

## **Motivation and Computer-Based Instructional Design**

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### *Abstract*

*Increasing student motivation is a major aim of instructional design. Teachers who experience a lack of student engagement in their classrooms should investigate instructional strategies and proactively address this issue. The approach of this particular research discussion is to use humanistic theory (holistic focus on student needs) to inform teachers' instructional and motivational design process. Research on computer-based instructional design informed by motivational theory provides a conceptual framework for teachers to use in combining motivational concepts with their instructional design strategy. With respect to computer-based instructional design, the use of computers outside of the classroom (for personal and recreational purposes) forms the basis of motivating students to learn using computers within the classroom. This implies that teachers benefit when engaging students in academic materials using computers.*

Student motivation is a major issue faced by educators in the field. To encourage motivation, teachers prepare instructional materials and design their courses to be both content-rich and appealing to students. Despite this preparation, some students fail to become engaged enough to focus on the learning experience and derive its benefits. With this in mind, this research is an overview of motivational design with a focus on computer-based instruction strategies. Using computer-based learning (CBL) as part of a teacher's instructional design may increase student motivation.

In discussing student motivation in America, Smith (2010) asserts that declining student motivation indicates an eroding national work ethic. According to Smith (2010), motivation is weak because students do not like school, do not work hard, and as a result, do not do well. Therefore, student motivation is of great importance to American teachers, as well as parents, policy makers and other stakeholders. If our educators do not adequately address motivation and student engagement today, the cultural decline in work ethic and student performance will become a larger problem for future generations. With this important issue in mind, a discussion on student motivation based on the humanistic psychological theories of

Keller and Maslow, along with a discussion on instructional and motivational design, should provide teachers with adequate information to purposefully incorporate CBL and motivation into their course planning.

Developing student motivation as an instructional strategy is increasingly pertinent to the instructional design process in the classroom. According to Kinzie, Julian, and Davis (2004), instructional design is a process of analyzing the learning needs of students with regard to course content, then developing a delivery system to meet those needs. It includes the development of instructional materials and activities, the implementation of the delivery system, and the evaluation of instruction and learner activities. The focus of this particular research is computer-based learning as an instructional strategy for motivating students. The purpose of this discussion is to better inform teachers in how CBL and other technology use can motivate students to engage in classroom learning.

In an era of declining work ethic, student motivation is key to the success of American schools (Smith, 2010), and the progress of the nation. Teachers should have the support of parents, administration, legislators, as well as

researchers in order to design instruction that incorporates technology and motivational strategies. It is hoped that this research be used to spark interest in tying computers into the designing of classroom content that will enhance student motivation. According to Prensky (2001) this change is needed because “today’s students are no longer the people our educational system was designed to teach.” (p. 8)

### **Conceptual Framework**

This study uses psychological theories of motivation along with a constructivist lens to inquire how CBL is used by both students and teachers to co-engage in creating meaning from course content. The conceptual framework links CBL to student motivation and instructional design (see Figure 1). In the field of education, the student lies at center. The goal of this discussion is to assist teachers in thinking about how to motivate students using computers. In focusing on student as center, motivational theory, specifically Keller’s ARCS model and Maslow’s theory of needs, can be used by teachers to inform the instructional design process. Incorporating computers into instructional design is the specific strategy posed by this discussion.

### **Motivation**

The definition of motivation may take several forms and differ upon its application. However, according to Keller and Litchfield (2002), motivation can be defined as a person’s desire to pursue a goal or perform a task. In the educational arena, the goal or task pursued should be student engagement in the learning environment. Motivation is personal and individual to each student, but the teacher/outsider can tap into this latent resource. Our purpose is to help teachers utilize motivational theory to address the psychological and emotional needs of students, especially at the K-12 level. Since much of motivation is internal, designers of instruction can use humanistic psychological theory to inform planning. Developing successful motivational

strategies poses difficulties both extrinsically and intrinsically in any learning environment. In other words, motivation can focus on extrinsic, non-personal factors, or intrinsic, personal factors.

