Comparative Evaluation of the Implementation of Computerised School Management Systems – in Hong Kong, The Netherlands and England

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Abstract: The paper describes the results of a study to assess the implementation of computerised school management systems used in secondary schools in Hong Kong, the Netherlands, and the UK. Large-scale surveys were carried out in all three countries and from the results we evaluated system-usage and the implementation promoting factors.

1. INTRODUCTION

Over the last decade schools in Hong Kong, the Netherlands and the United Kingdom have experienced much organisational change. There has been a tendency toward devolution of financial and managerial responsibility away from central government into local government and/or schools. Computerised school administration systems have been introduced into schools to contribute to such local management.

In 1993 the Hong Kong government invested 70 million US dollars in the development of an integrated computer network, linking the Education Department and all government and aided sector primary and secondary

schools. This included the implementation of a centrally developed and standardised School Administration and Management System, SAMS, in all public-sector schools.

In the Netherlands there has been no centrally led initiative providing school information system (SIS) software. Three SIS's emerged over the last decade as market leaders in the secondary education marketplace, School+, Scholis and Schoolfact. These three systems were investigated in the Netherlands study.

In 1989 the UK government made available £325million to provide computer systems to schools in an enterprise that was administered by Local Education Authorities. SIMS™ (Capita Software) the most widely used software was the focus of the UK study.

The SISs investigated were modular in architecture. The SAMS in Hong Kong consisted of 12 core applications and 4 supporting applications handling student, staff and organisational information in many different contexts. In the Netherlands School+, Scholis and Schoolfact consist of around 20 main modules with similar functionality. SIMS in the UK comprises 28 different modules.

This comparative study used a similar questionnaire in all three countries to investigate issues in this diverse range of SIS implementations. In 1996 in Hong Kong, questionnaires were distributed to 641 schools using SAMS with a reply rate of 56%. The schools included government, private and subsidised primary, secondary and special schools. In the Netherlands (1997) questionnaires were sent to 498 secondary schools with a return rate of approximately 13% (63 schools). In the UK (1999) questionnaires were sent to a sample of 962 English secondary schools with a return rate of 47%. Although the UK study was carried out respectively three and two years later than the Hong Kong and Dutch study we do not think the situation in those two countries has changed much.

2. RESEARCH QUESTIONS, FRAMEWORK AND DATA ANALYSIS

The following questions were addressed:

1. The extent to and ways in which SISs are used in schools
2. The user opinion on system-quality
3. Users' views on the nature and quality of the implementation process
4. Factors affecting the degree of SIS-usage.

Figure 1. The variable groups influencing SIS-usage and its effects (source: Visscher 1996)

The variables relating to the above issues that were investigated in this study fell into five distinct categories according to Visscher's model (Visscher, 1996; see figure 1 above): features of the SIS, system-usage, the implementation process, school organisation, and the intended/unintended effects. The studies assumed possible interrelationships between all these variable groups. System-usage is expected to be more intense if users' evaluations of the qualities of the SIS, the implementation process and the school organisation are more positive. More intense SIS-use is expected to lead to more (un)intended effects.

Descriptive statistics were computed for all variables studied (frequencies and cross-tabulations). A limited number of variables were selected since they were considered as the most promising predictors of system-usage. They were entered into a stepwise regression analysis to determine which variables influence SIS-usage.

3. RESULTS

3.1 System-usage

The extent and type of SIS-module usage varied quite widely in the different countries. In Hong Kong schools the amount of module use varied from one school to another, and only a small number of schools were found to be using all the SAMS modules. Overall, the most widely used modules were the Housekeeping and Security, Student, and Staff modules.

In the Netherlands the amount of module usage also varied widely between schools. The most frequently used modules overall are Student Test Scores, Final Examination Registration and Financial and Student Data modules. A little less common was the use of the modules Attendance Registration and Timetabling.

SIMS in the UK had the widest variety of modules of the three countries. Of these the most frequently used modules were Student Data, the Information Manager and Timetabling followed by Financial Management and Student Attendance.

3.2 Direct and indirect system-usage

Module usage varied with the users roles within the school. Usage was categorised into 'direct use' by those who had hands-on use of the system and 'indirect use' by those who used printouts supplied by other staff.

In Hong Kong 57% of the respondents were direct SAMS users (50% of these were SAMS administrators). Principals tended to be indirect users, mainly using reports from the system for routine administrative tasks. Teachers used SAMS least, over 80% for less than one hour a month (directly and indirectly). Only SAMS administrators used the system for a substantial number of hours per month (40% direct use 11-30 hours). Clerks or secretaries tended to use SAMS less than 10 hours per month, only 18% used it directly for over 11 hours. Overall, the degree of SAMS use was low.

