

INNOVATING ON A SHOE-STRING: A WESTERN CARIBBEAN CASE STUDY

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The Joint Board of Teacher Education, JBTE, is a partnership in teacher education in the Western Caribbean involving three Ministries of Education, fourteen colleges training teachers, three teachers unions and associations in the Bahamas, Belize and Jamaica and the University of the West Indies, Mona Campus. Established in 1965, the mission of the JBTE is to guarantee the quality of teacher education in the Western Commonwealth Caribbean. The Joint Board certifies teachers trained at the undergraduate level in colleges in the Bahamas, Belize and Jamaica. The Secretariat of the JBTE is located on the Mona Campus of the University of the West Indies, UWI, Jamaica. Since its inception the JBTE has certified more than 60,000 teachers in the three member countries.

The JBTE carries out its quality control and teacher certification mission through exercising final authority with respect to the determination of entry standards for admission in teacher education programmes, the approval of curriculum, the setting and marking of examinations for students employing a system of external examiners and in the awarding of professional credentials in teaching. Over the thirty-five years of its operations the JBTE has always carried out its quality control functions in an interactive and participatory manner that intimately involves the principals and staffs of the fourteen member colleges and external examiners drawn mainly from the Ministries of Education and the UWI. The Secretariat of the JBTE is located in the Institute of Education, which supports the work of the Secretariat by engaging research and activities in the areas of curriculum, material, staff and institutional development, project cycle management and policy advice.

CHALLENGES IN THE 1990s

The decade of the 1990s brought new challenges to the JBTE partnership. These included:

1. The modernisation of instruction to bring colleges in line with technology now common in homes, offices, factories, commerce and entertainment.
2. The improvement of the quality of teacher education in the light of the higher education standards required by the information and knowledge society.
3. The need to provide continuing professional development to teachers in-service. The rapidity and profound nature of the changes taking place in society and the generation of new knowledge about learning dictate career-long professional development by teachers in order to keep abreast of the transformations in progress.
4. Shrinking resources as structural adjustments and the financial woes of the country continue to threaten, and actually impede, the flow of resources to the education sector.

5. Globalisation, especially with respect to the internationalisation of educational standards particularly at the tertiary level.
6. The necessity for Caribbean societies to become not only consumers but producers of knowledge

In response to the demand to meet these challenges, as well as to find solutions to these very real problems, as they affect teacher education, the JBTE has identified information and communication technology as a critical resource and have embarked upon the following initiatives:

- A) Developed a Management Information System, College Manager, to allow colleges to manage their operations more effectively and effectively in the face of severe financial constraints as well as communication more effectively with the Joint Board Secretariat and the Ministry of Education.
- B) Established LANs in both the Institute of Education and the Joint Board Secretariat and integrated them so that there is on-line connections through the UWI network backbone. The intention is to facilitate research and development activities through access to more accurate and precise data available through the College Manager database.
- C) Established a Web Site that is designed as the hub of many of the JBTE operations. The Site has been designed to:
 - i) Provide information about the JBTE programmes, courses, regulations, personnel, publications, curriculum, examinations and events.
 - ii) Provide training and technical support for School and College Manager.
 - iii) Host the JBTE On-line Conference capability.
 - iv) Be the centre of the JBTE Distance Teaching operations.
 - v) House the tutorial system planned to assist students.
- D) Purchased from Simon Fraser University the license for Virtual U, a course management and conference system, which is intended to give Boards of Studies the means, through asynchronous conferences, to share best practices, archive their decisions and knowledge in ways that are easily retrieved, share teaching and Internet resources, and assist in the delivery of staff development through short courses and seminars.
- E) Started to deliver some UWI Masters in Education courses on-line, beginning with courses in teacher education.
- F) Plan to develop a tutorial system to designed to support the full and part-time instructional programmes in colleges and instruction through distance teaching operations. The tutorial system is currently on the drawing board.

This paper seeks to document some of the experiences gained and the lessons learned in establishing the College Manage Information System and database. This is still very much a work in progress. This innovation has been conceived and executed with no external assistance but totally from the resources of the colleges and the JBTE Secretariat. It is fair to say that this innovation has been done on a shoestring in terms of resources but with the determination of the partners involved to use information and

communications technology to improve the quality of teacher education through the better management of their operations.

THE GENESIS OF THE INNOVATION

Over the period 1981 to 1984 the JBTE partnership executed major reforms in teachers education and the operations of the JBTE itself. When the JBTE was established in 1965 Jamaica was the only independent country of the three. By 1981 all three countries were independent and began to execute national agendas that were similar but different in important details. Moreover in its first fifteen years of operation the JBTE operated under a policy that allowed each college a great deal of flexibility in its programmes. Accordingly the JBTE only set examinations in the final year of the three-year programme of teacher education.

