

## Association for Information Systems AIS Electronic Library (AISeL)

---

AMCIS 2001 Proceedings

Americas Conference on Information Systems  
(AMCIS)

---

December 2001

# Searching for a "Killer Application" for On-Line Teaching-Or Are We?

Celia Romm  
*Central Queensland University*

Arik Ragowsky  
*Wayne State University*

Follow this and additional works at: <http://aisel.aisnet.org/amcis2001>

---

### Recommended Citation

Romm, Celia and Ragowsky, Arik, "Searching for a "Killer Application" for On-Line Teaching-Or Are We?" (2001). *AMCIS 2001 Proceedings*. 22.  
<http://aisel.aisnet.org/amcis2001/22>

This material is brought to you by the Americas Conference on Information Systems (AMCIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in AMCIS 2001 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact [elibrary@aisnet.org](mailto:elibrary@aisnet.org).

# SEARCHING FOR A “KILLER APPLICATION” FOR ON-LINE TEACHING—OR ARE WE?

**Celia Romm**  
Central Queensland University  
c.romm@cqu.edu.au

**Arik Ragowsky**  
Wayne State University  
Aragowsky@aol.com

## Abstract

*This paper is based on the premise that the "killer application" for on-line education should be searched for in the realm of psychology - not technology. To support this argument, the Radical Model, an approach to on-line teaching that is "technology lean" but "psychology rich" is described in detail with examples from the authors' teaching experiences. The paper is concluded with an outline of a research agenda emanating from its major premise.*

## Introduction

The call in much of the literature on on-line teaching in recent years has been for a "killer application" that would make on-line teaching viable for students, facilitators, and institutions. A review of the literature reveals that the search for the "killer application" has centred on the following three themes:

1. **HOW - Discussion of candidates for the "killer application".** A range of options are described and debated in the literature, including the placing of class notes on a web site, the collection and marking of students' assignments on-line, the development of on-line multimedia packages for students' self learning, and the use of e-mail lists, video, and audio conferencing as the basis for class interaction.
2. **WHY - Discussion of the need for a "killer application".** The literature is replete with discussion of the advantages and disadvantages of teaching on line, with cost effectiveness and flexibility, particularly for students, mentioned as the major advantages, and "second rate" education and extra work for the facilitator mentioned as the potential disadvantages. There is general agreement in the literature, however, that the cost-effectiveness of on-line education is so compelling that it is bound to be the way of the future for universities.
3. **WHO - Discussion of the changes to the role of academics as a result of on-line teaching** - It is implied in much of the literature on on-line teaching that its introduction could herald a new role for academics, with a stronger emphasis on them as providers of "mass education" and a lesser emphasis on their role as creators of new knowledge, or researchers.

One of the issues that are missing in much of the debate on on-line teaching is a discussion of its underlying psychological principles. It is the major contention of this paper that the "killer application" for on-line teaching should be based on psychological rather than technological principles. In the following sections, we discuss the building blocks for such a technology with examples on how it can be applied to a "technology lean"/"psychology rich" on-line class environment.

One of the foremost models in the literature on learning psychology is the Operant Conditioning model (Skinner, 1971). The model is based on the assumption that by creating "pleasing consequences" to follow specific behaviour, the frequency of that behaviour will increase. This general principle can be translated into several more specific rules, including:

1. Desired behaviours should be clear.
2. Desired behaviours should be rewarded.
3. Rewards need to be immediate and "consistent".

4. Rewards should eventually become random to maintain the new behaviour, e.g., once a new behaviour has been established, the frequency of rewards should be reduced - learners need to do **more** to achieve the **same** results.
5. Undesired behaviour should NOT be punishment, because once a behaviour is punished, the individual may know what he/she should **not** be doing but they may not realise what they **should** be doing.

One of the major criticisms of the Operant model relates to the fact that individuals do not always learn by having their own behaviour reinforced. Instead, individuals can learn by observing what happens to other people. The view that individuals can learn through both observation and direct experience has been called "social learning theory" (Bandura, 1977).

Another body of literature that is relevant to any discussion of effective learning is the writings that link group dynamics with productivity. One of the key concepts discussed in the literature on group dynamics is that in order to maintain maximum group productivity, the degree of cooperativeness and competition within the group has to be carefully balanced (Robbins, 1979).

### **How can the above principles be incorporated into a psychologically based "killer application" for on-line teaching?**

In the following sections we present the Radical Model, an approach to on-line teaching that has been practiced with a range of undergraduate and graduate courses at Central Queensland University, Australia. Over the past three years, the elective courses taught in this way have consistently increased in size (from 30 to about 300), with extremely positive feedback from the students. Experiences drawn from using this approach are used in the following sections to demonstrate the merit of using psychological principles as the basis for an on-line "killer application".

The teaching materials for the Radical Model include:

- A video that contains detailed explanations on how the course is run;
- A ten-page booklet "Course Outline" which describes all necessary information about the course;
- A textbook; and
- A class e-mail list.

The first thing that students do once they read the Course Outline and watch the video is subscribe to the class e-mail list. They, then, introduce themselves to the class on-line so they can be divided into weekly presentation groups. The allocation to groups is completed by the second week of the semester. By this time, students are expected to establish contact with their virtual group members and start working on their assessment tasks. On week 3 of the semester, the first group makes its presentation to the class on-line. The presentation is made on Monday of each week. By Friday, each of the groups in the class is supposed to critique the presentation. On Sunday, the instructor reads and marks all submissions. This procedure repeats every week until the end of the semester, with each week dedicated to an in-depth discussion of a **different** topic. The students' mark for the course consists of 50% group mark for their performance in the group and 50% an individual exam.

