2003

Effective models as instructional designs to build student motivation in learning

Karla S. Lammers
University of Northern Iowa

Effective models as instructional designs to build student motivation in learning

Abstract

Effective Models As Instructional Designs to Build Student Motivation in Learning: A Review of Literature examines some of the research and academic literature related to successful designs/models that educators can use to build motivation in learners. Views of different motivations, extrinsic and intrinsic, as a learner are also discussed. Examples of designs/models are examined that integrate technology. The author concludes by presenting a technology-assisted, literature-based curriculum product that integrates these models to enhance learners' motivation.

Effective Models As Instructional Designs To Build Student Motivation In Learning

A Graduate Research Paper

Submitted to the

Division of Curriculum and Instruction

in Partial Fulfillment

of the Requirements for the Degree

Master of Arts in Education

UNIVERSITY OF NORTHERN IOWA

by

Karla S. Lammers

January 2003

This Research Paper by: Karla Lammers

Titled: Effective Models As Instructional Designs To Build Student Motivation In Learning

has been approved as meeting the research requirement for the Degree of Master of Arts

1/22/03
Date Approved

Leigh E. Zeitz
Graduate Faculty Reader

1/22/03
Date Approved

Mary C. Herring
Graduate Faculty Reader

1/22/03
Date Approved

Rick Traw
Head, Department of Curriculum and Instruction

Table of Contents

Abstract

Effective Models As Instructional Designs to Build Student Motivation in Learning: A Review of Literature, examines some of the research and academic literature related to successful designs/models that educators can use to build motivation in learners. Views of different motivations, extrinsic and intrinsic, as a learner are also discussed. Examples of designs/models are examined that integrate technology. The author concludes by presenting a technology assited-literature-based curriculum product that integrates these models to enhance learners' motivation.

Introduction

One of the relevant topics, included in the Instructional Development (ID) model, presented by Dick, Carey, and Carey (2001), is learner motivation. Before instructors can fully analyze their learners, in the ID process, we must assess what motivates students academically; extrinsically and intrinsically. Studies show a positive connection between the use of technology and motivation in learners (Belanger, 2000; McGrath, 1998; Alessi and Trollip, 2001; and Snow,1997). This paper will address learner motivation with the use of five different models/designs that instructors may use when incorporating multimedia in a lesson, and will provide some examples of these designs/models in progress. Different motivational views from various authors will be discussed. This topic is essential to the ID process as it is critical to identify "How learners feel before you design the instruction rather than while it is being delivered "(Dick, Carey and Carey, 2001, p. 98).

Methodology

The resources used to identify and locate sources of information for this paper included: the Educational Resources Information Center (ERIC search), Elton B. Stephen's COmpany (EBSCO), and the Proquest program on the Internet. The researcher also gathered information at the Manchester Public Library, the local Area Education Agency (AEA) 1 center, and from the Instructional Development class, 240:240. The author used the following descriptors, a) technology, b) motivation, c) student learning, and d) using technology to increase students' motivation. Many pertinent articles and document reports were found. The articles were selected based upon relevance and recency. After each source was read and evaluated, the

researcher outlined its' topics and categorized the information. All of the chosen articles related to using technology to motivate students and models that designers have used to achieve this.

Analysis and Discussion

Motivation is defined as the act or process of motivating, which is something (as a need or desire) that causes a person to act. Research has shown that students who learn using technology are more highly motivated (Dick, Carey, Carey, 2001; McGrath, 1998; Snow, 1997; Swanson, 1995) . "Developing life-long learners who are intrinsically motivated, display intellectual curiosity, find learning enjoyable, and continue seeking knowledge after their formal instruction has ended has always been a major goal of education" (Snow, 1997, p. 1). There are a number of different approaches to motivate students. Some of these approaches are designs/models that instructors can use when developing plans for the learner. These designs are the Attention, Relevance, Confidence and Satisfaction Model, (ARCS), the Relevence, Interest, Satisfaction, and Expectation Model, (RISE), the Student Interest, Student Success and Student Feedback Model, the Aptitude, Treatment, Interaction Model, (ATI), and the Challenge, Curiosity, Control and Fantasy Model. See Appendix A for a component overview of each model. All of these models play an important part in the design phase of a lesson because they lead the learner toward the anticipated motivational goal, to become a learner who acts upon a situation instead of being passive.

