

From Teaching to Learning: Learner-Centered Teaching and Assessment in Information Systems Education

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ABSTRACT

This paper makes the case for movement from a teacher-centered educational paradigm to a learner-centered paradigm by employing a template-based approach consistent with the intent of the *Capability Maturity Model Integration* (CMMI) (2002, 2004) attempt to bring quality standards to the systems and software development industry. The paradigm shift from the Teaching Paradigm to the Learning Paradigm is discussed and comparisons of the essential features of the two paradigms are explained. The effect of the paradigm shift on the task of assessment is posited and Weimer's guidelines for developing learner-centered assessments are enumerated and discussed. A twelve-step template-based approach to developing learner-centered teaching and assessment strategies is then proposed and discussed (Wagner et al., 2008). It is concluded that this approach to the construction of educational activities provides for greater student learning and a more authentic student assessment. It is also concluded that the approach is important for education of IS students (Landry et al., 2008).

Keywords: Learner-Centered Teaching and Learning, Educational Paradigm, Capability Maturity Model Integration, Learner-Centered Assessment.

1. FROM TEACHING TO LEARNING

Over the last two decades a paradigm shift has been taking place in American higher education.

The traditional, still dominant paradigm is the Instruction/Teaching Paradigm. In this paradigm a college is viewed as an institution that exists to provide instruction. Under it, colleges have created structures to provide for the activity of teaching, an activity conceived primarily as delivering 50-minute to 75-minute lectures; i.e., the mission of a college is to deliver instruction.

As a discipline some now recognize that our dominant paradigm mistakes a means for an end. It takes the means or method - called "instruction" or "teaching" - and makes it the

college's end or purpose. To say that the purpose of colleges is to provide instruction is like saying that the business of Chevrolet is to operate assembly lines. Some now see that the mission of our higher education system is not instruction but rather that of producing *learning* with every student by *whatever* means work best. This paradigm is usually referred to as the Learning Paradigm.

2. COMPARISON OF TEACHER-CENTERED AND LEARNER-CENTERED PARADIGMS

When comparing alternative paradigms, we must take great care in making the comparison. A paradigm is like the rules of a game: one of the functions of the rules is to define the

playing field and the domain of possibilities on that field. But a new paradigm may specify a game played on a larger or smaller field with a larger or smaller domain of legitimate possibilities. Indeed, the Learning Paradigm expands the playing field and the domain of possibilities, and it radically changes various aspects of the game.

In the Instruction Paradigm, a specific delivery methodology, the lecture, determines the boundary of what colleges can do, whereas in the Learning Paradigm, student learning and success set the boundary. Not all elements of the new paradigm are contrary to corresponding elements of the old; the new includes many elements of the old within its larger domain of possibilities. For example, the Learning Paradigm does not prohibit lecturing. Rather, lecturing becomes one of many possible instructional alternatives, all of which are evaluated on the basis of their ability to promote appropriate learning.

In the Instruction Paradigm, the mission of the college is to provide instruction, to teach. The method and the product are one and the same. The means is the end. In the Learning Paradigm, the mission of the college is to produce learning. The method and the product are separate. The end governs the means.

In the Learning Paradigm a college's purpose is not to transfer knowledge but to create environments and experiences that bring students to discover and construct knowledge for themselves, to make students members of communities of learners that make discoveries and solve problems. The college aims, in fact, to create a series of ever more powerful learning environments. The Learning Paradigm does not limit institutions to a single means for empowering students to learn; within its framework, effective learning technologies are continually identified, developed, tested, implemented, and assessed against one another. The aim in the Learning Paradigm is not so much to improve the quality of instruction - although that is not irrelevant - as it is to improve continuously the quality of learning for students both individually and in the aggregate.

The Learning Paradigm shifts what the institution takes responsibility for: from quality instruction (lecturing, talking) to student learning. Students, the co-producers of learning, can and must take responsibility for their own learning. Hence, responsibility is a win-win game wherein two agents take responsibility for the same outcome even though neither is in complete control of all the variables. When two agents take such responsibility, the resulting synergy often produces powerful results.