The 1981 reforms made three radical departures from the previous policies of the JBTE. First, it adopted the policy of aligning the teacher preparation programmes in each country to the national curriculum of the country and to award credentials consistent with the programmes in each country. Second, it adopted the policy that for each credential that the JBTE awarded there would be common admission criteria, common curricula, and common examinations, in all five programmes by which teachers were prepared. The third policy was to adopt a semester structure for the delivery of the teacher education programme and to require external examinations for semester examinations in all three years of the different teacher education programmes.

The first policy responded to the divergence in the national policy frameworks in the three countries requiring corresponding divergence in the preparation of teachers. The second policy responded to the strong demand for by the teachers unions for common pay for teachers holding the same credentials. The third policy was a response to demands to improve quality through the external review of standards in all three years. The experience of the first fifteen years of the JBTE was that failure rates were very low in the first two years that were internally assessed in each college but very high in the third year that was externally assessed.

The practical implications of these reforms for JBTE Secretariat was that from producing examinations for a single year in all countries, it now had to produce different examinations for the three countries and to produce examinations for all three years of the teacher education programmes. The number of examinations to be produced each year jumped for about twelve to over three hundred courses. At the same time the resources provided to support the reform did not match the magnitude of the increased responsibilities of the Board. The JBTE Secretariat met this challenge successfully by employing personal computers in the production of its examinations. Indeed, with only a modest increase in staff and resources the Secretariat was able to produce better quality examinations at the same time that the numbers of examinations increased dramatically.

By the early 1990s the JBTE Secretariat began to be interested in using computers not only to produce the JBTE Examinations but also to process them. The Secretariat

therefore commissioned PROSOFT, a small Jamaican software firm, to build a student and staff record system that would capture biographic data, health data, confidential information, courses taken by students, courses taught by staff, examinations, profile information, activities in college and other information.

THE DEVELOPMENT AND FEATURES OF COLLEGE MANAGER

Very early in the design phase of the student and staff record system, the other partners in the JBTE, namely the colleges represented by their principals and the Ministry of Education, Jamaica became interested in the extension of the system being developed to address issues that were important to them. College principals were interested in a system that would facilitate and improve their relationships and responsibilities with the JBTE but also in features that could be added that would enable them to manage their institutions better.

In Jamaica, while the Government has devolved final authority to the JBTE with respect to admissions requirement, curriculum, examinations and the award of credentials in teacher education they have retained the powers to deal with policy, finance, administration, and the discipline of staff and students. In addition, while the Colleges through their Boards of Directors, are fairly autonomous with to the selection of students, the appointment of staff and the expenditure of funds they must comply with Ministry guidelines with respect to the qualifications and experience of staff, student enrolment quotas, tutor student ratios and salary scales. The Ministry of Education, therefore became interested in obtaining more accurate data that would facilitate their planning, administrative and budget processes in particular.

What was therefore originally conceived as a student and staff record system eventually expanded into a comprehensive human resource management system. The expansion of the design concept was facilitated by the fact that PROSOFT had been successful in developing banking software that had obtained the seal of approval of the Bank of Jamaica. College Manager, therefore became a product jointly owned by JBTE and PROSOFT.

Features of College Manager

College Manager has the capacity to manage both single and distributive databases. College Manager therefore comes with a college-site server version that allows each institution to manage its own affairs using its LAN. By design, College Manager also affords online connectivity with the JBTE, Ministries of Education, Project Units or any other central body. However, the aggregated database allows only entities with vested interest access to the database at a particular level. College Manager therefore is also available in a Super-server version that has the capacity to facilitate the creation of databases for each of one hundred or more levels of aggregation on the criteria specified for up to 65,000 institutions.

College Manager is designed on a modular basis. Nine comes standard with College Manager. These are the:

- College Profile Module
- Student Module
- Staff Modules, three (Academic, Administrative and Ancillary)
- Attendance Module
- Student Assessment Module
- Report Designer
- Security Module

Other supplementary Modules includes:

1. Financial Manager
2. School Fees Manager
3. Data Transfer
4. Continuing Professional Development of Teachers
5. Payroll Manager
6. Accounts Reconciliation Manager

The Financial Manager is a fully functional resource and accounting package that is totally integrated with the database of College Manager and is capable of keeping record of all student accounts, all investments made by the school in major currencies and all regular transactions undertaken in the operation of the school. It can also be customized at the level of the college's operation. The School Fee Manager keeps record and accounts of all fees paid by each student.

