjoy the "dictates" of the system as long as there were good outcomes such as the school report certificates printed for the parents.

A new dialogue:

Based on the experience of the interviewees with ICT one can identify both;

1) a trend of 'a-synchronic' communication (meaning a dialogue that is carried out in different places and at different times on the computer screens using ICT).

2) a trend towards a dialogue that breaks down barriers and distances and brings the two sides taking part in the new dialogue to open- up new horizons.

The headteachers interviewed place emphasis on the greater openness and this is expressed by one of the headteachers who said (in great wonder):

"The keyboard makes everything possible!"

Schools open forums that allow dialogue mainly between the younger teachers, the pupils and headteachers and teachers. One of the interesting examples described by a headteacher concerned a study excursion to Poland to the extermination camps Auschwitz and Maidanek in which the headteacher, teachers and eleventh grade pupils took part. To assist with the learning about the Shoah (Holocaust) the headteacher

opened a site in which a summary of impressions of the day's experiences, photographs and opinions were entered by pupils and teachers who had been in Poland. As he turned the computer screen towards me so that I could see the site, the headmaster said:

> "Every day the parents who stayed in Israel could follow what their children were doing and experiencing, take part in electronic dialogues and, in this way, more than forty responses from parents were recorded every evening. The parents felt the experience of what the excursion was like as if they were going through it with us and this allowed a dialogue to develop between pupils, teachers, the headteacher and parents in real time while the excursion was in progress."

Those interviewed from the external authorities emphasized that the dialogues carried out using e-mail and the internet help them to get up-to-date information. One of the supervisors, for example, noted that a court judgment was brought to his attention exactly at the time he was dealing with a similar problem. The immediate contact that was made with him helped him not make the same mistake that another supervisor in another place had made. Communication using ICT creates a new language and in the different forums there are new dialogues as is noted by one of the supervisors (whispers -as if tells a secret):

"A stranger who enters the electronic dialogue for the first time will not understand the new language created and will feel like an alien who has just arrived from outer space".

This is not just a technical change; what we are talking about here is a higher quality dialogue based on more information.

The teachers who were interviewed noted the advantage of this 'a-synchronic' communication. One of the teachers, for example, noted that she had taken part in a university in-service training course that took place entirely on the computer screen. Both the study material and all the exercises were transmitted through the system so she never saw her lecturer face to face. Another teacher noted that in areas where there is poor security, and where pupils come from small settlements in the Samaria region, the army often does not allow free movement and so there is a problem about getting to school. In these circumstances the school operates the electronic communications system that connects the parents, pupils and teachers. Lessons, exercises and so on are conducted through the screens in order to reduce the damage caused by absence from lessons and to avoid the danger to the lives of pupils from traveling on unsecured roads.

The man in charge of computer maintenance at a school told us about the connection that developed between the Haifa school's pupils and pupils studying in a Boston school. This electronic dialogue began a number of years ago and, over time, cameras and microphones were added so that today the pupils can also see and hear each other. As a result of this electronic communication school delegations came for visits to each other's schools showing that, despite the distance, the contact was very good.

There are teachers who converse with their pupils using ICQ, Messenger or internet forums. These teachers note how they solve problems on-line even during the small hours of the morning. When there are serious situations the teachers note that they can send urgent E-mails to inform their head – and there is no need to make an appointment in order to make reports about urgent situations. One teacher (with great satisfaction) notes:

> "Conversations with the pupils that began using ICQ or Messenger often ended up with face-to-face discussions. Without the open communication that I have with them, however, I would never have managed to get to the face-to-face discussion".

Another teacher notes:

> "You need to realize that ICQ breaks down the distance between the teachers and pupils and so the teacher can become a partner and guide".

A Physics teacher notes how much the open communication that he has with the national supervisor helps him with his work.

> "In the old system (using the telephone) it was almost impossible to get hold of the national supervisor. Today I get into the internet site of the supervisor, ask him a question I need clarified and receive an answer on my screen at home in a relatively short time".

Another teacher, who is the school rabbi, notes that he often comes across real, current questions for which he cannot find answers in existing books. He exploits the site of the Chief Rabbis of Israel and poses the questions to them. It is well-known that the Chief Rabbis answer all questions even at midnight and so their site has been gradually building a data repository in regard to real, current questions that helps young rabbis in schools deal with "Halachic" problems (problems of Jewish religious practice) in modern times. Yet another teacher notes that when she was ill she not only transferred work through the internet and, in this way, allowing her class to continue to function despite her absence but, similarly, pupils' work was also sent to her through the internet by the school for correction. All this was done without the need for sending forms and papers which shows that electronic communication also helps reduce the amount of paper we use.

Together with the above opinions that refer to new channels of communication created as a result of the new 'electronic dialogue' there are some interviewees who have misgivings about this system. These interviewees include teachers, headteachers and people from the external authorities who expressed reservations about the fact that there is a tendency not to pass on true information through ICT since people hide behind false images in chats and do not enter correct details about their education, ethnic origin and level of income. This communication will never be able to be open because of the needs for privacy which make it impossible to reveal all the information to everybody and, because of this, schools cannot learn from each other's experience. One headteacher made the following point:

"Even if ICT becomes more sophisticated and offers a greater variety of newer forms of communication I will never give up human contact. Without human contact no educational process can take place nor can one motivate people".

One of the teachers commented that this 'a-synchronic' communication demands a considerable amount of effort and said that she would prefer to continue getting the information in written form by ordinary mail. She, (quite angrily), remarked:

> "I don't like the idea that the supervisor requires me to download the information from his internet site instead of taking responsibility to send it on a printed form by regular mail. Perhaps this is easier for the supervisor but it's harder for me".

Another misgiving was expressed by a teacher (with an amused look on his face) who worked in a relatively small school (350 pupils) and claimed that, even when he saw value in the potential of ICT, he preferred to talk to his pupils face-to-face:

> "For me it's like being a father talking to his children only through the E-mail or internet; it creates an artificial type of communication".

The question of ethics was another problem related to by the interviewees especially the problem of what could or could not be talked about on the network. One deep voiced headteacher talked about a teacher's sexual exploitation of a girl student who talked to him on the internet and pointed out that there was a problem of erotic conversations on the pupils' network which raised the problem of creating restrictions that would determine what was permitted and what was not. Today the network is wide open and there are no clear, unequivocal rules.

There is also a problem of very low level of language used which distorts linguistics and grammar. One of the teachers interviewed made the point that electronic communication needs to be defined as a "new culture" and not as just another form of communication. As soon as it is defined as a "culture" it will be possible to begin dealing with the content and low level of language and the more educators are involved and part of electronic communication the easier it will be deal with the above problems:

> "In my opinion the problem of the level of electronic conversations and the low level of language used is, first and foremost, an educational problem".

Ultimately it will be the "community of ICT users" who will determine what the rules will be. The teachers who join the "community of users" of ICQ chats and different forums need to determine rules just like a teacher determines the rules of discussion in the classroom. Thus the problem is the small number of teachers who join in and the circle of teachers who take part in this must grow. The teacher added:

"I don't think that teachers need to enter into all areas of conversation since one has to leave the pupils their own environment – perhaps the ICQ, but, in regard to the part they have to play in electronic communication in general the teachers need to be more active participants".

<u>The autonomy of schools- based on the interviews:</u>

A summary of the interviewees' answers about the level of a school's independence as a result of the use of ITEM tends towards the position that ITEM functions in two seemingly contradictory directions together – there will simultaneously be both more independence and more supervision of what is going on in schools.

Most of the interviewees explained that this was because of the transparency that results from the greater exposure of information about what is being done in schools. The school's transparency also has an effect on the transparency of the external authorities who are also more exposed to the public eye. In this way every one is in the same boat. The headteachers interviewed explained that today there is more clarity about the school's budget and that information about the number of pupils in schools is more accurate. The computerized information systems feed information to the authorities in real time, for example, if a pupil moves from one school to another and, in this way, each school gets its per capita budget in a more exact way even during the school year. This type of transparency allows the headteachers to set up real budgets and the system also leads the headteachers towards planning work programs whose success can be measured.

One of the headteachers expressed it this way:

> "A programme that does not have enough criteria for the measurement of the degree of success is not worth investing money in. ITEM is a good mirror of the realities we face and, from my point of view, this is excellent because I want to know that the money has been invested properly".

Thus there is no need to fear the fact that, parallel to the increase in the school's autonomy, the school's budget needs to be planned for the external authorities who are increasing their supervision over the degree of success of the plan - since there is a common interest here for both sides.

One of the headteachers said that, in the past as well, he made true reports to authorities so he doesn't feel threatened by the system. In his opinion the local authorities are not increasing their supervision because they know this will be a mistake as they cannot run the schools by remote control. ITEM's effect on the level of independence of schools is positive because:

> "The moment the external authorities receive the computer printout they relate to it more seriously than if a 'handwritten' report is sent to them".

Through ITEM the external authorities can increase their intervention into schools even more but they don't do this because they don't have any interest in dealing with details and prefer to focus on principles and the school's mission. The transparency of work done by schools has grown as a result of the information exposed by ITEM and the free access that the authorities have to this information but, together with this, the crossroads where decisions have to be made have remained. According to one of the headteachers interviewed:

> "ITEM does not determine the style of work. Those who determine that supervision ,or the school's independence, will increase are the people found on both sides of the system. This is why the crossroads of decision- making have not changed".

People from the external authorities, similarly, also see a balance between the independence of schools and an increase in supervision over them. Schools are given more autonomy because they can make better decisions based on ITEM and, together with this, as one of those responsible for managing the whole region, stated (raising his voice):

> "Schools receive autonomy to make short term decisions but crucial long term decisions are made by the head office of the Ministry of Education in Jerusalem".

Schools, even the largest, do not have enough manpower to efficiently manage changes taking place in the 'information era' as these are very big and demand a lot more mobility. Even if a school does get more autonomy to manage its own man power, it will not be as efficient as having a reservoir of teachers in the regional office that can be moved about according to the needs of the schools in that region and re-trained to teach other subjects according to need. According to one of the supervisors an increase in supervision by the external authorities together with an increase in school autonomy is a clear necessity because:

> " ...on the one hand, the headteacher is the boss of the school but, on the other hand, the Ministry of Education that supplies the school budget wants to know what the boss is doing with the authority that has been given to him".

There were some in the external authorities who were afraid that giving the school headteachers more authority to run the school, especially in financial matters, will lead to the headteachers being diverted from their pedagogical work in order to devote most of their time and energy to financial matters. According to the supervisors of MANBAS this tension between increasing the autonomy of schools together with increasing the supervision over them is not necessarily critical since decision -making by internal and external factors are based on the same data base so that the distance between them will not be great. On the pedagogical level, despite the large amount of information that has accumulated in MANBAS, the headteacher cannot create a curriculum and the autonomy given to him only involves the setting of educational goals.

The teachers interviewed noted that this issue of increasing the school's autonomy and its management as opposed to an increase in external supervision – both of which placed together, arises out of the transparency of both the schools and that of the Ministry of Education. This suggests one should accept this as natural because, in this way, cooperation between the school and the authorities will grow and can help the school from a budgetary point of view. One of the teachers noted that small businesses also undergo a similar process and that she knew this from her husband's business. Before the entry of IT into small businesses the owners would reckon their accounts with the tax authorities at the end of the financial year and would, meanwhile, use the money. Now, when the tax authorities can see what profits are being made in real time, the tax payments are made during the financial year and not at the end of the year. In this way businesses are run in a better and more up-to-date fashion. Similarly, schools also need to learn to operate according to real and up-to-date budgetary data through ITEM. It is impossible to separate ITEM from the obligation to manage schools properly – also from a financial point of view. As this woman teacher smilingly comments:

> "The moment you have typed something into IT you cannot change your mind and go back. From this moment on the information is not only yours but also belongs to the external authorities".

In the' information era' transparency and up-to-date information is an inseparable part being autonomic.

The increase of supervision by the external authorities together with an increase in the

autonomy of the school is a process of constructive supervision and does not threaten anything since it allows the external authorities to come to the aid of schools in areas where they need support and, as the subject coordinator of one of the schools commented:

> "My experience is that there is no intervention by the external authorities in the process of what is being done but only in matters of products and achievements – and so I don't feel threatened".

The updating of ITEM does demand constant effort and one needs to make more reports than what schools were used to but, as one teacher put it:

> "The report to the external authorities in the ITEM system assists in getting better, more reliable and faster service".

Learning to live with these two approaches is an inseparable part of life in the information era as one teacher put it:

> "We live in a generation where there is tension between psychology and technology. On the one hand we talk about the rights of the individual to understand every single unit and, on the other hand, the world of technology in the information era

invades privacy. We are all more exposed and every individual loses some of his privacy".

Classroom management – based on the interviews:

There is a broad area of clear agreement between all the interviewees about the change that has taken place since the system of ITEM began to be used to manage the classroom. Today there are no anonymous classes (because of the transparency of schools) and the products of the teacher's work in the classroom have been revealed to all in both; the Ministry of Education and the local authorities. Headteachers interviewed stress that, by using ITEM to make an analysis of the achievements, a comparison between one class and all the other classes studying at the school can be made as can the achievements of one teacher in a certain class be compared to those of others studying the same subject throughout the country. Questions asked in the Matriculation exams can also be analyzed, even at the level of single questions, to compare how pupils of a certain teacher answered a certain question in comparison to the rest of the pupils in the country. According to one of the headteachers (as he moved from one side of his desk to the other to show me papers full of tables) this transparency:

> "... is like placing a mirror in front of the teacher so that he can really see himself, what he has done and what his achievements are".

Another headteacher stressed that ITEM is more than just a reflecting mirror:

> "Today, because the achievements of each class in school are open to the administration, the inspectorate and the external authorities there is a significant difference. The teacher has to explain and justify why his class has not met the expectations or, on the other hand, a teacher whose achievements are above the national average can request a premium".

In cases where a teacher exaggerates the ability of his/her class there are even sanctions that can be applied by the Ministry of Education. A pupil generally receives a yearly grade from the school which represents 50% of his final grade and in cases of exaggeration both the teacher and the pupil are "punished" by reducing the weight of the year's grade by 20%-30%. The inspectorate also sends a warning letter to the school regarding the particular teacher and, because of the availability of the information system, these sanctions can be applied immediately. Today teachers can still close the classroom door and not allow anyone to see the way they teach but they cannot prevent anyone from seeing the achievements of their classes.

According to those interviewed from the external authorities the desire to expose more and more about what is being done on the level of class management will only increase. Today there is a tendency to measure everything the class receives both directly and indirectly – not only grades, attendance, discipline and so on but also subjects connected with the school package such as, for example, transportation, cleaning expenses, electricity, water etc. As one of the supervisors of MANBAS noted:

"Both the content and the school's overall package need to be measured since, only in the future can we know if we have wasted resources and energy –and what we have achieved by measuring everything, as well as how this has affected learning in the classroom".

Another supervisor who is responsible for pedagogical measurement and evaluation using MANBAS continued this line of thought and commented:

> The approach today is that one can measure everything even values, voluntary activities, social life, community life and cultural life".

There is a desire today to reach the greatest level possible of transparency in the classroom that will encompass both formal and non-formal learning.

The teachers interviewed noted that the problem is not the transparency of class management to external and internal functionaries but what one does with all this information that ITEM stores. According to a number of teachers the problem can be found in the fact that emphasis is placed upon the measurement of outcomes and achievements and that there is less scrutiny of the learning process. One of the teachers commented:

"As a physics teacher I claim that the problem solving process is no less important than the result –whether it is right or wrong. If there is only a mistake in calculation at the end of the process but all the process has been correct it is important that we know this.

At the moment ITEM does not examine the aspect of process in its measurement but only the final result".

Another problem common to all those interviewed was how available ITEM was to the teacher at school and the pedagogical decisions that he/she can make as a result of the use of ITEM. Teachers interviewed noted that they had no free access to the information. Every teacher can only see the information that he/she entered into the MANBAS which means that the single teacher does not have all the information about all the pupils in his class and so the teacher cannot evaluate his/her achievements compared to those of other teachers.

Those interviewed from the external authorities stressed that neither the teacher nor the educator has any great authority. If the teacher analyzes the information found in ITEM he/she can arrive at important conclusions but cannot decide upon an increase in the number of hours nor can he/she decide upon making changes in the make-up of the class and so on. The problem is not one of downloading information but what to do with it and what authority the staff has to make decisions. One of the supervisors of the MANBAS thought that it was very important to expose the teachers to all the information on the condition that the teachers get training and learn how to transform the information into knowledge. Lessons need to be learned from industry and the business world about how to deal with the great amount of information that accumulates in the ITEM system.

Just as in the business world, schools need to prepare a work programme, determine what the goals and measures of success are, arrive at conclusions, investigate events, analyze successes and failures and the moment this organizational culture becomes part of the school then there is some point in exposing all the information to the teachers. The ITEM system should act as a basis for making pedagogical decisions and the main idea is:

> "...to know how to transform all the information
>
> that accumulates in ITEM and develops new insights from it".

In the prevailing reality of schools teachers have no free access to all the information throughout the year and this is a flaw in the system because it damages the ability of teachers to make quality pedagogical decisions. The problem is that only at the end of the process of collecting the data, at the end-of-semester teachers meeting (which takes place twice a year), does any brainstorming take place rather than throughout the year. The teachers interviewed noted that they are unable to get a general picture of what is going on in their classes because of claims about the "right to privacy" and the desire to make sure that the information does not fall into the wrong hands. All of this prevents the teachers and home-room teachers (in Israel "educators") from showing initiative and adopting a high profile by managing their classes more independently. One of the teachers put it this way:

> "In my school there are only three administrators who have
>
> access to all the information found in ITEM and only
>
> they can get a general picture of the school".

In this way pedagogical decisions can only be made on the management level or cooperatively by teachers and administrators together.

Another issue arising from the interviews is the question of intervention by the authorities in classroom management through the publication of the results of the Matriculation exams and other exams that the school gives in different classes. Does ITEM's public advertisement of the results of the teachers' work (on the internet networks of the Ministry of Education and the local authorities for example) represent a threat that hangs over the heads of the teachers? Over the whole spectrum of opinions one can see that the interviewees do not see this as a sword dangling over their heads. The threat entailing ITEM's accumulation of so much information about the achievements and the possibility of publicizing them does not especially worry the interviewees. The widely held belief is that the Ministry of Education is not interested in intervening very much in the work process of classroom management but rather in the determination of goals. Today it is clear to everyone that the supreme goal of the Ministry of Education in Israel is to raise the number of pupils who pass the Matriculation exam. The quality of the certificate interests them less than the number of pupils who earn the certificate even on a level of minimal achievement.

According to the headteacher interviewed a school is judged by the number of pupils who receive the Matriculation certificate and, as one of the headmasters expressed it:

"It is true that nowadays a school is considered to be a 'factory' for the production of as many Matriculation certificates as it can".

In other words ITEM is mainly used to track pupils who are under-achieving in order to direct and help them get to the level of expectations that will allow them to succeed in the Matriculation exams even on the lowest of levels. Today teachers know that there are other factors that also examine the results such as the administration, the inspectorate, the local council, parents and so on.

It is clear to headteachers that the trend according to which a school's achievements are publicized by both the Ministry of Education and the local councils will grow. They are conscious of this fact and aware there are many problems involved with such public advertisement and, at the moment, they are reluctant to pursue this self publicity. As a result the "threat" is, at the moment, not concrete, but vague.

The reluctance to publicly advertise the results comes from the fact that it is difficult to compare all the populations in the country's schools because they are so varied. There are socio-economic differences and, despite the fact that everyone is examined on the same subjects, there are different backgrounds and it is impossible to compare one type of school with another. Because of this the headteachers think that it would be a mistake for the external authorities to advertise the results on the internet. Another reason is the fact that the data received by ITEM are numerous and wide-ranging and so need to be explained and clarified. One needs to know the learning history of every class and the external authorities know that it is complicated for them to get involved with intervention on the level of class management.

According to the external authorities there are insufficient tools at the moment to make intervention on the level of class management possible because these authorities do not have the technical means or manpower to carry out the close supervision involved. As

one of the supervisors of running the regional office pointed out:

> "In our region there are only three supervisors who use -laptop computers".

The desire to increase intervention on the class management level exists but there is also an awareness of the difficulties described above. As a result the focus continues to be placed on the number of students who receive the Matriculation certificate.

According to the inspectorate one should be able to get a picture of the situation through using ITEM and be able to evaluate: 1) those who meet the demands made of them; 2) those who are close to achieving this; and 3) those who do not meet the demands. This is preferable to categorizing the pupils according to their place in the class which does not necessarily provide the whole picture.

According to teachers interviewed the intervention of the external authorities in the management of the class is not threatening because the external authorities use ITEM for the good of the students and, if this is so, teachers should be interested in this. The teachers do not feel that there is a trend towards direct intervention and this was expressed by one of the women teachers:

> "I don't feel there is more supervision of my work as a teacher since they started using ITEM for the pedagogical management of the class. There is no hidden camera that tracks us personally nor the way I handle my class".

Teachers feel that if there is an attempt to intervene it is only motivated by an intention to be helpful. Schools are interested in raising the number of pupils who earn the Matriculation certificate so that they can be complimented by the Ministry of Education; thus there is a broad network of support for pupils who need to close the gap between their standard and the demands of the Ministry of Education. One of the teachers put it thus:

> "In our school the lights in the classroom are on till late at night - even up till 9 p.m. Here the under-achieving students receive help to raise their achievements to the level of expectations of the Matriculation exams".

There are teachers who think that the public advertisement of the results and school achievements on the internet is manipulative since it is possible to present the graphs and cross-sections that serve certain interests and ignore other data that the authorities do not find helpful to advertise. The main things that local authorities are interested in are data about the number of pupils in order to make it possible to move the student population from small schools to larger units and so save money. The Ministry of Education is interested in raising the number of students who receive the Matriculation certificate and less in presenting figures about how many pupils receive high quality Matriculation certificates which provide them with entry into high status faculties and departments at selective universities. Focusing on the number of pupils who receive the Matriculation certificate and on under-achievers comes at the expense of investing in talented pupils who are a real asset to the country. Put simply – mediocrity has taken over in the external authorities.

From the interviews one sees a common agreement about the use of IT as a teaching tool. All those interviewed agreed that this instrument is not used enough for teaching purposes but mainly for collecting information and analyzing it. Most teachers still prefer to teach in the "traditional" classroom rather than in the computerized classroom, despite the fact that pupils spend most of their time in a computerized environment.

The authority that runs MANBAS is aware of the fact that the pedagogical management of the classroom needs to be changed and, for example, is preparing a pilot programme with physical education teachers to construct a significant educational programme based upon a computerized work program.

In computerized learning programs all teachers will have to:

1) Set out their personal philosophies.

2) Set clear, measurable goals.

3) Set timetables for handing in work.

4) Explain what the pupil has to know at the end of the process.

5) Cross- reference the socio-economic background.

In this way the emphasis will not only be placed on the products and achievements but also on the learning process. Every skill will be measured and the final grade will not be the main thing but what the pupil did at each and every stage and in each and every process.

The work with ITEM has led to an interesting experiment in one of the settlements in the south of Israel when they decided to introduce "regional planning" into this settlement. The local authority there decided that they would teach English in their schools on the level of 4-5 points that is on a middle and high level. Despite this they decided to

remove the possibility for pupils to study English on the lower level of 3 points which also grants the right to receive the Matriculation certificate. The academic institutions, however, do not accept this level of certificate for university entrance purposes. After this strategic decision was made in this settlement they introduced surveillance over the pupils' achievements in English from kindergarten to twelfth grade. There is a steering committee that uses ITEM to collect data and analyze it so that, at every level, pedagogical decisions can be made about what has to be done to reach this learning goal.

Despite the fact that, during the last few years, there has been a trend towards using IT as a learning tool, teachers agree that its use is still inconsistent and insufficient. In this way the teachers, in fact, do not exploit the environment in which the pupils live a large part of their free time – and this is an environment that provides them with emotional and other experiences. As one of the managers who is responsible for the maintenance of the computers at a big school commented:

> "Very few teachers use the computer room for teaching or for using the IT that is available to them. Those who do come are usually the younger teachers. It is those teachers who are the least experienced pedagogically who use IT more.

