Simulations as Authentic Learning Strategies: Bridging the Gap Between Theory and Practice in Performance Technology

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Abstract

This article describes the design, implementation, and evaluation of a diagnostic experiential simulation (Gredler, 2004) in a graduate Performance Technology (PT) course. Simulations are experiences that provide an authentic learning environment that scaffolds novices' problem solving while minimizing the risks of 'practicing' their newly learned skills in a 'real-world' setting. The purpose of the study was to examine the effectiveness of using simulations with novice instructional designers and performance technologists as an instructional strategy for transfer of theory into practice. This study is a case study, Type one developmental research design (Richey, Klein, Nelson, 2004), which describes the design, development, and analysis of a simulation as a culminating instructional strategy and assessment. The student learning outcomes from the simulation are mixed, but overall the students perceived the simulation experience to be authentic and relevant to their learning. An unintended outcome was the development of a model for designing experiential simulations.

Introduction

It is well-documented (Conn & Gitong, 2004, Hybert, 2003, Medsker, Hunter, Stepich, Rowland, & Basnet, 1995) that in response to market needs and the subsequent maturation of the profession, Instructional Design and Technology (IDT) has transitioned over the past 25 years from focusing solely on promoting learning through well-designed instruction to a broader view of improving performance and organizational results. The expanded role of instructional design professionals requires an expanded set of competencies that include considerations for expertise in performance improvement.

In response to the need for additional knowledge and skills, many instructional design programs now include Performance Technology (PT) skills training in their program. In fact Medsker, et al. (1995) found that out of the 82 programs they surveyed all of the HPT (Human Performance Technology) topics included in the survey were included in the curriculum to some degree. However, Medsker, et al. (1995) also found that out of the 18 topics, training and training needs assessment were emphasized by more programs.

PT, an applied discipline whose goal is to improve human performance in the workplace (Stolovitch & Keeps, 1999), involves the identification of multiple and possibly unique or hidden causes, such as administration and resources, for performance problems and the implementation of interventions to solve those problems (Stolovitch, Keeps, & Rodrigue, 1999, Guerra, 2003). Similar to ID, the PT profession has undergone changes in its title and definition in an effort to adequately describe the functions of the field. The evolutionary dynamics of PT and the changes incurred as a result have contributed to ambiguous professional competencies (Guerra, 2003).

Using the ADDIE (analysis, design, development, implementation, and evaluation) activities (Gustafson & Branch, 2002) as the framework for her study, and comprehensively reviewing the literature related to PT, Guerra (2003) developed a list of competencies for performance technologists. These competencies were then validated by PT experts, who were asked to supply information about the frequency with which a competency should be applied and the frequency with which the competency is actually being applied. Although there were gaps between the frequency that was deemed optimal and the actual frequency of application, Guerra suggests that the discrepancy can be a function of the complexity of the decision making processes and influencing factors, such as organizational characteristics, inherent to PT.

Stolovitch, Keeps, and Rodrigue (1999) also categorize PT skills in a classification similar to ADDIE. Through observations of PT professionals, Stolovitch et al. categorized PT skills into basic skills groups of requirements for analysis and observation; analysis; analysis and communication; design and communication; design; design, evaluation, and management; evaluation and management; design and evaluation; management; communication; and communication and interpersonal skills.

Klein and Fox (2004) took a somewhat different approach in their study, where they assessed which PT competencies should be mastered by students in instructional design and technology programs. They surveyed PT practitioners and faculty from instructional design and technology programs, educational technology programs, and instructional systems programs. In the survey the participants were asked to rate the presented competencies according to their importance for graduates entering the PT field. Klein and Fox (2004) found results indicating "… that competencies related to skills such as conducting performance and cause analyses and selecting and evaluating performance interventions were rated as more important than acquiring knowledge about PT models (p. 24)".

The literature on PT competencies (Guerra, 2003; Klein and Fox, 2004; Stolovitch, Keeps, & Rodrigue, 1999) seems to reinforce the importance of providing authentic learning environments for PT novices by demonstrating the inter-related nature of PT competencies, including the need to develop general problem-solving skills. Even with knowledge and mastery of PT competencies, the PT technologist must exhibit expert decision making skills in order to fully assess the performance goals, gaps, and subsequent causes to appropriately apply a suitable intervention.