Other modules in varying stages of development includes:

1. Time Tabling and Scheduling
2. Curriculum Manager
3. Governance
4. Teacher Appraisal
7. Grounds Manager
8. Equipment Manager
9. Materials Manager
10. Playfields Manager
11. Sanitation Manager

The database and the programme are separated so as to facilitate the customisation of the database, which does not necessitate a change to the programme and vice versa especially with regards to upgrades.

College Manager has a powerful Report Designer whose output can be opened and used by any of the Microsoft Office suite applications. This facilitates mail merges using information from the College Manager database and MS Word or Excel Spreadsheets or Access Database or MS Project. Further, the Report Designer output files can be opened in SPSS, which facilitates statistical analyses using the full range of SPSS functionality.

The College Manager Reporter Design can be used to create reports from an Excel spreadsheet with data not in the College Manager database. This is a useful feature, since Excel does not come with a reporter designer.

The Developmental Stages

College Manager was first released in September 1996 using Windows technology. As colleges began the process implementing the system two major problems were encountered. First, some colleges were not able to afford the Pentium computers that were needed to establish the administrative LANs on which College Manager would run. Second, frequent crashes of Windows required regular site visits to correct problems that arose in the database. Neither the colleges nor the JBTE Secretariat could afford the maintenance costs involved. These two problems stalled the JBTE wide implementation of system.

Using web and browser technology tools that came available in late 1997, College Manager was upgraded to a web and browser based software. This resolved the two major problems that had stalled implementation since only the Server was required to be a top-end machine. Others machines on the LAN only needed to be able to support a standard browser starting at the level of Netscape 3 or Explorer 3. Second, corrections to the database could be made on-line once access was granted to the College Server. Also training in the use of the software could be developed on-line to provide just-in-time training. Prime Minister P. J. Patterson of Jamaica officially launched College Manager in November 1998 at the JBTE Exposition in celebration of the 50th anniversary of the founding of the UWI.

OBSTACLES ENCOUNTERED AND OVERCOME SINCE 1998

Having overcome the issues to deal with the cost of acquiring equipment by the colleges and the human and financial cost of maintenance of the system, through upgrading the software from a windows to a web and browser based application, the initiative moved to the implementation of the College Manager Administrative WAN linking the colleges to the JBTE Secretariat and the entry of data related to staff, students, courses, examinations etc. Since 1998 several obstacles have been encountered and overcome. These can be listed briefly as follows:

- Debugging the software. Like any newly developed software College Manager has had its share of bugs, which were made evident in moving from testing under laboratory conditions to implementation in the real situation. College Manager is as bug free as it is possible with any application, given the current state of web and browser technology.
- IP address and network issues related to the fact that the JBTE Secretariat is part of the UWI, Mona campus network and the JBTE has its own IP address class that is distributed to the networks in the colleges. A proxy server solution was developed to resolve the issues involved.

- The management of the college LANs and databases. Those colleges that have been able to employ full-time systems administrators/database managers, of the required technical competence, have made progress at a much faster rate than those that have had to rely on less available and/or less competent persons. Indeed, there have been two horror stories involving the wiping out of the college's database by persons running into difficulties in managing Window NT and re-installing it without properly backing up the College Manager database. In one instance the particular college had already put on its entire student enrolment and the person responsible for the error tried to pass it off on the staff of the JBTE Secretariat who uncovered the error. The resolving the issues that resulted from this situation took almost one year.
- Coordinating the work of the systems administrators/database managers in the colleges with the companies contracted by the colleges to service the hardware and JBTE Secretariat central system administrators who designed the College Networks and installed College Manager. It was a challenge to establish systematic channels of communication between these groups of persons all of whom are critical to functioning and reliability of the JBTE WAN and College Manager database.
- The huge burden of the initial data entry. The start up of the system requires biographic data to be entered for all students and staff members in each college. While time saving measures have been devised for entering courses, subjects and examinations data there is no shortcut for the biographic data that must be entered individually. This became a major problem for two reasons. First, the clerical and administrative resources of the traditional manual systems operated by the colleges are concentrated at the reporting end of the system. The computerised management information system makes reporting a breeze, just a few clicks. However, the data must first be entered. Second, Jamaican colleges training teachers are understaffed, hence the pressures and urgencies of the manual system generally poses substantial problems for the time needed for data entry. While the automation of management addresses and relieves the understaffing problem, getting over this hump constituted a significant obstacle that the larger colleges stumbled on. The Ministry of Education provided the solution making a grant to each college that allowed it to employ temporary staff to do the data entry. By October 2000 all colleges had entered their student and staff data.
- Turnover of clerical and administrative staff in the colleges is continuing challenge is that new staff needs to be trained, but often are assigned responsibilities before receiving the necessary training. The solutions developed for this obstacle has been the provision of periodic training for new staff and the production of a self instructional CD.
- Fire destroyed the administrative buildings of two colleges. In one instance, the fire occurred just prior to the commencement of the College Manager initiative. This delayed implementation at that college because the temporary accommodation, used until new buildings were constructed, was not conducive to the location of the administrative LAN. In the other instances, the college had entered all of their student and staff data, and had backed up their data on tape,

- but both server and backup tapes were in the building that was burned. Both colleges have overcome their setback and came on stream in 2000.
- While some colleges and the JBTE Secretariat were up and running early, because some colleges lagged behind in implementation, for different reasons, the system-wide implementation of the initiative was significantly delayed. From conception of the idea, to all colleges entering data that is shared with the JBTE Secretariat has taken seven years.