Motivational Designs or Models

The first of the motivational design/models is the Attention, Relevance, Confidence, Satisfaction Model, (ARCS). The ARCS model is used prior to instruction. ARCS is a systematic model for designing motivating instruction. John M. Keller, of Florida State University, (cited in Dick, Carey, and Carey,

2001) developed this model based on motivation. To understand this model, the following has been provided.

First, students' attention needs to be gained and sustained throughout the instruction by use of computer. Here, attention strategies are for arousing and sustaining curiosity and interest. There are two types of arousals that may be evident: perceptual and inquiry. Perceptual arousal involves providing novelty to the learner or uncertainty before the learning begins. Inquiry stimulates curiosity by posing questions or problems to be solved by the learner. Variability is also used as a strategy for attention. Variability incorporates a range of methods and media to meet students' varying needs.

Second, students need to think of their work as relevant to them. Relevant strategies link the learners needs, interests, and motives. Goal orientation, motive matching, and familiarity provide three strategies of relevance. These strategies all relate the objectives to the students' needs and motives.

Third, the students need to be confident. Confident strategies help students develop a positive expectation for successful achievement. Small (1997) states that there are three confident building strategies for the learning. The first is to have learning requirements. Learning requirements inform students about learning and performance requirements and assessment criteria. The second involves providing opportunities for success. These opportunities provide challenging and meaningful opportunities for successful learning by allowing the learner to practice getting the information from various sources and then providing feedback before a lesson. Lastly, personal responsibilities link learning success to students' personal efforts and abilities.

Alessi and Trollip (2001), addressing the ARCS model, argue that relevance and confidence are the two most motivational factors for the

designer to satisfy and require creativity. They suggest that when deciding on a methodology, the types of learning expected is critical. Games seem best for enhancing motivation. An example of this idea would be, adjunct reinforcement which is a method of enhancing motivation. "The idea is to follow successful completion of the drill (methodology) with some other activity the learner finds enjoyable, in other words, a reward" (Alessi and Trollip, 2001, p 205). This reward might be allowing the learner to play a computer game for pure entertainment. This method works if the designer picks activities that the learner finds enjoyable.

The last factor that comes into play in the ARCS model is satisfaction. An inventory to evaluate how satisfied students are, is an example of learner satisfaction. Feedback is essential and students should feel that the activity is beneficial. Students' satisfaction provides extrinsic and intrinsic reinforcement for effort. Intrinsic reinforcement encourages and supports intrinsic enjoyment of the learning experience whereas extrinsic rewards provide positive reinforcement and motivational feedback.

"Many instructors consider the motivation level of learners the most important factor in successful instruction. Teachers report that when learners have little motivation or interest in the topic, learning is almost impossible" (Dick, Carey, Carey, 2001, p. 97). Swanson (1995) supported this point with evidence from his chemistry classroom. He decided to integrate computer technology into the chemistry curriculum to determine whether this practice had a positive effect on student learning and attitude toward chemistry. His results concurred that most of his students seemed confident and eager to try out this new way of learning. "Through observations, interviews and surveys of his students, he found that students responded positively to the use of technology . . . and they felt they understood certain

concepts better after using the computer" (Swanson, 1995, p. 63). This study concludes that this instruction was successful and parallels with Keller's ARCS model.

Richards (1996) also agrees with Swanson's findings that science and technology should be an integral part of primary students' curriculum. He notes that the adaptation of science and technology together will "increase teachers' and pupils' motivation for primary science and technology..." (Richards, 1996, p. 24). If educators do not allow this motivation to happen, their design plan will not be as good as it could be. Swanson modeled this adaptation of science and technology to improve motivation in his chemistry study modeled after the ARCS model. Concluding, Richards notes that " . . . the range of attitudes developed through science are applicable in many respects to technological activities" and that there is a strong argument that science and technology should be experienced as a continuum.

