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Impact of management information systems (MIS) on school administration: What the literature says

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Abstract

The use of information technology in educational management has rapidly increased due to its efficiency and effectiveness. In the initial stages of its development, management information systems (MIS) main purpose and usage was to improve the efficiency of school office activities. It was used to store student and personnel data. The most concern was being focused on data entry and collation, rather than upon data transfer or analysis. The value of management information was recognized during its integration stages. Overall review of literature highlighted positive impact of MIS on school administration and management including better accessibility to information, more efficient administration, higher utilization of school resources, reduction in workload, better time management, and improvement in the quality of reports. A number of inhibitors to MIS use are evident in the literature; foremost among these are lack of time, lack of confidence or skills, lack of training, lack of senior management support, and lack of technical support. MIS can provide administrators and teachers with the information required for informed planning, policy-making, and evaluation. MIS have changed school management in the areas of leadership, decision making, workload, human resource management, communication, responsibility, and planning. These systems can assist the school manager in determining the aims of the school, formulating strategic plans, distributing resources, and evaluating staff performance as well as organizational success.

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1. Introduction

Computers are seen to have the potential to make a significant contribution to the teaching, learning, and administration in schools. An extensive amount of investment that has gone into introducing information and communication technology (ICT) into schools including hardware, software, networking, and staff development will be considered worthwhile if there is evidence that it has made a commensurate impact on school performance and effectiveness (Condie et al., 2007).

The use of information technology in educational management has rapidly increased due to its efficiency and effectiveness. School managers who used to spend large amount of time in solving complex allocation problems (e.g., staff allocation, resource allocation, timetabling) and monitoring the school operations have now better options due to enhanced technology. Information technologies facilitate the decentralization of work tasks and their coordination in an interactive network of communication in real time (Castells, 1996). They allow for greater

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flexibility and networking that emphasizes interdependence, interaction, and constant adaptation to an ever-changing environment (Castells, 2001).

Management information systems (MIS) are being used by schools to support a range of administrative activities including attendance monitoring, assessment records, reporting, financial management, and resource and staff allocation. MIS provide managers with the information required to manage organizations efficiently and effectively. These systems are distinct from other information systems in that they are designed to be used to analyze and facilitate strategic and operational activities in the organization (O'Brien, 1999).

Waston et al. (1987) describes management information system (MIS) as 'an organizational method of providing past, present and projected information related to internal operations and external intelligence. It supports the planning, control and operation functions of an organization by furnishing uniform information in the proper time frame to assist the decision makers'. Telem (1999) defines MIS as 'a management information system designed to match the structure, management task, instructional processes, and special needs of the school'. O'Brien (1999) referred MIS as 'a term given to the discipline focused on the integration of computer systems with the aims and objectives of an organization'.

Based on the foregoing definitions, MIS refers to a system that uses the information required by the organization's management at every level in making operational, tactical, and strategic decisions. Its main objective is to design and implement procedures, processes, and routines that provide suitably detailed reports in an accurate, consistent, and timely manner.

MIS plays a vital role in the area of decision making as it can monitor by itself disturbances in a system, determine a course of action and take action to get the system in control. It is also relevant in non-programmed decisions as it provides support by supplying information for the search, the analysis, the evaluation and the choice and implementation process of decision making (Obi, 2003). These systems have the ability to provide its users the processed information, analytical models, real-time updates and hypothetical scenarios to assist their decision-making process.

This paper will give an account of the studies that have examined the impact of MIS on school administration and management. Some of these studies have also highlighted the factors that hinder MIS usage in school administration.

2. Literature review

The most initial school administrative computer applications started its development in the late 1970s. In the early1980s, several loose, non-integrated clerical and administrative applications were developed but these applications limited the possibilities for management support as the relationships among data could not be analyzed (Visscher, 1996a). During the initial stages the main purpose of software development and usage was to improve the efficiency of school office activities. The use of computers and technologies in educational institutes was mainly to store student and personnel data (Carnoy, 2004). The value of management information was recognized during the integration stages. As a result, many projects were initiated by the governments in many developed countries that provided the stimulus to enter a higher development stage. These projects were directed toward the production of better school information systems which meant increased school efficiency and effectiveness. The focus was the development of a standard system for as many schools as possible with maximum flexibility. The professional approach to systems design was not widespread at this time (Visscher, 1996a). In the 1990s, the emphasis on using ICT to collect educational data and to improve the administration of educational systems began to increase in the developing countries.

