

## Game Play Learning Proposal – Fritz Yambrach

### 1) Title and Summary of Proposed Project

The proposed project “Game Play Introduction to the Pharmaceutical and Medical Device Industries” involves the integration of game play in learning the product development and manufacturing processes unique to the pharmaceutical and medical device industries. The unique constraints and steps to product development and manufacturing in the pharmaceutical and device industry are normally learned as an employee or learned from external industry specific seminars. The FDA requirements regulating product development and Manufacturing are unique to these industries and by comparison to other industries the most stringent and heavily regulated. If students are able to understand the “validity of process” system which is the core of product development and manufacturing then these students will be able to enter the pharmaceutical and medical product industries already prepared to perform at a level exceeding other industries.

A firm, Learning Key produces two board games designed to introduce players to the topics of drug development and GMP manufacturing. The role of game play allows for improved learning because of engagement of the students in active learning.

This project is targeted as course supplemental material for existing courses and the means for a student club to be formed on-campus. The club will introduce the specifics of a profitable and growing international industry to a multidisciplinary student group. This club could mature into a group that becomes very involved in the pharmaceutical industry and firms in the industry.

### 2) Targeted Learners

Targeted learners are both graduate and undergraduate students from multiple disciplines who may be future employees of the pharmaceutical and medical product industries. The wonderful part of this project is that a student club can cause students from several academic disciplines to interact together in a topic area they all have in common.

- a. The initial target student population are students enrolled in the 2 Packaging courses, 1 graduate (End Use Packaging) and 2 undergraduate (Medical and Pharmaceutical Packaging and Packaging Production Systems).
- b. In addition to this core group, a second group which may incorporate the Good Manufacturing Practices (GMP) game is Manufacturing Engineering Technology and Mechanical Engineering Technology groups in our department. These two disciplines place students in the pharmaceutical industry and learning about the FDA manufacturing constraints and quality levels is equally important to their graduates.
- c. Additionally, a multidisciplinary student club composed of **Packaging, Manufacturing, Business, Industrial Engineering, Industrial Design** and **Mechanical Engineering** students would be formed to play the games

together. This club would be a social/educational club where students interested in learning about the pharmaceutical industry before job interviews can gain some experience in how the industry works.

Faculty in these program areas have responded favorably to my questions of using this game as a tool to educate our students in an industry which hires many of our graduates.

3) Student Success and Numbers affected

The number of students which will be affected will be initially around 110 students in the Packaging and Manufacturing classes in our department. The longer term project which incorporates Packaging, Manufacturing, Business and Product Development students into these courses or alternatively introduces the game project into existing courses could conceivably double or triple the students to over 300 a year.

A student club would probably have a student enrollment of 10-30 members throughout the year.

4) Anticipated Impact on Teaching and Learning

Using game play as a method of interactive learning creates an environment of participation due to the student having a stake in the games outcome and an atmosphere of control over their own actions that leads to an effective learning process. Game theory facilitates interaction in the decision making process making students aware that:

**1) Decisions are made by group interaction.**

**2) Decisions impact other people within and outside the group.**

Game theorists have driven innovative thought in problem solving in a variety of fields, from economics to sports psychology. The use of games promoting student interaction adds to the rich educational experience of existing courses by engaging students to think, act and reflect on the actions.

Using a game to focus attention on the specific constraints found in the pharmaceutical and medical product industries would create an awareness of the industry. Specifically the game would teach the particular skills sets needed for a positive first job experience in a competitive and profitable industry.

5) Impact on Student Success

This type of positive and creative learning experience keeps students interested in the learning process and gives them control of their academic experience.

**Better learning experience? Improved student performance and attitude? Retention and Success**

6) Measuring Outcomes and Findings

Students and faculty involved with the game sessions will complete a questionnaire relating to the material learned, group dynamics and the effort-to-reward relationship they experienced in the activity. This data will be shared with the academic community as a means of evaluating unique learning systems and their effectiveness, specifically game play.

7) Rationale for Project

This project is external to the regular learning system in my college because it is a non-traditional learning project and not in the scope of regular college interests. The development of a multidisciplinary club is also beyond the regular department business.

The academic groups mentioned earlier **Packaging, Manufacturing, Business, Industrial Engineering, Industrial Design** and **Mechanical Engineering** all place students in the pharmaceutical and medical products industry. The interaction of these students in college will enable them to interact more effectively with other disciplines in the workplace when they arrive there. The concept of game play as a learning tool is relevant to many other disciplines and if this project is successful other faculty will investigate the applications of game theory. The use of game theory is common in a variety of disciplines from finance to healthcare, virtually any field where interaction of different groups and group decisions are made.

I have worked in the pharmaceutical and medical products field for over 25 years as a senior developmental engineer and a consultant. I developed the first course in medical product packaging offered in the US in our curriculum. My efforts and activity in developing courses has placed several hundred students in these industries. My former students keep in close contact with me and have become the backbone of our co-op program returning to RIT to hire co-ops. Additionally they have been the source of information in my reflexive evaluation and updating of course materials.

Packaging is the last activity in the manufacture of a product and because of that fact impacts on every level of product design and manufacturing design.

Understanding the constraints and networks in the pharmaceutical and medical product industries is essential for success in the field. This innovative learning experience will provide students with an understanding of the workings of the industry before they begin work and before they interview for positions. This improved understanding will only make their interview stronger and reflect well on RIT.

8) Timetable

1) April 9th receive notice of award

    If positive proceed to #2.

    If negative, look for other funding or start collecting cans and bottles.

2) Spring 2003 Order games from Learning Key

3) Spring 2003 Receive and Review games with other faculty participating.

4) Summer 2003 Schedule game play into courses

5) Fall 2003 Begin using games in class

6) Organize and advise Pharmaceutical Industry student club

7) Review and measure game effect with participating faculty and students by utilizing questionnaire developed to measure learned outcomes.

8) Fine tune applications using evaluations

9) Develop student club activities to expand interaction with industry groups