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► **To cite this version:**

Rory Butler, Adrie Visscher. The Hopes and Realities of the Computer as a School Administration and School Management Tool. Arthur Tatnall; Bill Davey. Reflections on the History of Computers in Education : Early Use of Computers and Teaching about Computing in Schools, AICT-424, Springer, pp.197-202, 2014, IFIP Advances in Information and Communication Technology (SURVEY), 978-3-642-55118-5. <10.1007/978-3-642-55119-2\_13>. <hal-01272284>

**HAL Id: hal-01272284**

**<https://hal.inria.fr/hal-01272284>**

Submitted on 10 Feb 2016

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# The Hopes and Realities of the Computer as a School Administration and School Management Tool

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**Abstract:** Software for school administration and school management started as teachers with a science background started to develop computer programs in order that school office staff did not have to repeatedly type and re-type student lists. Later, computing companies entered the market and software packages evolved. Some governments also mandated which school information systems were best suited for the schools in their country. This chapter traces the original aspirations for the school administrative use of computers (more school efficiency and school effectiveness) and compares those aspirations to eventual outcomes in schools. Some goals have been accomplished, others not yet. The reasons for the latter and the lessons that can be learned from this, are discussed.

**Keywords:** school administration, school management, computer use, school efficiency, school effectiveness

## 1. How It All Started

In short, the following may summarize in staccato what happened. It started with a new subject in the curriculum. Software for school administration and school management was lacking and teachers with a science background started to program in order that school office staff did not have to type and re-type student lists and class lists anymore. Some teachers started programming a TRS-80, an Apple IIe, a Commodore 64, a Sinclair ZX 80 or a similar machine. Next, computing companies donated computers to schools, or provided telephone networks to connect schools using micro-computers. Programs were written in compressed Basic or machine code to deal with the limited memory of the available computers. Some governments successfully mandated which computers and software were best suited for the schools in their country. In other countries attempts to do the same were unsuccessful and schools decided for themselves what they wished to use. A range of small companies, often founded by teachers, entered the school administration market and software packages evolved including, among other things, student data, timetables, subject results, an accounting package and electronic mark book, payroll, library, resource manager, and truancy control. In the early 1990s the programs were transformed to the Windows environment, and several years later, to web-based systems. School administration and school management software in several countries integrated with

software for the storage and analysis of the results of externally developed standardized student achievement tests.

Computers were introduced into schools in the 1980s as a new subject in the school curriculum. The machines in most cases were not intended for developing and enhancing school administration and management (Bluhm, 1987; Visscher & Spuck, 1991). In fact, school administration and management only began to establish as a discipline in higher education in the early 1980s. However, the unintended effect of computer-aided school administration did happen once teachers got access to these machines in schools. In the 1980s usually mathematics or science teachers started to develop stand-alone applications within their own schools for student registration, absentee administration, test score administration and the like. These same teachers were often the ones who had to construct the school timetable, and they loved the idea that the computer would 'spit out' a completed timetable after the relevant input had been entered. Later commercial software vendors entered the stage as they saw the market evolve. They sold packages of school administration applications which, to some extent, were integrated i.e. used the same data ('Single entry - Multiple use' was the slogan). These systems were intended to be used in as many schools as possible and were therefore less tailor-made than the first applications developed by the pioneers who worked for one or a few schools.

In countries like for example New Zealand, Australia, The Netherlands and England in the nineties companies, governments, universities and others set up special projects to approach computer-assisted school administration and management in a fundamental way by analyzing schools in terms of their information household characteristics and involving school staff to become involved to some extent in the design of school information systems that could provide as many as possible valuable forms of administrative and management support to schools (Visscher, 2001). They also tried to find a balance between the need for standardization, and options for tailor-made forms of support. *Efficiency* improvement had been the primary goal during the earlier stages of school information system development but in this later stage system developers thought that the new school information systems also could promote more school *effectiveness*. In the next section we will elaborate on this concept.

## **2. What was Expected/Hoped For?**

Initially the idea was that the advent of the computer would make *information retrieval and document production* more *efficient* in schools (i.e. less resources in terms of time, money, and human resources would be needed for these school office activities). The computer with a central database enabled the single entry of data instead of archiving and maintaining the same data manually at various locations (e.g. school office, caretaker, counselor, deputy heads) in the school. It was expected that this would save data-entry time, and prevent errors caused by the repeated registration of data. The *computer-assisted manipulation of data* (making computations, lists, reports, sorting data, etc.) was also expected to take fewer resources and as such to improve the efficiency of schools. The idea was that, as a result, teachers, managerial

staff and school counselors could dedicate more time to ‘higher order’ activities. Later, when web-based versions of school information systems came into existence, more efficient *data communication* between mutually connected internal and external computers (e.g. the Ministry of Education, the School Inspectorate, follow-up schools and feeder schools) was considered to be another way of improving school efficiency.

*School effectiveness* can be defined as the degree to which the primary goals of schools (adding as much as possible to students’ entrance levels in areas considered relevant for them and for society) are met. It was expected that computerized school information systems also could contribute to improving school effectiveness by supporting more *informed decision-making* with respect to structured problems (problems with a limited number of solutions, e.g. the composition of lesson groups, the construction of timetables), and regarding more ill-structured topics/problems, with a much larger set of ‘solutions’. The latter kinds of topics/problems are, for example, reflected by questions of the following kind (it was expected that questions of this kind could be answered better now by analyzing the data in the school information systems):

- 1 Does truancy in our school have a relationship with other school factors?
- 2 How do our students perform at national examinations, and which relationships exist between their performance on the one hand and student and school characteristics on the other hand?
- 3 To what extent do our teachers differ in terms of how much students learn in their classes, and how can we improve average teacher performance?