Visscher (1996b) believes that MIS can provide administrators and teachers with the information required for informed planning, policy-making, and evaluation. Gurr (2000) claimed that MIS have changed school management in the areas of leadership, decision making, workload, human resource management, communication, responsibility, and planning. These systems can assist the school manager in determining the aims of the school, formulating strategic plans, distributing resources, and evaluating staff performance as well as organizational success (Telem & Buvitski, 1995; Telem, 1999). Bober (2001) indicates that the growing interest in MIS's and the trend toward thoughtful, long-range planning for MIS implementation stem from the belief within the school community that such systems allow for better site and district management, empower staff at all levels, and increase a school or

district's accountability to the community it serves. Efficient and quick decisions could be made possible when school managers get accurate and up-to-date information by MIS (Christopher, 2003).

Several surveys have been designed in recent years to gather information on the extent to which schools are developing the capacity to integrate ICT into learning, teaching, and management processes. A steady increase in the number of computers and other technologies over time has been evident in the literature, with most schools achieving the baseline targets for computer-to-pupil ratios (Condie et al., 2007). This finding, to a degree, masks considerable variation within and across schools with regard to regular access to reliable technologies and broadband connectivity (Condie et al., 2007).

North et al. (2000) have focused on the impact of MIS usage on school management abilities. Their study looked at the role of support in bringing about such processes as well as their implications for the future. However, it was clear that an important feature to consider was the relationship of data collection and collation to data use, since school managers needed quite different forms of analysis in some respect to those that were needed by teachers.

Visscher, Wild, and Fung (2001) brought together a series of studies from a range of countries that highlighted important features of computerized school information and management systems, their implementation in a range of schools, the outcomes of this implementation, and implications for the future in terms of further research. Their studies offer the widest view of ICT and school management from the perspective of MIS. However, it was clear from their review that most concern was being focused on data entry and collation, rather than upon data transfer or analysis.

Zain, Atan, and Idrus (2004) investigated the impact of ICT on management practices in smart schools in Malaysia. Their analysis revealed some positive changes including the enrichment of ICT culture in schools, better accessibility to information, more efficient administration, and a higher utilization of school resources. The challenges encountered by the participant schools were time constraints, higher administrative costs, negative acceptance/support from untrained staff, abuse of the ICT facilities, and problems related to the imposed rigid procedural requirements.

Reduction in workload, beneficial impact on time management, and improvement in the quality of reports have been highlighted as major impact of MIS on school administration and management. Some studies show that, as staff in schools have acquired and developed ICT skills and confidence in using the technologies; they have experienced a reduction in some aspects of their workload (Condie et al., 2007; Cunningham et al., 2004). Cunningham et al (2004) claimed that ICT use was valued by senior management in developing school systems for administration and easing management tasks. Granville et al. (2005) found that staff of his selected schools believed that use of technologies had made administrative work easier with regard to accounts, attendance data, and the sharing of confidential information. In other words, school management information systems increase effectiveness and efficiency by saving time and facilitating development of alternative solutions for sophisticated problems (Visscher & Wild, 1997; Pegler, 1992).

The PricewaterhouseCoopers study of teachers' workload (PwC, 2004) established that, ICT did help address workload issues for some staff members, particularly those who were confident in its use. The staff perceived benefits in managing, storing, and maintaining information and other work such as preparing reports. However, some staff reported that it took longer to complete some of their administrative tasks. At the personal level, a lack of confidence or skills hindered progress, while at the school level, the absence of an ICT strategy that addressed workload explicitly and ineffective networks were significant negative factors. Positive factors in addressing workload issues were identified as good leadership, appropriate training, technical support, and effective networks.