At the root of classroom motivation is the individual. The individual learner ultimately decides whether to participate in learning. Factors that affect this decision may be extrinsic or intrinsic (Keller & Litchfield, 2002). Keller (1999), a pioneer in the field of motivational design, has articulated the foundational challenge to the field:

Motivation, which has traditionally been viewed by many people as “untouchable,” that is, a highly idiosyncratic and variable condition, can be approached systematically. Research on motivation and motivational design shows that there are stable elements of motivation, and even some of the unstable elements are predictable. (p. 46-47)

Therefore, predicting these elements and utilizing proven instructional strategies and classroom factors, such as classroom environment and interpersonal relationships, would be an invaluable tool for teachers. Whereas several models exist for evaluating such factors, the most prominent model for evaluating motivation is the ARCS model (Keller, 1987). The main categories for the ARCS model (attention, relevance, confidence, and satisfaction) provide a systematic structure for designing motivational strategies for learners. This structure may be integrated with lesson plans and instructional goals to implement motivational tactics. An evaluation of the instructional material, combined with an evaluation of the student and teacher, will help the designer integrate effective motivation. As mentioned above, the ARCS method is intended to be systematic; however, the individual learner’s motivation is not often measured systematically. Therefore, the instructor must insert personal judgment to shape instructional strategies towards the learner or learners (Keller & Litchfield, 2002). While other motivational models exist, the ARCS model has been applied to a variety

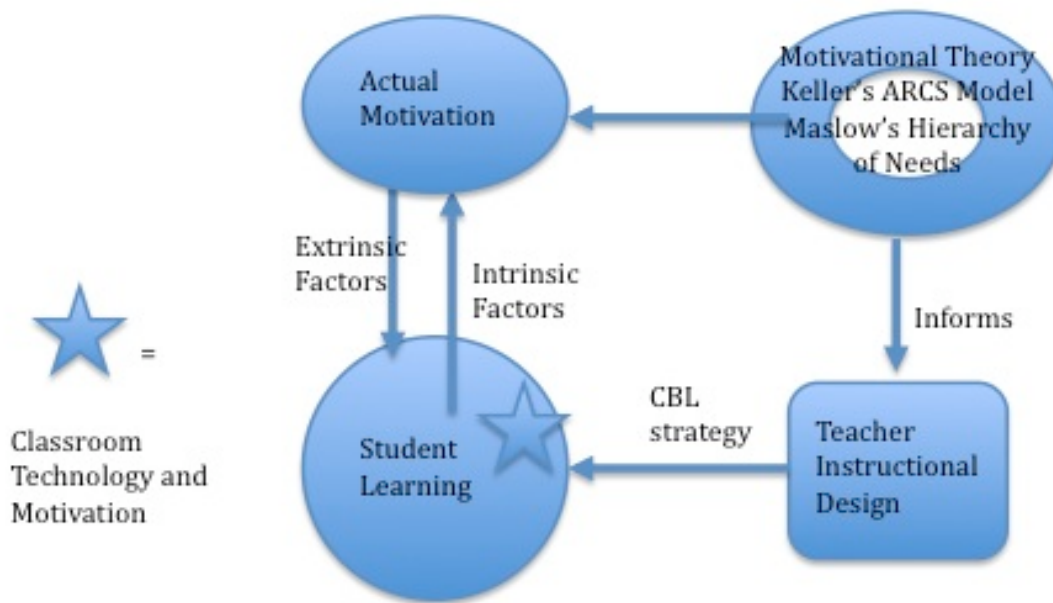


Figure 1: Conceptual Framework

of classroom and learning environments, including computer based learning and distance learning (Keller, 1999).

Keller and Litchfield (2002) emphasize that true motivation takes place at three levels: motivation to learn, motivation to work, and self-motivation. Each level places responsibility on the learner. However, the instructional designer or teacher can work with the environment and other extrinsic motivators to enhance the possibility of self-motivation. Skinner and Belmont (1993) advocate that the best approach to student motivation is at the intersection of psychology and educational factors. They contend, "This model has at its cornerstone the notion that the source of motivation is internal to the child, so that when the social surrounding provides for children's basic psychological needs, motivation will flourish" (p. 572).

