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An educational tool for planning and monitoring the teaching-learning process in Dutch secondary education

P. Hogenbirk
PRINT/VO
Plotterweg 30, 3821 BB Amersfoort, The Netherlands
Phone: (31)-33-4534343   Fax: (31)-33-4534353
e-mail: PRINT@XS4ALL.NL   or   P.Hogenbirk@Print.cps.nl

Abstract

Dutch higher secondary education is to be reformed in the next few years. The new system will be learner-orientated: it is intended that students will learn much more independently from teachers who will facilitate the learning process. This concerns a rather radical change in the view of learning, and therefore teaching, and students as well as teachers do need to transform their behavior. Both students and teachers will have new responsibilities in the educational process. To support these changes an educational tool for planning and monitoring the teaching-learning process will be developed. The tool consists of a database of activities, a planning module for students and a monitoring module for teachers. The tool should be linked to existing school management systems and to educational courseware and student assessment tools. An important aspect of the implementation of the system is that the coordinating body (PRINT) is preparing arrangements to make this system a nationwide standard for all educational parties involved.

1   INTRODUCTION

In the Netherlands we are in the middle of a process of reforming secondary education. In lower secondary education (age 12-15) the so-called "basic education" has been introduced in 1993. This innovation concerns general education for all students. The common objectives are aimed at:
- the application of knowledge rather than the knowledge itself;
- the emphasis on skills and abilities;
- the search for integration rather than separation of subject matter.
In 1998 this will be followed by restructuring higher secondary education (age 16-18). This reform will bring about an even more far-reaching change along two dimensions.

One dimension is that the content of all the subjects will be updated and redefined. The other dimension is that the organization of education will change from a teacher-oriented system into a learner-oriented system. This innovation is often referred to as the concept of the "study-house". It emphases the ability of learning to learn in the perspective of life-long learning and of learning more independently of the teacher. This second dimension of change will be the most difficult one, because it demands a total redefinition of the role of the teachers as well as the role of the learners. The teacher will more become an organizer of the learning-process and a companion of the students in their learning activities. The teacher is responsible for that element, but is not responsible for the learning itself. The latter responsibility has to be taken by the students. They have to plan their learning-activities according to their own abilities, preferences and interests.

  It is our deepest belief that this new view of the learning process and on the organization of learning can only succeed if the teacher and the learners are willing to adopt new behaviors. To make that possible and more convenient, support from all available new technologies has to be provided. For that reason PRINT (Project for Implementation of New Technologies) is developing a new educational management tool. PRINT is aimed at the introduction, adaptation and implementation of using computers in secondary schools (age 12-18) at the levels of school management, teachers and learners. These goals have to be accomplished through providing information, organizing all kinds of courses for professionals, supporting teacher networks, developing courseware and instructional materials, cooperating with educational publishers and software-developers and advising the Dutch government.

2   BRIEF DESCRIPTION OF THE EDUCATIONAL TOOL

A school information system has several more or less independent subsystems. The core of the system is a database with, among others, students data: their names, addresses, school history and other relevant information. All kind of modules can be attached to this database, for example a module for budgeting, an attendance (or absence) registration module, a scheduling module and so on. (See figure 1.)
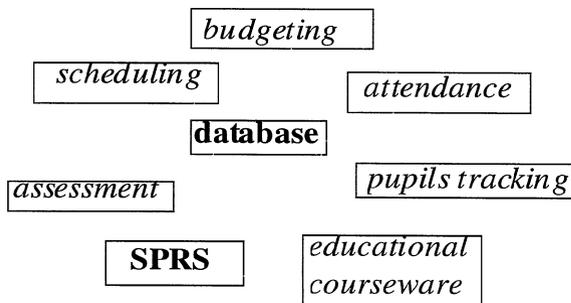

Figure 1   Modules of a school information system.

  For lower secondary education an additional module is developed in the Netherlands to follow the students in their well-being at school. We call it a pupils tracking module. All kinds of test results about basic skills, behavior, physical and emotional well-being of pupils can be stored in this module, as well as short remarks on pupils from group counselors and teachers. By combining these results a so-called "student profile" can be

generated, which gives the group counselors the opportunity to follow their students in their educational growth and satisfaction and to intervene if things are going wrong.

In order to support the described innovation process in higher secondary education a tool for planning and monitoring the teaching-learning process has been designed. The Dutch acronym for this module is SPRS. We will briefly describe the framework and starting points of this module. (See figure 2.)
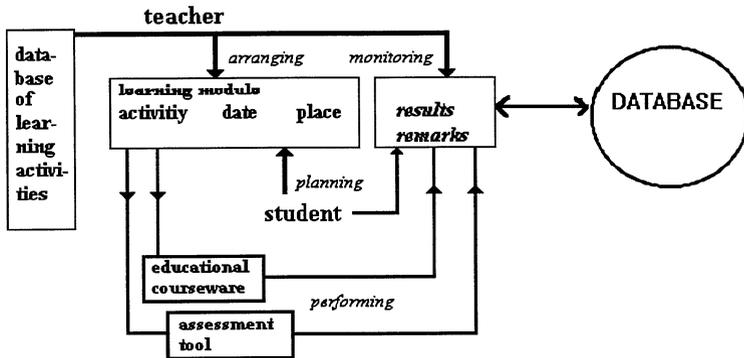

Figure 2   The tool for planning and monitoring the teaching-learning process: SPRS

Learning as an activity
The core of the module concerns a *database of learning activities*: These are descriptions of all kinds of activities to be carried out by students within a learning module. For example completing an assignment, studying some text, performing exercises, doing an experiment, making investigations, visiting a museum, an assessment, practising with educational software, and so on.