A major problem today is that no-one supervises teachers or evaluates their work in the computer room. Supervision takes place is in regular classrooms where traditional methods of teaching are used. In this way nobody bothers to pedagogically upgrade lessons by using the computer room.

Teachers who spend time in the computerized environment of the pupils point out the problem of the pupils' low level of language and high level of spelling mistakes. Students are reading fewer books and so their ability to express themselves is inferior. There are also teachers who try to get close to their pupils and speak the language that has developed on the ICQ and Messenger networks. One of the computer teachers made this comment:

> "As a teacher of computers I find myself to be a partner of the pupils when they are using ICQ and a regular teacher in the class when I teach computer theory. These transitions indicate that something has changed in the role the teacher plays in the information era and that it needs redefining".

The teachers who use the computer room for teaching want to see more teachers teaching with IT, more teachers exploiting the enormous information reservoir, and more teachers who not only know how to teach and guide pupils in how to transform information from the internet into knowledge, but how to use this tool in a more informed way and not get lost.

Discussion of the wider use of ITEM:

A question about the wider use of ITEM was added in the interviews. A summary based on all the interviews involving the question of what the popular uses of ITEM in school were indicates that most of those questioned believe that ITEM makes a contribution to schools at the present in the following areas: its role as a data repository for pupils and teachers, the building of timetables for pupils, arrangements for replacements for absent teachers, reports on grades, records of attendance and discipline problems, the preparation of certificates, library management, and here and there, in a really sporadic fashion, for the needs of teaching. The most common uses of ITEM were for the reporting of grades, the preparation of certificates and keeping attendance.

Headteachers interviewed also noted the use of ITEM for financial management, although this was mainly for funds budgeted by the local council or funds from parents and not for the payment of the salaries of teachers and other staff. External authorities emphasised the use of the data repository for teacher training purposes, for courses that prepared teachers for professional change as a result of subjects that were no longer being taught and their transferal to other course more in demand today. The teachers interviewed emphasized the need for ITEM to supervise pupil attendance and the preparation of their certificates. It should be pointed out that there were significant differences among a small number teachers interviewed who indicated that it was important to be part of an "environment" that pupils were involved in a significant part of their free time and so they communicate with them using ICQ or Messenger programmes that allow them to have electronic conversations and so get closer to their students.

There were also an even smaller number of teachers who noted the use of IT for teaching purposes albeit for a limited number of lessons.

With reference to questions of what was missing for them in the use of ITEM and what they would like to use in the system that they were not using because of all sorts of limitations the following responses were received:

Headteachers claimed that what was missing for them in ITEM was a three year picture of the pupil since today the headteacher has to relate to each year separately. A three year perspective, they claimed, is important for following up every year of study in senior high school since the Matriculation exams are spread over these years. The headteachers similarly wish to see all the information about each pupil on one line and not have to open up his/her window for each subject which makes it difficult to get a general picture at one glance. Today information about economic difficulties, learning difficulties, attendance problems and so on is found in different windows under different entry codes. The headteachers expect ITEM to provide them with a broader picture of the matriculation results – not just country-wide averages but analyses according to type of school and socio-economic make-up so that comparisons can be made between schools that are "similar". They also do not wish to have analyses that only show how many pupils were awarded their Matriculation certificates but what the quality of the certificate was and the number of study units that were examined and the level of difficulty of the subjects that students chose to be examined on.

The external authorities lack sufficient information on the school package –for example expenditure on transportation, excursions, water, electricity, accidents and staff

attendance. The school supervisors lack information about the process of teaching since ITEM only provides the final products at the moment. One of the supervisors commented:

> "I have responsibility for 25 schools and it is impossible to be in all at one and the same time, but if I were linked to all 25 schools with ICT I would like to know, in real time, what the attendance of teachers and pupils was on some specific day or information about other problems etc."

MANBAS which is one of the important information systems in Israeli schools does not document details about Special Education, nor does it document the work process or the appraisals of teachers. The headteachers can see the change but cannot see what the basis for this change was.

There were number of teachers who claimed that the system does not allow any interfacing between the socio-economic state of a pupil and his achievements in his studies, nor is there any follow up of pupils who are marginal. The subject of Mathematics, for example, is taught on three levels - 3, 4 and 5 study units and one of the Mathematics teachers claims:

"The problem is with the students who actually fall between 3.5 -4.5 units and to find out what is happening with them in real time before the end of the term"

What happens, in fact, is that pupils are moved to a lower level and that is unfortunate. Up-to-date information during the learning process would make it possible to give them more support and so, as a result, perhaps, they would not go down to a lower level.

Chapter five: Analysis:

1. Introduction.

As presented in the chapter on "Findings" the four research questions identified relating to this work (see page 52) deal with the following six areas of knowledge connected with the use of ITEM in schools:

1. The level of supervision and coordination between the school administration and the teaching staff.
2. The level to which a new electronic dialogue was created between the people working in schools.
3. The level of administrative and financial independence and autonomy of schools.
4. The level of involvement and intervention of the external authorities in the administrative and financial work of schools.
5. The level of teachers' involvement in class management and pedagogical achievement.
6. The level of intervention by outside factors in class management.

The analysis of the findings was carried out using two main research tools:

1. The analysis of 252 questionnaires filled in by principals, educational leaders, teachers and people from external authorities (supervisors from the Ministry of Education, local council staff that deal with education matters, Ministry of Education staff who deal with analysis and control of educational work in schools).

2. 18 interviews with principals, external authorities' staff, teachers and coordinators.

2. Analysis of the first tool – the questionnaire survey.

Discussion of the distribution of the respondents according to different categories indicates the following:

1. Division according to role:

The percentage of teachers who participated was 51, 59% including the external authorities and 61.3% when the analysis was done only for the schools. This is the biggest group of all the groups that participated in the survey so, when one makes comparisons, one must remember to take into account that this is the group to which most of the participants belong.

2. Division according to gender:

In the chapter on "Findings" it was noted that the number of female participants was 63% of the total teachers (almost 2/3) while of those in the external authorities they were only 40%. Thus when one makes comparisons one must remember that the proportional importance of females is the greatest among school staffs while in the external authorities people are more represented by a majority of males.

3. Division according to experience:

Among both the staffs of schools and the external authorities the largest group was that with 10 -20 years experience. There is importance to the fact that most of the participants had more than ten years experience since the process of learning how to use ITEM and MANBAS (the most important information system for Israeli schools) took place in the schools over the last ten years and so most of the participants know how

schools were managed before the introduction of MANBAS and what the implications of its introduction into their school were.

4. Division according to age:

Most of the participants were over the age of forty (almost 2/3) and their exposure to IT was considered to be exposure to the world of young people who know no other world than a world dominated by computers and computerized technologies. In contrast the older and aging population in the education system and the external authorities worked in environments not so computerized and so were able to compare what had previously existed to what exists today.

5. The use of IS technologies:

The first information system tool for respondents from the teachers and administrations (all the school staffs) is MANBAS and the second is the Internet while, for the external authorities' workers, the first tool is the Internet and MANBAS is second (according to the way the MANBAS system mainly works in the schools). Despite the above most of the participants are familiar with more than one IT system (almost 81%). What does stand out is that, in schools, a clear majority of the staff (87%) are familiar with more than one system while, in the external authorities only 47% are familiar with MANBAS as an information system.

6. Size of the school:

A clear majority of the respondents to the questionnaire (about 79%) come from medium sized (400+ pupils) and large (1000+ pupils) schools. This becomes important since, in

small schools, the interpersonal relationships are simpler because of the intimacy that comes from the small staff. Large and medium size schools need IT, not because it is matter of fashion and style, but because it is necessary for everyday functional efficiency (as noted in the review of literature).

Type of school:

As argued in the methodology section, schools which took part in the research project (both as respondents to the questionnaire and also in the interviews) represent a cross-section of Israeli schools. Five types of schools were selected for the research and the total number of participants was 211 with about 1/5 of each school participating. The distribution received was satisfactory to the needs of the initial planning of the research.

3. The level of supervision using ITEM over the school administration:

The question that had to be cleared up in the first research question (see page 52) was whether the level of supervision by the school administration over its staff grew following the use of ITEM. Did the coordination and uniformity of work in the school increase so that the work could be done with greater control exercised by the school's administration?

According to the findings (Table 4.4) the respondents to the question (overall) tended to accept the notion that ITEM is a tool that has succeeded in increasing the supervision and coordination of the internal work done in the school. According to the theories of statistical measurement (The Mean Procedure) the external authorities were more convinced that this is the direction of things than the school staff.

According to Table 4.5 in the chapter on "Findings", that examined the effect of different categories of characterization (role, gender, etc.) on the distribution of responses, it was found that, according to the analysis of variance (ANOVA), the characteristics that influenced the distribution of the responses were gender differences and types of school. Among the males there was a greater tendency than among the females to agree that ITEM is a tool that increases the supervision and coordination of work in the school. According to analysis done using Duncan's Multiple Comparisons it was found that, although all schools had a tendency to agree that the supervision had increased following the introduction of ITEM, in the technical schools the tendency was particularly significant and the level of agreement there was especially noticeable when compared with the other types of school (mean of 2.86).

When this issue is examined using the Stepwise procedure (see Table 4.17 in the chapter of Findings) it was found that the characterization categories of "type of school" and "gender" were included in the model that examined the level of supervision using ITEM (as in the ANOVA analysis) but that the category of "role" also was included. The educational leaders had a greater tendency than principals and teachers to agree that ITEM increases the supervision and coordination of work in school.

When this question is also examined according to the attitudes of the people from the external authorities it was found that the factor that influenced the distribution of responses was "gender" (see Table 4.22 in the chapter on Findings). The males had a greater tendency to agree that ITEM leads to more supervision by the school administration and to work that is more coordinated and standardized (mean of 2.85). This finding is identical to the finding in schools despite the fact that there is a majority

of females among teachers and school staff and a majority of males among the workers from the external authorities. When the Stepwise procedure is used on the model constructed the variant of "gender" is included as something that influences the difference between the respondents, something that supports the finding.

Using the Freq. Procedure an analysis of every question in the questionnaire was made to see how many of those from the school staff who took part (including administrators, leaders and teachers) marked the same answer (see Appendix B). The following results were obtained:

a. Most of the school staff (89%) does not agree that ITEM spoiled the relations at school and this is despite the fact that the majority (80%) agree that the work is more coordinated and standardized.

b. Another finding that was obtained was that the school staff was clearly convinced (64.6%) that the supervision had increased through the use of ITEM but the opinions are divided about whether this led to more instructions being imposed upon the teachers by the school administration.

c. There is wide agreement (82%) about the notion that the collection of information and its distribution in school had improved.

Staff working for external authorities (82%) think that work at school is more coordinated and that ITEM, as a result, has not caused any worsening of relations in school (89%). They, similarly, tend to agree that ITEM has increased the administration's supervision over the work of the teachers (65%) but, like the teachers, they are divided over whether this truly has had the effect of increasing the

number of instructions imposed by the administration. As with the teachers there is wide agreement in the external authorities (90%) that information is collected and distributed better than it was when it was handled manually.

The direction indicated from responses written by those who chose to respond to the open question in the questionnaire (see Table 4.4) can also be added to the analysis of the questions. The general direction indicates that ITEM helps to overcome the organizational laxity of schools (loosely coupled systems). Together with this the comments received show that the supervision was only partially felt since the schools are not yet exploiting the full potential of ITEM.

4. The second tool used for the research was the semi-structured interviews:

The line received from the analysis of the questionnaires – that ITEM is exploited as a tool for the increase of internal supervision and coordination in schools - was also maintained with the interviews. In the interviews, however, the notion of transparency in work was raised because ITEM led to a situation where the products of the school became transparent and this leads to more supervision by the school administration over the work of teachers. Work is more coordinated and the interviewees attribute this to ITEM's demand for uniformity in the way the computer programme is reported to and fed information.

The finding that males tend to agree more that MANBAS has increased supervision over the schools was identified by two research tools in this study (the questionnaire and the

interviews) after comparing the findings from the analysis of the questionnaires and the interviews about the level of supervision over the work of teachers. From the interviews, however, it appears that some aspects seen from the point of view of differing roles provide a different personal angle to the argument that ITEM leads to the transparency of the work and achievements in schools. From the evidence of principals interviewed, the transparency brought about by ITEM reveals weaknesses in schools that need to be related to and dealt with. Principals are very aware of the fact that this transparency is open to the inspection of the administrative staff and they are not interested in opening it up for teachers to see – not even the educational leaders. Every teacher and coordinator can receive information that affects his/her personal function but the administration shows no tendency of wishing to open the system up for everybody's inspection or allowing everybody to have equal access to the extensive information.

The principals argue that even if the supervision has increased and that they, for instance, know which teachers have updated the system and those who haven't, the teachers do not feel threatened and that the system does not lead to bad relations as a result of this. This is because the teachers, according to the principals, feel that ITEM helps create restraints and controls which make it possible for work in school to continue functioning. This attitude supports the findings from the questionnaire that showed that 89% of the school staffs do not think that the relations in school have become worse as a result of the use of ITEM.

The trend that appeared in the findings from the questionnaire whereby the external authorities gave even more credit to IT than the teachers and, in some circumstances, also more than the school administration did was expressed in this question that dealt with the

level of supervision and control exercised by the school administration over the teachers. They consider that the transparency that ITEM provides should cancel out what was accepted up till now i.e. that whoever held a higher position needed to know more. According to those interviewed from the external authorities the goal of ITEM is to create a new structure which is not based on who knows more but should be based on what they should do with the vast amount of information accumulated in the system.

Thus those interviewed from the external authorities, in contrast to the school administration, want to see more people who hold positions and teachers in the schools have access to the wider system in order to be able to get a more general picture and not what the principals are interested in – i.e. that everyone should only see what he/she fed into the system.

The trend that appeared in the findings from the questionnaire whereby the teachers were less decisive than the administration and the people from the external authorities and tended to agree less about the benefits of ITEM as a system that supervises and coordinates work in the school was also expressed in the interviews carried out with the teachers. Teachers interviewed made the criticism that ITEM's trend towards transparency does not achieve its goal since it is exclusively in the hands of the school administration and does not achieve its aim of becoming a mirror into which everybody can look and see their own true reflection. In other words the system does not allow free access to extensive information and, so, teachers cannot see and evaluate their work independently. Teachers interviewed give support to the findings from the questionnaire that show that the collection of information, control and supervision have increased but they do not see this as a goal in itself. According to them the goal should

be to make the work in school more flexible and the indication for this is how much work they can do at home and send to school by Email. In other words MANBAS as a school information system is not only meant to be a replacement for the typewriter of the past but a system that constructs knowledge in complete cooperation with the teachers. At the moment, they do not feel that they are full partners in the operation of MANBAS.

This increase in the coordination and standardization of the work of teachers in schools is one of the more significant findings of the analysis of the questionnaire and this finding is strongly supported by interview evidence. The principals interviewed emphasized their approach that claimed that the teachers had free access to the input from ITEM but not to the output. The standardization arises from the fact that MANBAS, which is one of the important IT systems used in schools in Israel, demands that everybody completes the "windows" identically. Today nobody can claim that he/she thinks that the data should be filled in some other way. People from the external authorities who were interviewed also support this trend claiming that people at school should work in a uniform manner and that there should be a consensus about the school's work methods. In other words the demand for uniformity in work is acceptable to the school administration and the external authorities because it makes supervision and surveillance easier.

An ambivalent tendency appears among the interviewed teachers. On the one hand there is wide agreement that the use of MANBAS, as a school information system, directly leads to work that is more standardized and coordinated – something necessary to the functioning of the school and which is understandable. In contrast to the principals and people from the external authorities, however, the interviewed teachers are divided in

their opinions about whether this is really the exclusive goal of ITEM. There are teachers who think that the prevention of direct access to the system's output (based on the desire "to preserve the individual's right to privacy") is an excuse the administration uses to preserve the power that exclusive information bequeaths - as is the case in all monopolies. Despite this there are teachers who were interviewed who claim that they are prepared to pay the "price" of not being able to freely access the IT output as long as the products of work at school are good and have improved as a direct result of the use of ITEM.

With reference to the differences according to the type of school (as received from the questionnaires) it is difficult to find any results from the interviews because this is not expressed by the different teachers interviewed and, perhaps, because of the relatively small number of interviewed teachers (as opposed to the large number of respondents to the questionnaire (N=212) which did not allow this to be expressed.

5. A comparison between the findings from the questionnaire and interviews and the review of literature.

As noted in the review of literature (page 58) the ITEM system can be used like a "double-edged sword" in that is its use can be applied in two opposite ways according to the intentions of the users. As a tool ITEM is neutral and it depends upon the user whether it is led in the direction of more supervision of the work done at school or in the direction of more flexibility and openness of the work done at school (see -Child, 1984; Yndestad, 1997; Tatnall and Pitman, 2003). According to the findings from both the interviews and the questionnaire one can see that the existing tendency today in

Israel, especially among the school principals and the people from the external authorities, is the direction indicated by the researchers who claimed that ITEM strengthens the supervision and coordination of the work in schools. The findings show that the males, more than the females, accept the approach of the researchers that says that schools are "loosely coupled systems" that need more coordination (see-Telem & Avidov, 1995; Telem, 1995).

The findings, in fact, show that most of the participants, in both the questionnaire and the interviews, tended to agree with the researchers who claim that ITEM tightens up the work in school in all ways by virtue of its ability to create a format of uniform reporting for the whole staff which makes the transfer of information comprehensible to everybody (see-Zeffane, 1992; Tatnall & Pitman, 2003).

The claim of research scholars that ITEM is exploited to tighten intra-school relations and relations with factors external to the school (see-Telem et al, 1995; Ravid, 2001) receives support from the research findings – especially from the principals, educational leaders, people from the external authorities and from a small number of (mainly male) teachers. According to the literature the supervisory trend of ITEM will increase (Sagi et al, 1995; Ravid, 2001) but, at the moment, as the findings indicate, while the teachers do not feel that there are more 'Top –Down' instructions, they feel that perhaps this is yet to come. This is because neither the principals nor the external authorities have completely exploited ITEM and its potential as a supervisory tool – but this is a universal problem not only in Israel (see-Wild, 1997; O'Mahony, 1997).

As the findings show the people from the external authorities are more decisive about the idea that the supervision will continue to increase. This is especially true since the schools are dependent upon the Ministry of Education for their budgets and cannot either operate or maintains the system within their own resources alone (Visscher, 1991; Ravid, 2001). One thing is clear – whoever controls the money can impose their will.

Researchers who claim that ITEM was introduced to increase the supervision and control over what is being done in schools and that the school administrations keep the extensive information to themselves and do not make it available to other members of the school staff also receive support from the research findings of this study. The finding arising from both the questionnaire and the interviews is that the principals allow the teachers to share things extensively only in regard to the "input" – in the process of feeding data into the MANBASON – and, from there to MANBAS. In everything that is connected with the "output", however, there is clear compartmentalization owing to the fact that each teacher and coordinator can only get hold of the information that he/she fed in and has no free access to all the information stored in the system. Because of this the researchers consider that the principals, in fact, act to preserve their power through utilizing ITEM this way and that they have no real intention of ending the existing situation in school whereby anybody who holds a higher position knows more. Thus the intention of the change to create a new structure based, not on who knows more but on what one does with the great amount of information that has accumulated (Warwick, 1997; Makela, 1997), does not yet exist in any practical way in Israeli high schools.

The findings from the questionnaires and interviews reject the approach of researchers who claim that ITEM has produced more flexible work patterns in school, something that

has changed the school's structure (O' Connor & Smallman, 1995; Salomon, 2000). The researchers belonging to the second group, who claim that ITEM has produced a reduction in the amount of supervision and control and a rise in the flexibility of work in schools, get no clear support from the research done in this study. Although there is support for the notion that ITEM encourages the combination of the 'Top- down and Bottom-up' approaches (Visscher, 1995) this, as has been noted above, mainly applies to the input of information and not to the output.

Findings from both the questionnaires and the interviews do point to the fact that ITEM has neither led to bad relationships as a result of the increased supervision nor has there been an increase in the number of Top- down instructions. However, the hopes of researchers from the second group (Jackson & Humble, 1994; Fung and Pun, 1997; Visscher & Wild, 1997; Gilley, 2000, Haughey, 2003), that ITEM would reduce the number of middle managers as a result of the direct connection between the administration and the staff (in both directions) has not been realised.

Moreover, the hopes of the researchers from the second group, presented in the literature review, that ITEM would lead to complete cooperation between the administration and the staff and that the principals would understand that they could not run or lead the schools by themselves and so would co-opt the teachers to lead the schools and would prefer to work using "brain-storming" approaches (Fullan, 1992; Dallin, 1993; Somekh, 1996; Fung and Hau, 1997; Lamby, 2001, Haughey, 2003) – all these hopes have not been realized at all and high schools in Israel are still far away from realizing such aspirations.

Findings from research undertaken do not confirm the fears of researchers drawn from the second group, that if schools do not work according to their approach then 'fear and terror would be the teachers' lot' as a result of "Big Brother's surveillance" (Yndestad, 1997). The findings show that the teachers do not feel threatened by the demands of ITEM for more supervision and coordination and see this as an insignificant "price" to pay for improving work in school. The interviews also show that the teachers do not feel that "Big Brother" is watching them. On the other hand the issue of transparency that reverberated throughout the interview process as a central factor that ITEM has brought into the schools was, surprisingly, was not found to be a significant issue in the literature.

6. The Electronic Dialogue in Schools – Findings from the questionnaire.

The second research question in this work focused on ICT's ability to create a new electronic dialogue and where such a dialogue might take the school. In the issue of the effect of ICT on dialogue in school it was found that all the characterized categories: position held, division according to gender (male/female) and type of school influenced the distribution of responses when the analysis of variance (ANOVA) was used as did the years of experience in the current position when measured according to linear regression. According to the findings (see Table 4.7 in the section on Findings) there are differences according to role and the principals tend to agree more than the teachers that ICT leads in the direction of a new type of communication. As was the case with the increase in the supervision over teachers (in the first question treated in this section) there is also a division between males and females in schools regarding the electronic dialogue. Males

(who are a minority in schools) tend to agree more than females that ICT creates a new dialogue (mean of 2.81). The division according to type of school also influences the respondents and people from the technical schools and Yeshiva high schools tend to agree more than people from secular comprehensive schools that ICT exerts an influence on the dialogue (see Table 4.7, in the section on Findings). We also learn that the more experienced members of staff tend less than the less experienced staff to agree that ICT creates a new electronic dialogue in schools.

This analysis receives more validation from the construction of the model using the Stepwise method and this model included the type of school, distribution according to gender and years of experience as was the case with the use of ANOVA and Linear Regression. With the Stepwise method, however, age was also added (see Table 4.17, in the section on Findings). The technical schools stand out as unique in their tendency to agree more than all that ICT creates a new dialogue and also that male, more than females, tend to accept this determination. There is also support using this method since those who are younger and have less experience have a tendency to agree more that ICT creates a new tool for communication.

In contrast to this distribution among the schools staffs, that included teachers, educational leaders and principals, the characterizing categories that were noted above among the staff of the external authorities did not influence the distribution of the responses. Together with this one can use the Mean Procedure to show that the mean score of the external authorities was higher than the mean score of the respondents from the schools.

The people from the external authorities tend (more convincingly) to agree that ICT creates a dialogue and an improved system of communication -mean 2.59, (see Table 4.4 in section on Findings) and also agree that because of ICT:

1. There was an improvement in the dialogue in school (57.5%).
2. 60% agree that there is an improved system of consultation in schools.
3. 80% agree that this is a dialogue system that takes place on the computer screen (see Table on Frequency Procedure, Appendix B).

In contrast to the people from the external authorities the school staff members consider that because of ICT:

1. Only 51% agree that there is an improvement in the dialogue taking place between the administration and the teachers.
2. Only 50% agree that the system improves the consultation in schools.
3. 64% agree that the system is readily available and makes it possible to solve problems in school.
4. A majority of 55% do not agree that an electronic dialogue takes place on the computer screen in schools (see Table of the Frequency Procedure, Appendix B).