By shifting the intended institutional outcome from teaching to learning, the Learning Paradigm makes possible a continuous improvement in productivity. Whereas under the Instruction Paradigm a primary institutional purpose was to optimize faculty well-being and success - including recognition for research and scholarship - in the Learning Paradigm a primary drive is to produce learning outcomes more efficiently. The philosophy of an Instruction Paradigm college reflects the belief that it cannot increase learning outputs without more resources, but a Learning Paradigm college expects to do so continuously. A Learning Paradigm college is concerned with learning productivity, not teaching productivity.

In the Instruction Paradigm knowledge, by definition,

consists of chunks of information dispensed or delivered by an instructor. The chief agent in the process is the teacher who delivers knowledge; students are viewed as passive vessels, ingesting knowledge for recall on tests. Hence, any expert can teach. Partly because the teacher knows which chunks of knowledge are most important, the teacher controls the learning activities. Learning is presumed to be cumulative because it amounts to ingesting more and more chunks. A degree is awarded when a student has received a specified amount of instruction.

The Learning Paradigm frames learning holistically, recognizing that the chief agent in the process is the learner. Thus, students must be active discoverers and constructors of their own knowledge. In the Learning Paradigm, knowledge consists of frameworks or wholes that are created or constructed by the learner. Knowledge is not seen as cumulative and linear but as a nesting and interacting of frameworks, each building on its predecessor. Learning is revealed when those frameworks are used to understand and act. Seeing the whole of something - the forest rather than the trees - gives meaning to its elements, and that whole becomes more than a sum of component parts. Wholes and frameworks can come in a moment - a flash of insight - often after much hard work with the pieces, as when one suddenly knows how to ride a bicycle.

In the Learning Paradigm, learning environments and activities are learner-centered and learner-controlled. They may even be "teacher-less." While teachers will have designed the learning experiences and environments students use - often through teamwork with each other and other staff - they need not necessarily be present for or participate in every structured learning activity.

In the Instruction Paradigm, faculties are conceived primarily as disciplinary experts who impart knowledge by lecturing. They are the essential feature of the "instructional delivery system." The Learning Paradigm, on the other hand, conceives of faculty as primarily the designers of learning environments; they study and apply best methods for producing learning and student success.

If the Instruction Paradigm faculty member is an actor - a sage on a stage - then the Learning Paradigm faculty member is more like a facilitator; that is, more like coach interacting with a team. If the model in the Instruction Paradigm is that of delivering a lecture, then the model in the Learning Paradigm is that of designing and then playing a team game. A coach not only instructs football players, for example, but also designs football practices and the game plan; he participates in the game itself by sending in plays and making other decisions. The new faculty role goes a step further, however, in that faculty not only design game plans but also create new and better "games," ones that generate more and better learning.

3. HOW THE SHIFT TO A LEARNER-CENTERED PARADIGM AFFECTS ASSESSMENT



The Learning Paradigm necessarily incorporates the perspectives of the assessment movement. While this movement has been under way for at least two decades, under the dominant Instruction Paradigm it has not penetrated very deeply into normal organizational practice,

although more and more colleges across the country are now feeling pressured by accrediting agencies to systematically assess student learning outcomes. The reason for this prior lack of outcomes knowledge is profoundly simple: under the Instruction Paradigm, student outcomes are simply irrelevant to the successful functioning and funding of a college.

Our faculty evaluation systems, for example, evaluate the performance of faculty in teaching terms, not learning terms. An instructor is typically evaluated by his peers or dean on the basis of whether his lectures are organized, whether he covers the appropriate material, whether he shows interest in and understanding of his subject matter, whether he is prepared for class, and whether he respects her/his students' questions and comments. All these factors evaluate the instructor's performance in teaching terms. They do not raise the issue of whether students are learning, let alone demand evidence of learning or provide for its reward. In the Instruction Paradigm, teaching is judged on its own terms; in the Learning Paradigm, the power of an environment or approach is judged in terms of its impact on learning. If learning occurs, then the environment has power. If students learn more in environment A than in environment B, then A is more powerful than B. To know this in the Learning Paradigm we would assess student learning routinely and constantly.