Hoostein (1998) presents the second design/model of motivation that would be comparable to Keller's ARCS model. He presents four conditions that should be addressed in order to motivate students. Relevance, Interest, Satisfaction, and Expectations, (RISE) make up this design. The RISE model's guide for planning includes strategies that increase the appeal for learning. The design's detailed characteristics are as follows; relevant subject matter, interesting instruction, satisfied learner, and expectations of success. This model reflects Keller's ARCS model very closely with the exception of a few differences in the use of terms. Both models could easily be integrated in a complete ID plan.

An example of the RISE model in use is a study done by Fisher and Stolarchuk (cited in Belanger, 2000). Belanger notes that using laptop computers in the classroom inspires students in many K-12 schools. One of

the laptops' advocate's main arguments is that it increases student motivation. "In their study of laptop use in middle school science classrooms, Fisher and Stolarchuk found that those laptop classrooms in which skills and the process of inquiry were emphasized had the most positive impact on student learning and attitudes" (p. 3). Some of the relevant work that laptops can facilitate are, but not limited to are, investigations in the field rather than in the classroom, creating book reports with presentations, and creating spreadsheets to solve math homework. Also, the laptop proves to be an "interesting part of instruction" that the RISE model reflects upon. The teachers instructing with laptops made instruction interesting. This study reported both an increase in cooperative learning and project-based instruction. There was a positive correlation between learners' satisfaction and attitudes. The learners' motivational needs were met. In conclusion, the laptop proved to be a catalyst in Fisher and Stolarchuk's study, it gained the motivation needed from the students.

Another method that every designer could use and build into lessons, for the highest student motivation, is a design presented by Desrochers (2000). Desrochers calls for the use of this planned instruction based on three factors; student interest, student success, and student feedback. Current study on the human brain suggests that to encourage motivation, instructors should create a positive learning environment. This can come through curriculum planning and instruction, interesting, success-oriented activities, and frequent feedback to students. This brain research makes Desrochers design appropriate for instructors to use.

An example of this design, is a two-week unit on different types of graphs followed by application of these graphs. The students use multiple sources of information, including the Internet, to discover bar, line and circle

graphs. Desrochers states that deliberate inclusion of student interest, student success, and student feedback in planning this lesson is recommended to adhere students' motivation. In this project, the students are motivated by their interest. The students work on graphs that are relevant to them and ones that they are curious about. The graphing application uses students' previously learned skills in a " . . . new, real-life (authentic) situation that extends their critical thinking and fosters motivation" (p. 52). Students are also motivated by clearly defined goals that helps determine their success. These goals are derived from what the students needed to achieve, in order to master the unit. Making the students feel that they can succeed is establishing an emotional climate of success for the students and is crucial to maintain student motivation. Student feedback is also important in this model. As learners, most people are all motivated by feedback. This feedback can come in the form of rubrics or other scoring guides, but are all essential in this design. This model illustrates the deliberate inclusion of student interest, success, and feedback when planning an instructional unit (Desrocher, 2000).

The fourth motivational design plan is Snow's (1997) Aptitude, Treatment, Interaction (ATI) model. He suggests that knowing students aptitudes before a lesson, and developing a plan to encourage maximum learning will capitalize students' strengths. Snow uses one of his own examples to demonstrate integrating technology to amplify students' aptitudes and motivation. Each student has his/her own learning preference learning in math, whether numerical or pictorial form. Each provides the student an alternative way to learn a math concept in his/her preferred way of learning. A computer program provides both alternatives to learn a new math concept. As a homework assignment, students log on to the computer and choose their preferred alternative, according to their own sense of aptitude, to do the

assignment. They can choose the pictorial or numerical method. When the assignment is completed, they may go back to the beginning of the assignment and choose the opposite method of instruction. Snow's ATI theory proposes that, "when student aptitudes are well matched or well tuned to the present instructional situation, learning progresses smoothly . . . " (p. 359). This view of individual differences is important and allows the instructional developer to choose, adapt and evaluate instructional conditions accordingly when planning a design for the classroom.

