

# A New Model for Teaching Pharmaceutical Care Services Management

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**This paper describes a model for teaching and training students in managing pharmaceutical care processes. The model was developed at the Department of Pharmacy at the University of Groningen. The objective was to create a teaching provision which enables integration of different parts of the education program under conditions controlled by the participants. Since 2000, the model, which is essentially a pharmacy practice game, has been used in the MPharm program. Although the game is still under construction, assessments reveal that in terms of objectives, methods and workload, the game seems to be successful. As may be expected in problem-based teaching, one troublesome issue with the game, both for students and staff, relates to education philosophy: students and staff find it difficult to accommodate to new roles and teachings styles.**

*Keywords:* Pharmacy education; Problem based teaching; Pharmaceutical care management; Games; Simulation

## INTRODUCTION

There is a growing interest for education innovation in Schools of Pharmacy and Medicine, for example, "skill labs" as training facilities for students are valuable learning tools. The role of the clinical pharmacist in pharmaceutical care is growing world wide. The Federation Internationale Pharmaceutique (FIP) and the European Society of Clinical Pharmacy (ESCP) have developed programs for developing and implementing pharmaceutical care in the daily practice of the clinical pharmacist. It is essential to teach students, in a controlled setting, practical pharmacotherapy and pharmaceutical care issues.

If one perceives pharmacists as being professionals who are committing interventions in

the pharmaceutical care process then community and hospital pharmacists must be able to integrate knowledge from different fields of expertise. In addition, because of the social context in which they do their work, they must be competent and capable in terms of social interaction.

In this respect it is interesting to note that until 2000 the pharmacy education program of the University of Groningen in the Netherlands was organized in a classic fashion. Students were offered different forms of lectures and seminars. However, the integration of knowledge with social, managerial and communicative skills, was basically supposed to be autodidactic. This situation was viewed as unsatisfactory and at the end of the 90s the decision was taken to develop a new educational provision.

In this paper we will describe the Groningen Institute Model for Management in Care Services (GIMMICS). We will clarify the characteristics of the model, which is a game, and discuss the experiences we have had during the 12 times we have administered the game.

## MATERIALS AND METHODS

For the design of a new educational provision first one needs to make clear where the starting point will be and what the product specification will look like. Based on Soft Systems Methodology, developed by Checkland and others (Checkland and Scholes, 1990; Wilson, 1998), the properties of the system to be developed were articulated and a general product specification was formulated.

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The starting points can be described as follows.

1. Pharmacists are perceived as professionals who administer pharmaceutical care by intervening in specific care processes.
2. Pharmacists should be able to improve knowledge integration across disciplines (Mailhot and St-Jean, 2002).
3. Care processes are perceived as social processes and by that one needs social, managerial and communicative skills for realizing effective interventions.
4. In an educational system the integration of knowledge and social competencies must be realized under controlled circumstances.

Based on these points a general product specification was formulated.

“An education provision with the properties that it reflects pharmacy intervention practice; that it appeals to social skills and integration of knowledge; that students, manage within a controlled setting, their affairs in order to realize that students will get experience in the practice of pharmaceutical care.”

Although the product specification is stated in quite general terms it gives substantial direction for the development activities that followed. After studying literature regarding learning theory and gaming, the decision was taken that the system to be developed should be a game. (Duke, 1980; Greenblat and Duke, 1981; Elgood, 1984; Kolb, 1984; Duke *et al.*, 1989; Armstrong *et al.*, 1992; Gijsselaars, 1995; Caluwé *et al.*, 1996; Hogerzeil *et al.*, 2001). This decision was taken based on the argument that a game is an attractive means if one wants to create processes of integration under conditions controlled by the participants, meaning that the participants can initiate, plan, execute and control activities themselves. If well designed, games have the property that participants are induced to reflect on their activities and actions.

## DESIGN

The model which was designed is based on the Dukes design parameters of game design (Table I) (Duke 1980).

### Format

During a period of four weeks the students have to manage, on full time basis, a community pharmacy. In the first week the students are introduced into the game. They get lectures on different subjects related to the game. They have to make a business plan, a mission statement, a statement about their internal organization. In addition, there is a “try out” and

evaluation. This first week is in fact a preparation. The second week things progress with the students working for themselves. The game is played for three weeks and is evaluated at the end.

The participants, in our case groups of 25 students, are divided into pharmacy teams of five students. We have to our disposal:

- Five classrooms. The participants have to transform the room into a pharmacy with displays, a counter and the like.
- Each team has to its disposal two computers with access to internet and a medication surveillance system for processing prescriptions (Pharmacom<sup>®</sup>, Zwolle, the Netherlands, EURONET<sup>®</sup>, A'dam, the Netherlands).
- Two conference rooms for meetings.
- Standard facilities of the university such as libraries and prescription production rooms.