Ill-structured problem solving is inherent to the field of PT. Domain-specific knowledge and skills are necessary to solve ill-structured problems, as well as highly proficient decision-making skills to address the ambiguities of the problem and its underlying causes (Ge & Land, 2003). Ill-defined problems are those that exhibit indefinite goals and offer opportunities for multiple solutions (Jonassen, 1999; Ormrod, 2004).

Because of the ambiguity inherent in ill-defined problems, they require higher order thinking skills and allow for innovative solutions. Stepich, Ertmer, & Lane (2001) state that expert problem solvers are more likely to consider the problem's foundational patterns and principles rather than simply its surface features. Sternberg (1998) suggests that an expert, along with the necessary informational knowledge, will possess the ability to form strong connections among well-organized schemata, filtering out irrelevant information (Patel, Glaser, & Arocha, 2000) in the process. Experts are also more inclined to consider the end results of the solutions on the organization or individuals (Stepich et al., 2001).

In order for knowledge to be applied in real world contexts, situated learning theorists suggest that learning take place in authentic contexts. However, Dick (1991) raised a concern about placing students in a complex situation, i.e. a constructivist-learning environment, for which many of them might not be ready. Ormrod (2004) suggests providing instruction in the necessary background knowledge for the context, facilitation of higher-order thinking, and providing diverse opportunities for gathering resources as well as opportunities for developing multiple solutions.

Ormrod (2004) defines authentic activities as "tasks that are identical or similar to those that students will eventually encounter in the outside world" (p. 396). Driscoll (2000) identifies the focus of situated, or authentic, learning as the emersion of the learners in the culture of the field through interpersonal contexts, where they become apprentices and learn from experts in that field. Whitson (1997) suggests that situated learning supports more innovative approaches to problem solving and improved judgment and decision making when developing solutions.

The use of authentic activities in the classroom allows the learners to recognize the interconnectedness among concepts with consideration for context and therefore, facilitates transfer to alternative situations and settings (Ormrod, 2004). Situated learning allows the novice to recognize and experience the relationships and interactions among people, contexts, and cultures as they influence and shape the knowledge required for practical application (Agre, 1997).

However, a criticism of situated learning (Ormrod, 2004) is that there is a possibility of reduction in transfer to alternate settings that differ significantly from the original environment in which learning occurred. It is important that learners not only recognize the relevance of the knowledge in other contexts (Ormrod, 2004) but also learn how to use the knowledge they have acquired (Schank, Berman, & Macphearson, 1999). Specifically, learners must learn how to use and transfer the knowledge they have acquired to new contexts (Mayer & Wittrock, 1996; Schank, Berman, & Macphearson, 1999).

Simulations have been used in educational settings for well over three decades (Dickinson & Faria, 1997; Gredler, 2004) to provide authentic learning environments. However, while there is an extensive literature base on simulations and games that spans many different disciplines, there is no generally accepted typology (Wolfe & Crookall, 1998).

Gredler (2004) breaks simulations into two types, experiential and symbolic, primarily based on whether the learners' role is external or internal to the simulation. In an experiential simulation the learners' role is as an internal participant. Gredler further differentiates experiential simulations based on the types of contingencies that the simulation provides. A diagnostic, experiential simulation's contingencies are "based on the optimal, near-optimal, and dangerous decisions that may be made" (Gredler, 2004, p 574).

Because simulations are "open-ended evolving situations with many interacting variables" (Gredler, 2004 p. 571) they can provide a model of a real world environment that contains ill-defined problems requiring analysis of many variables and may require more than one course of action. The ill-defined nature of the problems posed in simulations provides an authentic learning environment for PT novices.

While simulations may not provide an exact replica of a performance environment, perhaps limiting transfer of learning, they do offer many advantages over other instructional strategies. Because simulations are scaled down models of actual performance environments, they are able to focus on key issues related to the course content. This allows the novice to focus on a limited, but important, number of variables. Many authentic learning environments, in an attempt to increase the fidelity of the learning and consequently transfer of training, place the novice practitioner in an actual workplace setting. Simulations, on the other hand, offer a safe environment in which to practice their decision-making skills.