Snow's ATI theory touches upon the instructors' and learners' relationship to increase student motivation. McGrath (1998) sees the need of cooperation and collaboration among learners and instructors. "Technology increases student motivation, and motivated students are more receptive, more engaged, and more likely to learn" (p. 59). McGrath cites learning situations where technology plays an integral part in student motivation. A science teacher from a disadvantaged, urban school in New Jersey reports that her students come in eager to learn and get started in the morning because they know that they will be using the computer as part of their lesson, which is "much greater than in more traditional lessons." Another teacher from New Jersey observes, "Using computers, especially the Internet, definitely affects student motivation, and once students are motivated, they learn more" (p. 60). Moran (as cited in McGrath, 1998), a district staff developer in the use of technology in the curriculum in New Jersey, reveals that the motivation factor applies not only to students, but to teachers as well. "Technology inspires a teacher's passion for the discipline, which causes him or her to dig deeper into the subject matter, explore further, and investigate new areas of inquiry. This enthusiasm can't help but spill over to the students" (p. 59). This quote not only addresses the learner's

motivation, but also the instructor's reason to motivate. McGrath has sited some requirements that emerge from this learner/instructor relationship that instructors must do to have effective integration of technology.

If an educator incorporates technology into his/her lessons, it changes the teacher-student relationship on a positive note. It does require that teachers become comfortable with technology itself, explore the technology before hand, review one's own curriculum, revise lesson plans to incorporate technology, experiment with the lesson in the classroom, assess how well things worked, and refine the lesson. In doing so, McGrath found that 12 key changes emerged from these steps, one of these being that technology makes classroom activities ". . . feel more real - world and relevant, and students often take these activities more seriously." Foremost, she identified that the major theme was that, "technology increases student motivation, and motivated students are more receptive, more engaged, and more likely to learn " (p. 59). This correlates with studies that indicate technology plays a key role in motivation. The 12 concepts and requirements for instructors follow the RISE and ARCS models and give valuable insights to why educators should use these models, especially when integrating technology.

The fifth design in this paper is Malone and Lepper's (as cited in Alessi and Trollip, 2001, p. 25). They suggest that intrinsic motivators, motivation acquired from within a person, are more beneficial to learning than extrinsic motivators. They claim that extrinsic motivators diminish one's interest in learning because the goal becomes the reward rather than learning. The four elements that enhance their theory are: challenge, curiosity, control and fantasy. These elements are derived from intrinsic motivators that promote motivational learning.

The first relevant factor in designing motivating instruction is, challenge.

The level of challenge should be individual for and adjusted to the learner. Challenging goals, for the learner, at the start of each lesson is beneficial. Varying the level of difficulty throughout the lesson, as learner performance improves, maintains challenge throughout the lesson.

Curiosity is the next component in the design. Malone and Lepper imply that there are two different curiosity components, sensory and cognitive. Sensory curiosity is stimulated by visual and auditory effects that are surprising to the learner or attract attention. Cognitive curiosity conflicts with what the learner already knows or his or her expectations. If a learner encounters either of these two types of curiosities, it will encourage the learner to seek new information that will solve the conflict that they encountered.

The third factor is control. In learner control, there are three rules which are relevant to student motivation; contingency, choice, and power. The contingency rule follows the learner's actions and responses. Good multimedia lessons are the ones that give feedback on specific responses or learner performance is based on the content. The choice rule gives the learner the option to proceed in different parameters of the lesson, hence maybe varying the difficulty. Power can be motivating for the learner because it controls their actions.