In other words, as noted previously, a majority of the respondents from schools are teachers and are less enthusiastic about ICT as a tool capable of improving communication. The teachers agree that ICT is a readily available system that enables the solution of problems - that is it has the potential to do this, and, only on this point, is there really any wide agreement between the staffs at schools and the staff of the external authorities. At any rate from the table that compares between the holders of positions (see Table 4.36 in the section on Findings) the findings show that, with reference to the

question of electronic dialogue developed in schools, people from the external authorities and the principals tend to agree more than the teachers that ICT influences the creation of a new dialogue (mean 2.51).

Analysis of interviews

Compared with the findings from the analysis of the questionnaires, a tendency develops from an analysis of the interviews that there is wide agreement that electronic dialogue (ICT) has clear advantages. This is because it is asynchrony (that is it takes place in different locations and at different times) and, the interviewees note, it also has the capacity to break down barriers between teachers and pupils and between the administration and the staff. In this way new channels of interpersonal relations open up.

As with the tendency shown from the analysis of the questionnaires there is wide agreement between the interviewees about ICT being a readily available system that makes it possible to receive information in real time. The trend that appeared in the analysis of the questionnaires whereby the principals and people from the external authorities were more decisive about ICT creating a new dialogue on the computer screen also appears among the interviewees. The principals note the possibility of creating communication between themselves and teachers, parents and pupils; the people from the external authorities note the updates they receive in their Email or internet – which make it possible for them to make decisions in real time. Teachers meanwhile are divided. There are those who use ICT and are energized by the fact that their relationships with their pupils have changed and is less formal allowing them to learn more about the world of the pupils and what kind of attention they need. On the other

hand there are teachers (mainly the veterans) who prefer direct contact and feel that it is impossible to motivate pupils, or people in general, or to act by using remote control or through technologies alone. The teachers who have reservations about this tool are shocked by the low level of expressive ability the pupils have as a result of the low level of language used in ICT (for example in ICQ or Messenger).

The connection and links between the research findings and the review of literature.

The first group of researchers expresses wonder at the ability of ICT to bring about significant changes in the school's methods of internal and external communication. One learns from a review of the literature that there is a clear trend in the first group of researchers who believe that ICT has produced a new basis for communication in schools (Dalin, 1993; Gev, 1995; Maddux et al, 2001). Support for this position can be found mainly among principals and people from the external authorities who tend to accept this approach and this became clear in the analysis of the questionnaires.

There is also enthusiasm about ICT among the first group of researchers which appears in the literature where they claim that there has never been a tool like this before that can create interaction between people and improve the mutual consultation between them (Visscher, 1995; Selwood, 1995; Wild, 1997). This approach is also supported in the analysis made of the questionnaires and interviews although this is not the case with everyone. It is mainly true for principals, people from the external authorities and among males. In technical schools as well, where technology studies are more developed and where more emphasis is placed upon them than in other schools, the findings show that they support the approach of ICT researchers who claim that ICT has great potential as a

communications medium. Those who support this statement less enthusiastically are the female teachers who are not impressed by ICT's ability to produce the new, special interaction and certainly not on the computer screen.

Despite this there is wide agreement among those who took part in the research, both in the questionnaire and in the interviews, that ICT does allow access to updated information that flows currently in real time as claimed by the researchers of this group (Gatian, 1994; Nolan, 1996). The central problem, however, can be found in the point of view of the researchers who think that the new communication can operate from screen to screen and that, in practice, one can develop dialogue between people that is based upon an "electronic dialogue" (Kenway. 1996; Nolan, 1996; O'Brien, 1997). There is no great support for this point of view in the research undertaken with reference to schools in Israel. In fact more than half the participants in the questionnaire did not accept the position taken by the researchers. The limited support for this idea (that one can carry on a dialogue on the screen) comes from the teachers with the least amount of experience - that is the younger teachers under the age of forty.

The prevailing idea among the researchers in this group was that ICT produces "on-line information" and provides information in real time (Fulmer, 1995; Okamoto et. al., 1997; Holmes & Russell, 1999). Both those interviewed and those who participated in the questionnaire gave support to this idea. There is, however, a problem with the extra step that was taken in the literature which suggests that ICT has the ability to make decisions, provide consultation and also make it possible to construct an open and flexible dialogue that would lead to work that was more open and flexible (Hsu, 1995; O'Brien. 1997). It is difficult to find wide support for this approach in schools in Israel. The vast majority

are still convinced that the best type of contact is direct contact, both between principals and their staffs and between teachers and their pupils. Only a very small number of teachers (with little experience and who are under forty) made the point that ICT makes them feel that they are more partners and guides than teachers who pass on raw information. All in all the literature's hope was that ICT would bring about partnership between the administration and the teachers in matters of consultation and the mutual exchange of information. This hope has not yet been realized in Israeli schools (O'Mahony, 1997; Lamby, 2001).

Despite what has been stated above the ideas of the second group of researchers (whose ideas were analysed in the literature) are supported by the female teachers and the more experienced staff members (with medium to high levels of experience in schools). These ideas can explain the reservations of teachers that were expressed both in the open questions and, especially, in the interviews.

The basic idea is that it is impossible to impose a technological system on an organization that does not suit it because it creates antagonism towards the basic idea of the organization (Eason, 1988). In the opinion of these researchers, as we can see in the review of literature, direct contact in education is vital and it is impossible to exchange this for electronic contact (Barta, 1997; Makela, 1997). The feeling among the interviewees was that electronic dialogue came at the expense of direct contact (what the second group of researchers also felt) and that the teachers feared they would lose their ability to verbally influence their pupils if they moved over to electronic dialogue (See Lamby, 2001). The procedural contact using ICT was seen to be a disaster for education since contact was perceived as personal and informal (see also O'Neill, 1994).

The second group of researchers explained the reservations of the teachers as they were expressed in the questionnaires and interviews as the teachers' fears of being really harmed by the open electronic system. The system does damage to "the privacy of the individual" since all browsers can observe the electronic dialogue (Maddux, 2001). There is also physical damage done to the abilities of the users with this system (Casement, 2000) and the problem of the large amount of material and Junk mail which makes it difficult to differentiate between what is and is not important (see Tatnall, 1995; Visscher & Wild, 1997; Dusick, 1998). Mainly there is great fear of a degeneration of verbal ability and thinking skills since pupils accept what they see on the screen as a fact and do not dispute it (see Zaboff, 1998; Spector et al, 2002).

7. The Level of Independence of the school – Analysis of the questionnaires.

The third aspect of this research deals with two sides of the same coin. The first side examines the level of independence the school administration has in its administration of the school and the ability to increase its autonomy both from management and financial points of view. The second side is the level of intervention of the external authorities in the administration of the school. This part of the work will only deal with the first part and in the next section (section 8) the second side of the coin will be dealt with.

The level of independence of a school is first examined according to the Mean Procedure (see Table 4.11 in the chapter on Findings). In general the participants tend to agree that ITEM is a tool that helps to raise the level of administrative independence of schools (mean 2.77). It is clear in this question as well that the people from the external

authorities are more convinced than the staffs of schools (mean 2.98). The characterizing categories that were found to influence the respondents to the questionnaire, using ANOVA, were role, gender, type of school and, using the REG procedure, it was found that age also has an effect especially on principals who tend to agree more that ITEM increases their independence in managing the school (mean 3.07) compared to teachers (mean 2.62) and educational leaders (mean 2.82).

The difference between males and females was consistently preserved in this question with the males tending to agree more strongly that ITEM increases the school's independence. The distribution according to type of school also has an influence and one thing that stands out is that staffs of Yeshiva high schools and religious schools tend to agree more (mean 2.86) than staffs of comprehensive schools (mean 2.53) that ITEM has raised the level of autonomy of their schools when responding to a choice between agree-do not agree. It was also found that the higher the age the greater the tendency to agree that the independence of schools grew as a result of the use of ITEM.

When the characterizing categories that influenced the respondents using the Stepwise method were examined it was found that the characterizations of gender and role were included in the model. Thus, of all the findings referred to above, the two characterizations of gender and role receive greater validation. In other words also using this method (Stepwise) it was found that males tend more to accept that ITEM increases independence while the principals and educational leaders tend to agree more than the teachers that the independence of schools has grown.

When the perception of people from the external authorities on the independence of schools was examined no characterization was found that influenced the distribution of their answers. A small majority of the people from the external authorities (52%) do not agree that ITEM helps find more efficient solutions to educational problems in schools and this is despite the fact that there is an overwhelming majority (90%) that agrees that ITEM provides scientific and statistical analyses. There is also a great majority (77.5%) that agrees that ITEM improves the decision- making process in schools and helps manage finances independently (91%). Together with this only 60% of the people from the external authorities agree that the general autonomy of the schools has significantly grown.

In spite of the above, school staff, although with a small majority (55%), tended to agree that ITEM assists in finding more effective solutions to educational problems. Like the staff of the external authorities the schools staff also agree (88%) that ITEM provides better scientific and statistical analyses and has improved the decision making process in schools (63%). With regard to finances 62% of the school staff members agree that ITEM assists in the independent management of finances. One, however, has to point out that 19 teachers did not respond to this question noting that they had no information about the subject, are unconnected and receive no reports about the financial situation of the school. The majority that did respond noted that this is the business of the school administration and not the teachers. In spite of all the above the bottom line is that the staff do not see any significant change in the school's autonomy (57%). From a comparison also made between the educational leaders (see Table 4.36 in the section on Findings) one can see findings that clearly show that principals are convinced that ITEM contributes to an increase in a school's independence (mean 3.07) as are people from the

external authorities (mean 2.98). The teachers, however, are more hesitant (mean 2.62) and do not feel, as the administration does, that the independence of schools has grown.

8. The level of supervision of the external authorities over the management of schools.

As noted in the previous section the second side of the coin of the degree to which a school is independent is the level of supervision the external authorities exercise over a school's management of administrative and financial matters. According to descriptive statistics about the means of the indices in the questionnaire it was found that a majority of respondents had a tendency to choose between "disagree' and "agree" to the question of whether ITEM increases the involvement of the external authorities in the management of schools. In this case as well there is a difference between the school staffs (mean 2.49) and the supervisors who tended more to agree that ITEM makes it possible for them to exercise better and deeper supervision over what is done in schools (mean 2.71) which is closer to "agree" (see Table 4.4 in the section on Findings). The characterizing category that influences the distribution of the responses to this question is only the "type of school" (see Tables 4.11 and 4.12 in the section on Findings). According to an analysis using the Duncan approach to Multiple Comparisons it was found that comprehensive schools tend more to accept that ITEM has increased the involvement of outside factors in the supervision over what is done in schools from a management and financial point of view (mean 2.80). When, however, one examines this question using Stepwise method one finds that the following characterizing categories are included in the model; the type of school, the role and size of school. This method shows that:

1. role – the means indicate that educational leaders and principals tend to accept more than the teachers that external supervision over schools has grown.

2. in medium size schools especially, but also in large, there is more of a tendency to accept that external supervision has grown.

Using the ANOVA method it was found that, in the external authorities, the most significant use of the internet was for the collection of information and this significantly influences the attitude of the people in the external authorities in regard to the question of the level of supervision. The mean here was 2.95 and this piece of data shows that there is agreement in the external authorities that the supervision over the management of the schools and their financial affairs increased as a result of the use of ITEM. An analysis of the variables using the Stepwise method also supports the above finding that, of all the characterizing categories there were to construct the model, the variable of "the use of IT technology" was the one that was included. The finding arrived at, according to the Parameter Estimate as well, was that the more people from external authorities are exposed to the collection of information from the internet the more they tend to agree that IT increases their supervision over the management of schools. The table that compares position holders (Table 4.36 in the section on Findings) emphasizes the different approaches taken by the people from the external authorities and the educational leaders. While people from the external authorities tend to agree that their supervision has increased (mean 2.71) the educational leaders tend not to agree and do not feel that this is the case from their experience (mean 2.35).

From an analysis made using the Freq. Procedure (see Appendix B) we can see that 67% of the participants in the questionnaire from the school staffs do not agree that the

involvement of people from the external authorities in school decisions had increased as a result of the use of ITEM but 56% did agree that supervision over the exploitation of weekly teaching hours had increased. Opinions are fairly divided and not decisive about whether the supervision of the authorities had increased over the collection of money from the parents and the school's current expenses. Between 23-27 teachers (of a total of 130) did not answer these two questions and remarked that they were not partners to this and had not been informed by the administration about anything involving financial matters at school.

While people from the external authorities agree that there is no involvement on their part in the process of decision- making within schools (65%) there is also wide agreement that their supervision of the exploitation of weekly hours has grown as a result of the use of ITEM (80%). There is supervision over the exploitation of money from parents and the current expenses but less (only 58%).

From an analysis of the responses to the open questions it became quite clear that teachers are not involved enough in the management of financial matters in schools. The teachers have no clear information about how many teaching hours have been budgeted for the school or what its overall budget is but, despite this, the principals note that the transparency of the school helps them to better present their financial demands to the Ministry of Education. They are aware of the fact that the more the use of ITEM grows and deepens the more supervision there will be over the work done in school. The principals commented in the open question that they are sorry about the fact that there is no symmetry between the transparency of the work done in school and that undertaken in the external authorities. They expect the transparency in the Ministry of Education

and the local councils to also grow parallel to the school's transparency. At the moment, however, this is not the case.

Analysis of the interviews

From the interviews one can see that the interviewees have a tendency to present the level of independence of the school as something that goes together with an increase in the supervision over it. The interviewees do not feel that this is a contradiction but, rather, a new reality that ITEM creates because of the increase in the school's transparency.

The principals interviewed reinforce the findings received from the questionnaires in regard to the level of the school's independence following the use of ITEM. They are more convinced than the teachers interviewed that the level of independence of the schools has grown for the following reasons:

1. There is more clarity and transparency in the allocation of money to the schools both from a budget point of view and from the point of view of how transparently the money is used.
2. The accounting for funds is truer.
3. Both the principals and the external authorities are interested in knowing that the money has been used for the right things so that there is no apparent conflict of interests.
4. All the authorities relate to the computerized accounts as if they are more reliable (than the previous hand- written accounts).
5. The people behind the computers are those who hold the positions of budgetary

management, supervision and control and it is they who determine the style of work and not the computer system.

The common interests people have in the transparency that ITEM brings with it also influences those interviewed from the external authorities who also describe situations where the growth of a school's autonomy, by virtue of the principal's empowerment, does not solve their problem of wanting to know more about what is happening in the school. In other words the issue here is constructive external control – there is no attempt to intervene in the work process since the people from the external authorities are not interested in going into detail and are only interested in the final products. Thus this symbiosis between the increase in a school's independence and the increase in supervision over what is done in it is not contradictory according to those interviewed from the administration and the external authorities – as was possible to hypothesize before carrying out the interviews and which was also expressed in the research question.

The results received from the analysis of the questionnaires showed a significant difference between principals and teachers. We can see that the teachers tended to agree less that the level of independence has grown as a result of the use of ITEM (and, let us add, females less than males accepted this). All this created a difference since, after all, most of the teaching staff are female. In contrast to this finding, the gap concerning the attitudes of teachers was not expressed in the interviews. The interviewed teachers expressed the similar idea that it was impossible to increase the independence without increasing the supervision –especially in regard to the products. The transparency introduced by ITEM and the need to give an up-to-date reckoning is an inseparable part of the notion of being autonomous. There were also teachers who claimed

that the services schools receive are better as a result of this transparency. They agree that in the rapid information era one has to accept that the exposure of details that were once considered to be " very private" are, today, an inseparable part of the price we have to pay in order to enter the world of advanced technology of the 21st. century.

9. The link between the findings from the analysis of the questionnaire and the interviews to the review of literature.

In the literature the level of independence of schools following the use of ITEM is compared with the alternative possibility that the level of supervision by the external authorities will increase because it is easier to observe what is happening in schools using an information system. In other words this is described as being like a set of scales. On the one side we have the knowledge that if the autonomy of the school increases then it will be at the expense of the external authorities intervening less (Ezrahi, 1994; Telem, 1995; Hogenbirk et al, 1997). In this way, according to the researchers who think that the external authorities exploit ITEM for supervisory purposes on what is being done in school both administratively and financially, they reduce the autonomy of the school and the independent managerial space of the principals (Madden et al, 1992; Mohrman et al, 1995).

Surprisingly, the data received both from the analysis of the questionnaire and that of the interviews indicate something different in regard to ITEM. All the participants in the research do not see things as a set of scales but as a phenomenon that advances along two parallel axes. This means that, simultaneously with the advancement of the independent management of the school one can expect that, in parallel, the supervision of what is

being done in it will grow because ITEM creates a lot of transparency for school work. Thus those who participated in the research do not see things as one thing and its opposite but as something that has a "price", something one cannot do without in the era of transparent but exposing information. In this way it turns out that both groups of researchers, those who think that ITEM had led to an increase in the self- management of schools (Ezrahi, 1994; Telem, 1995; Hogenbirk et al, 1997), and those in the second group who think that the supervision of the external authorities will grow (Madden et al, 1992; Mohrman et al, 1995), receive both support and validation from the present study.

Most of the support for the first group of researchers who think that ITEM has increased the independence of schools comes from the principals, the males, the people from the external authorities and the religious schools. There is support for the idea that ITEM helps to make better decisions because it succeeds in concentrating attention on relevant information, chooses the best alternatives and thus the results are better. This process encourages the external authorities to grant more authority to the schools because they trust them to do the work in the best way possible (see Ezrahi, 1994; Telem, 1995; Hogenbirk et al, 1997).

According to the researchers in this group ITEM leads to more cooperative work because it encourages more comprehensive meetings that use "brainstorming". This is a tool that encourages the making of better agendas, shortens the length of meetings, focuses attention on the main point of the discussion and allows all the analyses to be made more scientifically and less intuitively (Mansfield et al, 1983; Wholeben, 1995; Spuck et al, 1997; Nunamaker et al, 1997). There is very broad agreement with high percentages in

the findings from both the questionnaire and the interviews that ITEM has changed the way work is done in the schools by virtue of the fact that up-to-date information provided in real time significantly helps the decision makers in school. There is, however, a problem in the process of practically applying this idea in schools. Although the literature shows how much ITEM and D.S.S (Decision, School System) helps in the making of high quality decisions, the respondents to the questionnaires and the interviewees are very reserved in their responses and there is a drop of 15%-20% in everything connected to the practical operation in schools of ITEM in this area (compared to the wide agreement about the potential of this tool). Thus, in contrast to the expectations of the researchers from the first group that ITEM would help place pupils in homogeneous ability groups, study streams and classes and would also help in the planning of long term programs, there was low agreement about this among the participants in the research – something that attests to the fact that ITEM is not utilized to the maximum.

The whole issue of the granting of wide authority, especially in the school's financial management, was surveyed widely in the literature and the expectations were enormous for the successful economic management of the unit independently and the transfer of funds to the principal so that he/she could use the money for what he/she saw fit (Lowrie, 1989; Caldwell & Spinks, 1992; Fawcett, 1990, Lumby, 2000; West et al, 2000). This approach is not at all realistic in Israeli schools. It appears from the research that the literature has raced too far ahead and the reality in the field has a much more "minor" and subdued tone. Schools in Israel are not run as independent economic units although there is agreement among the principals and people from the external authorities that the deployment of finance has improved. This improvement, however, has not

led the authorities to transfer all the money to schools in Israel so that, against all the expectations of the researchers in this group, the increase in the autonomy of the schools because of the use of ITEM is only marginal. There are aspects of management which the principals, external authorities' staff, religious schools and male teachers all agree have grown in independence. In contrast to them the teachers, mainly the females (who are the majority of staff members), tend to think that the school's autonomy has not grown. This is despite the fact that they agree that the potential for this exists in ITEM but, apparently, when it comes to what is being done in fact in the field – they don't feel it!

As noted from the second side of the coin, namely the increase in supervision and involvement of outside factors in the management of schools through the use of IT, takes researchers in a different direction from the second group. In the literature this group notes the increase in the involvement of the Ministry of Education and the local councils in the work being done in the schools since the internal information was revealed and, as a result of this, the ability to see what was going on improved greatly (Wholsetter and Smyer, 1995). The external authorities are not ready to change their long tradition of financial/managerial control over the allotment of resources to schools both because they do not want to lose the power this represents and because they do not trust the schools to run things properly (Madden et al,1992; Mohrman et al, 1995). According to the analysis of the questionnaire as well one can see that the external authorities, the comprehensive schools, the principals and the medium size schools think that the supervision has grown following the use of ITEM – especially the surveillance of the exploitation of weekly teaching hours.

In the literature there is an attempt to explain why external authorities are not prepared to give up their power mainly over the allotment of resources to schools. According to the researchers from the second group the financial supervision and the allotment of resources allows the politicians to cynically manipulate the funds in order to advance their personal interests in the sectors that vote for them in elections; and also because the tightening of belts in regard to school expenses is something the local councils are interested in so they can allot resources to other things important to the mayor (Lamby et al, 2000; West et al, 2000). According to other researchers the Ministry of Education is interested in making sure that the resources are distributed properly and knowing how they are exploited for the whole area. This surveillance makes it possible for them to move the resources to other things which the Ministry wishes to advance (Dixon.1994; Wholsetter & Smyer, 1995).

According to the results of this research, both from questionnaires and interviews, it is possible to claim that the Educational Leaders and the teaching staff, in contrast to the position of the principals and people from the external authorities, do not tend to agree that the supervision has increased as a result of the use of ITEM. One must state this with reservations since between 23-27 teachers did not answer all the questions in the section that went into detail about the school's current expenses claiming that they neither knew enough about the financial management of the school nor took part in the economic decisions concerning it. Thus we see that the level of supervision of outside factors over the management of the school is not felt on the level of the teachers and the middle managers. Together with this one can see from the interviews that the staff understands that the era of transparent information brought about by ITEM is an

inseparable part of our modern lives and so, if the supervision the external authorities increases, they do not see this as something that conflicts with their desire to advance the autonomy of the school - since the two sides of this coin are dependent upon each other.

10. The level of involvement of teachers in class management using ITEM.

The level of involvement of teachers in class management, which is the fourth research issue dealt with in this work, also deals with two sides of the same coin. The first side focuses on the subject of the level of involvement of teachers in the pedagogical management of their classes as a result of ITEM's constantly supplying them with data about each pupil's achievements and whether this has increased their involvement. The second side of the coin deals with the issue of the level of penetration of the external authorities in the management of the class (which will be dealt with in the next section). According to a table that describes the findings about the indices in the questionnaire (see Table 4.4 in the section on Findings) one can see that the most significant piece of data from among all the indices is that all the participants in the questionnaire (N= 252) "agree" to "strongly agree" that the pedagogical management and the involvement of the teachers has been influenced by the use of ITEM (mean of 3.11). The characterizing category that influences the distribution of the respondents – the size of school was found using the ANOVA analysis method. The small schools (compared to the large and medium –sized) tend less to agree that ITEM increased the involvement of teachers in class management. Using Stepwise in the model building method the category of role also entered together with the category of school size. The educational leaders, who are in fact school middle managers have a clear tendency to agree more that the

involvement of teachers in the management of the class has grown (see Table 4.13 and 4.21 in the section on Findings). These characterizing factors are less dramatic in their influence since there is broad and clear agreement among the school staffs (mean of 3.08) that this is less obvious in this case anyway (see Table 4.4 in the section on Findings).

The different characterization categories do not influence the distribution of the responses of the people from the external authorities and there was no influence found in either the ANOVA method or the model building method using Stepwise. Thus one must judge their responses as they are. When one analyses the table that compares all the participants, however, (see Table 4.36 in the section on Findings) the finding that stands out is that all the participants agree that ITEM has led to great involvement in the pedagogical management of the class since all the means are above 3 (where 3 reflects the "agree" position in the questionnaire). Within external authorities, however, there is a position which is even more significant than a mean of 3.3 – that is between "agree" and "strongly agree". In this issue as well the teachers as a separate group have the relatively low mean of 3.01. In other words, when compared to the principals and educational leaders and, especially when compared to the supervisors, the teachers again seem to have more reservations – although, in this case, it is clear that everybody agrees about the significant influence of ITEM on the management of the class.

