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PROFESSORS AS ARCHITECTS OF STUDENT LEARNING

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The famous French aviator, Antoine de Saint-Exupery, commented about leadership by saying, "If you want to build a ship, don't drum up people together to collect wood and don't assign them tasks and work, but rather teach them to long for the sea." In a similar fashion, as leaders of learning, professors should follow the precepts of educational psychology to inspire students to deeply learn the course material. A student who is made passionate about learning a topic will fill his or her own bucket with greater expedience and efficiency than any professor can. This is a testament to the virtues of intrinsic, versus extrinsic, motivation. An optimal learning environment can be crafted, first, by providing a setting for academic success. A savvy professor can then design the course assessment scheme around harnessing student desires for autonomy. Role modeling can be integrated into the curriculum to shape student attitude and behavior. In similar fashion, an overall reinforcement plan can be instituted to reward appropriate student behavior. Following these tenets, educators can make learning an autotelic event that it is a self-contained activity, pursued by students not just for a good grade, but for the sake of learning itself (Csikszentmihalyi, 1990).

Provide a Setting for Academic Success

What Antoine de Saint-Exupery was referring to in his quote about shipbuilding is a noble goal for all educators: producing an autotelic experience where the very act of learning serves as internalized motivation for students to further more learning in a self-sustaining chain reaction. The groundwork for producing such a mechanism in the classroom derives from an analysis of Maslow's hierarchy of needs. According to Maslow, the lower hierarchical needs of students must be met in order to be motivated to focus on learning processes. Although Maslow posits that achieving a lower level is a prerequisite for moving to a higher place in the hierarchy, this tenet has been called into question. The notion seems at odds with Asian mystics who attempt to obtain enlightenment by ignoring some of their physiological needs and by religious and political martyrs who become self-actualized through acts that will bring certain death (Tennant, 1997). Maslow's hierarchy is not perfect, but it does provide the basis for understanding the rudimentary nature of motivation, which is very applicable to fostering the proper learning environment in a classroom by teachers who use it to address the basic needs of students.

Fertile Soil Will Produce Strong Crops

An appropriate metaphor that aids in understanding how Maslow's theory applies in the classroom is taken from farming. By ensuring that soil is at its peak nutritional level and most propitious for supporting growth, farmers can produce optimal crops. In a similar fashion, teachers who meet the physiological and safety needs of students in their classrooms can foster an ideal environment for learning. The physiological needs required by students usually don't present much of a challenge at the university level of instructions, nor do physical safety needs. The same cannot be said regarding intellectual safety.

Intellectual safety is predicated on a student's perception of what ideas can be voiced in class. This perception hinges on the expected reaction by both the teacher and peers when a student expresses thoughts that are widely divergent from those held by mainstream society. Feeling intellectually safe empowers students to proffer unpopular opinions sans fear of being ostracized. According to E.D. Hirsch, an emeritus professor of education at the University of Virginia and the founder of the Core Knowledge Foundation, "Schools must encourage the idea of rational persuasion" (Merrow, 2004). Students must be urged to voice their sentiments about topics being discussed, provided that they back their assertions up with factual information and provide a rational argument to buttress their position. This is particularly important during the first few years of a student's college experience. Most undergraduate students' propensity to participate in class discussions derive from how their comments were treated during high school. Professors must be acutely aware of this mental baggage and should consider it as a possible cause of recalcitrant first and second year students.

An intellectually safe classroom will prompt shy students to take risks and make mistakes in the course of learning. In fact, capable professors may capitalize on student mistakes by requesting that the erring student divulge the logic behind how she or he arrived at their assertion. Doing so creates a safe environment for students to take risks and make mistakes, incorporating the process integrally into the learning that occurs in the course (Merrow, 2004). One way to provide students with the initial impetus to expose their

opinions in such a fashion involves having them perform a public analysis of personal strengths and weaknesses at the start of the semester. This may sound overly brazen at first, but if every student is encouraged to voice their strengths and weaknesses with regards to the course material, tremendous group cohesion can be orchestrated.

Icebreakers That Lower Mind Guards

An example of a propitious method for making students feel comfortable exposing controversial and personal opinions is to create an introductory activity where students explain their strengths and weaknesses during the first class period of a course. By taking a chapter from business theory, teachers can produce an icebreaker activity where students introduce themselves by conducting a metacognitive "SWOT" analysis as it relates to the course. A SWOT analysis consists of exposing the strengths, weaknesses, opportunities and threats that a student perceives, vis-à-vis their expectations for the course (Kotler, 2003). The effectiveness of such an activity fosters perceived acceptance by a student's peers, since all students must perform a similar analysis for themselves. The activity produces even greater dividends of acceptance when combined with a scheme where each student's learning partner is the one who showcases her or his partner's SWOT analysis. Such an icebreaker not only creates the impression that the course will be intellectually safe, but it shows student that they will have a say in what topics they study and how their learning takes place throughout the semester.

