GIMMICS: HOW TO ORGANIZE, MANAGE AND CONTROL A PHARMACY PRACTICE GAME

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Until 2000 the pharmacy education program of the University of Groningen, The Netherlands, was organized in a classic fashion. Students were offered lectures, seminars and practicals and a few internships. Surveys revealed that towards the end of the program, students have great difficulty integrating all the pharmacotherapeutical knowledge and social, managerial and communicative skills offered. This situation called for an educational provision aimed at supporting the integration of knowledge and skills. It was decided that the provision should be a game: well designed games induce the participants to reflect on their own actions and thus initiate processes of integration of knowledge and skills. The pharmacy practice game, called GIMMICS, was built during the first half of 2000 and introduced into the Master program in the second half of 2000 [van der Werf, 2004].

ORGANISATION OF GIMMICS

The game lasts four weeks full-time. It is managed by two teachers with working experience in community pharmacies and two student assistants who have already run a full game. About twenty -five students can participate in a single game; they are grouped into four or five teams and each team is appointed a class-room which will become the team's pharmacy.

Both game management and participating teams have access to several computers connected to the LAN and the internet. Among the software installed are the two most widely used pharmacy computer systems in the Netherlands.

During week one the teams prepare for the 'real' game. Preparations involve defining a pharmacy policy, developing and implementing a working model and familiarizing oneself with the pharmacy computer system. On day one of the second week, the game is on: the teams start running their own community pharmacies and the game management start providing assignments. There are three types of assignments:

- *routine assignments*: these involve the daily processing of about 25 electronic prescriptions from virtual patients. About half of these prescriptions need intervention by the students.
- *long term assignments*: these assignments run over a period of a few days and involve pharmacotherapeutical meetings with local physicians and negotiations with health insurance companies and drug retailers. Real life experts from the health care field are involved as actors.
- *ad hoc assignments or incidents*: each day the teams are confronted with 4 to 5 incidents. The majority of the incidents take place at the pharmacy counter and involve real life actors.

Apart from the assignments, the teams are also allowed to define, plan and execute projects of their own.

Each assignment and team project in the game is assessed by the game management. Assessments are based on expected output (e.g. the interventions that must be made) and on the feedback provided by real life experts and actors. If a team has done well they gain a number of patients, otherwise they loose some. At the end of the game the team with the

highest number of patients is the winner. The most important educational aspect of an assessment is that assessors are not allowed to clarify the nature and outcome of the assessment. A pharmacy team is expected to reflect on their actions and find out for themselves where they went wrong or underachieved. By providing similar assignments to the teams in a follow up, the game management can monitor the outcome of the reflections.

HOW DID WE FARE WITH GIMMICS ?

All student surveys from the period 2000-2003 clearly indicate that GIMMICS is a succesful educational provision. Students state that they not only enjoy playing the game, but it really helps them to integrate knowledge and skills. They say they feel more prepared for their internships and for a position as a community or hospital pharmacist. The success of GIMMICS has made other universities follow our lead: the Pharmacy Faculty of the University of Utrecht, The Netherlands, introduced GIMMICS into their educational program in the first half of 2004, and the Pharmacy Faculty of the University of Brussels, Belgium, will do so in 2006.

Despite the success of GIMMICS, some game issues turned out to be quite problematic. One of them relates to the external people involved in the game. These people are very important because they not only participate in the game as actors, but also bring in case material from their own practices. They expect the game management to introduce this material to the teams and monitor follow ups. The monitoring process turned out to be troublesome: the game management didn't always respond quickly enough to team follow ups, and sometimes didn't even respond at all.

TACKLING THE PROBLEM OF MANAGING GAME INTERACTIONS

Posed with the problem of managing game interactions, a reduction in the variety of cases by imposing standards was suggested as a solution. But wouldn't this eventually lead to a poor game setting, making it less interesting for everyone to participate? We analyzed the problem situation more carefully using the technique of causal loop diagramming [Vennix, 1996]. We concluded that if we could make response processing time less sensitive to changes in the amount of game interactions, the situation could improve. We identified three categories of game activities that can be foreseen and therefore placed and planned in our own time schedule.

The first category of activities is about the planning and documentation of people's schedules. To a large extent this can be done before GIMMICS is actually played. This led to the development of an Actor Registration System (*ARS*) which is technically a collection of tables in a relational data base and a web enabled user interface built on top of it. The system is accessed by two groups of users: the external people and the game management. Upon registration, the external people are invited to enter into the system their contact information, actor profile (i.e. the roles they are willing and able to play) and availability during the next game. The game management use this information to construct a case schedule, in which they match cases and roles to actors having the right actor profile and availability.

The second category of activities is related to the storage and retrieval of cases. In the past, case material was handed in digitally by the external people. But this material was just stored and never processed, making it tedious for the game management to retrieve it. This led to the development of a Case Management System (*CAMS*) which is technically a collection of XML files and a web enabled user interface built on top of it. Case material is now stored in a structured way, making quick retrieval based on well defined search criteria possible.

The third category of activities is related to the transfer of 'game knowledge'. This game knowledge encompasses facts, descriptions, lists of criteria and procedures, but it also

encompasses rules of thumb and strategies in order to handle game situations in which information is incomplete or uncertain. The game management are experts in running the game and take this knowledge for granted. But the student assistants, who are novices in running a game, are completely unaware of this implicit knowledge. So with every new game this knowledge needs to be transferred, adding adds considerably to the work load of the game management. We tackled this problem by building a GIMMICS Knowledge Base *(GKB)*. Using techniques from knowledge engineering we elicited knowledge from the game management on the preparation of the game, represented this knowledge as hierarchical task models and made it available digitally to the student assistants.

CONCLUSIONS

In 2004 the systems *ARS*, *CAMS* and *GKB* were built and tested and gradually introduced into the game settings in Groningen and Utrecht. After having used these systems for four consecutive games, the game management state that these systems have proven to be valuable tools in managing game interactions and reducing work load. All in all we believe that our analysis of the problem of managing game interactions was correct and that the solutions we proposed have proven to be effective. Work on all three systems continues since we believe that we will be able to capture even more of the dynamics of the pharmacy practice game.

REFERENCES

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