When one analyses each question in the questionnaire (according to The Freq. Procedure) one receives more detailed findings (see Appendix B):

1. 81% of all the respondents in schools (principals, educational leaders and teachers,

altogether N=212) "agree" or "strongly agree" that ITEM makes better surveillance of the advancement of the pupil's schoolwork possible.

2. 84% "agree" or "strongly agree" that ITEM (in the case of school the intention is MANBAS) makes it possible to statistically analyze the variety of examinations quickly.
3. 74% of the participants agree that there has been an improvement in the process of making pedagogical decisions.

This means that there is broader agreement about the potential hidden in this case of MANBAS-as an Israeli programme of ITEM and in what it provides but the percentage drops when the question goes over to application - although 74% of those who "agree" or "strongly agree" is certainly significant.

These results receive more validation when one analyzes the responses of the respondents among the people from the external authorities (N= 40).

1. 82% of the respondents "strongly agree" or "agree" that ITEM makes better surveillance possible over the advancement of the pupils in school.
2. 95% of the respondents "agree" or "strongly agree" that ITEM makes the statistical analysis of examinations possible.
3. 87.5% "agree" to strongly agree" that there is an improvement in the pedagogical decision- making process.

Again, despite the high percentages of agreement there is a drop when one compares between sections 2 and 3 – and there is still place for improvement in the application part of the information system in matters concerning the making of pedagogical decisions.

From a study of the open questions in the questionnaire the principals note that ITEM has succeeded in demonstrating the real state of things in school and, thus, ITEM has acted as a catalyst for a constant improvement. According to the people from the external authorities educational and pedagogical work is now more based on measurable criteria because of ITEM (and not as it used to be in the past –based on intuition). Teachers think that the presentation of the data using ITEM is sometimes done in a manipulative manner and does not necessarily always help people to focus on critical issues.

11. The level of involvement of the external authorities in class management using ITEM.

The second part of the fourth research question asked in this work focused upon the level of involvement of the external authorities in class management as a result of the possibility of receiving data and analyses of the pupils' achievements in school on all levels and ages. According to the descriptive statistical table of the index means in the questionnaire (see Table 4.4 in the section on Findings) which dealt with all the respondents, there is a clear tendency to agree that ITEM makes it possible for the external authorities to become involved in class management because the achievements of the pupils are openly available to their scrutiny (mean 2.96). In the data from this question there is no difference between the attitudes of the school staffs and the external authorities and, in fact, this agreement is common to all the different functionaries in both the schools and the external authorities. This also receives reinforcement from the fact that, according to the analysis of the means in Tables 4.15 and 4.16 (in the section on Findings); no characterizing category was found to influence neither the tendencies of the

responses from among the school respondents – neither when ANOVA is used nor when the Stepwise model building method was used. A similar situation is revealed for the external authorities as well so that, from this point of view, there is uniformity in the situation of questionnaire respondents.

When one also analyzes the results according to Table 4.36 (see section on Findings) comparing the means of all the participants the finding that stands out is a broad agreement that ITEM allows the external authorities to become more involved in the learning achievements and their analysis. It is, however, interesting to note that the educational leaders are the most decisive about this being the way things look (mean 3.02) – even more than the principals (mean 2.86). The middle managers in schools (N=50) were even more decisive in this issue than the teachers and the people from the external authorities that the involvement of outside factors had grown in the matter of class management.

When the analysis of the data on this question was done from the table of the Freq. Procedure the following findings were received from among the school respondents:

1. 85% of the respondents "agree" or "strongly agree" that ITEM provides the external authorities with up-to-date information about the results and achievements in schools.
2. 85% of the respondents "agree" or "strongly agree" that ITEM makes it possible for the external authorities to compare results and achievements between schools.
3. 64% "agree" that ITEM exposes the work of the teacher to public scrutiny.
4. 87.8% "agree" or" strongly agree" that ITEM provides the supervisors and the people from the external authorities with statistical analyses that grade the achievements of each and every school.

5. Only 50% agree that the external authorities ignore the internal data that has accumulated in the schools when they analyze the final achievements of the pupils.

It really seems that there is broad agreement between all those who hold positions in schools that ITEM provides a lot of information about the pupils' achievements and that this is a tool that the authorities can effectively analyze to grade the schools. Together with this the percentages drop significantly when the questions examine whether this threatens the teachers or whether there is a separation between the data of the Ministry of Education and that of the schools. A drop in the percentages in both cases indicates that the threat that ITEM, supposedly, represents to the schools when it is exploited by the authorities is neither large nor profound.

In parallel we have the same questions but this time the means are from the people from the external authorities.

1. 92.5% of the respondents "agree" or "strongly agree" that ITEM provides them with up-to-date information about the achievements in schools.
2. 87.5 % of the respondents "agree' or "strongly agree" that ITEM makes it possible for them to make comparisons between the achievements of different schools that are under their supervision.
3. 62.5% "agree" that ITEM exposes the work of the teacher to public scrutiny.
4. 87.5% "agree" or "strongly agree" that ITEM provides them with statistical analyses that makes it possible for them to grade the achievements of the schools.
5. 62% of the respondents from the external authorities "disagree" that they ignore the data that have accumulated in the schools when they analyze the pupils' achievements.

Like school staff people from the external authorities (87%) agree that ITEM provides them with up-to-date information about the achievements of the pupils under their jurisdiction. Like respondents working in schools, among the people from the external authorities, there is a drop in the percentage who agree that teachers are more exposed to scrutiny. What particularly stands out is that external authorities (62%) do not ignore the data from schools and stress that they do not rush to publicize the data they have before checking it against the data that comes from the schools. Thus the external authorities also broadcast the message that ITEM is used less as a tool that threatens the schools and more as a tool that provides up-to-date information.

12. Analysis of the interviews

From an analysis of the responses received from the second research tool – the semi-structured interviews – we can see that we have to relate to both sides of the fourth research question (which deals, on the one hand, with the level of increase of the involvement of teachers in class management and, on the other, with the examination of the involvement of the external authorities in class management). On this issue interviewees do not see anything in the two tendencies (which seem contradictory) threatening the work of teachers in schools. The transparency of the products of the teacher's work in his/her classroom and the level of the success of his/her pupils in the Matriculation examinations is exposed to the scrutiny of everyone and the external authorities, like the school administration, can, through the use of ITEM, analyze the results in great detail. The fact that they can, for example, compare the answers from different schools to some question not only does not bother the teachers – it is seen as another means of helping them improve their work.

Teachers interviewed do not see themselves as being threatened by the process of exposing their work since the central question that needs to be asked is what is being done with the enormous amount of information that accumulates. On both sides of the question there is a significant drop in the percentages of those who agree, that is very high percentages are given to ITEM's ability to store and analyze the data and achievements of schools and to expose this information to the external authorities and the teachers. The percentages drop significantly, however, (down to 20%-25%) in regard to the response to both the question of application - and whether the pedagogical decisions will improve, and the question of the increase in external exposure and control.

All the interviewees, both from the school staffs and the external authorities, do not feel that the teachers are threatened by the transparency of the results and achievements of schools. This attests to the fact that, on the one hand, the potential is great (and the high percentages of more than 85% also attest to this). On the other hand, when dealing with the question of whether this level of threat will reduce the level of the teachers' independence, the percentages drop.

From the interviews one can see that there is clear disagreement between the principals and the teachers about how one should approach ITEM. The principals think that the existing policy of compartmentalizing access to ITEM so that teachers and coordinators can only get the data they have entered is right. According to this approach they have no overall picture (justified on the grounds of preserving "the right to privacy") and the teachers see the decision to do this as the "Achilles heel" and weakness of the system since, they argue, this lack of equal access damages their ability to make quality decisions. According to the teachers only the core administration has access to all

the accumulated information and that this is not right because it neutralizes their role as full partners in the process of making pedagogical decisions.

There are also differences in the arguments and explanations among the interviewees about why there is no feeling of "threat" among the teachers that the supervision of the external authorities is growing. Everybody agrees about the fact that ITEM has led to a growth in the transparency of the products and achievements of schools in comparison to the period prior to the use of IT. The principals' explanation for the lack of feeling of threat is that the Ministry of Education is careful about the way it publicizes the data. The ministry does not publish the material on the internet and does not mention the names of schools but satisfies itself with publishing general data. According to the principals the Ministry of Education works this way because they understand that it is difficult to compare different schools from a socio-economic point of view. On the other hand comparing only "similar" schools is a sensitive and complex political problem.

Despite this, those interviewed from the external authorities think that the desire to increase their involvement in class management does exist and that it is only a matter of time and process before the involvement increases. The teachers who were interviewed, however, have a different opinion and have the feeling that the Ministry of Education is interested in increasing the number of pupils who receive the Matriculation certificate – even if the cost is lower standards and that pupils, as a result of this, do not get an equal opportunity to go on to higher education (universities, colleges, the Technion etc.). The main effort being made today (through using an analysis of the data on the achievements of schools) is the reinforcement of under-achieving pupils in order to increase the number of pupils who get the Matriculation certificate. In this way the teachers do not

feel threatened because they, for example, are not being asked why good pupils are not achieving higher grades.

From the interviews one can see that the teachers do not exploit IT enough either for teaching or learning. The system of teaching and learning mostly uses traditional methods and only a small part of teachers use the new learning environments that IT offers. Thus there is little attempt to upgrade the learning process by which information is turned into knowledge and to exploit the enormous amount of information available today as an impetus for a new kind of teaching that is more suitable to the youth of today. After all, pupils spend a lot of their days and nights in an internet environment and in communication systems such as ICQ, Messenger and so on.

13. The connection between the research results and the literature.

Results of the research clearly show very broad agreement that ITEM makes it possible to follow the learning progress of pupils because of its ability to carry out rapid and wide-ranging statistical analysis and, in this way, improves the making of pedagogical decisions about individual pupils. Most of the responses to the questionnaire range between "agree' and "strongly agree" for all the 252 participants but what especially stand out are the responses of the people from the external authorities and the educational leaders who are closer to "strongly agree". Thus, if in the previous three research questions we discussed the tendency to more or less agree, in this particular issue the discussion is around "agree" to "strongly agree". The results of the research, thus, support the position of the first group of researchers who argued in the literature that ITEM has the potential to change the work of teachers in their management

of classes and to bring about greater involvement in everything to do with pedagogical decision- making.

Results of the research support the researchers belonging to the first group in the literature who claimed that it is impossible to separate ITEM from pedagogical management (Wholeben, 1995; Fung & Hau, 1997; Fung & Pun, 1997; Telem et al, 1997). This research clearly supports the opinion of the group in the literature who claim that ITEM makes it possible for teachers to manage their classes while they are intellectually engaged as a result of the statistical analysis provided to them on the achievements of their pupils. The system sets out the achievements across all the subjects so that it provides a wide perspective for each pupil and adjusts the expectations to the achievements and any improvement made. The teachers are interested in being more active in the management of the class because they see that this is useful for advancing the pupils (see Wholeben, 1995; Rubinstein, 1995; Maddux et. al., 2001; Haughey, 2003).

According to the literature teachers have to be involved not only in the collection of the information but also in its analysis. Thus their access to information in the computer should not be limited as it is important that the teachers independently understand the reasons for the success or failure of their students and make the appropriate pedagogical decisions. In this way the internal forces in the school mobilize to accept pedagogical responsibility and this is more important, and has greater chances of success, than leaving things to the forces outside the school to come and shake things up and analyze the pedagogical achievements (see Netz, 1995; Yahalom, 1995; Hassal et. al., 1996; Hogenbirk, 1997; Crawford, 1997).

According to the interviews in this section there is criticism among the teachers about the school administration preventing them from gaining free access to information because of "the right to privacy". The teachers' expectations that something will be done about this have not been realized and the teachers, in fact, rely upon the analyses made by the principals who are the only ones who have free access to MANBAS which is the main tool for analyzing the results of learning in Israeli schools.

As noted above, the second side of the coin of the fourth research question about the use of ITEM is whether the external authorities have increased their involvement in the pedagogical management of the class. Surprisingly, in this case as well, ITEM does not cause any dichotomy between the involvement of teachers and the intervention of the external authorities. In this case too there is no evidence, in either the schools or the external authorities, that what we have here is a balanced situation – either the involvement of teachers is increased or the intrusion of the external authorities is greater than before since it is impossible for the two phenomena to coexist together. The research shows, however, that all the participants did not see this as two contradictory matters but as two subjects that go together in a parallel fashion. If there is an increase in the involvement of teachers there is also an increase in the involvement of the external authorities in the management of the class because the transparency caused by ITEM leads to this.

The findings from the questionnaire and the interviews clearly show the above results so that in the questionnaire all the respondents, both from the schools and from the external authorities, responded identically. There is also no characterizing category that influences the respondents so that the finding is unambiguous that ITEM helps the

external authorities to receive information about the results and achievements of the schools and makes it possible for them to intervene even on the level of class management. There is support in this for the researchers from the second group who claim in the literature that ITEM is a tool that makes it possible for them to tighten the supervision over the results of the pedagogical work of the teachers (Telem and Avidov, 1995-6). ITEM makes it possible for the external authorities, the Ministry of Education, the supervisors and the directors of the education departments of the local authorities to analyze the pupils' achievements, to praise schools for good results and criticize schools that do not satisfy the demands made by the Ministry of Education and Culture (Netz, 1995; Gev, 1995; Barta et al, 1995; Tatnall & Pitman, 2003.).

In the literature there is an emphasis among researchers drawn from the second group that ITEM not only leads to closer scrutiny and more wide-ranging analyses of the pupils' achievements but also to essential changes in the nature of the teachers' work – mainly in the question of the influence of the information era and on what role the teachers need to focus their main efforts for class management. The researchers think that the main change is that the teachers will stop being the exclusive sources of knowledge and information and become guides who teach the pupils how to approach the sources through the use of IT and how to covert information into knowledge. In other words in the information era teachers and pupils are expected not to focus on the transfer of information but on its analysis (Rorty, 1991; Duchateau,1995; Visscher & Wild, 1997; Underwood, 1997; Selinger, 1999; Maddux et al, 2001.). According to the literature all of this is supposed to open up the "doors of the classroom" and allow outside factors to enter and influence the management of the class. The teachers have no exclusivity over teaching and class management and are supposed to accept the new

cultural climate brought into the world by information systems (Fung & Pun, 1997; Makela, 1997; Mioduser et al, 2000). Teachers need to understand the cultural change that has taken place since the pupils find themselves most of the time in a computerized information system environment and so the teachers have to join them – otherwise they will not be able to understand them. Apart from the generation gap there has also developed a cultural gap that needs to be bridged (Kwok and Ma, 1997; Williams & Zald, 1997; Salomon, 2000; Haughey, 2003).

The management of the class in the era of almost instant information (superhighway information) does not stop only with computerized pupil evaluation but breaks through existing frameworks and demands re-thinking of class management in the wider sense including structural and pedagogical changes (Salomon, 2000). Indeed, not all the changes noted above in the literature have permeated the classrooms in schools in Israel. In the interviews there were teachers who stated that they were not impressed by the educational-pedagogical ability of the existing information systems and see, on the contrary, a regression in the pupils' ability to express themselves verbally because of their "undernourished and poor vocabularies" following the use of ICQ or Messenger. From this point of view there has been a change in the literature although it has not been a great change (see Armstrong & Casement, 2000).

There is also no significant support from the questionnaire and interviews for what is described in the literature as the opening of the "doors of the classroom" and the entry of the outside factors into what is going on in the management of the class. Quite the contrary, the ability of ITEM to increase and improve the surveillance over pupils' achievements, the analyses of the results on both the school level and the national and

local levels receive high percentages of agreement (more than 85%). When the teachers are asked in the questionnaire about the whether ITEM intimidates them or about downright intervention into the class management file the percentages drop to 60% of agreement. The reason for this is that ITEM does not represent a threat to the teachers because, according to the data, only 50% agree that the Ministry of Education ignores the internal data of the schools when they analyze the achievements. In other words there is no majority that claims that there is a threat since the Ministry of Education has left an opening for every school to explain the results on the basis of data and internal data that the Ministry has no knowledge of. One also has to remember that, in the literature, the point is made that the publication of things on the internet creates a lot of tension and disagreement about the data published without pre-consultation with the schools (Warwick, 1997). In Israel, however, the Ministry of Education does not publicize this on the internet and things stay inside the various bureaus which do not individually pass them on to the public for its edification. Thus the transparency of data via the use of ITEM does not create a threat to the schools. Walking hand in hand, so to speak, with, on the one hand, an increase in the involvement of teachers in the analysis of the results and, on the other hand, a growth in the amount of supervision by outside factors in the analysis of the pupils' achievements can be explained as a common attempt by all the factors to improve the management of classes and help the pupils reach higher achievements.

<u>The wider use of ITEM</u>:

Based of the findings which were collected from both the open questions and the

interviews one can see that the current mainly use of ITEM in Israeli schools is for office work such as registering of personal information about both teachers and pupils, school's results etc (see pages 212-214, 249). There is, however, no use made of ITEM for dealing with the problems of teaching –learning disabilities, nor do the teachers have free access to ITEM to enable them to track the pupils' achievements in real time. The fact that only five principals (out of eleven) directly run MANBAS while the other principals leave this to the school secretary attest to the fact that most of the principals still see ITEM as a tool that assist mainly in matters of administration and collection of grades for the purposes of preparing school reports and certificates. They are not sufficiently aware of the strategic possibilities ITEM can offer as indicated in the literature chapter (see pages 64-113).

CHAPTER SIX: CONCLUSION.

The effects of ITEM on Israeli secondary schools.

To sum up this research one can say that, of the seven characterizing categories examined for their influence upon the attitudes of the respondents to the questionnaire in regard to ITEM (1.Position/role, 2.Gender, 3.Experience, 4.Age, 5.Use of technology, 6.Size of school, and 7.Type of school.), it was found that the most influential were the divisions according to "role" and "gender". There was a certain level of influence for "type of school" but the other characterizing categories had only a minor influence as we shall see in the next section.

A summary of the seven characterizing categories.

The principals and their deputies tended to agree more clearly than the teachers in most of the issues that ITEM influences the school's administration in a way that is different from what existed before its introduction as a management tool. This was especially so in the following areas: ongoing management, supervision over what is being done in the school, the creation of an electronic dialogue, financial management, the increase in the independence of the school and in pedagogical management –which focuses upon the ongoing surveillance of the pupils' achievements and the analysis of the results of different examinations.

Educational leaders who, in practice, are the backbone of middle management were closer to the positions of the teachers in their responses to most of the questions than they were to the principals, except for several issues where they were even more decisive than

the principals; for example: they were more convinced that ITEM increased the supervision of the principals over the work of the teachers in school. In contrast the teachers took a more reserved view than the principals, the external authorities and the educational leaders. This particularly stood out in questions that dealt with the level of independence of the schools, the increase in the administration's supervision and the establishment of a new dialogue. In all of these subjects the teachers tended less to agree that ITEM has brought about a significant change. Only in regard to the questions of ITEM's contribution to an improvement in the pedagogical management of the schools, surveillance over studies and the analysis of the results in these areas was broad agreement expressed by the teachers and, here, their attitudes were closer to the other position holders.

It is worth noting that the external authorities were even more decisive than the principals about all the issues discussed in the research and tended to agree that ITEM has brought about a real change in the internal working of schools. They also asserted that it has improved their ability to supervise and oversee what is being done in the schools better – especially when it comes to products. In the light of the position taken by the external authorities, principals can see them as supportive of the trend to both deepen the use of ITEM as a tool the principals can use to supervise the work of the teachers and as tool that leads to greater coordination between all the departments in the schools (Telem et al, 1997).

The second characterizing category that is significantly influential is the division according to gender. The research shows that women show more reservations than men in regard to everything said about the contribution of ITEM to a change in the work in

schools. Perhaps this division in general reflects that men show more interest in computers and information systems and so tend more to give more credit to this technology. This finding will be dealt with more extensively further on in the section that deals with suggestions arising out of the research.

Another characterizing category influencing some of the issues was the division according to type of school, for instance, questions about the level of supervision by principals over the work of the teachers in school and the creation of a new electronic dialogue. The vocational schools tended to agree more than the other schools about these cases. In vocational schools there is a clearer educational orientation than in the other schools that emphasizes the importance of modern technology for the shaping of our lives in the 21st century in a "more natural" way.

The other characterizing categories had a more limited effect and, only in sporadic cases, was it possible to identify even a small amount of influence, for example:

1. In questions involving the new electronic dialogue, those teachers who had fewer years of experience tended to agree more than those who had more experience that, because of ITEM, a new dialogue has been established.
2. The more experience the teachers have the more they tended to agree that ITEM leads to the school's independence.
3. The people from the external authorities who use computer technologies (for example the Internet) tended more than those who use them less to agree that their involvement in school management has grown.

An overview of the findings – research questions

The first research question:

The first research question examined in this work was: "Does ITEM increase or decrease the control of leaders over schools?" The answer to this question depends upon who you ask. Males more than females tend to agree that ITEM has increased the supervision over the work done in schools. Teachers teaching in vocational high schools where a clear emphasis is placed on technological studies (something that causes them to appreciate the potential of ITEM more) accept this notion. The educational leaders (coordinators and heads of departments), also tend to agree, even more than the principals, that the supervision over their work has increased in schools as the result of the use of ITEM. One must also add the people from the external authorities to this circle of those who think that the supervision has increased (this idea can also be found in the literature; see Tatnall & Pitman, 2003).

The teachers and the principals express reservations about whether, on the face of things, ITEM has increased the supervision but, in regard to the question about the coordination of the work in school, there is wide agreement among all participants in the research (N=252) that ITEM has succeeded in overcoming the loosely coupled system operating in the schools (Telem et al, 1995) and has succeeded in making the work of all the departments, subjects and streams more coordinated and standardized (Zeffane, 1992). Together with this the participants in the research do not see this coordinated work as a level of increased supervision that threatens the amount of freedom and independence the staff has. The staff does not feel that the number of instructions they get from "top down" has increased, nor do they feel that the relations have become more problematic or

even more technical (see this idea also in the literature: Telem and Avidov, 1995-96; Makela et al, 1997; Ravid, 2001).

The absence of the feeling of "being threatened" and the absence of the feeling that ITEM is an " insensitive technical system" can be explained by the fact that the interpretation of the participants in the research (as it is expressed in the interviews) is that ITEM is actually an introduction to transparency. None of the participants see this transparency as a threat to the independent space of the teachers since such exposure helps to identify problems and thus helps to both establish a focus on the weaknesses of each school (see also the literature Yndestad, 1997).

This transparency was supposed to bring an end to what was acceptable up to that point – that whoever had a higher position needed to know more. Instead of this the new structure that needed to be created was not a structure based upon who knows more but on what one does with the large amount of information that has accumulated in the ITEM system (see also Coleman, 1997). This vision has not yet been realized in Israeli schools and the reason for this is that the compartmentalization of the information has been preserved as in the old system – manually. The main information is in the hands of the school's leadership and in the hands of certain people in the external authorities. This means that the extra step that the schools, according to the literature (Fung & Pun, 1997; Visscher & Wild, 1997; Gilley, 2000; Haughey, 2003), were supposed to take was to allow the broadest possible access to the whole teaching staff and the educational leaders (and not confine this only to the school administration) – but this step was not taken.

The fact that teachers have free access only to the input but not to the output of information prevents ITEM's transparency from achieving the goal of fully integrating the teachers as well into the work of the school. Perhaps this is the reason for the reservations expressed by the teachers about ITEM i.e. because they are not full partners with full access to this tool. This may also be the source of the criticism that the operation of ITEM today is as a replacement for the typewriter of bygone days and that schools in Israel have not yet managed to learn how to use this tool as a system that constructs knowledge for the whole teaching staff (see also Wild, 1995).