Permit Student Autonomy

The tantalizing glimmer into learning autonomy provided during the SWOT analysis can be perpetuated through a program of instruction that answers each student's need for a sense of competence and self-determination. These are fundamental building blocks for developing a student's motivation to learn new material.

Striving For Competence

Each student possesses two primary sources of motivation that prompts the learning of concepts exposed by a professor. The first source consists of the personal expectations of performance outcomes, such as the expected grade for a certain amount of effort. The second motivation stems from self-efficacy, or a student's desire to improve their capability and competence in mastering the course material (Zimmerman & Schunk, 2004).

Every individual has an innate yearning to become competent in dealing with their environment; a motivation which stems from grasping the perceived benefits of becoming competent. In fact, students measure their attainment of competence by matching their efficacy beliefs to the curricular demands of a particular course and from what will be expected of their performance (Bandura, 1997). By providing students with a clear depiction of a professor's expectations for their performance during the semester, we allow students to gauge how their competence will have to develop in order to be successful in the course. Expectations can be outlined for the students through the syllabus and by conveying what the teacher requires during the first class period. These expectations may require a rather lengthy syllabus to convey. Some educators are in the practice of providing take-home syllabus quizzes so that students become intimately familiar with the contents of this very important course guide. Such a quiz also shows students that the professor takes the course design and expectations very seriously (Raymark & Connor-Greene, 2002).

If a student's sense of competence in a course is so vital, then how do educators assess the actual competence of their students in the course, versus simply the professor's perception of it? Measuring competence is a tricky undertaking. After all, determining behavioral objectives that are accurate indicators of competence is challenging, especially when drafted in advance of the course. The multifarious range of human expression makes correlating behavior to competence unpredictable (Tennant, 1997). Furthermore, students can restrain their demonstration of competence when doing so may undesirably expose their socioeconomic status, religious affiliations or political inclinations. Lastly, not all learning outcomes can be perceived in behavioral terms (Tennant, 1997). So then, what can educators do to encourage student competence in a way that makes attainment of competence observable and measurable for assessment?

Giving Students a Say

I believe this quandary can be addressed through humanistic psychology. By allowing students to show competency via their preferred means, educators can assess a student's learning progress while minimizing concerns that the perceived behavior has been artificially misrepresented by the student. This concept was originally pioneered as determinism, where learning was viewed as the product of a series of events versus from prescribed actions and thus, prompts individuals to self-influence their motivation to learn (Bandura, 1997). The process is also discussed as the cornerstone of self-determination theory, where learners are provided with a sense of autonomy regarding the actions they pursue and thus directly feel in control of their future (Ryan & Deci, 2000).

Educators who create a course designed to foster learning through self-determination will instill an intrinsic motivation in their students to master the material. This runs counter to the orthodoxy of previous education models, where teachers controlled the specific subsets of knowledge that students were tasked with mastering, versus being supportive of student learning autonomy for self-direction. A student who perceives autonomy in their learning will be intrinsically motivated to plumb the depths and nuances of the course material. Such students will perceive an internal locus of control which creates internal rewards for learning the material, versus being dependant on externally imposed

learning goals for their motivation (Ryan & Deci, 2000).

On a practical level, the concept of learning autonomy can be implemented by providing students with choices over as much of their learning process as possible. Having the ability to choose instills feelings of ownership in learning that is accomplished. (Wright, 2006). For example, students can be asked to select from a range of questions to answer for assignments, they may have the freedom to decide which book to use as the supplemental reference in a course, and they can choose the topic for their research paper. Perhaps the ultimate expression of encouraging self-determination and assessing student competency would entail allowing each student to determine the learning objectives and means for measuring performance in a given course. Since learning objectives are inextricably tied to institutional accreditation standards, it may prove unrealistic to allow students to construct their own learning objectives. However, what if educators allowed students to construct personalized assessment tools for accurately showcasing their competence towards the course material?

Custom-Tailored Exams

One radical initiative for the final exam in a course encourages metacognitive reflection, provides learning autonomy and assesses mastery of the material. It involves allowing each student to create their own personalized final examination. The exam can be graded in two parts, the first stressing the quality of the questions posed by the exam, and the second focused on the answers provided by the student. A few weeks prior to the examination period, students can submit the exam to the professor and receive a grade on the quality of the questions that they have posited. That should encourage thoroughness and familiarity with the course contents and learning objectives. Then, each student can be allowed to answer the questions on their personally created exam during the slated period at the end of the course, which will constitute the second part of the grade. By following this process, students will have to build their metacognitive awareness of the primary facets of the course from a perspective of future usefulness. Furthermore, such an exam encourages students to study in a focused fashion, since they will know precisely the questions that will appear on the exam. Each student will be able to tailor their culminating learning experience to what they perceive to be the paramount knowledge imparted by the course, including presentations made by guest speakers and any role models used to highlight course concepts during the semester.