The instructors capacity is 0.4 full time equivalent, and for each game two full time student-assistants for a period of six weeks. In each game 30 external professionals are involved, such as community and hospital pharmacists, people from wholesale companies, and from insurance companies, among others. In addition, 25 actors are involved in each game. They play the role of patients and mystery guests. Mystery guests have the job of checking the pharmacy for specific standards. Pharmacists do not know if somebody is a patient and/or a mystery guest. Mystery guests are used routinely in the Dutch pharmacy practice and many other sectors.

### Events

As mentioned before an important feature of GIMMICS is that there is an emphasis of control by the participants. However, this control is restricted and conditional. The participants are confronted with a set of assignments. For this set the participant control is limited to the execution of the assignments. Besides that teams are free to initiate assignments themselves. (Table II)

Because it is expected from the teams that they manage their affairs in terms of planning, administration and execution, the given assignments are of a different complexity in terms of certainty and predictability. The teams are, in this way, forced to build management systems which can cope with uncertainty.

The assignments are divided in three categories: routine assignments, long-lasting assignments and incidents. An example of a routine assignment is the processing of prescriptions. Each day a team has to process about 35 prescriptions. On average five of these prescriptions contain irregularities or errors. The teams have to take action by contacting

TABLE I Gimmics in Dukes game parameters

Game elements	Duke	Gimmics
Format	The structure of the game (introduction, first round, evaluation, second round etc.)	1 week, introduction, lectures, try-out and evaluation. Three rounds of 1 week and 2 evaluations.
Rules	Rules which can not be changed by the participants	1. Rules which are valid in the pharmacy practice regarding prescription processing and registration. (different legal arrangement such as the laws on drug provision). 2. Rules which are specific for the game such as deadlines for delivering different outputs.
Policy	Rules that can be changed by the participants	They are to the discretion of the teams but have to be specific in terms of aims, conditions, restrictions so that they can be subject of assessment.
Scenario	Context data	Each team has a population of patients with data about their medication history. There is information about the local setting of the pharmacy.
Events	Incidents that disturb the daily routine	There is a set of incidents at the disposal of the game coaches. Incidents are used to keep the teams under pressure and to create uncertainty within the game.
Roles	An overview of functions and activities that have to be divided	Functions, positions and activities are described. In the introduction program the participants have to design a management system. They have to formulate a vision and mission statement about pharmaceutical care and the position which is held by that pharmacy. In that management system they have to clarify how the functions, positions and activities are divided, how the decision system is organized, how the documentation and quality system is organized.
Decisions	The decisions which has to be taken or are taken	The activities in the game are partly fixed and given and partly to the discretion of the teams. All the decision have to be registered.
Game sequence	A description of the sequence of the game	A description of the game sequence is at the disposal of all the participants.
Counting system	System for assessing, registering and presenting results	The counting system has two elements. 1 Products which can be assessed on correctness like prescription processing are assessed by the game coaches. 2 Products which must be assessed in terms of relevancy and plausibility are assessed by the coaches and the external professionals. The results are made public on the Gimmics website.
Models	Models within the game	The medication surveillance system which is used is an existing software package used in the Dutch pharmacy practice. This is manipulated in the sense that 1 game day is an equivalent of 1 week real-time. The Interaction databank is used to develop medication histories for the pharmacies.
Indicator	Indicate performance of participants and effects of their decisions	The number of patients is the indicator of performance. All the pharmacies start with 8000 patients. The number can increase or decrease. There is not a zero sum situation for the total of pharmacies. To create a resemblance with the pharmacy practice as adequate as possible the effects of separate actions are made difficult to trace. Effects of a set of actions are easy traceable.
Symbols	Images of elements, activity or decision.	1 day is equivalent to 1 week real-time.

the physicians, a registered pharmacist or the patient, to clarify and improve safe drug use.

The long-lasting assignments concern negotiations with third parties like wholesale companies, insurance company and pharmaco-therapeutical meetings with family doctors. The participants know in advance that they have to conduct these negotiations. For each of these assignments three meetings are scheduled. Each meeting results in activities that the teams have to fulfil.

Incidents (type 1), like a visit of the healthcare inspector or the burning down of a pharmacy are introduced by the game coaches whenever they see it as appropriate. In addition, the students are invited to develop their own project (incident type 2).

Some will specialize in pharmacy for older persons, others will try to take over a pharmacy or build a pharmacy chain. They are free to take initiative but these projects have to be feasible and consistent with their own business plan and mission statement.

### Decisions

The teams have to develop a management system. They need to express their vision of pharmaceutical care and they have to formulate a mission statement. Vision and mission statements must be formulated in detail so that a team is able to firmly support the refusal of some specific assignments because they are in conflict with the vision and mission statements.