Demir (2006) surveyed 98 elementary school principals in Turkey to explore their perceptions about MIS and their use in primary schools' management. The study indicated that although technologic infrastructures of elementary schools in were insufficient, MIS had an important contribution to school management. Demir (2006) suggested that school managers should be encouraged to use information systems and they must believe that data are valuable sources for decision making and that the MIS back up the implementation of educational reforms.

Mumtaz (2000) in her review of this area highlighted both positive and negative factors affecting ICT use in schools. Positive factors included collegiality among computer-using staff, availability of technical support, resources for school development, smaller class sizes, and more formal computer training. Technical support and senior management commitment and support were the most recurring themes (Mumtaz, 2000; NGfL, 2002; Scrimshaw, 1997). Other themes apparent in the literature were the staffs' personal feelings, skills, and attitudes to IT in general (Hruskocy et al., 2000; Kirkman, 2000; Mumtaz 2000).

Similarly a number of inhibitors to ICT use are evident in the literature, foremost among these are lack of time (NGfL, 2002; Mumtaz, 2000; Kirkman, 2000), lack of training (Kirkman 2000, Mumtaz 2000), lack of senior management support (Kennewell et al., 2000; Passey, 2002), lack of technical support (Yee, 2000), lack of ICT resources (Mumtaz, 2000), lack of a genuinely supportive culture (Kennewell et al., 2000), and lack of staff individual confidence and motivation (Kirkman, 2000; NGfL, 2002). Some of the important barriers highlighted in research specifically for ICT use in educational management are the lack of data analysis skills among administrators, lack of training in using ICT-based management tools, and lack of user-friendly softwares for analyzing test results at the school level (Carnoy, 2004).

A more recent study conducted by Dawam et al. (2009) examined the extent of ICT utilization in public and private higher learning institutions in Northern Malaysia. This study focused on identifying the extent of ICT resources provided by the university authorities, the type and extent of ICT usage in daily activities, the ICT proficiency level among faculty members, and the level of ICT integration in teaching activities. The findings indicated that the facilities provided in public higher learning institutes were not as plenty as in private institutes but the level of their usage was quite encouraging. Considerable differences were observed in the use of ICT by educators in their perceived proficiencies and integrating computer technology. The researchers suggested for the inquiry of hindering factors for ICT usage by the educators.

The importance of ICT to society and to future prospects is clear within the educational literature. However, the real significance of this for educational management has yet to be seen within the literature (Passey, 2002). The educational management literature is beginning to indicate that attitudes towards ICT are shifting, and often significantly. This is likely to have a major impact upon ICT and school management. According to Passey (2002), the role of ICT in supporting school management is an area of clear developmental as well as research need. There are a number of critical gaps in the research literature for example the role of data bases within MIS is not being translated into practice (Passey, 2002).

3. Conclusion

Information technology in educational management is a relatively new field that not only needs in-depth studies on systems utilization in schools but also on their effects on the school processes and maybe outcomes (Bisaso & Visscher, 2005). Demir (2006) further supports this argument stating that although there are many studies on the role of information systems on class and teaching, few studies have been done on the use of them in educational management and their effects on the managers.

Passey (2002) states that one of the key priority areas for future research is the investigation of MIS assistance in effective school management. There are issues in this area both with the forms of technology being used, and with the lack of techniques available to enable users to make use of data currently available. Research could have a major role to play in supporting educational endeavour and practice in this area.

The overall review of literature indicates a very positive impact of ICT use in the area of educational management. Principals and teachers' skills in working with ICT have developed significantly over the years and they are using ICT to support a range of administrative activities at both class and school level.

School management information systems have greatly improved over the last two decades and most of them incorporate several important functions required by school administration; however, every school has its own specific needs. Further studies are needed to explore the areas of improvement in MIS as most of these systems are not developed according to the site-based needs. These systems are usually adopted from outside and may need further enhancement according to the site-based management. As Fulmer (1995) suggests that in order for an MIS to be utilized effectively, it should be designed through an inductive process that includes stakeholders from all levels of the organization in order that faculty will take ownership of the system and actually use it.

Studies on MIS should also focus on finding ways of enhancing its use by school principals and administrators. Appropriate training and effective leadership could escalate the benefits of MIS in the area of school management.

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