BENEFITS

Notwithstanding all the obstacles that have been encountered and overcome, the delays and setbacks in implementation, the JBTE partnership is now well on the way to reaching their intended destination and have derived several important benefits from this initiative. Without attempting to be exhaustive it is important to list at least of benefits. These are:

- The JBTE partners now have installed a state-of-the-art management information system, customised to the JBTE operations, which they could not afford to purchase on the open market. While each partner has probably contributed more than they envisaged originally, that contribution pales in comparison to the cost of comparable products and their customisation to the specifics of the JBTE operations.
- Colleges now have a management information system that has the potential to relieve their perennial problems of understaffing in handling student and staff matters, which makes information more readily retrievable and allows on-line transactions with the Joint Board and the Ministry of Education and Culture.
- The JBTE Secretariat now have in place a central database that has the potential to significantly speed up the time for processing and producing the JBTE examinations results and will allow much more sophisticated techniques to be used in ensuring common standards across the colleges. The Institute of Education has readily available database that should facilitate the conduct of research and facilitate project cycle management.
- The system that has been put in place has the potential to allow the partnership to address issues that were not envisaged originally. For example, students in Jamaica apply to a specific college and compete for the places available at that college. While each college admits the 'best' from among its applicants, as a whole the colleges certainly do not admit the 'best' applicants from among the total applications to enter the teaching profession because the quality of applicants are not evenly distributed across colleges. As a result of discussions involving the Jamaican colleges, the Ministry of Education and the JBTE Secretariat it was agreed that for the college year beginning in August 2000, colleges receiving large numbers of applications would overbook their admissions by 20 per cent and send all other qualified applications to a common pool to be held by the JBTE Secretariat to which all colleges would have on-line access. Those colleges not satisfied with the quality of their applicants, and needing additional applications to complete their admissions could go to the common pool for such applicants. Analysis of these data could have important implications for guidance of students

in secondary schools intending to enter the teacher profession as well as to issues related to policy and planning. This new approach has the potential to improve the overall quality of applicants admitted to teacher education in Jamaica. Further, for the first time the Ministry of Education, the JBTE Secretariat and the Institute of Education will have access to accurate data concerning persons applying to enter teacher education.

- The JBTE and PROSOFT now have a new revenue stream. When some principals of secondary schools heard of the initiative being taken to develop College Manager, they voiced their frustrations in trying to find an affordable and appropriate management information system for their schools. JBTE and PROSOFT responded by developing Secondary School Manager and Primary School Manager which are now being marketed and sold to schools in Jamaica. Recently, under competitive bidding JBTE/PROSOFT was won the contract to provide the educational management information system for technical high schools in Jamaica. The competition consisted of other products developed in Jamaica and a well-known British product. Secondary School Manager was found to be technically superior to the British product on eight criteria out of nine. This was mainly because the latter is a Windows based product with several third party components while Secondary School Manager is an integrated web and browser based product with a single user interface that is easily mastered.

CONCLUDING COMMENT

While College Manager took longer to develop than was originally envisaged by the JBTE partners, the losses due to delay was somewhat compensated by the decrease in computer prices and the increase in power of the later equipment. The decrease in price and increase in power has been a major boon to this initiative, especially with respect to such issues the size of databases and archiving and backup of data and in time of processing data and producing reports. The JBTE partners have learned a tremendous amount from this initiative that have put them in good stead in subsequent projects involving the application of information and communication technology to other aspects of their work. The major challenge still facing the partners in the full use of the technology and the system that has been put in place with respect to decision making, improving practice, formulating policy and in generating knowledge that will improve and enhance the preparation of teachers and subsequently the improvement of learning of students in schools. The outcome depends on their willingness to learn, the readiness to change the culture to take account of the new ways of operating and the openness to deal with the unexpected and unintended developments. Success to date has been in no small part due to a key core of persons within the JBTE Secretariat and in the colleges to stay the course through all the ups and downs of the various stages. No doubt it is this capacity that will make it likely that the full potential of this initiative will be eventually achieved.