The research results support the approach shown in the literature that ITEM is exploited to strengthen both internal relationships in schools and those with external factors (Telem et al, 1995; Ravid, 2001) – and this is all done to overcome the fact that schools are loosely coupled systems. This means that, in Israel, ITEM is clearly directed towards creating more coordination and standardization of work where everybody can share the input of data but not the output which remains in the hands of the administration who continue according to the old tradition of seeing information as power which should not be made available to all the staff. At the moment the supervision worries the teachers less since the external authorities have not yet taken full advantage of the potential that ITEM has for control and supervision and what has been done so far has not represented any threat. Together with this there are signs that, in the future, the supervision will increasingly grow when the external authorities and school administrations discover the full potential of this tool –as has been noted in the literature (Sagi et al, 1995; Ravid, 2001). The non-exploitation of the full potential of ITEM in Israel is, in fact, a world-wide phenomenon and this work has found that the supervision will only continue to

grow and that we are only in the first stages of this. This idea is also supported by the literature (Wild, 1997; O'Mahony, 1997).

The new structure that the professional literature expects stresses the importance of the decentralization of information among all the school staffs. The aspiration, here, is to remove the present structure that allows whoever is higher up in the hierarchy to know more and replace it with a structure in which everybody knows the same thing regardless of position. In the new structure the focus needs to be on what is to be done with the data. How does one convert information into knowledge? How does one change teachers into full partners in the operation of ITEM? In the meantime none of this yet exists in Israeli schools – and the idea is still waiting to be realized (Warwick, 1997; Makela, 1997; Salomon, 2000).

The vision of the researchers who think that ITEM will make work in school more flexible and that more authority will be passed on to the teachers is also a long way from taking place in Israeli schools. According to this vision, middle managers will not be needed as intermediaries (between the principals and the teachers) because of the unmediated contact that ITEM allows between the administration and the teachers (Jackson & humble, 1994; Visscher & Wild, 1997; Haughey, 2003). In reality, however, the old hierarchy and the old division remain in the schools in Israel and those who are ranked higher get more information and know more, so the expectations that ITEM will bring about structural changes in schools has not yet been realized according to this research. ITEM has not made the work more flexible in Israeli schools and has not turned the teachers into full partners who share the accumulated information in the

system (Gilley, 2000). Thus, from the point of view of the researchers who expected this process to be an indivisible part of the use of ITEM, this has not taken place in Israeli schools as yet and what is found in the literature has remained purely theoretical (Fullan, 1992; Dallin, 1993; Fung & Hau, 1997; Lamby, 2001).

The second research question

The second question for research in this topic is: Does ICT create a new way of dialogue in schools or does it either weaken or strengthen existing personal ties in schools?

To sum up the findings on this question form the results of the research done on Israeli schools one can say that there are signs that the principals, the males, vocational schools, young teachers and the external authorities tend to more agree that ICT produces a new dialogue than the educational leaders, the veteran teachers and the female teachers.

Despite there being wide agreement among those who took part in the research that ICT is an available communications system making it possible to solve problems in schools, when this is examined in practice we find that the ICT's potential is only very partially applied. Educational leaders, female teachers and veteran teachers do not see significant changes taking place in the dialogue and so, for them, a new dialogue has not been produced and there has been no strengthening of interpersonal relations. This group also does not agree that, at the moment, there is a dialogue being carried out on the computer screens and so, for them, all the expectations written about in the literature are still almost non-existent. According to this group there is no alternative to unmediated interpersonal relations – especially in educational frameworks (see also Kenway, 1996;

Nolan, 1996).

In contrast to them the group consisting of the principals, the male teachers, the vocational schools (where people know how to appreciate technological development more than in other types of schools), the junior teachers (who feel closer to this technology) and the external authorities think that ICT is in a constant process of improving the communication between people both in and outside the schools. The advantages they ascribe to ICT are:

1. Asynchronic communication, that is communication that can take place in different places at different times (Holmes & Russel, 1999).
2. Communication that breaks down barriers between teachers and the administration, between schools and outside factors and between teachers and pupils (Maddux et al, 2001).
3. Communication that makes it possible to carry on simultaneous dialogues between principals, teachers, pupils and parents (O'Mahony, 1997; O'Brien, 1997).

We can conclude from this that the answer to the research question is:

1. That there is no wide agreement that ICT produces a new dialogue and strengthens interpersonal relations. Thus the hopes of the researchers, as expressed in the literature review, that ICT would bring about better partnership between teachers and the school administration in everything to do with consultation in real time - has not yet been realized in Israeli schools (see this idea also in O'Mahony, 1997; Lamby, 2000).
2. At the moment a new electronic dialogue in Israeli schools has not been produced and there is not yet any open on-line system for all the teachers that makes a new kind of

interaction possible that is supposed to take place on the computer screens (see this idea also in Selwood, 1995; Kenway, 1996; Nolan, 1996; Wild, 1997; O'Brien, 1997; Visscher, 1998).

3. Despite this there is very wide agreement about the potential of ICT to provide up-to-date information regularly and in real time as noted in the literature (Gatian, 1994; Nolan, 1996; Okamoto et al, 1997).

4. The results of the research pursued in this work show that there are two groups in Israeli schools: A. the female teachers, the veteran teachers and the middle managers. B. The principals, people from the external authorities, the males and the vocational schools.

Group A has apparently not gone through the process of assimilating ICT in the same way as group B. Thus group B's support for what is written in the literature review, i.e. that ICT produces a new basis for communication in schools, is stronger (see Dalin, 1993; Gev, 1995; Maddux, et al, 2001).

5. The notion expressed in the literature that ICT helps in simultaneously consulting and making decisions on-line is strongly supported by the principals and the people from the external authorities who took part in the research (see also Hsu, 1995; O'Brien, 1997; Lamby, 2001). Indeed the teachers do not share this notion and so the trend that appears in the first research question is maintained which means that the teachers think they are compartmentalized and have no free access to the system. Because of this there is a missed opportunity to realize the hopes for a new breakthrough in dialogue that the researchers had pinned upon ICT (see Barta, 1997; Makela, 1997; Visscher & Wild, 1997; Maddux, 2001).

The third research question.

The third research question of this work is: Does ITEM increase or decrease a school's independence from the external authorities and thus its autonomy in the decision making process? To sum up the discussion on this question, the participants in the research tend to agree that ITEM is a tool that can increase the independence of schools. It is worth noting in particular that the principals, the males, the religious schools, the Yeshiva high schools and the external authorities agree that ITEM is a tool that increases a school's independence – but, in this question as well, the phenomenon that appeared in the two earlier research questions reappears. On the one hand there is wide agreement that there is potential in this tool but, on the other hand, there is less agreement that, in practice, the autonomy of schools in Israel has grown as a result of the use of ITEM.

While the principals and people from the external authorities agree that ITEM assists more in the independent handling of finances, administrative decision making, and scientific-statistical analysis and in the making of more rational decisions (i.e. not acting intuitively) the teachers do not see that any significant change has taken place in the level of the autonomy of schools. This difference shows once again how much the teachers are not active partners in the operation of ITEM and that they do not see what its purpose is.

The external authorities, the principals and the comprehensive schools agree that the supervision over schools has increased as a result of the use of ITEM and this is in contrast to the teachers and the educational leaders who do not accept that the supervision of the external authorities has grown over everything done in school.

The main involvement of outside factors revolves around the exploitation of teaching hours in Israeli schools (see also Mohrman et al, 1995). All in all, the findings here go against the assumptions of the research question that we are dealing here with contradictory premises - that there is either more school autonomy or there is more supervision - is presented since they attest to another approach. The transparency of the school's work leads to both of these phenomena which make it possible for the school's independence to be increased and, simultaneously, for the supervision of outside factors to also increase. The transparency brought about by ITEM is a common interest of both the schools and the external authorities and the criticism expressed is that the Ministry of Education and the external authorities should also adopt the level of transparency that exists in the schools and apply it to their own offices as well.

The teachers and the educational leaders do not feel threatened by the increase in the supervision over what is being done in schools since they do not intervene in their everyday work but only in the examination of the school's products. The principals, on the other hand, have to face the external authorities in regard to practical matters more than the teachers and need to explain why the school's results and achievements are the way they are. The principals are interested in transparency because reports made using ITEM are received by the external authorities as being more serious and reliable and the authorities are more ready to assist because they assume that they have the necessary information in their hands.

To sum up, the results of this research show that the following expectations expressed in the literature have not been fulfilled:

1. That the potential of ITEM helps in making better decisions since this tool makes it possible to choose the best alternatives. In reality there is not a great amount of cooperation in decision making (Ezrahi, 1994; Telem, 1995; Hogenbirk et al, 1997)

2. That ITEM can cut down the time spent on meetings and encourage the staff to make decisions through using "brainstorming" (Mansfield et al, 1983; Wholeben, 1995; Spuck et al, 1997). In the reality of schools in Israel the meetings are not carried according to these expectations!

3. That ITEM, according to the literature, can assist in the independent management of finances (Odden, 1995; Fawcett, 1996; Lamby, 2000). In the reality of schools in Israel the full budget is not transferred to schools and the principal cannot decide how to apportion the financial resources of the school!

4. That, according to the literature, ITEM is supposed to increase the cooperation between the teachers and the administration in regard to everything to do with running the school (Dixon, 1994; Wholstetter & Smyer, 1995; Nunamaker et al. 1997). In practice the teachers are quite disconnected from the management of the school's finances and are not aware of the size of the budget and the level of supervision over it!

<u>The fourth research question</u>:

The fourth research question of this work is: Do analyses of school results by ITEM increase or decrease a teacher's involvement in managing the class and, if so, how?

To summarize the response to this question about what is happening in Israeli schools one can say that a large section of the participants in the research "agree" to ""definitely agree" that ITEM exerts great influence over the surveillance and analysis of the results of the pupils' achievements in Israeli high schools. One can even say that this is one

of the unshakable findings of the present research since the educational leaders, who represent middle management in the schools, and the external authorities are more decisive and even tend to "definitely agree" that the involvement of teachers in class management has increased as a result of the analysis of the results of the pupils' achievements. Moreover, since there is such wide agreement over this issue, the characterizing categories of the respondents did not find expression similar with earlier issues examined.

The change ITEM has brought to Israeli schools via the use of MANBAS (and MANBASON) represents a very significant improvement in the surveillance over pupils' achievements, the statistical analysis of the pupils' progress in different subjects, the statistical analysis of a range of examinations and the school's ability to improve its pedagogical decision -making process. The fact is that the teachers and administrators see this change as a positive process that exposes and identifies where the weaknesses and strengths are and acts as mirror in which everyone can see themselves and their contribution to the success of the pupils in their examinations. All of this is done based on the analysis of statistics and not on intuition. ITEM acts as a catalyst for the constant pedagogical improvement of schools (see Rubinstein, 1995).

To summarize one can say that, in the fourth research question of this work as well, the trend that was evident in the previous research questions continues. This means that the question which examines two sides of the same phenomenon uses the basic premise that there contradictions: either the involvement and autonomy of the teachers has grown as a result of the use of MANBAS as an important information system of ITEM in Israel or the outside factors, mainly the supervisors, have succeeded in increasing their

supervision over the teachers and the achievements of the schools (see also Tatnall & Pitman, 2003). The research findings, however, present a different picture of the situation which means that the situation here is not a case of contradictory situations but a process of two axes that are advancing in a parallel fashion. It is impossible for one of the sides to advance without the other side advancing. In other words, the involvement of the teachers in class management has increased simultaneously with the increase in the supervision over the products of the school.

Not only are the educational leaders convinced that the supervision of outside factors over the school's products has grown but the other position holders tend to agree with this as well. The main reason for this agreement is the transparency of the up-to-date data concerning the achievements of all the schools in Israel that is provided by ITEM. This system makes it possible to compare the achievements of all the schools and rank them according to their achievements in each subject (see also Visscher & Wild, 1997).

Together with this the analysis made using ITEM does not threaten the schools or the teachers because the Ministry of Education does not reveal the data for particular schools but only provides general data. Another reason is that the Ministry of Education does not ignore the data that has accumulated in the school's MANBAS and are open to receiving explanations about the results that have been received. Apparently this is the reason for the trend that is evident and which shows that the more involved teachers are in managing their classes the more the supervision over their work simultaneously grows. In this issue as well the problem arises that the teachers cannot be full and equal partners in the making of pedagogical decisions because they do not have free access to MANBAS (see this idea also in Hogenbrik, 1997). The teachers are

dependent on the principals for a full picture of their pupils' achievements and the educational leaders are also dependent on the principal to get a clear picture of the pupils' achievements in the subject for which they are responsible. In this way the potential ITEM contains (about which everybody clearly agrees) – that is the ability to survey and analyze the pupils' achievements in real time (Maddux et al, 2001) – is not exploited because of the compartmentalization of the teachers who can, in real time, only receive the information that they, themselves, fed into the computer . The educational leaders, likewise, can, in real time, only receive the results of the teachers for whom they are responsible.

The literature shows that ITEM should act as an impetus not only for the analysis of statistics of the results and achievements but also as an impetus to making changes in the teaching methods so that they will be more suitable to the period we live in – i.e. "The Information Era". The central axis of this approach needs to concentrate on the process of turning the large amount of information stored in ITEM into knowledge (Salomon, 2000; Mioduser et al, 2000). This process is an inseparable part of the change ITEM needs to bring to the analysis of the learners' achievements. As long as this process works together the potential that exists in ITEM can be fully expressed. Unfortunately, up till now, schools in Israel have not implemented this process either properly or promptly.

To sum up the connection between the literature and the research results of this work one can clearly show that there is agreement among the participants in the research that it is impossible to separate between administrative management of the school and its pedagogical management (Wholeben, 1995; Fung & Hau, 1997; Fung & Pun, 1997;

Telem et al, 1997). The use of ITEM for pedagogical analysis is even seen to be more important than its use for administrative management in Israeli schools. The need for pedagogical analysis also attracts wide support among the principals, educational leaders, teachers and external authorities so that everybody is united in this effort - something which attests to the fact that the reason it is widely appreciated is that it leads to constant cooperation (see this idea also in Wholeben,1995; Rubinstein, 1995; Maddux et al, 2001; Haughey, 2003).

The mobilization of the internal forces of the school (mainly the teachers) to collect and analyze information is consistent with the trend popular in the literature that says that, although the initiative for change should come from the leadership and outside forces, the real success of any change depends on the level of cooperation between the internal forces of the system. From this point of view the research done in this work shows that there is wide support given by the teachers to ITEM and this channel needs to be exploited in order to both widen and deepen the teachers' cooperation over a greater use of ITEM (see this idea in Netz, 1995; Yahalom, 1995; Hassal et al, 1996; Hogenbrik, 1997; Crawford, 1997).

At the same time one can summarize this by saying that the participants in the research also support the approach mentioned in the literature review whereby ITEM is said to increase the supervision of the external authorities in matters of class management through the analysis of examination results and the school's achievements (Telem & Avidov, 1995-1996; Netz, 1995; Gev, 1995; Barta et al, 1995; Tatnall & Pitman, 2003). While it is true that the Ministry of Education and the authorities have increased their supervision over the products of the school, the results of the research show that in

Israeli schools there is no feeling of threat or that people are under strict surveillance. The research in this work shows that the pressure coming from outside is aimed at increasing the number of people who get their Matriculation certificates and not the quality achieved. The external authorities also do not concern themselves with questions of "how" to improve the educational work but with how to raise the number of pupils who graduate school with Matriculation certificate in any given year in comparison to the numbers of the previous year.

To sum up, this piece of research clearly shows that ITEM is not exploited as a fulcrum to complete the process of increasing the independence of the teachers' in managing their classes. In contrast to what is written in the literature, in Israeli schools teachers are not allowed free access to the information stored in MANBAS. Further and also in contrast to the professional literature, schools in Israel have not yet exploited ITEM enough as a fulcrum to change the learning environment. Possibilities opened up by the information superhighway have been largely ignored. We can thus see that the ideas of the researchers have, as yet, not trickled down to the Israeli schools and they are still not methodically and extensively teaching how to convert information into knowledge. The teacher still acts as the source of information in the class and not as a guide whose role is to help pupils acquire information. (Rorty, 1991; Duchateau, 1995; Visscher & Wild, 1997; Underwood, 1997; Selinger, 1999; Salomon, 2000; Maddux et al, 2001).

According to the summary of this research, the teachers neither feel that the doors of the classroom have "opened wide" and let outside factors easily enter into what is being done there, nor is there the feeling (that appears in the literature) that "Big Brother" is closely watching what they do (Fung & Pun; Makela, 1997; Mioduser et al, 2000). Only small

numbers of teachers approach the pupils' computerized environment - which is not the case with the pupils themselves who spent most of their time in such an environment. Most of the teachers have no part in this and so none of the expectations (Kwok & Ma, 1997; Williams & Zald, 1997; Salomon, 2000; Haughey, 2003) that the class will be managed in an environment that is more computerized and that structural changes will take place in schools is being realized at the moment in Israeli schools. The summary also indicates that teachers in Israel do not see ITEM as an impetus for significant change in the learning environment of their classes but reinforce the trend in the literature of those who fear this change (Armstrong & Casement, 2000). The conventional claim is that information systems lead to a decline in the ability of pupils to express themselves verbally, a drop in the size of their vocabularies, a large number of syntactic errors and even many spelling mistakes – and all this disturbs the teachers.

Summary of the findings:

1. Division according to gender.

Taking an overview of the findings one can summarize that there are clear differences in the positions taken by males and females towards ITEM in regard to questions that deal in the following areas: with the level of increase of the supervision of the school administration over the staff; the creation of an electronic dialogue and the level of the school's independence. In all the above questions the males tended more to agree that changes did take place following the introduction of IT into schools and, in general, tended towards accepting the idea that the school administration's supervision increased and that this technology succeeded in creating both a new dialogue and a large amount of

independence. All of this took place because the quality of the decisions made in the schools improved as a result of being able to access more up-to-date information that allowed them to choose better alternatives. Indeed, in contrast to the males, the females (who are the majority of those who took part in the survey) had more reservations and showed less enthusiasm concerning the opinions expressed.

What does become clear in these three questions is that the teachers are not sufficiently included in those who have access to the output of ITEM. Unfortunately, administrators appear quite satisfied with a situation where teachers are only included in the group that has access to the input. Not fully including the teachers in the whole process damages the ability to fully exploit this tool and, therefore, many of the expectations expressed in the literature, whereby the use of ITEM in educational institutions would lead such changes, are not presently realized. The key to the full exploitation of ITEM in Israeli schools is in the hands of the principals and the level of training they will be able to provide as well as the attention they pay to the teachers (especially the female teachers) so that they can become full partners in the use of both the input and output of IT. In the literature they make the point that if one wants the teachers to make the most of themselves they have to be full partners in the educational work and be given more authority to take pedagogical decisions (Harris, 1990; Hand, 1995; Cunningham et al, 2001). The teachers need considerable freedom so that they can carry out their roles fully and allow their pupils to move from one state of knowledge to a new state of knowledge and understanding (Cooper, 2004). Thus the use of ITEM is an opportunity to realize the idea of creating a full partnership for the teachers – not only in matters involving the input but especially in the output.

Evidence that it is possible to improve this cooperation can be found in the findings from question 4 in the research of the discussion concerning the level of involvement of the teachers in class management. For this question the responses of all the participants, including the teachers, were very positive in the positions expressed about the contribution of ITEM to an increase in the involvement of the teachers in following up the pupils' achievements. In Israeli schools the most popular programme is MANBAS and each teacher also gets the MANBASON (i.e. a "little MANBAS") for his/her personal use for the collection of data. In this way all teachers are actively involved in the analysis of the results and achievements of their classes and this involvement encourages them to be active partners and take responsibility for their pupils' achievements. Thus, on this issue, no differences in approach were found for males and females, something which attests to the fact that there is a lot to do in everything connected with the issues which were mentioned in the other research questions (see also Hassal et al, 1996).

2. Roles/ Positions held:

Another difference that stands out is the difference in approach to ITEM expressed by people who participated in this research and who held positions meaning: the principals, the educational leaders, the teachers and the people from the external authorities. In the findings that came out of the first three research questions two different groups crystallized in regard to the way they related to ITEM. The first group was made up of people from the external authorities, the principals, the males and, to a great extent, the teachers from vocational schools and it formed according to how positive their attitudes were towards ITEM's contribution to change in the way schools work. The members of this group think that the supervision of the administration has grown significantly, that

ICT has created a new kind of communication and that the level of independence of the schools has grown. Opposed to them is the second group, which relates to ITEM in a minor fashion when dealing with the first three research questions. This second group is mainly made up of female teachers, middle managers, comprehensive high schools, general secular schools (and religious schools to a lesser degree) and veteran teachers. Although this group does appreciate the potential of ITEM it does not see that the three questions discussed above have succeeded in being realized in practice in the field and, it appears, this failure has taken place because of the non inclusion of people from this group in any active use of ITEM's output.

Indeed, in the responses to the fourth question examining the subject of the involvement of teachers and people from the external authorities in class management, all the barriers between the different position holders and the different groups, becomes blurred. One common positive attitude towards the contribution of MANBAS as an important information system of IT in Israel mainly in regard to everything connected with the collection and analysis of the results of the pupils' achievements rises to the surface. All the participants express a positive attitude towards the contribution of ITEM regarding the improvement of the pupils' achievements. In spite of the fact that in this matter as well the teachers do not have free access to ITEM's output, they appear to be influenced in their level of partnership because of their strong involvement in the collection of data and its analysis (not in a direct way but in their participation in meetings about grades that the administration initiates). This involvement can certainly be a positive starting point for an improvement in the level of cooperation in regard to school activities using ITEM (see also Yahalom, 1995). In other words, the involvement of the teachers

in class management can act as a model for the other school activities and allow the full exploitation of ITEM to develop in the direction the literature indicates - which shows how important it is to rely upon the wisdom and experience of the teaching staff to collectively arrive at better decisions and a greater improvement in pedagogical achievements (see also Somekh, 1996; Jessup et al, 1995-6; DuFour et al, 1998)

3. Two tendencies that are complementary.

Surprisingly, and against all the basic assumptions present in the very posing of the third and the fourth research question, schools in Israel do not see the increase in supervision and the increase in the school's independence through the use of ITEM as two opposite subjects but as an inevitable overlapping process wherein they both march forward in a parallel fashion. The results of this research are also contrary to the research approach (see page 58 and Child, 1984) stating that we are dealing with contradictory tendencies in ITEM. The third research question basically assumes that if a school's independence grows then the authorities' supervision will be decreased. Indeed the research carried out in this work shows that the schools and the people from the external authorities see in the transparency brought about by ITEM a golden opportunity to increase openness and share information, not in a threatening way (i.e. not "Big Brother's" supervision), but in a cooperative way through looking into a mirror that reflects a true reality. In this way ITEM's transparency causes all those involved in education to understand that, as the independence and autonomy of the school grows as a result of the transparency ITEM provides, this transparency also takes on additional partners in the external authorities

which include the supervisors, Ministry of Education staff and local council staff who deal with education. The reason for this is because everybody is looking into the same "mirror" and relating to the same transparency. As a result their supervision grows simultaneously with the growth of the school's independence.

The fourth research question also shows a similar trend of a growth in independence and involvement which takes place simultaneously with a growth in supervision. This question discusses the issue of whether the teachers' involvement in class management has grown or whether the supervision over the achievements has grown. The trend that appears in Israeli schools is that these two things develop in a parallel fashion, that is the more the use of MANBAS increases the teachers' involvement in the collection and analysis of the pupils' results and achievements the more the supervision of the external authorities over the analysis of the school's achievements and surveillance of their improvement grows – as a result of this transparency. There is no contradiction here since everyone is looking into the same "mirror" which analyses the results of the achievements statistically and presents the data in such a way that all the participants in the research see the two trends as a "price" that has to be paid in the information age; and that price is the relative "loss" of privacy in order to become more efficient through the use of ITEM (see also Yndestad, 1997).

This finding attests to a different experiment from what was tried in the IAP (Individual Action Planning) programme carried out at the University of Leicester. The IAP programme's intention was to empower teaching students through an increase in freedom so that they could follow their own progress - but the programme was, in fact, exploited for closer surveillance that included many reports to those in charge – and so the

"freedom" and "liberalism" were only an illusion (Lawson & Harrison, 1990, p.90). As noted above the research done in this work shows that there has been no attempt to create an illusion and that ITEM's transparency creates the two above trends at one and the same time because everyone can look himself/herself into the same "mirror" .