TABLE II Types of activities

Self control activity	Execution	Assignment
Routine	Prescription processing Mystery guest Patients contacts —	Game coaches
Long lasting projects	Insurance Wholesale FTO —	Game coaches
Incidents 1	Municipality decides to break open the street in front of the pharmacy Pharmacy burns down Visit inspector of health care —	Game coaches
Incidents 2	Initiatives from the team Taking over of other pharmacy Project poly pharmacy —	Pharmacy team

### Counting System

Every assignment in GIMMICS is assessed. In the handout of the game the criteria for assessment are specified. The assessment is done by the coaches and external professionals. The results, which are made public on the GIMMICS website, are expressed as an increase or decrease in the number of patients.

Feedback is also organized within the game itself. The teams are confronted by the reactions of different players. For example, patients may get angry, complain, or an insurance company may react. So the teams are provoked to reflect on their own actions, evaluate them and if necessary bring about a change.

Students are used to getting an explanation about what went wrong when they make mistakes. In GIMMICS, when they see that something went wrong, they have to find out what went wrong themselves. Students are not familiar with this approach and actually resist it. So we compromised on this issue and introduced a concept of a “wild card” which every team receives. They can use their wild card only once. When they use the wild card the coaches have to give all the information about an assignment and clarify the reasons for a specific outcome of an assessment to the team.

The overall assessment is based on three dimensions:

1. Attendance during the game.
2. The participants have to function within the team. The team may decide to fire a participant on the grounds of not working according to standards.
3. The pharmacies have to be viable and maintain a minimum number of patients.

The GIMMICS website offers:

- The assessment of assignments.
- The GIMMICS newspaper.
- Communication between those involved.
- The standard documents of GIMMICS.

### DISCUSSION AND CONCLUSION

GIMMICS was introduced in the Pharmacy Master’s Program in 2000. So far, the game has been played 12 times and we are able to reflect on some of the experiences we have had.

Teaching should be based on clear objectives and one should be able to measure performance in terms of efficacy, efficiency and effectiveness (Hogerzeil *et al.*, 2001). However, in practice it is always difficult to measure the performance of education models. This seems to be the case for output as well as outcome measurements. In the case of GIMMICS we are able to assess some aspects of the output like the development of practical skills, such as the processing of prescriptions, the preparation and documentation of meetings—activities which have some tangible appearance. Even so, the development of the integrative capabilities of students is very difficult to address. In addition, outcome assessments are much more troublesome because they ask the question “do pharmacists become better pharmacists by applying models like GIMMICS?”

In the Dutch education system all the courses are submitted for a student evaluation. The student panel stated that GIMMICS is organized in a satisfactory way, regarding content, structure and management of GIMMICS as well as the workload for the students. The value of GIMMICS in terms of the integration of different fields of knowledge and social competences was perceived by the students as “excellent”. Although the program review states that continuous modifications and improvement of the project is necessary.

One interesting issue that emerged from the discussions between students and staff is about the educational philosophy. Students are inclined to perceive their role and the role of the staff in a technical, instrumental way. Repeatedly they wanted to know what they did wrong and wanted the staff to explain it to them. On the other hand the staff sees the relation between staff and students in a more collaborative way. They do not want to go into a technical instrumental role. At first, this friction resulted in a controversy between students and staff. We therefore compromised on the issue. From the fourth time we played GIMMICS we introduced the so called “wild card”.

A second interesting point is the issue of competition. Within the game, teams are competing

with each other in different aspects, including economic terms. We noticed that teams tried to buy other ones or tried to attract staff from each other; they were competing as well as forming chains and the like. In social and psychological terms we noticed that they were monitoring each other quite closely and were actually accommodating to each other because of this. The success of one is copied by another, so, in a way, they collectively produce standards of practice. As described earlier the ultimate indicator is the number of patients for a team. You can win or lose patients. Before 2002, we worked with a zero sum system. So the gain of one team is the loss of another. This system created too much tension in the game and resulted in arguments between different teams and between teams and game coaches. We have since stopped the zero sum system. At this moment all the teams can win in the sense that they finish with more patients than the number they started with, but the team with the most patients gets the prize. The effect was that the arguments and quarrels stopped.

GIMMICS is constantly reviewed by the staff. This type of education is time consuming for the staff, but what seems to be more important is the creation and maintenance of commitment to the program. For the involved faculty staff and external professionals the program is only interesting if we are able to create a rich game setting. But by doing so, the management of the game is becoming more and more complex. One needs to exchange lots of different types of information between all those involved and the interactions between the involved people need to be monitored and assessed. This process is complex and the people responsible for the management of GIMMICS struggle with balancing richness on the one hand and standardizing on the other.

All in all we believe GIMMICS is a successful innovation in the pharmacy education program of the University of Groningen. Other schools have followed our lead. In 2003 the Pharmacy Faculty of

the University of Utrecht decided to take a license and they introduced GIMMICS in their program. Together with Utrecht, we applied for a grant by SURF, a government foundation which subsidizes Information Communication Technology projects in higher education. We applied ICT in order to improve the management of GIMMICS so that we are able to create the richness we want in the game setting without falling in the trap of standardizing. SURF approved our project and granted a substantial subsidy.

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