Seifert (2004) outlines four major theories that seek to explain student motivation from a systemic approach: self-efficacy theory, attribution theory, self-worth theory, and achievement goal theory. Self-efficacy theory looks to a student's confidence in his or her capabilities as the primary motivation to achieve. Attribution theory, put forth

by Weiner (1985), holds that students will attribute academic results to certain attitudes or actions held before the outcome. The attribution then becomes a motivating factor for future actions. A more emotional approach, that of self-worth theory (Covington, 1984), contends that student academic behavior is a result of the desire to increase or maintain self-worth. Finally, achievement goal theory states that motivation to succeed is based on set goals, which are set by goal-oriented learners (Seifert, 2004). Given these four major approaches to motivation, one can observe that traditional classroom factors (like lecturing) could have positive or negative effects on students' motivation to engage in classroom learning. Furthermore, well-designed instruction that utilizes CBL may greatly affect student motivation.

### **Instructional Design and Humanistic Theory**

In addition to Seifert's (2004) outline of four major theories, the Humanistic theoretical tradition orients the present discussion to the interaction of instructional design with motivational design.

### **Instructional Design**

Reiser and Dick (1996) present an appropriate systemic model for instructional design

(see Figure 2). This design fits our research focus on computer-based instructional strategies. The fifth step of the process, “choosing instructional media,” is where we anchor our approach, using computer-based media to meet the goals and objectives of motivating students. Computer-based learning (CBL) is the use of computers as a complementary or central part of the educational experience. Computers are an instructional tool with which students have had prior personal or recreational experience. Computers provide audio and visual as well as text, and can be integrated into the instructional delivery system. This integration causes a de facto combination of recreational use with educational use, which is likely to motivate students to learn more interactively and to utilize their prior knowledge base.

According to Keller (2006), motivational design is the systematic process of arranging resources and procedures to bring about changes in student motivation. It aims at creating new materials or systems with which students learn (Hakkinen, 2002). The Reiser and Dick (1996) instructional design model itself provides a motivational design focused on solving specific problems related to instruction such as designing materials, adjusting teaching style, and designing the structures of courses themselves (Keller, 2006). Keller (2006)

refers to the focus of motivational design as the specific strategies, principles, and processes for making instruction appealing to students. Motivational design strives to make instruction more intrinsically interesting (Keller, 2006). The balance issue with motivation is how to make instruction appealing while supporting the content-focused goals of learning.

### **Humanistic Theory**

Humanistic theory is a psychological perspective where the whole human is center. Humanists emphasize the here-and-now instead of examining the past or predicting the future. The ultimate goal of living, in this perspective, is to attain personal growth and understanding, and key concepts are free will and a drive for self-actualization (Eggen & Kauchak, 1999). Abraham Maslow, a humanist theorist, contends motivation and drive are a part of human self-awareness. Motivational instructional strategy seeks to enable this awareness in students in hopes of effectively engaging them in the learning process. With regard to computer-based learning, computers have a general appeal to students. Many were introduced to computers by gaming and social networking. Using computer-based learning in the classroom is an important motivational tool that provides an alternative to more traditional pedagogy.