4. The current contribution of ITEM to Israeli schools.

There was very broad agreement among all the participants in regard to the fourth research question dealing with class management and the analysis of the pupils' achievements using ITEM. This removed all the barriers that existed among the participants - meaning between the males and females, the administrations and the teachers, the veterans and the junior staffs and so on; but, apart from this, in the questions over which there were basic disagreements one can also find points of agreement despite the differences detailed above. The points over which there was agreement among all participants about the contribution of ITEM to Israeli schools up till now are worth mentioning as possible starting points for constructing a more successful model of cooperation between all position holders in the future (For details about this subject see below in the section on suggestions and the contribution of the research).

In the first research question some points of agreement for all the participants were that ITEM was a direct factor that led to more coordinated and standardized work, uniformity of reporting and registration of the input and output and created a single shared format for both making reports and analyzing information. Everybody dealing with education in Israel speaks "virtually" one language and uses and an identical terminology, something which prevents mistakes and contradictory interpretations. In this way it helps

everybody get over the different disagreements in schools and the problem that schools are loosely coupled systems (Telem et al. 1997). Something else all the participants agree about is that ITEM creates a "non-threatening" transparency as though someone is looking into a "mirror" and examining how he/she looks. The transparency teaches us that: a) there is nothing to hide in the educational system and, b) those who deal with education attempt to use the large amount of stored information to analyze these significances and construct new insights and constructive criticism (See also Wohlestetter & Smyer, 1995).

In the second research question the point of agreement of the participants was that ICT constitutes up-to-date and available on-line information which has the potential to solve problems in "real time" (see also Holmes & Russell 1999; Maddux et al, 2001). Another area of agreement was that ICT did not make the relations between people cold and technical and that the internal relations in schools did not get worse. The point of agreement of the third research question for the participants in the research was that the supervision increased but did not represent a threat since the external authorities are interested in results and not processes (see also West et al, 2000). Another area of agreement was about the fact that ITEM's transparency leads to two phenomena that operate in parallel: the more the school's independences grows the more the supervision of the Ministry of Education simultaneously grows.

The most positive points of agreement among the participants in the research can be found in the responses to the fourth research question and these are that the ideas that appeared in the literature have actually been realized and that ITEM (MANBAS) directly brings about:

1. The possibility to manage a class while being intellectually involved as a result of basing oneself on statistical analyses and not on intuition (see also Wholeben, 1995; Maddux et al, 2001).

2. The increasing involvement of teachers in class management simultaneously with the parallel increase in supervision by the external authorities. This combination does not threaten but does advance the pupils towards better achievements (see also Fung & Pun, 1997 in regard to the classrooms that do not lock their doors to outside factors).

3. The collection of large amounts of information that makes it possible for better surveillance to take place over the progress of the pupils and that improves the process of making pedagogical decisions since this analysis is based on measurable criteria (see also Rubinstein, 1995; Kaly & Chen, 1995; Haughey, 2003).

4. An increase in the involvement of outside factors in the analysis of the pupils' achievements in Israel, something that makes it possible to make comparisons and grade the schools that take part in the Matriculation exams (see also Tatnall & Pitman, 2003).

5. Expectations from the literature that were not realized.

There is no general agreement among the participants in the research concerning the following expectations that ITEM, according to the literature, was supposed to have brought about – and which, in fact, have not yet been brought about. The responses to the first research question clearly show that ITEM has, thus far, not succeeded in removing the "hierarchy of knowledge" whereby those who are found higher up on the tree "know more" and the teachers lower down do not have free access to the computer's output – based on the claim that "the individual's privacy" needs to be protected

(see also Visscher, 1995; O'Brien, 1997; Hogenbrik, 1997; Maddux, 2001). Up till now ITEM has not brought about the structural changes that the literature expected would take place. For instance the middle managers have remained and their numbers have not dropped: work has not become more flexible enough to enable teachers to be able to undertake their work anywhere, including their homes; the number of "face-to-face" meetings has not been reduced; and the transfer of more authority to the teachers has not happened (see also Jackson & Humble, 1994; O'Connor & Smallman, 1995; Visscher & Wild, 1997).

The responses to the second research question clearly show that there is no general agreement that a new electronic dialogue can take place on the computer screen (Nolan, 1996; Kenway, 1996) and, at the moment, there is no new electronic dialogue in schools (O'Brien, 1997). The responses to the third research question show that there is no agreement that ITEM encourages the external authorities to grant financial and academic autonomy to the schools. The hope that this tool would help in the orderly management of financial affairs and improve the decision making procedures has, as of this time, not helped schools in Israel advance towards wide autonomy (see also West et al, 2000; Lamby, 2001).

In the responses to the fourth research question there is no general agreement that ITEM has succeeded in advancing the learning environment in this information age. The teachers have still not properly read the changes that have taken place in our world of the information superhighway which means that teachers do not yet understand that they are not the sole sources of information and that their role today should be to function as the people who teach pupils how to turn information into knowledge. Most of the teachers

are still not part of the internet "environment" that most of their pupils are familiar with (Fung & Pun, 1997; Salomon, 2000).

Teachers are still not full partners in the sharing of the output that analyzes the grades given (Gilley, 2000) and this limitation prevents then from taking part in "brainstorming" sessions in meetings devoted to grades. As a result the quality of the pedagogical decisions being made has not improved to the level expected from all of this (Hassal et al, 1996; Somekh, 1996). Similarly the fact that the teachers are not full partners prevents the introduction of the structural changes that the literature hoped for, that is, on the one hand, to reduce the number of middle managers and, on the other, to make it possible for the teachers to have direct contact with the administration. The old structure, where those higher up know more, has not yet been cancelled and replaced by what the literature expected to happen – that everyone would share all the information. The central question here would then be: What does one do with all this information and how does one turn the information into knowledge and new insights? None of these expectations have as yet been realized in Israeli schools (see also Salomon, 2000; Haughey, 2003).

Based on the findings and analysis of the wider use of ITEM (see pages 212,249, 301), one obvious conclusion is that more principals need to be made aware of the strategic potential of ITEM and to use it in their long term planning, the analysis of the general work in schools and raising the level of professionalism so that it can identify urgent problems and find the best solution to them. Therefore, the recommendation of this work is that more principals will be directly involved in the operation of ITEM and not leave this only to the school secretary. Otherwise the impression is that ITEM is

an office tool whose main task is to replace the typewriter. This negates the point made in this work namely that ITEM should be also used as a strategic tool that is suited to the age of the information superhighway. For example ITEM should be used for independent management of finances, for a closer surveillance of the pupils' achievement in real time, for analysis of the link between the pupils' achievements and their socio-economic status etc.

6. Comparison between all respondents according to indices and position holders:

1.Scale of indices according to the order of research questions

External	Schools	Overall	Content
2.73	2.62	2.64	Supervision 1
2.73	2.59	2.61	Electronic
2.98	2.73	2.77	Independent
2.71	2.49	2.53	Supervision 2
3.31	3.08	3.11	Involvement
2.97	2.95	2.96	Intrusion
17.43	16.46	16.62	Total

2. Rising scale of indices (bottom up):

External	Content	Schools	Content
1) 3.31	Involvement	3.08	Involvement
2) 2.98	Independent	2.95	Intrusion
3) 2.97	Intrusion	2.73	Independent
4) 2.73	Electronic	2.62	Supervision 1
5) 2.73	Supervision 1	2.59	Electronic
6) 2.71	Supervision 2	2.49	Supervision 2
17.43	Total	16.46	Total

Figure 6.1 Respondents' answers in rising order

The setting out of six content areas in rising order in Figure 6.1 demonstrates that the external supervision over the management of schools and classes received the lowest values among the external authorities while the increase in the independence of the teachers and the growth in their involvement in class management received the highest values. This represents an important declaration of intentions by the external authorities that expect the schools in Israel to strive for, and achieve, the realization of these expectations – although not at the cost of the external authorities giving up on strict surveillance as was explained in the section about the two parallel trends of supervision and independence.

What is clearly shown is that in Israeli schools it is clear that those values receiving the lowest estimations were supervision of the pedagogical management of classes, and related electronic dialogue and supervision of administration in schools. In contrast to this the highest values were given to the aspiration to raise the level of the school's independence, the supervision of the school's achievements and, especially, the increase in teachers' involvement in the pedagogical management of the class. This is also a declaration of intent by schools in Israel that this is their hope and approach and that they have no fear that, parallel to the increase in their involvement in class management, there will also be an increase in external supervision (as shown above as the "price" for living in the information age). Thus if intentions do exist both in the authorities and in the schools the question that needs to be asked is: What does one have to do for these intentions to take form and not remain just aspirations?

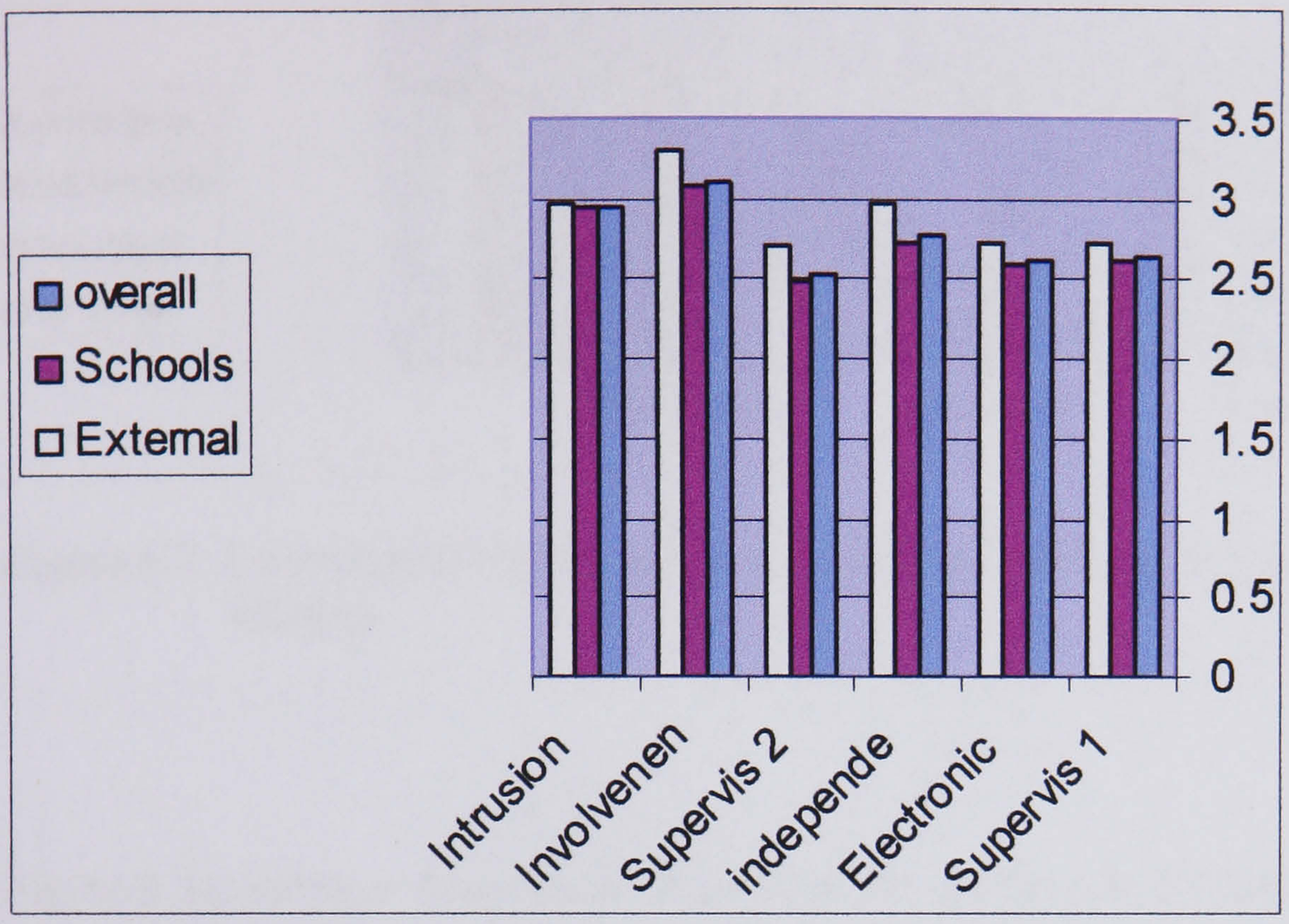

Figure 6.2 Respondents' answers - Comparison between schools and external authorities

Figure 6.2 demonstrates the involvement of teachers in class management using ITEM received the highest evaluations from the external authorities and schools and this is also the key for the success of ITEM in all the other issues discussed in this research work. Just as MANBAS turned into a most important information system in Israeli schools and the MANBASON became the personal tool for linking up with the input of this programme for every teacher - so the other subjects discussed in this research work also need to be treated. This means that there needs to be a higher level of teacher involvement in administration, electronic communication and in the free access to the ITEM's output as well. It should be possible for them to receive the large amount of information that is stored in ITEM and this should not be limited only to principals and their secretaries (who are the only people in the school who have the code and password that will allow access to all the information).

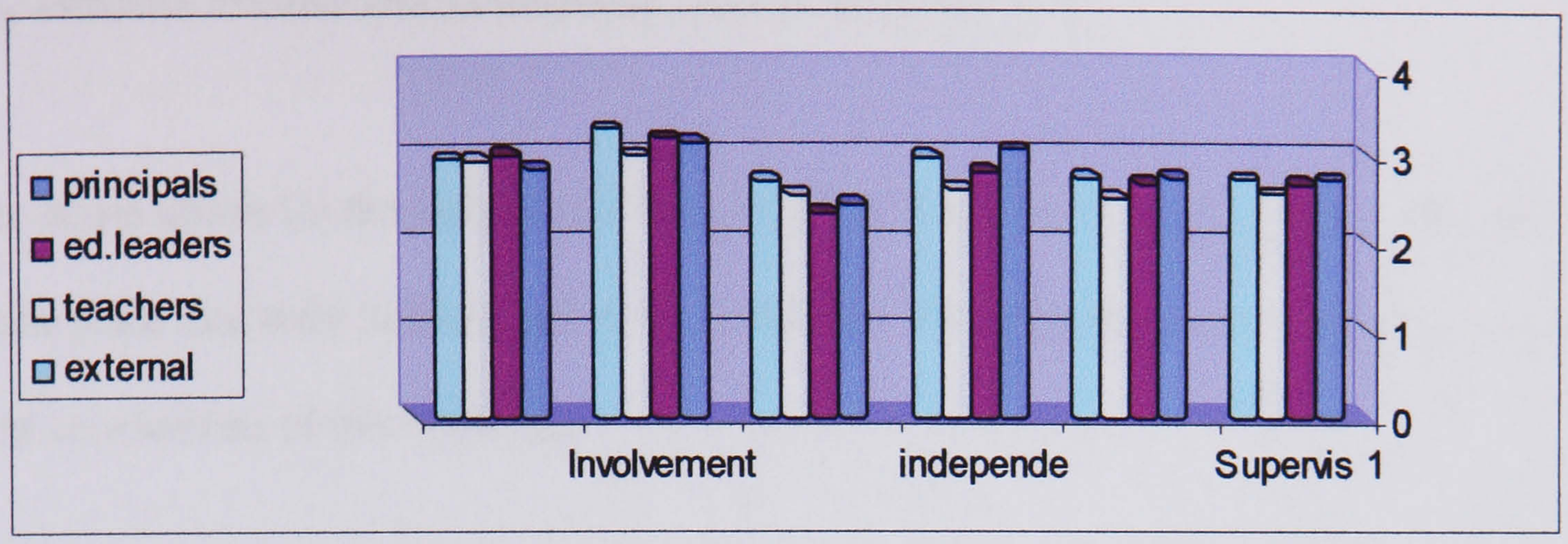

Figure 6.3: Comparison between all respondents according to indices and position -holders

Figure 6.3 presents a comparison between all the participants in the research and their attitudes towards the six content areas that this work deals with. Here the teachers, in comparison to the other position holders who took part in the research, stand out across the board in their reservations about the practical influence of ITEM on the working of schools.

This research claims that it is possible to find support for this idea in the area of the class management of pedagogical matters. Figure 6.3 clearly shows that the highest values (between 3-3.5 i.e. between "agree' and "strongly agree") were received from all the participants in regard to this content area, something which shows the involvement of teachers in school in the input of general pedagogical information. The grades and evaluations of pupils' achievements earned very positive responses from the participants and, so, just as the cooperation between all the participants is great in this area so this model of cooperation should be applied to the other areas in which ITEM is involved in schools.

7. Teachers Women and Technology – the **TWT** model.

As noted above (in the section that dealt with the points that the literature expected to take place that were not realized in the operation of ITEM) the reasons for this, based on the conclusions of this work, are:

A. The non-involvement of the teachers as full partners who have full rights of free access to all of ITEM's information which should include access to both the input and output. Teachers should not be related to with "suspicion" as being people who cannot respect "the right to privacy" and so deserve to be "compartmentalized". The teachers know a lot about their pupils irrespective of the information in ITEM and their integrity does not allow them to share this knowledge with the wrong people. The same thing can be expected to happen if they have free access to the rest of the information and an atmosphere of suspicion is not helpful to the building of the necessary trust for full operation of ITEM.

B. This research has clearly shown that women (who are a considerable majority of Israeli teachers) need the suitable training they demand that will provide them with the confidence to operate this technology. The "hesitance" demonstrated by women (in comparison with the male teachers) as revealed in this research has no place in the information age, in the era in which pupils spend a large amount of their time in electronic and computerized environments. In-service training that suits the demands made by the women teachers need to be given at a pace and involving content that will allow the female teachers to gain confidence in this tool equal to that of the male teachers (see Green et, al., 1993; Gattiker,1994; Brown,1995; Reynolds et al, 2000).

C. Information technologies need to be a central learning subject in all the different types of schools in Israel and not only in the technical-vocational schools. As this research work showed the vocational high schools teach IT as one of the important subjects in their school curriculum. In the other schools in Israel this subject is either taught in small groups or not at all. IT and ICT are modern technological subjects without which it is impossible to enter the 21st century and the school administration and external authorities have a clear interest here to educate a generation of teachers and pupils to work in this area not only as a hobby but for work. Therefore it is necessary to include the subject of learning IT as a compulsory subject in the teacher training curriculum so that a future generation of teachers can be prepared to face the challenges that IT sets before them.

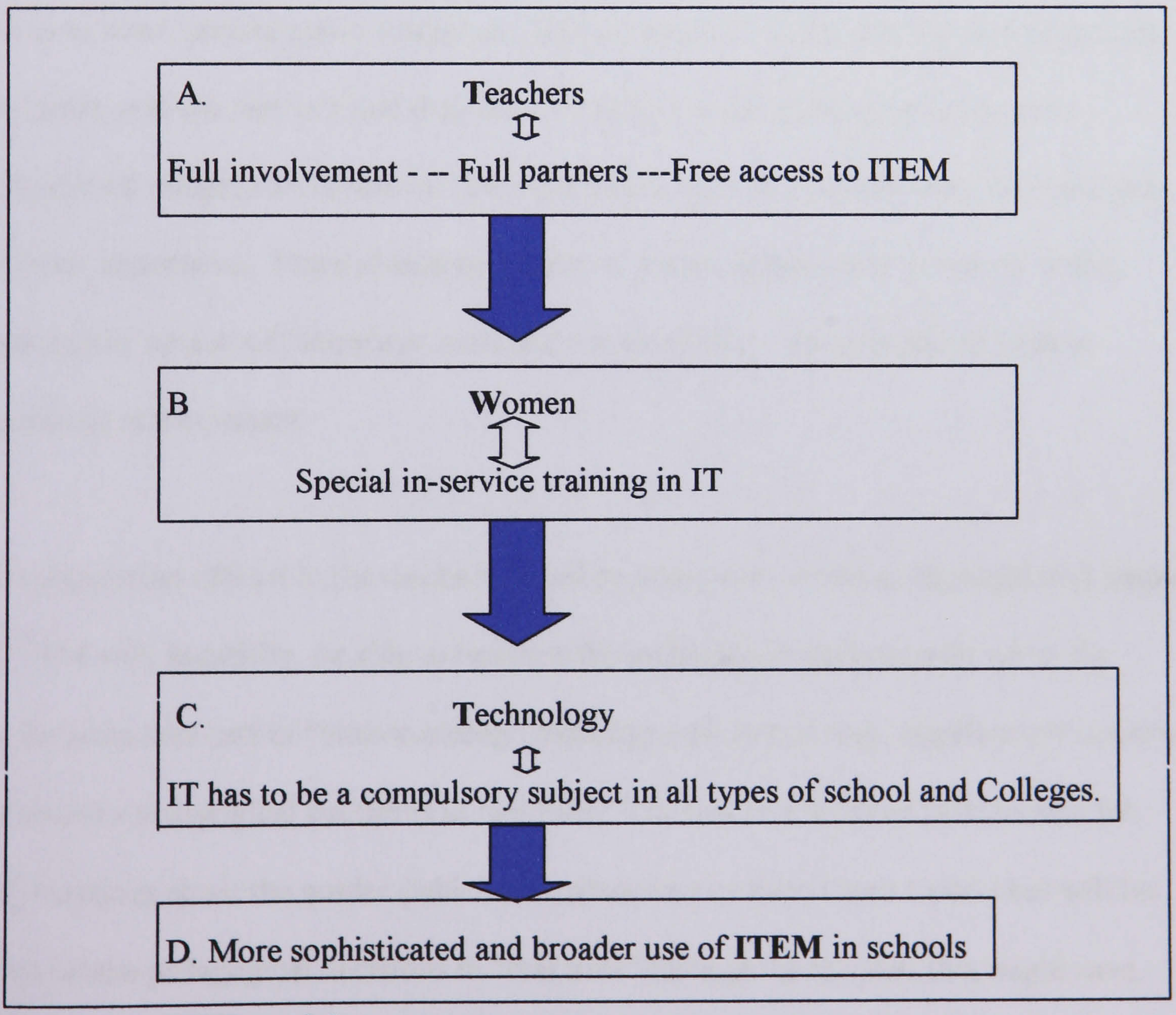

Figure 6.4: **TWT model.**

As Figure 6.4 demonstrates this research proposes using the TWT model which can help extend the use of ITEM into all the other activities that take place in schools both in the area of administration and in the area of pedagogy. The TWT model relates to three stages that, at the moment, are not present in Israeli schools and each stage, or so this work claims, has the capacity to advance schools towards the goal of using IT in a more extensive and sophisticated fashion.

A. Full partnership for teachers:

This stage includes the strategic decision the school has to take, and this research claims that the decision to make the teachers full partners in both the input and output of ITEM has to be clear, precise and courageous. Such a constructive partnership will broadcast the message to the teachers that they are trusted by the administration to use their professional integrity and preserve "the right to privacy" no less well than the principals and their secretaries. There should be no fear of allowing them free access to ITEM because this access will broadcast trust and not suspicion – the opposite of what is happening at the present.

This expression of trust in the teachers as full partners with access to the input and output of ITEM will, hopefully, be able to improve the pedagogical management when the teachers can take part in "brainstorming" meetings and, in this way, significantly improve the school's pedagogical decisions in real time. The teachers will not have to wait for staff meetings about the grades (which take place two or three times a year) but will be able to make pedagogical decisions in "real time" throughout the year that might save, help and encourage pupils to succeed in examinations, that will allow them to remain in

close contact with the parents and inform them about educational actions that need to be taken in "real time" and not only on "Parents Day" (which take place twice a year). It will help in the distribution of term reports (two or three times a year), the teachers and subject coordinators will be able to closely follow the work of pupils and, in particular, this will help those pupils who find themselves in "grey areas" and who, with a little timely help, will be saved from being dropped from a study track or ability group in their schools. This is all despite the fact that there is considerable satisfaction today about everything connected with the pedagogical management of the class - but the last word has not been said and even better and more impressive achievements can still be made. Full partnership with the teachers in the use of the input and output of ITEM will, hopefully, create a new situation where there will no longer be a "hierarchy of knowledge" with those higher up knowing more than those of a lower rank. The information in ITEM will also be freely accessible to the teachers and so a new hierarchy will develop in which those who know best how to turn the information into knowledge and thus gain new insights will be those who are most valued.