An Applied Research Approach

As in most professional disciplines, Instructional design is a blend of theory and practice. One strong research methodology that recognizes the importance of empirically examining instructional design practice is developmental research. Richey, Klein, and Nelson (2004) describe two types of developmental research, Type one and Type two. Type One developmental research "involves situations in which the product development process used in a particular situation is described and analyzed and the final product is evaluated" (p. 1102). The purpose of this type of research is to produce context-specific knowledge that provides empirical evidence that serves a problem-solving function (Richey, Klein, and Nelson, 2004). The purpose of Type Two developmental research is to examine the general processes of instructional design, development and evaluation.

The context-specific nature of the types of research questions posed when designing and implementing a simulation fit well within Type One developmental research. The questions this research project investigated were related to the types of learning outcomes, both cognitive and motivational that are promoted through the use of a diagnostic experiential learning simulation. More specifically, the two questions that guided the design of the course, the simulation, and research methods are

- Will an extended diagnostic experiential PT simulation foster the learning outcomes identified from the literature on PT competencies?
- What are the necessary components of a PT simulation for a) promoting & evaluation discipline specific learning outcomes and b) ensuring content validity, as well as content/context fidelity.

Course Design

Similar to other ID programs (Medsker, et al., 1995) the curriculum for the Instructional Design and Development Masters and PhD programs at our university include topics related to PT. In fact the Masters program offers a concentration in Performance Systems and Training. However, this is somewhat a misnomer in that there is only one course, Performance Systems Technology, whose focus is entirely PT. Therefore, the course serves as both a survey and an application course.

From a content analysis of the PT competencies discussed in Guerra (2003), Stolovitch, Keeps, and Rodrigue (1999), and Klien and Fox (2004), we divided the PT competencies into seven general categories. The first two categories (Conceptual Framework and Planning) were related to skills, knowledge and attitudes (SKA) that were global rather than domain specific. For each of the seven categories we developed core objectives. The other five categories were sorted into the ADDIE activities used in earlier categorizations, and because it was a familiar model for our learners. The following matrix of objectives by category guided our course design.

Table One: *Course objectives derived from the PT competency literature (Guerra, 2003; Stolovitch, Keeps, and Rodrigue, 1999; and Klien and Fox , 2004)*

Conceptual Framework:

1. Define performance technology and its philosophical, systemic, theoretical and organizational underpinnings.
2. Describe the role of the Performance Technologist within an organization.
3. Identify and describe the fundamental components of an HPT model (the systematic combination of performance analysis [PA], casual analysis [CA], and Interventions).
4. Compare and contrast HPT models.
5. Describe a variety of specific performance technology problems.

Planning:

6. Apply fundamental research skills to a PT analysis.
7. Determine the organization's cultural climate for change.

8. Identify change theory approach.

Analysis:

9. Distinguish between performance problems requiring instructional solutions and those requiring non-instructional solutions.
10. Conduct a performance analysis for a specific situation to identify how and where performance needs to change (performance gap).
11. Determine the importance of gaps between what is and what should be at all organizational levels.
12. Conduct a cause analysis for a specific situation to identify factors that contribute to the performance gap.

Design:

13. Match improvement efforts to organizational mission and strategy. (Context specific)
14. Develop recommendations concerning:
    a. What must be improved to maintain required performance?
    b. What must be maintained to improve performance?
    c. What must be abandoned to improve performance?
15. Apply change theory in your approach to PT.
16. Apply systematic research-based design principles.
17. Identify and prioritize possible training and non-training interventions to performance problems at all levels.

Development:

18. Determine resources, time, money, people, and existing interventions.
19. Develop resources specs.
20. Produce required performance intervention according to design specs.

Implementation:

21. Derive implementation plan based on intervention requirements.
22. Derive implementation plan based on organizational dynamic.

Evaluation:

23. Plan a formative evaluation, based on pre-specific performance objectives:

Communication:

24. Communicate effectively in visual, oral and written form.
25. Demonstrate appropriate interpersonal, group-process, and consulting behaviors.

While the learners in the PT course consisted of adults, they were novices in the area of performance technology. Therefore, to prepare the learners for emersion in an authentic learning environment we implemented a combination of instructional strategies early in the course. These instructional strategies provided the necessary conceptual basis (entry level skills) needed to solve the ill-defined problems the learners would be faced with in the simulation. In addition to classroom discussions of the text material, the early instructional strategies included case studies, PT model building, and the design and discussion of several non-instructional interventions.