The final factor is fantasy. Fantasy encourages learners to imagine themselves in fantasy images. "In any lesson, it may be valuable to encourage learners to envision themselves in a situation where they can really use the information they are learning" (Alessi and Trollip, 2001, p. 26). Fantasy plays an important part in simulations. In discussing Malone and Lepper's theory, Alessi and Trollip suggest that simulations tend to be more motivating, they enhance the transfer of learning, and are usually more efficient. Active participation is more motivating than passive observation in a

simulation. Two examples of motivating a learner with simulations include that it is more interesting to fly a simulated airplane than to read about it, and it is more exciting to try to diagnose and treat a simulated patient than it is to attend a lecture about it (Alessi and Trollip (2001). Simulations allow the student to actively participate in authentic forms of fantasy.

Alessi and Trollip (2001) suggest that no matter what form of motivational design used, "The multimedia designer should approach the issue of motivation with two objectives in mind; how can one capitalize upon entering motivation, and how can one design the lesson to improve motivation beyond that" (p.27). Different methodologies stimulate different levels of motivation by the user or learner. Hypermedia, is itself a way of increasing intrinsic motivation by making it fun to use. Many people think of hypermedia as only encyclopedias and reference material and downplay the issue of motivation. They need to understand the significance of motivation when using this technology. If the instructor does not pursue the issue of motivation, the student/learner will not start with the motivation needed before a lesson.

Motivation and Multimedia

Pierson (2001) makes it clear that if the learner begins a lesson on a positive note, he/she is more likely to be motivated throughout the lesson. If the instructor does not allow for this motivation to happen, the repercussions could be negative. Instructors, therefore, need to also be motivated in the design phase and throughout the lesson. According to the proposed definition of technology integration, "technology in the hands of a merely adequate teacher will lack the experienced and thoughtful motivation necessary to embed it within a context of sound teaching practice" (Pierson, 2001, p. 427). One way that this dual motivation by instructor and learner can

take place is by connecting learners with various technology equipment and products. One of these products is the Early Language Connections (ELC).

ELC is an integrated, literature-based curriculum product with technology assistance. It is directed toward the primary grades to enrich students' language skills. Not only does this program enhance student's skills, it also motivates students to be more desired to interact with the computer. It introduces primary school teachers to technology and launches their students into reading, writing and literature. "Even without being prescriptive, computer technology allows for a more individualized approach to learning." (Guthrie and Richardson, 1995). Findings from this program's use show that kids are drawn to technology and are intrinsically motivated to use computers. Keeping the ARCS model in mind, the next learner's analysis that the instructor does on this group of primary students, will show a higher level of motivation in the learner because of the positive interaction with ELC previously. The students will feel confident and satisfied with what they have done in the ELC program and hence, even more motivated about other programs as well because of their experience. ELC findings conclude that kids are drawn to technology and are intrinsically motivated to use computers."(Guthrie and Richardson, 1995) ELC also reported that a "teacher's ability to construct a learning environment based upon collaboration, peer support, appropriate technical tools, and motivation provided the ingredients necessary for such a breakthrough." This quote came as a result of an illiterate child learning to read as a result of ELC.

Conclusion and Recommendations

In conclusion, instructional designers must assess what motivates students academically; extrinsically and intrinsically. Studies show a positive connection between the use of technology and motivation in learners. They

also show that integrating technology into the curriculum, increases students' motivation, both extrinsic and intrinsic. The 5 different designs/models addressed in this paper prove to be a solid foundation that educators can use to build and assess learner's motivation before, during, and after a lesson. Views of intrinsic and extrinsic motivation by different authors and why they are critical in the learning process are presented. A technology program, ELS, that is implemented in classrooms to improve students' motivation, seemed to also be critical in forming motivation in primary students.