In the Netherlands 76% of the sample were direct users and 24% indirect users. There was limited system use by teachers together with relatively intense use by clerks and SIS administrators, which was consistent with expectation, as was the limited direct use by principals. Among 60% of principals SIS-usage was limited to 4 or less hours per month. This is much lower than that in the UK study. However 25% of principals and SIS administrators used the system indirectly for 5-10 hours per month, which is similar to UK findings.

In the UK a different pattern was observed. On average across the whole school, direct use was 5-10 hours per week and indirect use 1-4 hours. This was much higher than in either of the other two studies. Only 1% of the sample were never direct SIS users. Clerical staff and office managers worked the longest hours using the system directly, followed by SIMS administrators and teachers. Heads and deputy heads used the system least. However the amount of time spent on indirect use was similar across all roles.

3.3 Modules used in making management decisions

The Hong Kong study showed that for managerial purposes, the most frequently used information was on Student Achievement. Student Attainment and Annual Score statistics, Class Overall Score List, Score Statistics and School and Class Structure Lists were the printouts most commonly used by principals in making managerial decisions, but there was no evidence to show that a large majority used these modules over others.

In the Netherlands the analysis showed that considerable numbers of printouts that were supposed to have a management support capacity were not used by principals. The printouts used most commonly concerned student results and administrative printouts (e.g. student counts).

In the UK, the modules used for managerial purposes were financial management and information analysis, followed by timetabling, attendance and personnel, assessment and cover (teaching duties) modules.

Modules such as financial and personnel reports in which relationships between data are portrayed, or in which patterns in the data are analysed in support of school policy-making were not used much in the three studies. Hence it is probable that management support, if it exists, is of an administrative type while higher order forms of management support are largely under utilised.

3.4 Perceived quality of the SISs

The perceived quality of the SISs compared with manual/previous systems used was assessed for direct users only (Table 1).

Table 1. Average overall level of satisfaction compared to previous system

	HK (secondary)	Netherlands	UK
Much Worse/worse	2%	7%	4%
Same/ Satisfactory	20%	22%	14%
Better/much better	57%	71%	64%
Don't Know/Missing	21%		18%

The following aspects of SIS-quality were compared to the previous system: data input, data accuracy, data relevance, data currency, information completeness, management support capacity, system performance evaluation and ease of information availability.

The Dutch and UK results were broadly similar to the majority of users preferring the current system to any previous. The results for Hong Kong however suggested that a slightly smaller number of users evaluated the system as (much) better.

3.5 The implementation process

In Hong Kong about 60% and 40% of users had received external and internal training respectively. The rest had not been trained at all. The training hours varied among the four respondent groups, administrators being trained the most: 40% for 1-30 hours, 60% for more hours. Around half of the users were neutral on the quantity and quality of the external and internal training received. Around one third of them were (very) happy and one fifth (very) unhappy.

About 60% of Dutch users had had external training and only about 30% had internal training, much lower numbers than in the UK. As with the UK study, the amount of training they received was very dependent on the role of the user, for example the majority of clerical staff had received 11-30 hours training.

In the UK 91% of the sample received some external training. Of these 80% were trained externally by the Local Education Authority (LEA). Internal training was received by 90% of the respondents. There has not been much internal training in the UK, the majority of users having experienced little or none. The majority was happy with the quality of the training but not so happy with the quantity.

The emphasis in the balance of training was slightly different between the UK and the Netherlands with more technical and practical training in the Netherlands. Table 2 shows how users evaluate the content of the training, when they have to choose between two extremes.

Table 2. Balance of training*

	Hong Kong	Netherlands	UK
Technical system aspects –	20% v 60%	50% v 15%	14% v 43%
How to use system			
Practical system use –	65% v 10%	37% v 20%	45% v 11%
Theoretical use			
Administrative work –	30% v 45%	36% v 28%	21% v 25%
Managerial functions			
Retrieving data – Inputting data	NA	37% v 13%	18% v 17%
Printing out data –	50% v 20%	37% v 23%	35% v 16%
Interpreting and using data			
Printing self-defined reports	10% v 60%	28% v 27%	14% v 36%
– Printing standard reports			

* Extremes only shown, central values not included

3.6 Access to help outside or within school

In Hong Kong, if users experience a problem with SAMS, 40% were (very) happy about the ease of getting help from school, 30% neutral and 30% (very) unhappy. As far as external help was concerned, only 48% were (very) happy. Sources of help being used were the SAMS-hotline of the Education Department, the SAMS administrator in school, help from a colleague, and the user manual.