[See Figure One]

Simulation Design

While this simulation was implemented the previous year in the same class, the simulation was still in the formative evaluation stages. The simulation for the current PT course was revised based upon the objectives derived from the PT competency research, an analysis of the student end-of course surveys and the audio-taped simulation debriefing from the earlier course, and a systematic model of simulation development that emerged during planning.

As stated earlier, the course was designed around specific core objectives related to competencies needed for successful PT practitioners. St. Germain and Laveault (1997) state that because the benefits of simulations are "mostly qualitative in nature, it is important that the learning objectives and the means for evaluating them be well established" (p. 321). Our instructional analysis supported St Germain and Laveult's claim, in that we determined the simulation design process needed to be more systematic to ensure that the simulation met the learning objectives.

The data from the earlier course, and a more extensive review of the simulation literature, led us to conclude that we also needed to address the content validity of the simulation (Dickinson & Faria, 1997; Feinstein & Cannon, 2002; St-Germain & Laveault, 1997), and to improve the overall fidelity of the simulation. In order to address these important design considerations and to move the process in a more systematic direction we developed systematic design model for designing and developing diagnostic experiential simulations.

[See Figure Two]

In an effort to increase the content validity of the simulation a PT expert evaluated the simulation materials before they were implemented. The materials were presented in a workbook that included an overview of the performance technology problem, the background information related to the simulation, the scripts for each actor, the data available to the simulation participants, and a process map of the simulation. The workbook moved the expert through the simulation in roughly the same steps the students would proceed, only with more in-depth information.

After each step, which represented a timeframe in which the students gathered data through actor interview, the experts were prompted in an "Expert Notes" page to ask questions they might ask during that step of the PT process. The process was designed to help the expert reflect on both the performance analysis process, explicitly, and on the fidelity of the simulation. For example, in the notes from the last "interview" section she was asked to answer two questions: What ideas do you currently have based on the information you've received, and Would you ask additional questions, or follow-up questions? And in the second section of the expert notes sheet the expert was asked What questions do you still have, and How will you answer the questions? (given the avenues of data collection you've been afforded.)? In the third, and final section the expert was asked to list any questions or comments she had about the content of the simulation.

Based upon the expert's feedback several changes were made to increase content validity and simulation fidelity. For example, many details were added to the simulation in the form of actor's notes and available data based on the PT expert's statement that "Data about the problem is not sufficiently specific" and that the data "Seems vague on metrics or benchmarks, both internal and external". After the simulation had undergone modifications based on the expert's recommendations the simulation was implemented in the second half of the semester during a six period.

Simulation Implementation

The simulation was implemented in a graduate level Performance Technology (PT) survey course within an Instructional design program. Because the course is only required for Masters students in one of the three concentration areas offered in the program and is offered online in the fall and on campus in the spring, the course enrollment tends to be low. In the Spring of 2004 there were three Ph.D. students and three Masters students enrolled in the course, but only five completed the course.

On the first night of class each student filled out a 36-item survey that consisted of questions about demographics, general knowledge skills, and performance technology competencies. The first four questions were demographic questions. There were seven questions related to general knowledge areas, e.g. word-processing, use of on-line resources, communication, team skills, and metacognition. The remaining 25 questions corresponded to one of the PT competencies listed in Table 1.

The students then participated in a short simulation in which they were confronted with a performance technology problem. The students were divided into dyads, presented with a scenario that included the performance problem and the current data. Each group was asked "What are your next steps (i.e. what do you need to know and how will you get the information)?" Their decision-making process and solutions were intended to provide a base-line measure for comparison to their final project solutions and PT processes.

Because the PT course was a survey course, there was a great deal of content to cover. In the first half of the sixteen-week semester the students were required to read and discuss the fundamentals of performance technology. These instructional strategies were designed to move the learners from a novice level to one of adaptive expertise (Bransford, et. al, 2000). Fore example, the students were assigned several case studies to analyze, in writing, and discuss in class. These case studies built upon the foundational concepts from the readings, and in turn provided an opportunity to practice the problem-solving skills required to move from needs assessment to problem identification in a PT systematic process. The problems in the case studies, and their related interventions, were similar to the four performance interventions the learners designed throughout the course.