The full integration of teachers into the use of IT will help close the "generation gap" that has developed as a result of the pupils finding themselves in IT environments most of the time while most of the teachers, at least up till now, have been far less present in this environment. A closing of this gap will make it possible to build new learning frameworks in which teachers will be able to both help pupils turn information into knowledge and show them how to use the information found on the internet correctly and so on. The full integration of the teachers in the operation of all of ITEM's functions will bring them closer, not only to activities connected with pedagogical management but also to the school's administrative activities. Today teachers do not seem to be devoting

the same attention to activities that take place in the framework of the school in financial and general management matters and it is possible that this lack of interest is one of the factors that leads to the school being a "loosely coupled system" (see also Telem et al, 1997).

If this takes place teachers may see that the teaching of their particular subject will appear to be better when the general framework is more stable and credible. In this way teachers will hopefully be active partners in the improvement of the school's management of administrative and financial matters and this will not only increase the school's credibility with the wider public and the external authorities but may even advance the school towards receiving more autonomy. Thus, if one wishes to reach a situation in which teachers can take part in the making of decisions about all the school's activities, they have to be made full partners in the use of ITEM's input and output – and it will even reduce pressure and some of the burden of work borne by the administration.

B. In-service courses for women teachers

This is stage includes the increased need women have for the appropriate skills when they come to use information systems (IT). The research shows that women teachers have greater hesitance about using ITEM in school in practice in comparison with the men, the administrators and the people from the external authorities who see this more positively. Gaining knowledge about using computers, the ability to overcome minor problems, and the technological thinking of the 21st century all need to be included in in-service programs given to the women teachers in schools at a pace that is suitable and in simple, comprehensible language so that they can dispel their fear of all this. It is

apparently difficult for the women teachers to free themselves from the methods and style of working they used before the introduction of IT into the schools and so this is a question of initiating a process rather than making decisions on high without taking into consideration the psychology of what it means to pass from a period of frontal teaching and hand operation to teaching in the age of the Information Superhighway and electronic operation.

In reality Israeli males are directed towards technological education more than females and perhaps this has had a delayed influence on the way women relate to technology in general and to the operation of ITEM in particular. Thus, together with the introduction of a new strategic policy directed at integrating the teachers as partners in pedagogical and administrative management. As noted in section A with the T.W.T model, the special in-service courses also have to be part of the operation of ITEM in all areas of school management. These have to focus mainly on the needs of women teachers in order to make it possible for them to acquire the skills and confidence to use the input and output of ITEM (see also Green et. al., 1993, pp.35-45; Miller et. al., 1996).

C. Technology.

As noted in section B of the T.W.T. model, technological education in Israel has been reduced in most types of schools and mainly remains in vocational schools. In the past it was possible to find quite a lot of technological education in comprehensive, general, religious and even Yeshiva high schools but, during the last few years, this has increasingly disappeared. This research work shows that in those vocational schools where technological education is more extensive the way people relate to ITEM is

also more positive.

In the information age information systems are indeed necessary to allow people to face all the challenges presented by our entry into the 21st century. Therefore the learning of information systems (IT) needs to be a compulsory subject studied for matriculation examinations just as one learns History, Bible Studies, and Mathematics. All the students, males and females, need to be exposed to this subject in order to learn about the different aspects of hardware and software so that IT can become an inseparable part of the required curriculum in Israel. The moment this subject is made compulsory in all types of schools in Israel (including Colleges of Teacher Education) the more conscious the general public will become about the fact that IT is more than a compulsory subject for Matriculation. Rather it is a subject providing working tools that makes entry into the world of literacy possible. And, as in the past those who did not know how to read and write were thought of as "illiterate", those in our generation who do not know how to use information systems will be considered illiterate.

When the three stages of the T.W.T. model come into operation there is a great chance that ITEM will also be supported by the teachers on the same level as the people from the external authorities and the principals. At that time the possibility for the wider and more sophisticated use of IT in schools will open up.

8. The contribution of this research work to ITEM.

This work has the potential to make a modest contribution to the research of ITEM in four areas:

a) Emphasis on ITEM's contribution to the transparency of the education system.

Schools in Israel have learned that this technology has exposed them more to the scrutiny of the public. They relate to IT as if it were a "mirror" in which the real face of all those who are involved in the craft of teaching is reflected. Even though this exposure invites criticism, schools do not see this as a threat but as looking into a mirror that demands improvement and advancement. Moreover there is also an expectation that the Ministry of Education and the external authorities will reach a level of transparency equal to that of the schools. As noted in the section of Findings one of the claims heard in the interviews was that the Ministry of Education is not the Ministry of Defense and has no vital secrets to protect so it should carry out its work with appropriate disclosure.

This work shows that the transparency brought by ITEM into the education system has led to two trends that, at first, seem to be contradictory but, in the new reality of IT, not only do not contradict but complement each other and while there is the intention to introduce more independence into schools there is also the intention to introduce more supervision by the external authorities over the schools that have been awarded autonomy (See also page 58). The transparency of ITEM shows us that the advantages of IT are bound up with the loss of a certain amount of "privacy". We have seen this in the experiment carried out by the University of Leicester with the IAP (Individual Action Planning) programme. Here the more "freedom" given to the post-graduate certification of education student teachers was accompanied by an increase in surveillance over them (Lawson & Harrison, 1999, p.90). Even though this was not the intention of those who organized the IAP program this was the result. In the case of ITEM the transparency from the very outset creates a situation in which independence and supervision are simultaneously increased because everybody is looking into the same mirror.

b) The need to focus on teachers, and especially female teachers.

The research shows that women have doubts about the ability of IT to improve the management of schools, to turn the teachers into full partners, to create a new electronic form of communication on the computer screen or to increase the school's autonomy. As this work demonstrates, without making teachers full partners who have free access to ITEM all the expectations people have from this tool will not be fully realized. Thus there is place to examine what women teachers need to allow them to operate IT in the best way possible for their work and what the school administrations have to do to prepare suitable in-service training courses to satisfy this need.

c) The influence of different position holders on attitude towards IT.

This work shows that not all of those who work in education "here and now" have a common attitude and that the way one relates to ITEM is, among other things, determined by which role they fill and from which angle of vision they look at ICT. The external authorities adopted a very positive attitude towards IT and had great hopes that it would succeed in creating more coordinated work, a new dialogue, independent management of the schools and more involvement of the teachers in class management. Together with this they did not hide their expectation that this tool would give them the possibility to know more about the products of the schools they supervise and, so, be more connected with what is going on in the field. The principals, deputy principals, and heads of the junior high schools are next in line after the external authorities of those who had such hopes, although a little less. It should be noted that the principals differ in their attitudes towards the question of the school's autonomy from the external authorities. In

most cases the attitudes of the educational leaders, who represent middle management in schools, are less positive than the principals and external authorities. In regard to the question that deals with the increased presence and involvement of the external authorities in the surveillance of the pupils' achievements, however, their attitudes were the most decisive. In other words they believe ITEM is exploited by the external authorities to carry out deeper surveillance over the pupils' achievements. The teachers are the least decisive and the most hesitant about the contribution of ITEM in all the issues discussed above.

d) The uniqueness of the vocational schools in the focus placed on technological studies.

This work compares the types of schools in Israel and shows that the vocational schools whose hallmark is technological education have, in comparison to all the other types of school (general secular, comprehensive, state religious and Yeshiva high schools), the most positive attitudes towards IT – as should be the case with schools that value the importance of technological education. All the other schools have reduced or eliminated technological studies from their curricula and prefer to focus on theoretical studies in the humanities and sciences. It seems that this is also one of the factors that directly or indirectly influence the doubtful attitudes the teachers have towards ITEM.

e) The contribution of T.W.T :

This work proposes that three areas found to be problematic in Israeli schools should be focused on. Such a focus will, hopefully, lead to the use of ITEM in its entirety and only then will it really be possible to evaluate the full potential that exists in this tool.

This combination of making a strategic decision about allowing teachers to become full partners in the use of the input and output of ITEM and the establishment of suitable in-service training courses that take the special needs of women teachers into consideration in regard to the full operation of IT is needed as is an unambiguous decision to make technological studies, especially IT, compulsory subjects in all schools including Colleges of Teacher Education. Doing all this together should complete the puzzle which will lead to achieving the goal of fully and more efficiently utilizing ITEM in all areas. In this way, most of the ideas expressed in the literature may also be able to be realized (see also pages 329-332 in this chapter).

9) Perspective on the thesis as a whole.

a). Findings that support studies from current literature and those done in the past:

Some of the findings from this study faithfully reflect what has already been published in this sphere of IT knowledge and can enhance the literature and research that has been published in the past concerning the implications of IT on the school management. Following is a number of subjects discussed in the literature and IT studies and there are findings of this work to both reflect what is already known in this area and add new layers to the body of knowledge.

One of the problems that the literature and studies on ITEM deal with is the question of how schools are managed in general and the claim put forward in this study and the literature (see pp.58 -63) is that the organizational management of schools is an example of very loosely coupled systems and that, in practice, there are no substantial links between the different departments operating in the school, within the departments

themselves and with the school management. The findings of this study based both on the data collected from those who responded to the questionnaire (N=252) and the interviews confirm what has already been published i.e. that ITEM contributes to an increase in cooperation and coordination in schools. This technology is an aid for this because it increases the standardization and coordination of the work of all the different departments, within the departments and with the school management. What enhances this tendency, according to this study, can be found in ITEM's ability to demand uniformity of reporting from all members of the school staff and the use of identical terminology. The findings from the interviews carried out in this research show that the school staffs indicate that the use of ITEM demands that they comply with a defined time frame (otherwise the computer window shuts down) and make reports in the uniform manner dictated to them by the MANBAS programme.

The findings of this study also clearly support the literature and studies done that show that a great improvement took place in the area of the collection and distribution of information in the schools' data base thanks to the use of ITEM (see pp. 71 -72, 78 -82, 90 -91, 96 -100, 106 -111). The work also focuses on the findings taken from the questionnaires that the data collected from the schools mainly concentrates on the timetable, pupil and teacher attendance reports, discipline problems, grades for school certificates and summary meetings of teachers and library work.

Together with this the work points out that, according to the findings from the interviews with the principals, there was a window missing that reflected the achievements of pupils over a three year period (grades 10- 12) that could, at a glance, provide the ability to see a full picture of the pupils' achievements in matriculation exams that are spread

over three years. The supervisors and external authorities lacked details in the data base about the school package - like expenses for water, electricity, transportation etc. The teachers lacked information in the data base about special education pupils and everybody lacked information that, on the one hand, made it possible to see changes made in the schools' decisions but, on the other, did not make it possible to see the reasons for the decision changes.

The literature and studies dealing with ICT showed that we are living in the era of the "Information Superhighway" that allows us to access available information on-line and, as a result, a kind of dialogue has been created between those who use this information system cooperatively (see pp.77 -83). This information system is not limited to any specific country but has a global character and allows asychronic communication – in other words there are no limitations placed upon the differences in time and place for the communicators.

Based on the findings from the interviews and the questionnaire the study supports the claim that ICT provides on-line information and a variety of possibilities for using this information. Together with this the findings of this research do not unambiguously support the claim that a new electronic dialogue exists in schools in Israel that takes place screen to screen. In addition there is only partial support for the notion that ICT breaks down the barriers that exist between the teachers and the school management and the teachers and the pupils.

There is no support from either the questionnaires or the interviews in this study that ICT has created a kind of alienation or arouses cold relations between people in education.

Together with this there were opinions expressed in the interviews that supported the idea in the literature that ICT allows people not to provide true information (since people hide behind false images), are exposed to problematic sites and that there is a deterioration in people's language expression abilities.

The literature and studies that deal with DSS (see pp. 89 -96) show that ITEM, by using the DSS programme, significantly improves a school's decision making ability and, as a result of this, also provide prestige based on the school's ability to function independently and make the right managerial decisions – including independent budgetary management. All of this is supposed to increase the autonomy of the school in the making of independent decisions that will advance the school.

According to the findings from the questionnaire this work provides support for studies done mainly in regard to the improvement in the decision making ability of schools as a result of ITEM providing statistical and mathematical analysis tools and the ability to manage budgets independently. In addition the study shows that the external authorities increased their control as a result of the use of IT principally in the exploitation of teaching hours in schools. The findings from the questionnaire do not clearly show that the weighing of all the findings ultimately led to an increase in the autonomy of schools in Israel. Based on the findings from the interviews there is agreement with the studies done that ITEM improved the collection of up-to-date information which could be used to make better decisions. The interviews also provided an explanation for why the external authorities relate more seriously to schools since the system can measure investment and success.

The professional literature and research that deal with class management using ITEM showed that it is important not to separate between the administrative management of the school and class management by the staff because of ITEM's contribution to an improvement in the management of the class (see pp. 102 -105). The literature and research showed that this system helps the staff to analyze results and learning achievements in a more scientific and less intuitive way. By using ITEM the school staff improved its pedagogical decision making process whose goal is to arrive at diagnostic assessment, something which is characterized by demonstrating positive concern for helping teachers find what the real needs of the pupils are (see pp.106 -109).

The findings from questionnaire support the approach taken in the literature and studies which refer to class management and especially school management. The findings, like the conclusions drawn in the literature, show that ITEM allows the progress of pupils to be better monitored and allows all kinds of tests to be quickly and objectively analyzed. Similarly the findings from the interviews support the literature that showed that ITEM provides the means to improve the pedagogical decision making process and emphasizes that it allows the staff to manage their respective classes while they are intellectually engaged. This study shows clearly the broad agreement among all the participants that ITEM is helpful in managing the class. The staff sees great value and importance in independent analysis and the identification of the reasons for the pupils' success or failure that allows them to arrive at possible conclusions independently about what has to be done in order to maintain the success or prevent the failure.

The findings from the questionnaire also support the conclusions arrived at in the literature and research that indicated a tendency towards the strengthening of the process

of following up after the achievements of the schools, their ranking, and the making of comparisons by the external and governmental factors. The studies carried out show that ITEM is used as an evaluative assessment tool in schools by which pupils, teachers and schools are judged (see pp.109 – 121). The contribution made by this study is in that the findings from the questionnaire show that the external and governmental authorities, even when they are capable of making comparisons between schools independently using IT, do not ignore the data that exists in the school data base. In this way the school has the possibility to enter into a dialogue with the authorities, explain the results that they received and so shed more light on the meaning of the dry facts.

b) Key points of the dilemma:

1. Areas that this study could not confirm:

The first research question was: Did the control grow or decrease following the use of ITEM? The answer to this was expected to be clear but this was not so and led conclusions from the findings in another direction: Did the coordination and standardization of the administrative work of the school increase more in the direction of increasing control through the use of ITEM? This was the direction that the respondents to the questionnaire chose to emphasize in contrast to the expectations from the first research question posed in this study.

The responses to the questionnaire, which were analyzed using the ANOVA programme, related to a number of characterizing categories such as the role/position held, gender, use of system, type of school, and size of school. These were analyzed using the GLM

procedure, while the years of experience in the present position and age were examined using the REG procedure (linear regression).

The use of these research methods raised additional ideas that had not been discussed in the literature such as the observation that the way the respondents responded to the question on 'perception' in relation to the administrative work carried out in the school was influenced by the division according to role/position held, gender and type of school. One should take into account that the following characterizing categories received a level of explanation of 15% in the Stepwise Model – which is not an explanation of a high level. Despite the fact that not all the components were discussed profoundly in the literature this was something of a surprise when compared to the earlier expectations of the research and the discussion that had taken place on the literature in this study.

At any rate the three characterizing categories (role/position held, gender and type of school) in this question (and also in the two following research questions) were found to have had an influence (even if only partial) on the completion of the questionnaire. The principals, the external authorities, the males and the vocational schools, in contrast to the female teachers and the educational leaders, only tended to agree (on a scale from 1-4) that control had increased following the use of ITEM. In spite of this, the findings from the questionnaire indicate clearly about general agreement among all the participants that ITEM has increased the coordination and standardization in schools. It appears that the respondents to the questionnaire preferred to answer in this way in order to make it clear that they do not agree that ITEM has increased this control but that it has increased the level of coordination and standardization in the work carried out in schools.

While the expectations from the questionnaire were high because of the large number of participants (N=252) it was actually the interviews that shed new light and provided an explanation for things that were not discussed in any depth in the literature. The interviews made it possible to gain access into a person's thinking as was anticipated in the chapter on Methodology (see p.139).

From the interviews it became clear that ITEM leads to work done on a high level of transparency. The interviewees stressed that people who work with transparency also behave differently since their work is exposed for all to see. We can conclude from this that transparency in work done in schools using ITEM does not link up with over-control but with an increase in a deepening of the coordination and standardization of the work and a uniformity of reporting that the ITEM system demands in order to achieve this level of transparency.

2. Conflict with previous research

In the literature section of this work two Israeli studies were presented which examined the effect of the information system IS on the management of schools. The first study by Telem was carried out at the University of Tel Aviv in 1995 (see p. 61) and the second, by Ravid, was carried out in 1996-7 (see p.62). The findings of this study stand in conflict with these two studies.

The first study by Telem examined only 7 high school principals using a questionnaire and interviews upon which he based his conclusions that SMIS allowed them to tighten up their control over what was being done in school. There were additional conclusions

that the transfer of information improved, class management became more institutionalized and contact with the parents and external factors were made more direct and better.

This work demonstrates that it is impossible to base oneself on research done only on principals in order to evaluate the influence of ITEM on schools. To do this one has to examine the whole range of those who hold positions in schools and also their direct superiors outside the schools. This study has shown that the attitudes are varied and are influenced by the position from which the office holder judges the matter. Thus answers to these questions must be seen as more complex and not so unilateral. In the question of how one overcomes the problem of the school as a loosely coupled system, not only the fact that the principals and the external authorities tended to take a more positive attitude to agreeing that ITEM does in fact help tighten the belt (especially in comparison to teachers), but there was also a gender difference with men tending more to agree with this conclusion than women. There is yet another important difference with the vocational schools tending more to agree with this than the other schools. This data was not taken into account in the above study by Telem.

There is another, no less, important difference. This study clearly shows that there was broad agreement between the respondents to the questionnaire that ITEM increased the work of coordination and standardization and less agreement about the question of control in order to overcome the loosely coupled system. It was also clear from what came out of the interviews that the question of transparency that ITEM directly brings about leads more in the direction of coordination and standardization (rather than in the direction of control). It appears in this issue that standardization is more measurable and

relatively more easily given to evaluation (in contrast to control which is difficult to measure and, perhaps, a little more abstract to some of the staff).

Ravid's study, which examined the effect of MIS on the methods of communication used in secondary schools and based itself on a case study that included 30 interviews, did examine a wider range of office holders in comparison to Telem's study but examined this in only one school. Some of the findings (as shall be seen anon) are in conflict with the findings of the present study.

The findings from the questionnaire given in this study (N=252) clearly show that, in the matter of communication within the school (as with responses to the other two research questions in the study), the type of school is an important characterizing category that influences the perception of the respondent. Thus, according to this study, if Ravid's study had been carried out in a vocational school she would have received more positive attitude responses than in a comprehensive school. The lack of identification of the type of school in which the research was done is most significant.

In addition to this some of the findings (see p.62) conflict with the conclusions of this study. This study clearly shows in the fourth research question, both based on the questionnaire and on the interviews, that freedom of access into the ITEM system is principally used for the input of information and it is required to have more freedom to retrieve information (output). Ravid's study presents it as an advantage of the system the fact that in many cases the information can be accessed without the teachers being involved. This stands in conflict with the conclusions of this study which indicate the

importance of the teachers' involvement in managing their respective classes and to have equal access to ITEM (and not only a small exclusive group the principal, deputy principal and school secretary who really have free access to the system).

3. Conflict with my expectations:

Involvement and intrusion:

There is an assumption made, and an expectation, based on research questions 3 and 4, that ITEM is a kind of two-edged sword that, on the one hand, can increase the administration's control over the staff and so operate with a centralistic policy while, on the other hand, can be an effective tool for decentralization which allows open access to the system to the staff and people who hold positions lower than those in management.

Based on this perception the last two research questions deal with the school's autonomy and the management of the class using ITEM. The expectation was that, if the findings showed that the autonomy of the school had grown as a result of using ITEM, it would be at the cost of intrusion by external factors into the activities of the school. On the other hand, if the findings showed that intrusion by external factors into the activities of the school grew then this would be at the cost of reducing the freedom of action in the school (see pp.88 – 90, 99 – 100). This was also the case in regard to the fourth research question. If the findings showed that the involvement of teachers in the analysis of pupils' results increased after using ITEM then the freedom of their role would also increase. This freedom would grant the teachers the possibility to manage their classes more independently and with less supervision. If, on the other hand, the findings of this study showed that the external factors, such as the Ministry of Education and the local

authorities, increased their control over the school's results following the use of ITEM this would, apparently, be at the cost of the amount of freedom the teachers would have in managing their classes. This action would be carried out by the authorities because the analysis of the results is more easily available using ITEM and the inevitable result would be that the supervision of teachers would increasingly grow and they would lose the "academic freedom" that the profession of teacher is supposed to provide them (see pp.105 – 107, 117 – 120).

Indeed the results of this study show, both according to findings from the questionnaire (see pp.178 -186) and the interviews (see pp.231 -248) that the respondents and the interviewees did not see things this way. The findings show that the transparency of ITEM to a situation whereby educational work today bases itself more upon educational/learning tasks that lend themselves to scientific measurement and the analysis of the results is done according to statistical and mathematical standards. All of this information, which is as open and available to the authorities as it is to the school, leads to both involvement and intrusion existing side by side together. Both of these options are, in fact, the two sides of the two-edged sword and exist simultaneously. This does not mean that one exists at the cost of the other but they are, rather, two phenomena that appear to be in conflict which, paradoxically, seem to cause each other to exist as if in some sort of symbiosis. The study indicates that the possibility of increasing the freedom of activity of the teachers in class management will grow if the involvement of the external authorities is received with understanding. The transparency that ITEM system brings with it is inevitable and makes it possible for all the parties involved in the life of the school to look at the same statistically processed data. This transparency also makes it possible to look at the contribution and part played by each person in the

improvement of the pupils' results as if a mirror has been placed in front of each person which allows him/her to see himself/herself as he/she is. In this way every person can see what his contribution has been and what part he/she has played in improving the school's results.

The next finding is something of a surprise since in the three research questions for a large part of the positive answers the findings indicate a tendency of agreement and the expectation was that there would be a decisive answer in all the statements in the questionnaire and not only in some of them. This expectation was not only based upon the number of participants (N=252) and their variegation which, as is noted in the section on methodology, reflects the population in Israel and the existing socio-economic situation, but also on the statements that were checked carefully and the choice of a scale of values of 1-4 in order to prevent respondents moving towards choices in the centre (which was the reason for not choosing a 1-5 scale).

Thus the results that we received for the fourth research question become more conclusive and the findings and analyses that deal with the subject of managing the class using ITEM received answers of "agree" and " strongly agree " (on a scale of 1-4) and cancelled out the distribution that existed in the three other questions according to role/position, gender and type of school. The broad agreement of all those who responded to the questionnaire and interviews (see pp. 288 – 290, 291 – 293) that ITEM significantly improved the analysis of the pupils' results and the following up of the pupils' progress (both by the teaching staff and the external authorities) endow the analysis of the findings and the subsequent conclusions drawn from them with greater authority. This is also the reason that there is a recommendation in the conclusions of the

research to construct the system of relationships between all the office holders in the school, irrespective of gender, and between all the different types of schools in the way they use ITEM according to the model of class management since this can be used as support for all the other subjects dealt with in the research. While this model has been used with great success in everything that has to do with the input of the system the hope is that this work will make it possible to broaden the participation of teachers completely in matters concerning the output. The success of the class management model using ITEM emphasizes even more why the "Tomorrow 98" project did not succeed (see pp. 23, 45 - 47). The programme lacked the involvement of teachers who were neither consulted nor participated in the whole process since the approach was top down. While the teachers are and will remain the most important asset and function in the school, certainly from the point of view of teaching and learning, and according to this study they are also the most important factor for strengthening the educational management of the school.

c) Things I would have done differently:

1). Methodology:

From a methodological point of view I would have increased the number of people who participated in the interview. At the time the research was being planned the expectation was that the questionnaire, (into which much time and thought was invested especially in the preparation of the statements), and the number of participants which was both significant and varied (N=252), would provide unambiguous explanations for all the issues that were being examined in the study (see pp. 129-134). The expectation also

was that the interviews should have shed more light on the findings from the questionnaire through the use of semi-structured interviews and thus making it possible to base the research on cross referencing (see pp. 130 – 131).