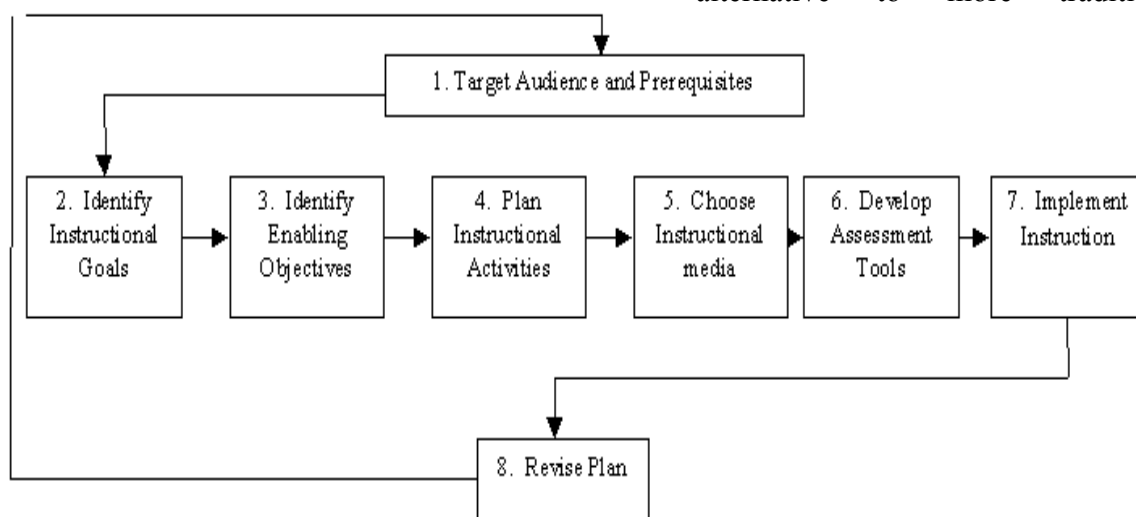


Figure 2. Instructional Design Process

Humanistic theory, as described by Eggen and Kauchak (1999), is one of the best-known theories of motivation. It is important in that it informs motivational strategy. Maslow believed that humans are driven to achieve their maximum potential unless obstacles inhibit this growth. Designers of instructional strategy, in order to best serve student needs, must consider these basic needs, as well as the obstacles. Does the student come to school hungry, is there physical danger in their home life, does this student experience emotional deficiencies, etc. According to Maslow's theory, reaching self-actualization is a rare condition. Teachers are here to guide students toward self-confidence and academic achievement (see Figure 3). Motivational theory is positioned to enable to instructor to enable students to get the most of an instructional experience. Motivational theories of learning are based on the educational psychology stance that motivation is a condition based on individuals' needs, desires, and wants (Eggen & Kauchak, 1999). In Maslow's theory,

motivation should not focus on the base drives or needs of a human, but instead on the specific goals of instruction.

A strength of humanistic theory is its focus on human good, which is a positive perspective to take when studying student learning. It assumes that all students have the power and the drive to learn. The value of this perspective is its use in changing lives for the better. A weakness of humanistic theory is that it assumes rather than proves human good and drive. It theoretically ignores variation in goodness or drive. Under the umbrella of humanistic tradition, Maslow's hierarchy of needs model greatly enriches the discussion of motivational instructional design and strategy.

### **Maslow's Theory of Motivation**

Abraham Maslow is a major theorist in the humanistic tradition. His specific focus was on humanistic psychology and self-actualization. He is best known for his "hierarchy of needs" shown below in Figure 3.

