

Reflections on how M. David Merrill's First Principles of Instruction (FPI) Can Transform Student Learning

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Three previous action research studies illustrated the transformative power Merrill's First Principles of Instruction (FPI) had on three graduate-level Instructional Design and Technology courses. Data collected indicated statistical increases in overall student mastery, student course satisfaction, and student perception of course tasks. These studies included courses dealing with an introduction to audio, video, and interactivity, learning management systems and organization, as well as instructional design and evaluation. Encouraged by these results, the researchers desired to know if Merrill's FPI could be applied to a master's capstone project course (Media Asset Creation). Upon completion of this stage in the study, results indicated that Merrill's FPI had a transformative positive influence on the Media Asset Creation course, although not as strong as the findings from the previous courses, due to the small numbers of students in the study. Indicators show that any course may benefit from the application of Merrill's FPI.

Introduction

Merrill's First Principles of Instruction (FPI) were applied to three Instructional Design and Technology courses at a private university located in the southeast area of the United States. Based on the findings from these previously FPI-transformed courses, the researchers replicated the study with a follow-on graduate course called IDT680 - Media Asset Creation, in which students completed their Master's Capstone Project. In the spirit of action research and reflection on the success of the previous course re-designs, this study also included qualitative student reflections on their development processes using FPI.

IDT680 – Media Asset Creation, the course where students develop their Master's Capstone Project, is four weeks long. As part of the action research, every part of Merrill's FPI was applied. Data collected came from six months prior to the re-design using Merrill's FPI to six months after the application of Merrill's FPI was applied. One may wonder what Merrill's First Principles of Instruction are. They are noted as follows:

Task-centered: Learning is promoted when learners acquire skill in the context of real-world problems; Activation: Learning is promoted when learners activate existing knowledge and skills as a foundation for new skills; Demonstration: Learning is promoted when learners observe a demonstration of the skill to be learned; Application: Learning is promoted when learners apply their newly acquired skill to solve problems; Integration: Learning is promoted when learners reflect on, discuss and defend their newly acquired skills (Merrill, 2018; 2020).

Results of Applying Merrill's FPI

As in previous courses Merrill's FPI was applied in re-designing them (McBride et al., 2020; 2022; Cropper et al., 2021); for IDT680 the researchers gathered data from the following areas:

1. Overall student mastery of content (MoC);
2. Positive instructor experience (PiE);
3. Positive overall experience (PoE);
4. Perception of Merrill's FPI being applied to the course (FPI effect).

Prior to the application of Merrill's FPI, IDT680's MoC was 94.16 percent. After the implementation of Merrill's FPI, the MoC rose to 94.46 percent. The PiE stayed about the same, with the previous six months at 4.95 (on a scale of 1 to 5, with 1 as "strongly disagree" and 5 as "strongly agree), with the PiE dropping slightly to 4.94. However, the PoE went from 4.89 for the previous six months to 5.0 for the six months after the implementation of Merrill's FPI. The "FPI effect," however, was a solid score of 5. It is important to note that despite the scores not being as high as the researchers had hoped for, the re-designed IDT680 course was more rigorous and robust as compared to the older version of the course, indicating the positive effect Merrill's FPI has on student retention and engagement. It is important to note further that the "N" was small, consisting of only 22 students. As the action research continues, and as the "N" increases, the researchers expect an increase in the aforementioned areas.

Before the application of Merrill's FPI, IDT680 was originally put together based on outcomes and objectives, not task-centered. It consisted of learning activities, but no conscious decision in using any particular instructional design model was followed. In other words, it consisted of good ideas and activities but did not follow a conscious instructional design model. Merrill's FPI changed all that, and the results, as discussed above, indicate that.

Literature Review

A literature review also encourages further exploration of the "FPI effect." A review of instructional theories and models revealed that FPI was represented in many of them (Merrill, 2002). Studies researching the effectiveness of FPI revealed renewed confidence in Merrill's FPI and task-centered approach (Merrill, 2018; 2020).