The fact that the computer enabled the possibility of studying these aspects of school functionality was expected to improve the quality of school decision-making and, by that, to improved school effectiveness. Moreover, school staff was expected to contribute more to school effectiveness because the computer would take over lots of the ‘stupid’ (routine) work they used to do. As a result teachers, school managers, and counselors were expected to be able to spend more time on trying to improve the quality of instruction and overall school functioning.

### **3. What Really Happened and What Can We Learn From This**

Indeed, lots of routine school administrative activities are done nowadays by means of the computer. Things that were already done before we had computers can now be done more efficiently. New activities that have become possible since we have computers (e.g. web-based surveys among parents or school staff) can also be done now without requiring a large amount of resources. Although the prediction of the ‘paperless office’ has not become reality very few schools probably would like to go back to the days of the manual registration and manipulation of data. Exchanging data with parents, other schools, individuals and organizations, also as a result of the internet, has become much easier and efficient.

Using the computer for solving structured problems (e.g. timetable construction) will also have added to more time savings, and maybe also to more school effectiveness as the computational power of the computer enabled computing several

alternatives which from an educational point of view a best alternative could now be implemented.

School staff are saving considerable time as a result of computer use. What the time that is saved is used for is uncertain. Probably part of that time is spent on computer-assisted activities that previously were not yet carried out but it does seem that more and more administrative paperwork is being demanded of teachers. Part of the time saved may be spent on other activities as well. We however have the impression that not many schools use their school information systems for making more informed decisions for ill-structured problems by answering the kinds of questions presented in the aforementioned. This may be due to various factors (Visscher, 1996):

- a) The systems do not support answering these questions in a very user friendly way which means that it will be very difficult for the average school to obtain the information they would need for more informed decisions.
- b) The data stored in school administrative information systems neither tell validly how much students learn in schools and to what extent that knowledge gain is satisfactory (for example, in comparison with a relative or an absolute standard) nor provide insight into the quality of the teaching processes within the classroom. As such the basis for improving the most important school process and its output is weak. There is however a trend observable that results on standardized student tests become more integrated in the systems that initially were developed purely as school information systems. That trend makes those systems more valuable for improving the primary process of schools.
- c) The average school does not operate like a 'learning organization' which yearly sets very specified performance goals and evaluates their accomplishment, and as such tries to improve the quality of its functioning in a systematic way. We know from international research (e.g. Witziers, Bosker & Kruger, 2003) that few school leaders operate as instructional leaders who see improving the instructional quality of their school as the most important task. Generally, schools also are not known as very powerful policy-makers. The most important coordination mechanism in schools in terms of Mintzberg is the standardization of skills: teachers are supposed to be able to deal with the uncertainty and complexity of the teaching-learning process as a result of the profound training they have received regarding subject matter content and didactical strategies. So, teachers are relatively autonomous and most school managers do not interfere much in teacher territory by analyzing teacher work (e.g. by means of classroom observations), their results, and by looking for ways to improve these. As most schools do not have a performance-orientation that leads to the continuous analysis of the quality of the primary process (i.e. teaching in classrooms) and the related levels of student achievement, it is not surprising that providing them with an information system that could support them in important ways in analyzing the quality of school functioning, and how that quality can be improved will be a sufficient precondition for benefitting from this tool for performance improvement.

Changing schools in this respect would first of all require that managers and teachers learn to see the importance of investing in such activities. If they become

motivated for improving performance they will need the knowledge and skills for doing it, like learning to ask the questions that can be answered by analyzing data from a school information system, to involve the relevant actors in decision-making processes (including the teachers who love their autonomy), to take decisions, and to implement and evaluate the decisions taken. This is all easier said than done especially if the decisions refer to the teaching process where teachers are used to much freedom. Teachers in general work hard and do their best, and many reason that, if student achievement is not as hoped for, then they should not be blamed for it as in other years they had good results with the same kinds of activities). At the same time we know from research (Hanushek, 2011; Hattie, 2009; Nye, Konstantopoulos, & Hedges, 2004) that teachers vary a lot in terms of their professional expertise, teaching skills and results, so there is good reason for utilizing the available tools for improving poor performing teachers (especially in the interest of the future of the students, and society as a whole). It will take a lot of school organizational development in order to make informed decision-making for school improvement happen. That is not so much a matter of technology (although user friendly ways for data retrieval form a necessary precondition) but especially a matter of how schools operate, and the skills school staff have for benefitting from the wealth of data in their school information systems. Schools cannot do this on their own, it will take carefully designed and tested professional development trajectories to transform schools into more learning- and improvement-oriented organizations.

In addition we would like to end with a few observations of a different nature:

- a) Governmental departments proved to be the least likely to be successful in guiding the evolution of computerized administration. What seemed to happen was that a few younger people, frequently without the experience of having been teachers in schools and with little experience of the way governments interface with their communities, were given the power to make decisions which were often ill-informed. As a consequence huge wastes of energy, time and finances resulted. It seems to be far more efficient to let the market decide what works best.
- b) Locally produced software is best. A package might look wonderful operating in another country but it inevitably fails to cater for the myriad of details specific to a particular country. These have evolved over time and it is not at all sensible to expect a 'foreign' package to meet the needs of a local community – even in the case of something as seemingly straightforward as school financial accounting where processes are based on international practices.
- c) It is not particularly wise to build too much flexibility into your systems even if some users ask for it. For the average user lacking the skills to deal with and benefit from that flexibility, standardization is best and most attractive.

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The authors thank Alex Fung for his feedback on the previous version of this chapter.