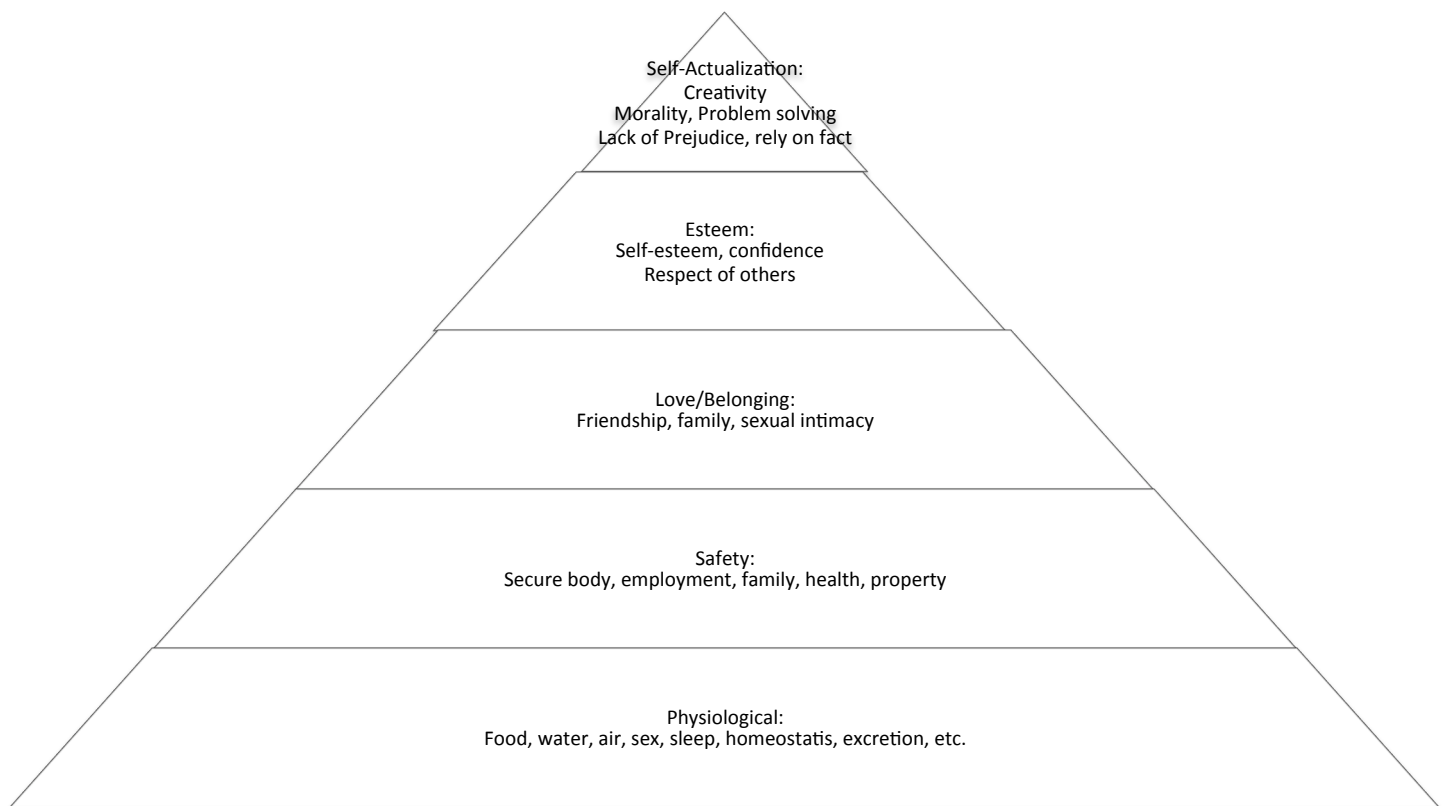


Figure 3. Maslow's Hierarchy of Needs

This model is useful in tracking basic psychological needs of humans in order to service/teach them effectively. According to Maslow, the lower needs (physiological, safety, belonging, self-esteem) must be met if a student is to experience self-actualization. With this theoretical assumption, if students are not properly fed, ensured safety, or encouraged to feel self-confident, it is difficult to engage or motivate them, regardless of the instructional strategies employed.

Instructional strategy is further informed by Maslow's theory. Identifying student deficiencies (with respect to the hierarchy model) corresponds to number three in Reiser and Dick's (1996) model, "identifying enabling objectives." Identifying the enabling objectives follows the identification of the overarching instructional goals, or the learning delivered to students. Enabling objectives support learning goals by providing strategies that enhance motivation and the consumption of course content by each student.

Reiser and Dick's (1996) enabling objective precedes the choosing of instructional media (Figure 2), but our focus begins with media. By linking instruction with a tool widely used for personal and recreational reasons, computer-based learning enables a broad array of instructional delivery catered to how students use technology outside of the classroom. This in itself is a motivational strategy that exposes students to the educational utility of computers.

### **Classroom Technology and Motivation**

According to Prensky (2001),

Today's students – K through college – represent the first generations to grow up with this new technology. They have spent their entire lives surrounded by and using computers, videogames, digital music players, video cams, cell phones, and all the other toys and tools of the digital age. Today's average college grads have spent less than 5,000 hours of their lives reading, but over 10,000 hours playing video games (not to mention 20,000 hours watching TV). (p. 1)

Prensky (2001) calls today's students "digital natives." By connecting technology with educational content across disciplines, teachers can capitalize on the prior experience within students as a resource. This is to apply the humanistic perspective with the student as center. By connecting CBL as an instructional design strategy to student motivation, we want the educator to utilize latent technological understanding to connect to learning activity (see star in Figure 1).