The database of learning activities should be provided by educational publishers in a well defined national standard and data-format. These learning activities are linked to the instructional materials the educational publishers provide. As part of a teacherguide a sequencing of learning activities can be proposed. The ultimate purpose is, of course, to enable the teacher to arrange and rearrange these activities to provide maximum benefit to the students. The teacher can also add remarks and hints, and the time and place for some or all of the activities. We could call this part of the SPRS the "*curriculum organizer*".

Planning the learning process
The schedule of learning activities is loaded into a *planning tool* for the students. They can add a date for every activity on which they plan to carry out the activity, and a date for actually having performed the activity. They can also input (in some cases) the result of an activity. Finally they can add remarks for the teacher. In that respect the system can also be a supportive instrument for communication between teacher and learner. This planning tool for the students is essential for the new vision of learning. The students are more responsible for their own learning path. They can skip some activity they do not consider necessary and they can add activities (like doing a diagnostic test, or performing more exercises) whenever they feel the need for that. The only constraint should be that their planning of the learning path fits with the constraints

the teacher has given. These constraints can be the date and place of certain obligatory activities, for example a traditional instructional class for economics, an arrangement for an experiment in science or a summative assessment at the end of the learning module.

Monitoring by the teacher

The data in the student planning tool are also accessible by the teacher. In fact the teacher is watching the same screen, but with has another authorization. For the teacher this part of the system is a *monitoring and registration tool*. The teacher can add a result for a specific activity, especially when it concerns a general summative assessment; can also make remarks to be mailed to the students; and can generate reports for one student and reports on certain issues for a group of students.

The students can look at their results and to the remarks from the teacher, but then again via their planning tool. They are not authorized of course to change these data.

This monitoring tool is very important to allow the teachers to control the learning process and the achievements of the students. Without this source of information the independence of the students could easily develop into non motivation and dropping out. To encourage the adpotion of new vision of learning by teachers (and parents), these effects should be prevented.

Import and export of data

Besides these three described major components, the module should be able to exchange data with other educational and managerial tools. This is a demand for implementing the module in the existing educational environment. This means that there are two additional and essential starting points for the SPRS module.

The module has to be linked fully with the student-database of the school information system. The schools have invested a lot of time and money in the past few years to set up an information system for storing student data. If the SPRS module were to require a totally new implementation of the existing information system, this would not be accepted and it would not be very efficient.

The module can also be linked to educational software and assessment tools. The advantage is that name, class, level and other relevant student data can be imported from the general system and that results or remarks generated in the courseware and assessment tools can be exported to the general system. These results and remarks can be stored in the monitoring part of the SPRS and be read by students and teachers. This starting point is very important, especially for the publishers of educational software and assessment tools. They can develop new materials for use in the new higher secondary education without having to invest in a rather costly module like the one described here.

3   THE SYSTEM AS A NATIONAL STANDARD

Next to the design of the SPRS as a tool in the way described above, it is of the utmost importance that this system be standardized. This gives all the parties involved in supporting the educational system and in developing educational materials the opportunity to contribute to the new educational process in such a way that costs are reduced and effectiveness is maximized. It also means that all parties involved do have to commit themselves to the standard. Therefore the aim is to involve all relevant parties in defining, developing, distributing and implementing this system. These parties are the Ministry of Education, the developers of school management software, the educational publishers and software houses, the institutes for educational support and above all the schools themselves.

We try to build this commitment by involving all these parties in the development process. In the heart of this development there are four development networks of teachers and school managers, accompanied by members of educational support institutes and the software distributors. These networks will also be used for testing the prototypes of (components of) the system. The RAD-technique: Rapid Application Development, will be used. In this the different features of the tool will be built as prototypes, to be commented on and tested by future users.

The building of the system will take place in four phases. In the first phase a data-model will be made on the basis of a detailed interrogation of the schools and educational experts involved. The second phase consists of building parts of the system. The third phase will be an extensive evaluation of the system in the schools. Therefore the schools have to set up a testing environment in which the new ideas on independent learning and teacher guidance have to be implemented. The schools involved are prepared to do so in certain parts of the curriculum at certain levels of higher secondary education. In the final phase the system will be prepared for broad-scale implementation. In order to give support to all users of the school information system a helpdesk will be set up and the educational experts involved will define ways of implementing the SPRS in various types of schools. This implementation will start in 1998.

4   BIOGRAPHY

Pieter Hogenbirk started as a teacher in secondary education and was also involved in the development of innovative educational materials at the universities of Utrecht and Amsterdam. In 1987 he became project manager within the so-called NIVO-project, with a follow-up in the PRINT-project from 1989. He has been in charge of managing projects on the development of curricula, courseware and in-service teacher training and the implementation of materials and training for informatics and Computer Aided Learning. Since 1993 he has been director of the PRINT-management for secondary education. PRINT is carrying out more than 100 projects with respect to the development and implementation of the use of information and communication technology in Dutch secondary education. The SPRS-project is one of the topics that are being carried out for upper secondary education.