The second half of the semester, weeks nine through 15, was dedicated to the simulation experience. The simulation began by providing the students with background information on a United States-based animal health care company, the perceived performance problem to be addressed in the PT analysis, and the key stakeholders involved in the project. As stated earlier, this was the same simulation used in the same course the previous year, only modified based on student and expert feedback.

The initial information was provided to the two "performance technology teams" by their employer (the first author and instructor of the course) in preparation for an interview with the animal health care company's "VP of Human Resources" (the second author). The following is a excerpt from the initial information provided to students:

> *You and your team members have been recently hired by a small Human Performance consulting firm, PerformING Solutions. You will be located in the home office in (name of University Town). Although in your previous job your main responsibilities involved large instructional design projects, you have some experience with small Performance Technology projects. In fact, each of you has had some success with the implementation of the interventions that you suggested in your last position. Because of your part in the success of these projects, the CEO of PerformING Solutions, (1st author's name) felt that you were well qualified, as a team, to conduct a performance analysis of the gaps and opportunities related to veterinary vaccine sales in North America for a new Client, (Company's name)*

During the initial interview the two teams were also provided with an interview schedule with upper and middle management in the form of a flight itinerary.

Both teams were given the same information about the company and the interview processes in the first meeting. They were also told that everyone had the same opportunity to ask for additional interviews if they felt they needed additional information. The only caveat was that they email their requests to their employer (the instructor), rather than make the requests in class. The intent of separating the two groups' process was to see what differences in the PT processes would develop from the choices the two teams made about what data to collect. We hypothesized that the questions each team asked in the interviews would influence their decision-making process and their choices about which additional data to pursue.

During the simulation the two student PT teams interviewed actors recruited from the instructional design program, the drama department, and the management department at our university. While the first meeting with the VP of Human Resources (the 2nd author) took place with both teams, all other interviews were conducted twice-once with each team. The actors were given a copy of the same information on the animal health care company that the students received. In addition they received written and verbal information about their individual roles, their relationships with their "colleagues" (actors) and an overview of the processes and expectations for the interviews.

All interviews were recorded in hopes that the decision paths, as evidenced by their questions, for the two teams could be compared. In addition, each team met with the instructor halfway through the simulation to discuss their processes, i.e. within their chosen PT model, and their current ideas for causes, gaps, and interventions. This discussion, in the form of an interim report, was designed to make the teams' implicit decisions explicit. In addition, the discussion of the interim report with the team's employer (the instructor) was an effort to add fidelity to the simulation.

Simulation Evaluation and Results

The final product for the course was a PT analysis report and presentation. The reports were analyzed and compared to both the pre-simulation outcomes and the decisions made during the actual simulation. In addition, the two groups participated in a whole-class debriefing, which was also audio-taped. As part of the debriefing the participants completed two surveys, a post-course/simulation satisfaction survey and a retrospective self-assessment of PT competencies.

In the pre-simulation each of the three pairs of students moved quickly to drawing conclusions and suggesting interventions. Neither group discussed putting into place a process for next steps or determining what data they currently had and what data they still needed.

A paired sample *t* test was conducted to determine if there was a significant difference between the Retrospective Self Assessment of Competencies and the Final Self Assessment of Competencies for the class as a whole (with a rating scale of 1 – 5; 1 = low and 5 = high). Results indicate that the average rating for retrospective competencies ($M = 1.56$) was significantly lower that the average rating of the final competencies ($M = 3.92$), $t(24) = -18.504$, $p < .01$. This suggests that the students felt they had significantly increased their mastery of PT competencies after completion of the simulation and the course.

However, from an analysis of the final product it was fairly evident that while the students felt that they had increased their PT skills overall, there were still some competencies that needed to be improved. For example, one group did not go beyond the data that was given to them during interviews or provided by the instructor. This was indicative of a poor inquiry process and an overall lack of applying research methodology principles. While the other group did a great job of going beyond the data, their presentation of the information to the stakeholders was not well organized and was written with a lack of sensitivity for the stakeholders. This was an indication of their lack of communication skills and, to a lesser extent, a lack of application of change management principles.