The following list serves to summarize the major differences between the Teaching Paradigm and the Learning Paradigm:

- In the Teaching Paradigm, the professor's role is to be primary information giver and primary evaluator, whereas in the Learning Paradigm the professor's role is to coach and facilitate. Professor and students evaluate learning together;
- In the Instruction Paradigm, teaching and assessing are separate but related activities, whereas in the Learning Paradigm teaching and assessing are intertwined through formative and summative assessments;
- In the Instruction Paradigm assessment is used to monitor learning, whereas in the Learning Paradigm assessment is used to promote learning and diagnose learning mistakes;
- In the Instruction Paradigm emphasis is on right answers, whereas in the Learning Paradigm emphasis is on generating better questions and learning from mistakes;
- In the Instruction Paradigm desired learning is only assessed directly through the use of objectively scored tests, where in the Learning Paradigm the desired learning is assessed directly/authentically through papers, projects, performances, portfolios, and the like depending on the fit between the activity (test, paper, performance) and the outcome;
- In the Instruction Paradigm the student culture is competitive and individualistic, whereas in the Learning Paradigm the student culture is cooperative, collaborative, and supportive.

4. GUIDELINES FOR DEVELOPING ASSESSMENT TASKS THAT PROMOTE LEARNING

In developing activities to promote student learning we

should be governed by the design principle that the student successfully completing the task will, in the process of completing it, demonstrate their success in learning the task. Maryellen Weimer (2000) has identified key elements that we should consider when designing student learning tasks.

4.1 Focus Students on the Learning Process

Ensure that students know and describe the desired outcome of the learning process. Discuss how the learning process is designed to assist the students to achieve the desired outcome by being mindful of being certain to avoid passive processes known to be relatively ineffective. Discuss how learning activities lead to the desired outcome. Make students mindful of what they are doing, question why they are doing it, and expose them to alternatives (potentially more effective approaches). Challenge them to explore their approaches and presenting alternatives at times when you have their attention.

4.2 Reduce the Stress/Anxiety of Learning Experiences

Experiences that prepare students for what is to come help them manage stress. *With exam reviews* use authentic, bona-fide test questions, not ones that would never appear on an exam. Building student confidence in their ability helps to make the assessment itself more authentic. The goal here is to provide for optimal student learning, not categorizing students according to their results on the assessment. *With papers*, it means access to samples that illustrate appropriate topics and levels of treatment. Anxiety falls when the stakes are lower. Does it matter how long or how many tries it takes if students ultimately learn the content? Sometimes, perhaps, it does, but not always. The goal is to reduce and better manage the kinds of stress that inhibits and prevents learning. Opportunities to redo or try again are effective tools in the pedagogical repertoire of the learner-centered teacher.

4.3 Do Not Use Evaluation to Accomplish Hidden Agendas

Avoid using evaluation to demonstrate the rigor and complexity of the content. This de-motivates students and encourages them to see success in terms of ability, not effort. Rigor and standards belong in courses. They challenge students and result in more learning, but there is a point of diminishing returns. Evaluation events can be used to measure application and critical thinking skills, but they promote these skills more effectively if students have the opportunity to work on them in class or on homework first.

4.4 Incorporate More Formative Feedback Mechanisms

Grades are summative feedback, highly judgmental, and comprehensive in their conclusions. And they often get in the way of learning. It is usually best to separate the two. Feedback should be directed toward the performance and should use language that describes more than it evaluates.

4.5 Provide Learning Approaches and Assessments that Meets the Criteria of Exemplary Assessment Tasks

Huba and Freed (2000) provide criteria of an exemplary assessment task. At the conclusion of each learning session (class or activity) it is advisable to consider how the session

was conducted with respect to their criteria. According to Huba and Freed, exemplary learning tasks are considered to be:

- Valid – yields useful information to guide learning;
- Coherent – is structured so that activities lead to desired performance or product;
- Authentic – addresses ill-defined problems/issues that are either enduring or emerging;
- Rigorous – requires use of declarative, procedural, and meta-cognitive knowledge;
- Engaging – provokes student interest and persistence;
- Challenging – provokes, as well as evaluates, student learning;
- Respectful – allows students to reveal their uniqueness as learners;
- Responsive – provides feedback to students leading to performance improvement;
- Retention – leads to a high percentage of cognitive retention for most students;
- Reasonable – efficient use of class and homework, as well as instructor time commitments; and
- Resources – adequate resources are planned and provided in a timely manner.