In the Netherlands 44% of the users were (very) satisfied with the ease of getting internal help when they experienced a problem with their SIS. About 30% were (very) satisfied with the ease of getting external support, 30% of the users were unsatisfied.

When users had a problem, 77% of them frequently worked this out themselves, 50% often consulted the system administrator. A hot line, colleagues within school, and the system manual were each used frequently by 20-30% of the direct users. Colleagues outside the school were seldom a source for problem solving.

In the UK similar results were obtained. 48% found it (very) easy to get help within the school and 37% found it (very) easy to get help outside the school. The majority of these (85%) often or very frequently solved problems themselves. Of the users 46% said that SIMS administrators often solved problems and 40% indicated that they successfully used the SIMS/LEA hotline. Only 18% used on-line help.

3.7 Levels of user satisfaction

When average variable scores were investigated a number fell below neutral on a 1-5 normalised scale (5 being the most positive user response, 1 the least).

In Hong Kong users were mostly dissatisfied with the quality of SAMS. The results below neutral value were: the extent of user training, the quality and quantity of both internal and external training which was also perceived to be unsatisfactory, previous computer knowledge, perceived quality of information about SAMS, and the perceived clarity of the goals of the innovation process.

In the Netherlands the variables below neutral value were: the extent of external and internal training, ease of getting external help, extent of hot line support, satisfaction with the innovation pace, help from internal colleagues, external colleagues, and from the user manual.

In the UK below neutral scores were obtained for working environment, training (internal and external), problem solving, user interface issues, system quality, planning and communication, the amount of time spent on the system, and the users computing experience.

3.8 Predictors of SIS-usage

In addition to the descriptive results presented so far regression analyses were carried out to find out which variables explained most variance in SIS use. Put differently, the goal was to determine which variables seem to be associated most with the extent of system-usage. Fourteen variables were entered into the analyses because they were expected to be the best predictors of SIS-usage. Table 3 shows which variables indeed proved to predict SIS-usage in one or more of the studies.

Table 3. Predictors of System-usage

	Hong Kong	Netherlands	United Kingdom
Start motivation	x		x
Computer experience	x		x
Internal training	x	x	
External training	x	x	x
SIS quality	x		
SIS data quality	x		x
Clarity innovation goals	x		
Clarity innovation means	x	x	
Ease internal help	x		x

Five variables did not have a significant relationship with SIS-usage: ease of external help, encouragement from principal, encouragement from SIS-administrator, satisfaction with training, the length of the SIS in operation.

Table 3 clearly shows the importance of the implementation process. Training is the most relevant variable, possibly because it can be used to motivate the target group to use the system and clarify the goals and methods of the innovation process. The perceived quality of the SIS and the data it produces also appeared as significant predictors of system-usage.

Also found to be important are the amount of computer experience users already have, and the ease with which they can get internal help if the experience problems with SIS-usage. The data show that the quality of the design activities, the resulting SIS, and the data it produces are crucial.

4. CONCLUSION

Summarising, the meta-analysis showed that:

- SIS-usage varies considerably between the schools in the same country
- The basic administrative SIS modules prove to be used most for routine tasks (e.g. financial and student administration)
- There is little support of higher order school management activities which could lead to better school policies and improved school functioning
- Few schools use all modules of the SIS they possess
- Direct system-usage varies across the three countries between 60% and 100% of the respondents and is dominated by clerical staff and SIS administrators
- Principals use SISs mainly indirectly
- Across the three countries about 60-70% of respondents think the SIS is (much) better than their previous system; according to 20-30% the SIS is no improvement (2-4% even considers it a deterioration)
- About 30% of users are unhappy with the ease of getting support in solving problems with SIS use
- Users on average also seem to be dissatisfied with the quality of the SIS and the training (e.g. too technical), the innovation clarity, and the support received during the change process
- Most predictors of SIS-usage prove to be aspects of the implementation process.

Overall, the research indicates that although there is room for improvement SISs are a useful, if not indispensable tool for school administration. However, school staff should benefit much more from the possibilities of SISs to support their higher order management work. To

achieve the latter we first of all need better SISs, systems that have been designed from the perspective of school management work. The results clearly highlight the impact of the implementation process, particularly the role played by training. This has provided an impetus for further research on how carefully designed training can help in promoting managerial SIS use. For example, Visscher and Branderhorst (2001) are currently involved in a quasi-experimental study, in which a school management training course has been designed to take account of the professional experience of school managers, their characteristics as adults, the factors motivating them for change, the ideal mix of instructional strategies, and the potential barriers for change. From this further research we hope to be able to refine our insights into how training can help in adding value to the management and functioning of schools.

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BIOGRAPHY

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