While one group did discuss the PT model that they used to guide their processes, neither group included a graphical representation of a PT model or used the steps of a model to guide their learners through the document. This could be interpreted as either an outcome from the end of semester rush to completion or a more substantial lack of understanding of how to apply a PT model. Because neither group chose to include a model, a third explanation could be a misunderstanding of the assignment. In any case, the fact they chose not to use a model showed a lower level understanding of how to organize and report data to stakeholders.

However, compared to the pre-simulation outcomes the final products for both teams showed vast improvements. Both teams identified the gaps and the causes for those gaps and then aligned their solutions with those causes. The team that sought out additional data did a better job of providing a more holistic approach to the performance problem by suggesting more global interventions. For example the group's suggested interventions addressed the following areas of concern: Organizational Communication for all both internal and external customers, Job Analysis/Work Design, Organizational design and development, and Organizational values in addition to training interventions. However, focused on more of an individual level, i.e. for the employees that they interviewed. The second team's suggestions were for Soft skills training, Job analysis and work design, Motivational system, Organizational communication- between internal clients, and Benchmarking for the two groups they interviewed. In addition, the data from the final project showed that the team that provided a more holistic view of the problem also tied their suggestions to their data, whereas the other team's suggestions were not tied to data, rather they appeared to be based on opinion.

After each of the two teams presented their final project to the stakeholders (actors and instructor), the first author conducted a debriefing. Immediately after the debriefing, each student completed an individual questionnaire about the course, which included questions related to the entire course and specifically to the simulation. The survey was divided into three sections, General Course Evaluation, Course Topics & Assignments, and Simulation experience. One of the questions asked the students to rank the three most relevant assignments in the class. The choices were case studies, intervention assignments, simulation experience, simulation report, group charter, and individual project. All five respondents chose Case studies as one of the three most relevant assignments, whereas only four of the respondents chose the Simulation experience as one of the three most relevant assignments.

Similarly, the responses to Simulation experience questions were mixed. When asked to choose what level, high, medium or low, best represented the fidelity of the simulation two respondents chose high, two chose medium and one chose low. However all but one of the students chose the highest rating for the question about how effective the debriefing of the simulation was for their learning,

Conclusions

There were several research methodology problems with this study. First, the two groups were not matched on their general skills or knowledge and skills related to PT. This makes any comparison across groups invalid. However, it did provide an interesting look at each group's decision-making process.

A second methodological problem was the incompleteness of the data. While we tape-recorded all of the interviews, several of the recordings were lost. Our original purpose in recording the interviews was to compare each group's decision paths based on the questions they asked as they progressed through the simulation. Because of the lost recordings we have no such comparison.

The final methodological problem was that of emerging data. As stated earlier, in the pre-simulation each group seemed to jump to interventions rather than determine the next steps in data gathering. If we had analyzed our data as it emerged, rather than at the end of the study, perhaps we could have helped the teams develop better data gathering skills. Again, perhaps this too was an interesting outcome in that we discovered that our students don't have a high level of research skills. This is an important PT competency and therefore a skill that needs to be taught or reviewed.

Next we'll specifically address our two research questions. There were mixed results for the first question, Will an extended diagnostic experiential PT simulation foster the learning outcomes identified from the literature on PT competencies. The students' self reports did show that they felt that they had a significant increase in the 13 PT competencies in Table one. However, their final projects showed that they were still weak in several general competencies, i.e. competency number 6 and 16: applying research skills, and several PT competencies, i.e. competency number 15 (applying change theory), 17 (identify and prioritize interventions at all levels), 24 and 25 (communication skills).

St-Germain and Laveault (1997) state that because of the qualitative nature of the learning outcomes from simulations both the learning outcomes and the evaluation should be well established. While the simulation was based on specific learning outcomes derived from the literature on PT competencies, the evaluation methods were not as well established. Therefore, our second question, which was related to the necessary components of a PT simulation, cannot be addressed without additional data. While we have anecdotal data related to the fidelity of the simulation, and content validity from our expert review, the incompleteness of our data does not allow us to draw any empirical conclusions.

While the outcomes from the study were mixed, we believe the study is important for the following reasons:

- To provide alternative learning and assessment opportunities for non-traditional students.
- To continue to look for strategies that increase critical thinking and problem-solving skills in our graduate students.
- To add to the theory base of instructional strategies that promotes authentic learning contexts, specifically simulations.
- To add to the growing body of empirical knowledge on developmental research. This is important for the continued growth of the field of Instructional Design. As Richey, et. al (2004, p. 1102) states "Given this definition of the field, developmental research is critically important to the evolution of our theory base."