All the models presented keep the learners in mind first, which should be the number one goal of educators. These models can easily be built in any lesson and should be flexible with each individual educator depending upon the goal in mind. To be successful, most of the authors conclude that their plan should be used in every lesson. Educators' days and nights, are filled with numerous tasks and activities to be prepare for the daily or weekly plans. To implement one of these designs for every lesson, instructors should take more of an integrated approach using these designs/models. For example, in Snow's ATI model, putting the learner first by knowing each learners' aptitude before a lesson, ideally, represents a successful model, but realistically, it might be difficult to do. Educators should build lessons that address, at various levels and times, a model's components, rather than trying to design lessons that address each component, each time. Using any model integrated into an instructional design process throughout the school year, might be a more realistic approach. Educators probably have some indication where students' needs are at each level of cognitive ability, knowing the student's abilities, an instructor can concentrate on making the lesson relevant to the student in Keller's ARCS model.

Based on the information given, these designs/models have validity.

It is the instructor's job to make sure that technology is integrated in a design plan before a lesson starts. Once the design is in place, the instructor can be more of a facilitator who will give assistance to the learner to gain the motivation from the student's needed.

Studies, like Swanson's (1995), showed improved students' motivation toward their learning experience. "If the materials are perceived as relevant to personal needs and interests, then attention is gained and maintained" (Dick, Carey, and Carey, 2001, p. 191). Designers of instruction, should use planned models/designs that include addressing motivation to gain knowledge about the learner and infer how they will perceive the content and activities. This process, along with the integration of technology can provide a meaningful, project-based lesson that will be successful for both the designer and learner.

References

Alessi, S. and Trollip, S. (2001). Multimedia for Learning(3rd ed.). Massachusetts: Allyn & Bacon.

Belanger, Y. (2000). Laptop computers in the K-12 classroom.[online]. Available: http://ericir.syr.edu/ithome

Desrochers, C. (2000). Creating lessons designed to motivate students. Contemporary Education, 71(2), 51 - 56.

Dick, W., Carey, L. & Carey, J.O. (2001). The systematic design of instruction (5th ed.). New York: Addison-Wesley Educational Publishers Inc.

Guthrie, L. and Richards, S. (1995). Turned on to the language arts: computer literacy in the primary grades. Educational Leadership, 53(2), 14-17.

Hootstein, E. (1998). Motivating the unmotivated child. Teaching, PreK-8, 29(3), 58 - 60.

McGrath, B. (1998). Partners in learning: Twelve ways technology changes the teacher-student relationship. The Journal, 25(9), 58 - 62.

Pierson, M.E. (2001). Technology integration practice as a function of pedagogical expertise. Journal of Research on Computing in Education, 33, 413 - 430.

Richards, C. (1996). Innovation in primary education. European Education, 28(3), 20 - 27.

Small, R. (1997). Motivation in instructional design.[online]. Available: http://ericir.syr.edu/plweb-cgi/obtain.pl

Snow, R. E. (1997). Aptitudes and symbol systems in adaptive classroom teaching. Phi Delta Kappan, 78, 354 - 361.

Swanson, C. (1995). How technology in the chemistry classroom affects students' attitudes and motivation. Teaching and Change, 3(1), 63 - 79.

Appendix A

Motivational Designs

ARCS	RISE	Student Interest, Success and Feedback Model	ATI	Challenge, Curiosity, Control and Fantasy Model
*developed by John Keller	* educators should make the subject matter relevant	* Desrochers' design	* developed by R. Snow	* educators should create challenging goals for the learner
*educator makes strategies for student's attention	* educators should have interesting instruction	* educators should make interesting subject matter for the learner	* educators should know students' aptitudes for maximum learning	* educators should develop into their plan two different curiosity components, sensory and cognitive
*make the design relevant to the learner	*is the learner satisfied?	* educators should have success - oriented activities	* educators should develop a plan or treatment for the learner	* when an educator enforces control, they should integrate contingency, choice and power
*educators should build learners confidence for successful achievement	* student's expectations of success	* educators should give frequent feedback to students	* educators should engage or interact the plan with the learner	* fantasy simulations are more motivating because of activie participation
*are the student's satisfied?	* Hoostein's model			* Malone and Lepper's design