In recent studies, Frick et al. (2022a; 2022b), and Frick and Dagli (2022) provide evidence of the transformative effectiveness of FPI through analysis of student performance on an Indiana University Plagiarism Tutorials and Tests (IPTAT) Massive Open Online Course (MOOC). The latest study (Frick & Dagli, 2022), included 131,000+ learning journeys with adult students participating from 169 countries worldwide from August 21, 2022 to October 18, 2022. Using Google Analytics for tracking student use of the IPTAT website – a new version of Google Analytics (GA4) was leveraged to do an Analysis of Patterns in Time (APT) along with Excel spreadsheets (Frick & Dagli, 2022). The main APT findings showed that students who tried any part of an IPTAT designed with FPI (Merrill, 2020) were two times more likely to pass a certification test. Further, students who tried all parts of the IPTAT designed with FPI were four times more likely to pass a certification test. By the same token, students who tried no parts designed with FPI were 1.2 times more likely to fail a certification test.

Discussion

Merrill (2018; 2020) contends, and research confirms, transformative student learning takes place when learners are engaged in solving real-world problems; existing knowledge is activated as a foundation for new knowledge; new knowledge is demonstrated to the learner, applied by the learner, and finally, integrated into the learner's world. In previous courses, as discussed earlier, the researchers noted positive results in the Action Research items/indicators listed above, where Merrill's FPI was implemented, as compared to the earlier versions of the courses prior to such implementation. They expected to find similar results in the IDT680 - Media Asset Creation course, the course that was redesigned during this study. Further, the researchers evaluated how well and to what extent Merrill's FPI impacted students' learning in the development and quality of their individual capstone projects, which was the purpose of the redesigned course. What is significant is students experienced the transformative effect of Merrill's FPI in a course directly dedicated to reflection on skills learned in past courses, and in the development of a capstone project.

But aside from the statistics, what did students feel or perceive about the "FPI effect," and how did it influence the development of their capstone projects? The following is taken from qualitative student reflections regarding their experience in IDT680 – Media Asset Creation:

"Merrill's First Principles of Instruction (FPI) is an organized yet straightforward framework to ensure task-centered training. Each of the five phases included in the diagram combines to create a solid design foundation. Instructional designers begin by determining a learning outcome. Next, they activate prior knowledge and follow with a demonstration. Once learners have new knowledge, they apply it in the application phase. Finally, designers assess learning in the integration phase. The framework is easy to follow, making it an excellent choice to help develop a capstone project."

"By incorporating activation, demonstration, application, and integration, I ensured that students were actively engaged, gained a thorough understanding of the material, and had ample opportunities to apply their knowledge and skills in authentic situations."

"My successes amount to feeling empowered by producing a project I feel proud of, and I haven't been able to say that in a long time with my coursework because of the bumps in the road along the way. I also love building eLearning content that was fleshed out with my online learning with Articulate. My most important success has been the absence of feeling overwhelmed or stressed with this project, and I feel like that goes back to the IDD Blueprint and Merrill's FPI."

"These would serve not only as road maps for the path ahead but repeatedly going over the plans for the project helped me to quickly identify potential issues and mitigate those issues. Eventually, during this course and the execution phase of the project, those plans became a checklist that I was able to follow to verify that each task was being completed. If you fail to plan, [you] then plan to fail."

Conclusion

Students who have experienced FPI and who have had the opportunity to reflect upon past course experiences that have been transformed by applying FPI expect the same quality of course, especially in their capstone project course. For many, the capstone project becomes the centerpiece of their professional portfolios, which often leads to greater opportunities in the field of Instructional Design. Having experienced the transformative power of FPI in this course will allow students to further hone and sharpen fundamental skills, knowledge, or perspectives that should be pursued to ensure they can contribute meaningfully and responsibly to the effective and impactful design of learning experiences.

For-profit universities, like the one involved in this research, are uniquely motivated by what provides the best results with the highest return on design time invested—their existence depends on it! Having reflected on data indicators collected from previous studies and from the findings in this redesigned course, the researchers suggest that Merrill's FPI can be generalized as transformative design guidelines.

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