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Figure One: Course Design

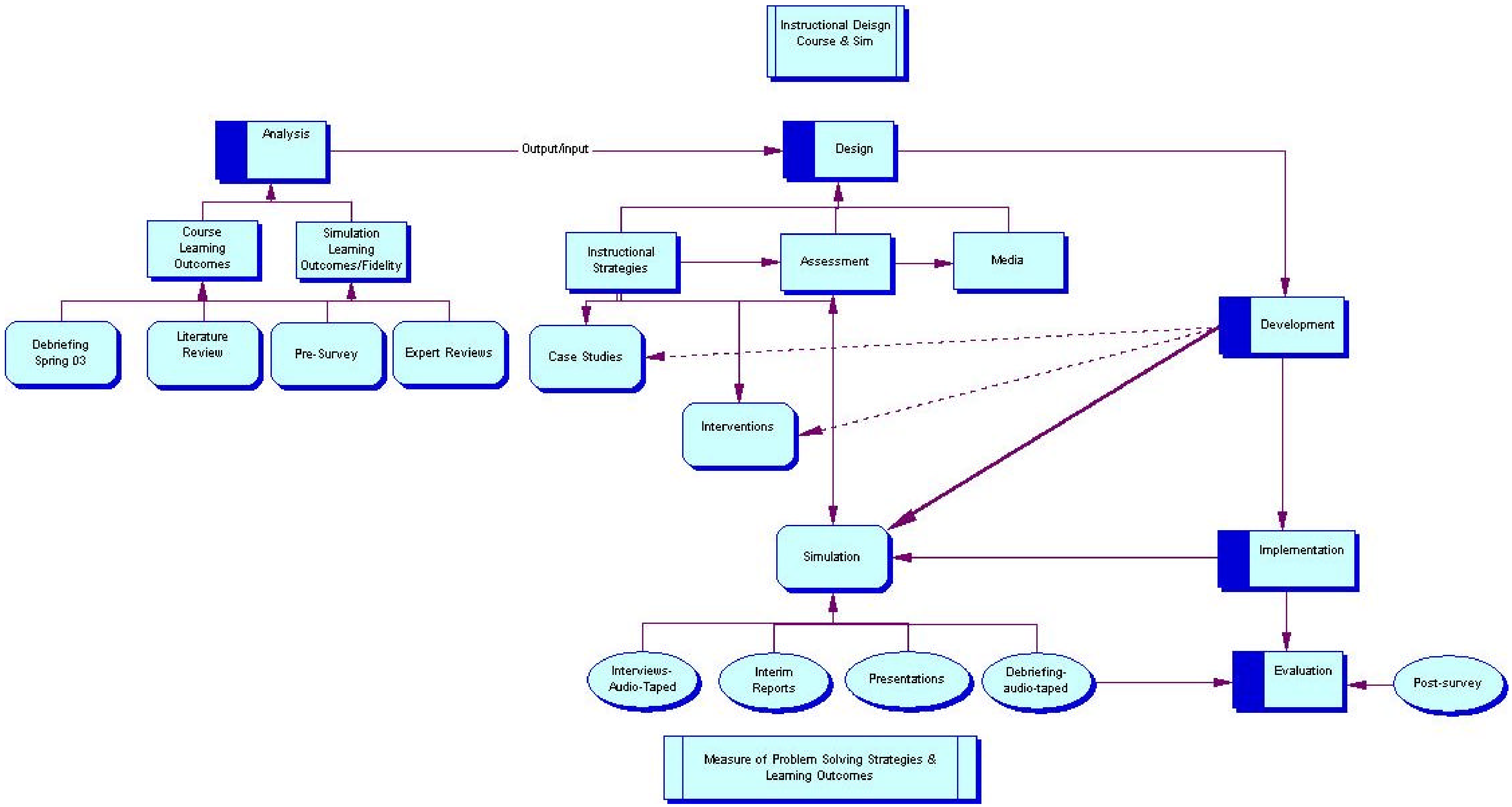

Figure Two: Simulation Model

Simulation Type:
Experential/ Diagnostic