5. USING ASSESSMENT TO MAKE OUR CLASSROOMS MORE LEARNER-CENTERED



Wagner et al. (2008) presents a demonstration of a template approach for development of documents that incorporate the principles discussed above for the development of Learner-Centered achievement of outcomes. The specific example presented shows a very successful approach we use involving building teams, which we then use as a teaching method to enhance significantly the quality of learning outcomes. This approach represents a profound break with previous methods and is essential in for achieving success for programs of information systems. Landry (2008) reviews the importance for IS faculty to embrace this new approach.

A template approach was chosen consistent with the intent of the *Capability Maturity Model Integration* (CMMI) (2002, 2004) attempt to bring quality standards to the systems and software development industry. The template presents a very explicit manner for implementing templates for other learning outcomes and for assessing their performance with an eye towards improvement based on measurement. In principle, this describes a CMMI level 5 reusable approach. Each step of the template consists of instruction for completing the step as well as an example of what the template user might create as a final document. When the new template is completed, the instructions may be retained or deleted. The two assessment instruments presented in Wagner et al. (2008) provide mechanisms to gain student feedback on the educational approach in a manner consistent with the above specified concepts. An additional assessment structure is provided for the instructor to pre- and post-assess the template, and to develop recommendations for maintenance. This loop closing behavior is characteristic of CMMI level 5, and allows for continuous improvement to take place. Landry et al. (2008) suggests that the improvement process can be facilitated

through a community of practice type involvement, as does Longenecker (2007).

The recommended template consists of 12 steps as follows:

- Context of the Method (including goal definition);
- Mapping the Goals of the Method to National Models;
- Interaction with Other Learning Outcomes;
- Rationale for this Learning Outcome;
- Strategy for Achieving this Learning Outcome;
- Assessment Concepts/Methods;
- Exam Objectives for this Learning Outcome;
- Supporting Materials Required for the Method;
- Pilot Study Observations;
- References;
- Planning Summary for Deployment of the Method; and
- Performance Review.

6. CONCLUSIONS

What are colleges and universities for? Like many such questions, this one is often ignored even though it is so very important. And it is most likely to be ignored by those of us who work in colleges and universities. We are in the schema of teaching... we do it how it has always been done. The places where we work are so familiar to us, the schedules and rules so constant, the routines so natural that we can easily assume that they have always been done that way. We can so easily focus on delivering what we consider to be a sound curriculum that we ignore whether or not our students are learning. Indeed, we can become a bit myopic about our environment simply because we have been there for so long. We cease to notice what our environment implies about the purposes and goals of our institutions, and how these features affect the lives our both us and our students. Indeed, the things we see everyday are the things that we see not at all.

The fact that we do not notice the structures of our organizations does not mean that we like them. In fact, most colleges are beset by an underlying dissatisfaction, a sense that things are not quite right. But why are things not quite right? And what is the cause of the problems? The real root of our most persistent problems may be the invisible enemy, the one we don't see because we see it every day: the teaching-centered organizational paradigm governing our institutions.

Too many of us spend too much time focusing on what we teach and not enough time on how we teach. In fact, teaching is not the real issue here – the real issue is student learning. The template we propose herein moves the teaching, learning and assessment cycle from the traditional teacher-centered paradigm to a more learner-centered focus. The example we present, while focusing on the concept of building successful work teams, is easily transferable to any number of student learning objectives.

Authentic assessment is any type of assessment that requires students to demonstrate skills and competencies that realistically represent problems and situations likely to be encountered in their daily work life. Employing our proposed template moves the assessment of our students to a much more authentic mode. Our students are now required to

produce ideas, to integrate knowledge, and to complete tasks that have real-world applications. Moreover, our students are required to analyze their own growth relative to the rubrics they generate as part of the reflective process.

So, what are our colleges and universities for? In fact, we have many stakeholders. These include our students, alumni, faculty, and the industries which employ our students. By moving from a teaching-centered to a learner-centered educational paradigm we have positively addressed the concerns of all of our stakeholders, and in doing so produced graduates of our programs much better prepared to fulfill the workplace requirements of the 21st century. As IS faculty we must embrace and support this profound change for the improvement of our students and for the improvement of our or any profession.

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