Encourage Role Modeling

Custom-tailored exams would be even more effective if there were a means to link them to the realities of the world outside of academia. How can educators bridge the chasm that often separates academia from real life? Students form part of a campus culture, which is a subset of the overall human experience, yet educators often neglect the tremendous learning opportunities that lie just outside the classroom door. Students stand to benefit greatly from courses designed to promulgate the precepts of social cognitive theory by tapping the outside world through role models and guest speakers presented to encourage certain student behavior.

Role Models to Raise Self-Efficacy

Since no absolute measure of adequacy exists for many activities, students are prone to assess their capabilities in relation to the attainments of others; particularly to those people respected by the students and who are perceived to be similar to the student (Bandura, 1997). By seeing others who are similar to them perform a task successfully; students experience a rise in self-efficacy since they perceive themselves to possess similar capabilities with which to accomplish the activity that the role model does (Bandura, 1997). A carefully chosen role model for a particular discipline can be referenced continuously throughout a course to stimulate student cognitive involvement. Hypothetically speaking, it proves curious for professors to entertain the notion of developing a fictitious person that meets the needs of the course. However, that requires a harmonious blend of initiative and imagination that many professors may not wish to explore. Most of us typically resort to real role models, either historical figures or contemporary ones, and use them as illustrations during our lectures. What if professors deliberately chose role models for their courses and then deliberately integrated their role models with the material being presented?

Role Models as Teaching Aids

If the vicarious observational learning purported above truly garners an increase in student self-efficacy, then shouldn't courses be intentionally designed to showcase role models to motivate student learning? Role models should be carefully picked so that they provide positive, controlled influences on student learning. Although it may seem suitable to pick role models who exhibit personal traits that are beyond reproach, doing so may actually distance the role model from the student and thus prove less effective. Instead, professors can constrain appropriate role model characteristics to those which exhibit robust interpersonal skills, positivism, commitment to excellence, integrity and leadership (Wright & Carrese, 2002). In ideal situations, role models can physically be brought into the class as guest speakers to provide students with an up-front and personal learning experience. Idealistically, each professor stands in front of the class as a type of role model for her or his students, but realistically, a student can reap huge benefits by meeting an external role model that echoes the professor's qualities and which the student has come to respect during previous class presentations that discussed the role model's actions.

Soapy, the Ultimate Role Model

Last semester, I taught a Flight Safety course that delved into the ambiguous nature of safety. The course theme

centered on the question of how one person's perception of safety can differ from someone else's. As part of the course, I presented a thought-provoking case study into the 1983 emergency landing of a British Navy aircraft on a civilian cargo ship. The incident occurred when the pilot became separated from his aircraft carrier and running low on fuel during a mission in the North Atlantic. At the outset of the case study, my students were convinced that the British pilot had acted heroically by saving the very expensive aircraft from certain loss. As the study progressed however, I altered the perspective on the incident, arguing that the pilot's action may have been construed as irresponsible for endangering the lives of the civilian ship, instead of simply choosing to eject from the aircraft and await recovery by the ship or by a navy helicopter. The pilot of the aircraft, whose military call sign was "Soapy," had unwittingly provided my class with a fascinating feat for showcasing the gray areas inherent to pilot decision making, but little did I know that he would soon also prove to be a role model for my students.

After a few days of discussing Soapy's incident as a case study, I discovered that Soapy had moved from England and actually resided in the local area. I invited him to present his personal perspective on the story to my class, which he accepted with surprising alacrity. With Soapy stealthily seated in the back of the room, I started the next class period by asking my students if they desired to meet the pilot we had talked so much about. The look of wonder and elation on the students' faces will forever be etched in my mind as the pinnacle of my teaching career to date. At that point, I introduced Soapy to the class and everyone's attention was riveted as Soapy exposed how he became separated from his fleet and came to land on a passing ship in the middle of the Atlantic Ocean, 22 years ago.

After Soapy's appearance in the class, the students were so moved by the opportunity to exchange opinions with the man behind the case study, that they kept prompting me to invite Soapy back for subsequent class sessions. In essence, the students adopted Soapy as a role model. This adoption was completely fortuitous and became a very welcome addition to the strategy for conveying the course material. It proved to be an insightful lesson in how professors can integrate role models into a carefully crafted reinforcement plan, in order to control the feedback that students receive in a more deliberate fashion.