It is our belief that the Radical Model is a "killer application" because it is based on sound psychological principles. To demonstrate this point, we would like to go back to the principles of effective learning outlined in the previous sections, with specific examples from the on-line interactions in our classes.

#### **1. Individuals should be clear about what is a desired behaviour.**

At the beginning of the semester, to make sure that students understand what is expected of them, facilitators post over twenty messages about the "rules of the game" on the class list. In particular students get to hear about how to establish groups, how to submit assignments and how to comment on other people's work.

#### **2. Desired behaviours should be rewarded if they are to occur frequently.**

One of the most important behaviours that students need to undertake when they join the on-line class is to establish contact with their group members. The reward for this desired behaviour is administered mostly by the facilitator (in statements like, "I am happy that you are all communicating with your group members"). However, once students start working in groups, their rewards come from the group members as well. Throughout the semester students are assessed on 11 assessment tasks (including their group presentation, comments on other students' presentations and an end of term exam). In a class of 100 students, this would result in over a hundred units of input for each student throughout the semester, which is far beyond the amount of feedback that is normally provided in the face-to-face environment.

**3. To achieve fast learning, rewards need to be immediate and consistent.**

Feedback on students' performance starts on the third week of the semester and continues every week until the end of the semester. Each week, the group that made the presentation gets a "personal" message from the facilitator. In addition, each of the other groups gets marked for their written comments on the presentation. Given that students consult with their group members on each presentation, this results (in a class of 100) with 20 units of input per student per week, or over 100 units of input per student for the whole semester. In fact, the division of labour that is possible to achieve in the on-line class results in students being rewarded for EACH one of their contributions to the class discussion.

**4. To achieve long-term learning, rewards need to be modified from consistent to "random", namely, once a new behaviour has been established, the frequency of rewards that accompany it should be reduced - learners need to do more to achieve the SAME results.**

Once the groups have been established and students understand that the class list should be reserved for class presentations only, the facilitator reduces the amount of traffic from him/her quite dramatically. Instead of 20 or more messages to the class on the first few weeks of the semester, the number of messages from the facilitator is reduced to only TWO per week, including one message to the presenters with comments on their performance and their mark, and another to the class, with comments on the quality of their comments on the weekly presentation. Despite the fact that from week 3 onward the amount of feedback from the facilitator is greatly reduced, the class continue to perform consistently, with submission rates of 100% for all groups throughout the whole semester.

**5. It is important that the learning process is NOT accompanied with punishment, because once a behaviour is punished, the individual may know what he/she should not be doing, but they may not realise what they should be doing.**

Given the potential impact of detrimental or negative feedback (punishment), particularly when it is administered by nine groups in their comments of each other's work, the facilitator spends a lot of time explaining to students how to develop a positive critique. The presenters are told not to be offended by comments from the facilitator about their presentation because these are not intended to "punish them" but to teach the other students how to make good presentations. Students are encouraged and rewarded for being generous and courteous with each other, even though they are still expected to produce methodical and through critiques.

**6. Individuals can learn by observing what happens to other people and being told about a reward that may accrue if they were to engage in that behaviour.**

The above principle is applied by the facilitator when commenting each week on the performance of all groups. This practice achieves two results: (1) the reinforcement of superior performance by groups that made exceptionally valuable contributions to the class discussion; and (2) improvement of students' performance through having them observe the "role models" being rewarded.

**7. For a group to be productive, there has to be a balance between the level of competitiveness and the level of cooperativeness of its members.**

This principle is maintained in two ways. First, students are encouraged to use their small groups as "support groups". By encouraging the students to think of their groups as "support groups", the level of cooperativeness within the groups is maximised. Second, students are encouraged to think of the OTHER groups as their competitors. In fact, they are told directly and indirectly through the weekly feedback messages from the facilitator that their mark each week is based on how they compare with the other groups. Thus, the weekly feedback messages to the class serve to build **both the competition between groups and the cooperation within groups, creating a balance between positive and negative conflict within the on-line class.**

## **Research Agenda for the "Killer Application"**

The underlying premise of this paper, that the "killer application" for on-line teaching should be searched for in the realm of psychology rather than technology, can serve as a basis for a research agenda that takes the following directions:

1. **Outcomes** - Future research could compare different on-line teaching styles ("technology lean" and "technology rich" versus "psychology lean" and "psychology rich") in terms of their effect on outcome variables such as student and facilitator

satisfaction, quality of learning, etc. Once undertaken, such research could determine empirically the relative contribution of technological and psychological aspects to the "killer application".

2. **Process** - An analysis of the interactions in the on-line class, particularly from a qualitative longitudinal perspective, could reveal patterns of communication and group dynamics that are typical of effective versus ineffective on-line class environments.
3. **Antecedents** - The effect of a range of moderating variables on both the outcome and the process of effective on-line teaching can be explored. Mediating variables could include: demographic variables (gender, age, socio-economic class, ethnicity), attitudinal variables (learning style, preference to work in the distant mode), institutional variables (course, program studied) and global variables (national culture).

## References

- Bandura, A. *Social Learning Theory*. Englewood Cliffs, NJ, Prentice Hall, (1977).
- Cunningham, S, *Technology and delivery: assessing the impact of new media on 'borderless' education*, Australian Universities Review, 1, (1998), pp.10-13.
- Robbins, S. P. *Organizational Behavior* (6<sup>th</sup> edition), Prentice Hall International, (1979).
- Skinner, B. F. *Contingencies of Reinforcement*, East Norwalk CT: Appleton Century Crofts, (1971).