After the research was carried out the findings from the interviews not only shed light on the facts but also revealed findings that the questionnaire did not reveal, for example, the matter of the transparency that ITEM brings with it to the work done in schools. The findings from the questionnaire regarding the three first research questions of this work needed support from the interviews in order to more clearly establish the direction the findings were tending towards and to what conclusions it was possible to arrive. It is possible to learn from this study that when one faithfully sticks to the rules and directions given for carrying out the semi-structured interviews (see pp. 150 – 152) this tool can be extremely efficient.

2) Gender:

As has been pointed out several times this study focused on the analysis of four areas that create interaction between those who use the ITEM system and those who work in education. After all the data was collected, and especially after the analysis of the questionnaire, a division between the attitude of males and females towards ITEM became clear (only in the fourth research question, as noted above, all these divisions collapsed). As the findings show (see pp. 173, 176, 179, 257 – 258) male tended more to agree with the statements in the questionnaire which related to the three questions in the study while female were more skeptical.

If I were beginning the work today I would include a direct research question that would examine the differences between men and women when they use ITEM. Despite the fact that this issue was not included in the research questions the study shows that women (as major part of the teaching public), lack equal access to the system mainly in regard to anything connected with the output of ITEM and this issue has been criticized in the conclusions of the study (see pp. 321 – 323).

3) Control- Coordination / Standardization:

In the first research question I would change the word "control" for "coordination"/"standardization. It appears that the term "control" is perceived as "control over" and "surveillance" in the sense of one being under the eyes of the all-seeing "Big Brother". Perhaps, in addition, the term is less measurable and more difficult to evaluate than the term "coordination" which not only gained greater response from the respondents to the questionnaire but also answers that were clearer and less ambiguous than those they supplied to the word "control".

d) Further research directions:

Based on the findings of this study and what has been previously discussed, a number of subjects and questions have arisen that could be a direct continuation for additional research in the area of the effect of ITEM on schools and the subsequent interaction with people in the field of education.

1). The first subject that needs to be examined is why differences in approach develop between teachers when they begin to put ITEM into practice as a tool to help them with managing the school and the class and the school principals and people in the authorities. Does this develop because of the technological system and the demands it makes or do these differences develop with no direct cause but because they are the result of different attitudes involving a lack of sufficient appreciation by the principals and leaders for the importance of the place of teachers and their centrality in the school system, not only in the area of learning and teaching but also in matters of school management?

2). What are the reasons for the differences in the approach of male teachers and female teachers when they come to use ITEM as a technological aid for managing the class? Why does this difference exist whereby the male teachers tend to accept ITEM more positively than the female teachers? What more needs to be done to reduce this difference or even make it disappear completely? It is not all reasonable to assume that the reasons are biological thus ways and additional means have to be found (beyond what is suggested in this work) to guarantee complete equality of access to this technology.

3). It is not enough to just raise questions of principle about the application of ITEM in schools. Every question for discussion needs to be first examined with respect to the office holders (for instance the study showed that there is a different angle of vision for high school principals and head of departments), the division between men and women (see the previous section) and the type of school (the research should include all existing types of schools). These characterizing categories were proved by the study to be most

influential on the perceptions of the respondents to the questionnaire. There is no single attitude among educators so the research question has to take this into account.

4). Do differences towards ITEM exist between men and women teachers, office holders and male and female pupils in technological schools? In light of the findings from this study there is place to examine whether the attitudes in vocational schools only look more positive in comparison with the other schools or whether, if we compare all vocational schools, these differences will still exist.

5). Since ITEM is a technological subject that is constantly developing this work cannot claim that the discussion is "over and done with" and there will certainly be issues in the near future that have been raised in the work (and others) that will need to be researched again and again in light of the technological advancements and developments that take place in parallel with the teachers' use of ITEM. What could especially be interesting (from the point of view of the author of this work) would be to re-examine the same types of schools that took part in the research after T.W.T model has been applied and to see to what degree the T.W.T. model succeeded in solving the problems of the non-realization of the expectations for ITEM that were detailed in the literature (see pages 329-332 in this chapter).

Appendix A: **Questionnaire**

Please give the following details about yourself and your school:

Either fill in space or circle correct answer.

1. a). Male b). Female

2. Age_____

3. Teaching experience_____(years). 4. Your current position is_____

5. Years of experience in current position _____(years).

6. Type of school: a. Secular b. Religious c. Comprehensive d. Vocational

e. Yeshiva f. Other (please specify)_____

7. Please indicate what kind of information systems you use in your school:

a. Manbas b. Internet c. A Ministry of Education network program.

d. Financial program e. Classroom Management programs. f. Other (please specify)_____

Questions 8-10b are addressed to the principal only.

8. Number of pupils in your school_____

9. Number of teachers in your school_____

10a. Please indicate what kind of information systems you have in your school:

a. Manbas b. Internet c. A Ministry of Education network program.

d. Financial program e. Classroom Management programs. f. Other (please specify)_____

_____

10b. Please indicate who is in charge of running ITEM in your school:

a. The principal b. Vice-principal c. Secretary d. One of the teachers

e. Other (please specify)_____

_____

Please circle the number that reflects your attitude to the situation in your school on a scale of 1-4 as follows:

1) Strongly disagree 2) Disagree 3) Agree 4) Strongly agree.

11) As a result of the implementation of ITEM in your school do you think that:

	Strongly disagree			**Strongly agree**
a. leaders adopt a more flexible approach towards teachers.	1	2	3	4
b. staff inter- personal relationships in school have deteriorated.	1	2	3	4
c. the work is more coordinated.	1	2	3	4
d. the gathering and diffusion of information has improved.	1	2	3	4
e. the control over teachers by administrators has increased.	1	2	3	4
f. the number of instructions from the leaders has increased.	1	2	3	4
g. the number of staff face-to-face meetings has decreased.	1	2	3	4
h. the staff's involvement in school affairs has increased.	1	2	3	4

12) If you wish to add anything about the control and the use of ITEM please do so:

_____

_____

_____

13) Do you think that ITEM:

	Strongly disagree			**Strongly agree**
a. has created a better dialogue between leaders and staff.	1	2	3	4
b. has created a system which has improved interaction and consultation.	1	2	3	4
c. has created on-line communication which helps resolve conflicts in school.	1	2	3	4
d. has created a working form of communication on computer screen.	1	2	3	4
e. negatively affects the quality of human inter- relationships in schools.	1	2	3	4
f. threatens the privacy of people in education.	1	2	3	4

14) If there is something else you wish to add on the effect of ITEM on the dialogue in schools please do so.

_____

_____

_____

Please circle the number that reflects your attitude to the situation in your school on a scale from 1-4 as follows:

1) Strongly disagree 2) Disagree 3) Agree 4) Strongly agree.

15) Do you think that ITEM assists schools by:

	Strongly disagree			Strongly agree
a. helping staff members choose better solutions to problems.	1	2	3	4
b. providing statistical and mathematical analysis.	1	2	3	4
c. improving the decision-making process.	1	2	3	4
d. providing the capability to manage finances independently.	1	2	3	4
e. enabling external authorities to intervene in internal school decisions.	1	2	3	4
f. increasing government supervision over the exploitation of the hours of teaching budgeted for the school.	1	2	3	4
g. increasing government supervision over payments made by parents.	1	2	3	4
h. increasing government supervision over the school's day to day expenses.	1	2	3	4
i. increasing the schools' autonomy.	1	2	3	4

16) If there is something else you wish to add about the effect of ITEM on a school's independence please do so. _____

_____

_____

_____

Please circle the number that reflects your attitude to the situation in your school on a scale from 1-4 as follows:

1) Strongly disagree 2) Disagree 3) Agree 4) Strongly agree.

17) Do you think that ITEM increases the teachers' involvement in managing the classroom by:

	Strongly disagree			Strongly agree
a. allowing the progress of pupils to be monitored better.	1	2	3	4
b. allowing all kind of tests to be quickly and objectively analyzed.	1	2	3	4
c. providing the tools to improve the pedagogical decision-making process.	1	2	3	4

18) Do you think that ITEM increases the control of external authorities' in managing the classroom by:

	Strongly disagree			Strongly agree
a. providing them with analyses of pupils' results.	1	2	3	4
b. allowing comparisons to be made between the achievements of different schools.	1	2	3	4
c. exposing the teacher's record of achievements to public perusal.	1	2	3	4
d. providing inspectors and other educational authorities with information which will allow them to grade the schools.	1	2	3	4
e. ignoring the data-base of school when they analyze the pupils' results.	1	2	3	4

19) If there is something else you wish to add on the effect of ITEM on managing the classroom please do so.

_____

_____

_____

Please go back over the questionnaire and make sure you have not forgotten to answer any question. Thank you for your help.

Pilot questions:

20) Please indicate what you consider the strong and weak sides of this questionnaire to be?

a. Strong sides:_____

_____

b. Weak sides

_____

_____

21. Please add any questions you think are missing in this questionnaire

_____

_____

_____

APPENDIX B:

THE SAS SYSTEM-THE FREQUENCY PROCEDURE AND THE MEANS PROCEDURE:

The SAS System

The FREQ Procedure **SCHOOLS:**

Q11_1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	33	16.10	33	16.10
2	80	39.02	113	55.12
3	72	35.12	185	90.24
4	20	9.76	205	100.00

Frequency Missing = 7

Q11_2	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	83	39.15	83	39.15
2	107	50.47	190	89.62
3	18	8.49	208	98.11
4	4	1.89	212	100.00

Q11_3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	7	3.33	7	3.33
2	35	16.67	42	20.00
3	124	59.05	166	79.05
4	44	20.95	210	100.00

Frequency Missing = 2

Q11_4	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	5	2.36	5	2.36
2	33	15.57	38	17.92
3	119	56.13	157	74.06
4	55	25.94	212	100.00

Q11_5	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	12	5.66	12	5.66
2	63	29.72	75	35.38
3	97	45.75	172	81.13
4	40	18.87	212	100.00

The SAS System

The FREQ Procedure

Q11_6	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	14	6.64	14	6.64
2	91	43.13	105	49.76
3	80	37.91	185	87.68
4	26	12.32	211	100.00

Frequency Missing = 1

Q11_7	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	42	19.81	42	19.81
2	135	63.68	177	83.49
3	30	14.15	207	97.64
4	5	2.36	212	100.00

Q11_8	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	30	14.29	30	14.29
2	119	56.67	149	70.95
3	52	24.76	201	95.71
4	9	4.29	210	100.00

Frequency Missing = 2

Q13_1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	13	6.16	13	6.16
2	89	42.18	102	48.34
3	86	40.76	188	89.10
4	23	10.90	211	100.00

Frequency Missing = 1

Q13_2	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	12	5.66	12	5.66
2	93	43.87	105	49.53
3	84	39.62	189	89.15
4	23	10.85	212	100.00

The SAS System

The FREQ Procedure

Q13_3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	9	4.29	9	4.29
2	67	31.90	76	36.19
3	99	47.14	175	83.33
4	35	16.67	210	100.00

Frequency Missing = 2

Q13_4	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	14	6.60	14	6.60
2	102	48.11	116	54.72
3	78	36.79	194	91.51
4	18	8.49	212	100.00

Q13_5	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	71	33.49	71	33.49
2	128	60.38	199	93.87
3	12	5.66	211	99.53
4	1	0.47	212	100.00

Q13_6	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	70	33.02	70	33.02
2	113	53.30	183	86.32
3	19	8.96	202	95.28
4	10	4.72	212	100.00

Q15_1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	20	9.62	20	9.62
2	73	35.10	93	44.71
3	90	43.27	183	87.98
4	25	12.02	208	100.00

Frequency Missing = 4

The SAS System

The FREQ Procedure

Q15_2	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	4	1.90	4	1.90
2	20	9.48	24	11.37
3	104	49.29	128	60.66
4	83	39.34	211	100.00

Frequency Missing = 1

Q15_3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	9	4.31	9	4.31
2	68	32.54	77	36.84
3	99	47.37	176	84.21
4	33	15.79	209	100.00

Frequency Missing = 3

Q15_4	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	20	10.36	20	10.36
2	53	27.46	73	37.82
3	82	42.49	155	80.31
4	38	19.69	193	100.00

Frequency Missing = 19

Q15_5	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	26	13.07	26	13.07
2	107	53.77	133	66.83
3	51	25.63	184	92.46
4	15	7.54	199	100.00

Frequency Missing = 13

Q15_6	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	13	6.60	13	6.60
2	73	37.06	86	43.65
3	84	42.64	170	86.29
4	27	13.71	197	100.00

Frequency Missing = 15

The SAS System

The FREQ Procedure

Q15_7	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	16	8.47	16	8.47
2	78	41.27	94	49.74
3	69	36.51	163	86.24
4	26	13.76	189	100.00

Frequency Missing = 23

Q15_8	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	16	8.65	16	8.65
2	75	40.54	91	49.19
3	69	37.30	160	86.49
4	25	13.51	185	100.00

Frequency Missing = 27

Q15_9	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	26	13.27	26	13.27
2	87	44.39	113	57.65
3	69	35.20	182	92.86
4	14	7.14	196	100.00

Frequency Missing = 16

Q17_1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	7	3.30	7	3.30
2	32	15.09	39	18.40
3	109	51.42	148	69.81
4	64	30.19	212	100.00

Q17_2	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	6	2.83	6	2.83
2	28	13.21	34	16.04
3	91	42.92	125	58.96
4	87	41.04	212	100.00

The SAS System

The FREQ Procedure

Q17_3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	9	4.25	9	4.25
2	45	21.23	54	25.47
3	111	52.36	165	77.83
4	47	22.17	212	100.00

Q18_1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	6	2.93	6	2.93
2	24	11.71	30	14.63
3	122	59.51	152	74.15
4	53	25.85	205	100.00

Frequency Missing = 7

Q18_2	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	5	2.42	5	2.42
2	26	12.56	31	14.98
3	114	55.07	145	70.05
4	62	29.95	207	100.00

Frequency Missing = 5

Q18_3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	9	4.35	9	4.35
2	65	31.40	74	35.75
3	90	43.48	164	79.23
4	43	20.77	207	100.00

Frequency Missing = 5

Q18_4	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	5	2.43	5	2.43
2	20	9.71	25	12.14
3	119	57.77	144	69.90
4	62	30.10	206	100.00

Frequency Missing = 6

The SAS System

The FREQ Procedure

Q18_5	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	18	8.87	18	8.87
2	82	40.39	100	49.26
3	68	33.50	168	82.76
4	35	17.24	203	100.00

Frequency Missing = 9

The SAS System

The MEANS Procedure

Variable	N	Mean	Std Dev	Minimum	Maximum
Q11_1	205	2.39	0.87	1.00	4.00
Q11_2	212	1.73	0.69	1.00	4.00
Q11_3	210	2.98	0.72	1.00	4.00
Q11_4	212	3.06	0.71	1.00	4.00
Q11_5	212	2.78	0.82	1.00	4.00
Q11_6	211	2.56	0.79	1.00	4.00
Q11_7	212	1.99	0.66	1.00	4.00
Q11_8	210	2.19	0.73	1.00	4.00
Q13_1	211	2.56	0.77	1.00	4.00
Q13_2	212	2.56	0.76	1.00	4.00
Q13_3	210	2.76	0.78	1.00	4.00
Q13_4	212	2.47	0.74	1.00	4.00
Q13_5	212	1.73	0.58	1.00	4.00
Q13_6	212	1.85	0.77	1.00	4.00
Q15_1	208	2.58	0.82	1.00	4.00
Q15_2	211	3.26	0.71	1.00	4.00
Q15_3	209	2.75	0.77	1.00	4.00

Q15_4	193	2.72	0.90	1.00
4.00				
Q15_5	199	2.28	0.78	1.00
4.00				
Q15_6	197	2.63	0.80	1.00
4.00				
Q15_7	189	2.56	0.83	1.00
4.00				
Q15_8	185	2.56	0.83	1.00
4.00				
Q15_9	196	2.36	0.80	1.00
4.00				
Q17_1	212	3.08	0.76	1.00
4.00				
Q17_2	212	3.22	0.78	1.00
4.00				
Q17_3	212	2.92	0.78	1.00
4.00				
Q18_1	205	3.08	0.70	1.00
4.00				
Q18_2	207	3.13	0.71	1.00
4.00				
Q18_3	207	2.81	0.81	1.00
4.00				
Q18_4	206	3.16	0.69	1.00
4.00				
Q18_5	203	2.59	0.88	1.00
4.00				

The SAS System

The FREQ Procedure **External authorities**

Q11_1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	1	2.63	1	2.63
2	21	55.26	22	57.89
3	15	39.47	37	97.37
4	1	2.63	38	100.00

Frequency Missing = 2

Q11_2	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	9	22.50	9	22.50
2	25	62.50	34	85.00
3	6	15.00	40	100.00

Q11_3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
2	7	17.95	7	17.95
3	21	53.85	28	71.79
4	11	28.21	39	100.00

Frequency Missing = 1

Q11_4	Frequency	Percent	Cumulative Frequency	Cumulative Percent
2	4	10.00	4	10.00
3	18	45.00	22	55.00
4	18	45.00	40	100.00

Q11_5	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	1	2.50	1	2.50
2	13	32.50	14	35.00
3	19	47.50	33	82.50
4	7	17.50	40	100.00

Q11_6	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	1	2.50	1	2.50
2	18	45.00	19	47.50
3	21	52.50	40	100.00

The SAS System

The FREQ Procedure

Q11_7	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	8	20.00	8	20.00
2	26	65.00	34	85.00
3	6	15.00	40	100.00

Q11_8	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	2	5.00	2	5.00
2	23	57.50	25	62.50
3	13	32.50	38	95.00
4	2	5.00	40	100.00

Q13_1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	1	2.50	1	2.50
2	16	40.00	17	42.50
3	18	45.00	35	87.50
4	5	12.50	40	100.00

Q13_2	Frequency	Percent	Cumulative Frequency	Cumulative Percent
2	16	40.00	16	40.00
3	18	45.00	34	85.00
4	6	15.00	40	100.00

Q13_3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	1	2.50	1	2.50
2	7	17.50	8	20.00
3	24	60.00	32	80.00
4	8	20.00	40	100.00

Q13_4	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	2	5.00	2	5.00
2	17	42.50	19	47.50
3	16	40.00	35	87.50
4	5	12.50	40	100.00

The SAS System

The FREQ Procedure

Q13_5	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	6	15.00	6	15.00
2	30	75.00	36	90.00
3	4	10.00	40	100.00

Q13_6	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	10	25.00	10	25.00
2	27	67.50	37	92.50
3	3	7.50	40	100.00

Q15_1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	3	7.69	3	7.69
2	17	43.59	20	51.28
3	13	33.33	33	84.62
4	6	15.38	39	100.00

Frequency Missing = 1

Q15_2	Frequency	Percent	Cumulative Frequency	Cumulative Percent
2	4	10.00	4	10.00
3	15	37.50	19	47.50
4	21	52.50	40	100.00

Q15_3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
2	9	22.50	9	22.50
3	20	50.00	29	72.50
4	11	27.50	40	100.00

Q15_4	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	1	2.78	1	2.78
2	2	5.56	3	8.33
3	21	58.33	24	66.67
4	12	33.33	36	100.00

Frequency Missing = 4

The FREQ Procedure

Q15_5	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	4	10.00	4	10.00
2	22	55.00	26	65.00
3	13	32.50	39	97.50
4	1	2.50	40	100.00

Q15_6	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	1	2.50	1	2.50
2	7	17.50	8	20.00
3	22	55.00	30	75.00
4	10	25.00	40	100.00

Q15_7	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	1	2.78	1	2.78
2	14	38.89	15	41.67
3	12	33.33	27	75.00
4	9	25.00	36	100.00

Frequency Missing = 4

Q15_8	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	2	5.00	2	5.00
2	15	37.50	17	42.50
3	15	37.50	32	80.00
4	8	20.00	40	100.00

Q15_9	Frequency	Percent	Cumulative Frequency	Cumulative Percent
2	16	40.00	16	40.00
3	20	50.00	36	90.00
4	4	10.00	40	100.00

Q17_1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
2	7	17.50	7	17.50
3	17	42.50	24	60.00
4	16	40.00	40	100.00

The SAS System

The FREQ Procedure

Q17_2	Frequency	Percent	Cumulative Frequency	Cumulative Percent
2	2	5.00	2	5.00
3	16	40.00	18	45.00
4	22	55.00	40	100.00

Q17_3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	1	2.50	1	2.50
2	4	10.00	5	12.50
3	21	52.50	26	65.00
4	14	35.00	40	100.00

Q18_1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	1	2.50	1	2.50
2	2	5.00	3	7.50
3	26	65.00	29	72.50
4	11	27.50	40	100.00

Q18_2	Frequency	Percent	Cumulative Frequency	Cumulative Percent
2	5	12.50	5	12.50
3	18	45.00	23	57.50
4	17	42.50	40	100.00

Q18_3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	1	2.50	1	2.50
2	14	35.00	15	37.50
3	19	47.50	34	85.00
4	6	15.00	40	100.00

Q18_4	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	1	2.50	1	2.50
2	4	10.00	5	12.50
3	22	55.00	27	67.50
4	13	32.50	40	100.00

The SAS System

The FREQ Procedure

Q18_5	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	2	5.13	2	5.13
2	22	56.41	24	61.54
3	10	25.64	34	87.18
4	5	12.82	39	100.00

Frequency Missing = 1

The SAS System

The MEANS Procedure

Variable	N	Mean	Std Dev	Minimum	Maximum
Q11_1	38	2.42	0.60	1.00	4.00
Q11_2	40	1.93	0.62	1.00	3.00
Q11_3	39	3.10	0.68	2.00	4.00
Q11_4	40	3.35	0.66	2.00	4.00
Q11_5	40	2.80	0.76	1.00	4.00
Q11_6	40	2.50	0.55	1.00	3.00
Q11_7	40	1.95	0.60	1.00	3.00
Q11_8	40	2.38	0.67	1.00	4.00
Q13_1	40	2.68	0.73	1.00	4.00
Q13_2	40	2.75	0.71	2.00	4.00
Q13_3	40	2.98	0.70	1.00	4.00
Q13_4	40	2.60	0.78	1.00	4.00
Q13_5	40	1.95	0.50	1.00	3.00
Q13_6	40	1.83	0.55	1.00	3.00
Q15_1	39	2.56	0.85	1.00	4.00
Q15_2	40	3.43	0.68	2.00	4.00

Q15_3	40	3.05	0.71	2.00
4.00				
Q15_4	36	3.22	0.68	1.00
4.00				
Q15_5	40	2.28	0.68	1.00
4.00				
Q15_6	40	3.03	0.73	1.00
4.00				
Q15_7	36	2.81	0.86	1.00
4.00				
Q15_8	40	2.73	0.85	1.00
4.00				
Q15_9	40	2.70	0.65	2.00
4.00				
Q17_1	40	3.23	0.73	2.00
4.00				
Q17_2	40	3.50	0.60	2.00
4.00				
Q17_3	40	3.20	0.72	1.00
4.00				
Q18_1	40	3.18	0.64	1.00
4.00				
Q18_2	40	3.30	0.69	2.00
4.00				
Q18_3	40	2.75	0.74	1.00
4.00				
Q18_4	40	3.18	0.71	1.00
4.00				
Q18_5	39	2.46	0.79	1.00
4.00				

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