Crafting a Reinforcement Plan

The greatest benefit stemming from Soapy's adoption by the students in the course was that he validated the concepts that were being exposing to the students. During his occasional presence in class, Soapy would interact with the student learning teams, providing examples of his own that buttressed the ones that I used in class. His presence in the course illustrated the principles of operant conditioning, where student behavior is directly related to the quality and quantity of feedback they receive in the classroom and in life. In order for the feedback to function effectively, however, it must be timely and tied to the course objectives.

The Law of Effect

Since an educator's desire is to alter student behavior in order to produce a certain effect, it becomes imperative to study how Thorndike's Law of Effect views learning as the relationship between a stimulus and a student's response. A given action performed by a student will only be associated with the preceding stimulus if rewarded, although the reward itself is not considered a psychological component of the association (Henley, 2003). The reward itself functions as a catalyst which solidifies the association between stimulus and behavior in the mind of the student. When the same cue is noticed in the future, a student's cognizance of the desired behavior will strengthen in proportion to the amount of reinforcement applied in the past. A professor's challenge is to provide reinforcement. This task is especially important when the student finds it hard to perceive the outcomes of their actions against a given standard (Henley, 2003). The timing for reinforcement provided for such events is critical.

Immediacy of Feedback

Educators must practice a curious blend of patience and expedience in order to time the feedback they provide to their students. On one hand, teachers must make sure that the entire action being assessed has been completed in the mind of the student before providing comment. However, care should be taken to provide the feedback as soon as possible after the action, since the value of operant conditioning decays as the time between the action and the feedback increases (Mackeracher, 2005).

Reinforcement Plan

Although time is of the essence, teachers must be careful not to rush into providing feedback in the absence of a concerted strategy. When viewed as reinforcement, the teacher should plan who will apply the reinforcer, what the reinforcer will consist of and what schedule will be followed for providing it (Mackeracher, 2005). At the adult level, the type of feedback provided should focus on analyzing the student's performance as related to the performance standards, versus by providing a value judgment of "good" or "bad." In the aviation world, this process is manifested through the use of the formation position of different pilots when describing the actions they took during a flight. During the debriefing session that follows each flight, actions are compared against the prebriefed standards. For example, instead of saying that "Larry" turned "too hard" during an air combat engagement, Larry's position as the number three wingman is referenced and his turn is debriefed in reference to the desirable performance. The appropriate debriefing comment would thus be, "Number three performed a 6g turn, versus the desired 4g turn." Providing feedback in such a fashion proves extremely

useful to the student under analysis. It diminishes the blow to the student's ego, which could distract attention from the comparative performance standard being analyzed. When feedback is passed along in this fashion, the instructor should follow the comments by mentioning how a future turn should be performed under similar circumstances, while resisting the human urge to reference the inappropriate turn that Larry performed during the flight (Mackeracher, 2005).

Linking Feedback to Objectives

In the previous example, the need to tie feedback to previously stated learning goals cannot be overemphasized. All learning progress should be referenced against the stated goals in order to strengthen student self-efficacy and motivation (Charness, Tuffiash, & Jastrzembski, 2004). Furthermore, it has been shown that positive feedback serves to enhance a student's intrinsic motivation, whereas negative feedback diminishes it. A mediating factor in how feedback affects motivation is each student's perceived competence in the discipline (Ryan & Deci, 2000). That is to say, the exact same feedback provided to two different students will elicit a different motivational reaction within each student.

Using a Calendar when Planning Assignments

One classroom management tactic stemming from reinforcement theory entails planning an assignment and evaluation schedule around the need for immediate feedback of student performance. The assignment and evaluations of a given course can be scheduled by referencing an academic calendar for the semester. Professors can set when assignments are due and when tests are administered so that sufficient time is scheduled for them to provide a detailed review of student work immediately following its administration. This will also allow time for the professor to link the student's work to the previously stated educational objectives for the course through the comments written by the professor.

For example, term papers can be submitted prior to a weekend or extended break so that sufficient time is provided for grading the submissions prior to the following class period. Doing so is a perfect illustration of strategizing courses to foster the best possible learning in all students.

The Professor as Architect

Whether it is called strategizing or design, it is clear that a professor acts as the architect of learning in a course. By using a carefully crafted syllabus as a blueprint for managing the class and adhering to the principles derived from educational psychology, a professor can brew an optimal learning experience. By providing students with a modicum of control over their learning, professors can instill intrinsic motivation. Role models can be used to ad vigor and relevance to the subjects being discussed in class. A reinforcement plan designed around immediacy and tied to course objectives can keep student learning focused and further self-efficacy. As Antoine de Saint-Exupery would put it, educators should engender a longing for the benefits that stem from learning; versus simply relying on the external motivation created by the desire to obtain good grades. ✈

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