With the relatively recent advent of accessible classroom technology, students and teachers can consistently find uses for modern technology in the learning process. Technology is not only revealing new applications in the classroom, but it is also redefining the concept of a classroom due to the increase of online and distance education. The prevalence of technology does have motivational effects. In fact, one study indicates that e-learning, or learning via online computers, fosters stronger intrinsic motivation than traditional classroom learning (Rovai, Ponton, Wighting, & Baker, 2007). Technology in the classroom can be viewed from a variety of angles, depending on how one defines the classroom, and the technology in use. E-learning and self-paced computer-based learning are just two of the many avenues available to teachers and learners in the area of technology.

Individual, self-paced learning in a computer-based environment is becoming more prominent. The learner may or may not be a part of a physical class, but the responsibility for learning rests solely upon him or her. The pace and efficiency of the learning is decided by the learner and is therefore a matter of individual motivation. Intrinsic motivational theorists would say that any learning environment, self-paced or regular classroom, that engages the students in the learning process will yield better motivation (Lepper, Henderlong, & Iyengar, 2005). A self-paced environment relies almost solely on the students and should yield some motivation. However, involvement should be coupled with interest to produce the best motivation (Lepper et al., 2005). Therein lies the challenge of self-paced learning environments. The use of a computer in these

environments may provide the opportunity for interest in addition to involvement. Without the presence of an instructor, the constantly changing level of motivation may not be measured and adjusted. According to Keller (1999),

... in self-directed learning environments, this type of continuous adjustment has not been a feature. Once the instruction has been designed and “packaged,” everyone receives the same program, with the exception of limited branching and other learner control options. (p 42)

Therefore it is necessary for instructors to implement options and opportunities for the self-paced learner to engage in that will increase interest. While specific and proven examples of these implementations are still being discovered and are not covered by this study, the opportunity for their usefulness is obvious. As the common trend towards individual, self-paced computer learning increases, so will the need for personal motivation.

Teacher-directed classroom technology stands in contrast to the self-paced student directed classroom technology. Less autonomy exists when the teacher expects certain steps to be taken in the use of technology. However, from a motivational standpoint, similar results for using teacher-directed technology can be noted. The individuality of student learning is an important consideration for any teacher who wishes to use technology in the classroom. Furthermore, prior learning and personal assumptions will affect the motivational response to technology use (Jarvenoja & Jarvela, 2005). According to Laurillard (2002), instructor-led teaching does not mean the instructor is imparting all knowledge. Instead, the instructor can lead by creating an environment conducive to learning. Therefore, teacher-directed technology use does not have to limit student use of technology. In this way, students can have input in setting their own learning goals, which, as noted above, can have intrinsic motivational effects.

There is evidence that, in general, students respond positively to computer use by the teacher (Lowerison, Sclater, Schmid, & Abrami, 2006).

According to Becker (2000), students are generally more on-task and express more positive feelings when they use computers than when they are given other tasks to do. However, the positive response is linked to an active participation of the learner. If the learner is passive, the technology has less effect in increasing student interest and motivation to achieve. Teacher-directed technology that is limited to a reproduction of old material using technology (e.g. using PowerPoint to display written notes) is not considered a beneficial use of technology by many researchers (Lowerison et al., 2006). In a study by Cordova and Lepper (1996), elementary students were subjected to three different abstract learning strategies designed to allow students to tailor the content to their own needs under direction of the teachers. The strategies utilized educational computer games and led to increased intrinsic motivation to achieve. Similar results were found in a study with middle school students and their views on technology in school. Students valued the use of computers in school because computers and other technologies were such a big part of their lives outside of school (Spires, Lee, & Turner, 2008). As Prensky (2007) contends, these students are digital natives, and technology use is what they know and are comfortable with. Prensky (2006) goes as far as to say that all out-of-classroom technologies, including cell phones and game systems, should be used in the classroom as a motivator for digital natives to learn. These technologies can be personal or a possible avenue for teacher-directed use in the classroom. However, according to Spires et al. (2008), students prefer personal computer use and internet research over teacher explanation when encountering a task.

### **Implications**

CBL is an important strategy in connecting student technological experience with learning content. Based on this discussion, the student is center, and often comes to the classroom having prior experience in computers. This implies that teachers, in designing their courses, should create a student-centered environment, informed by motivational theory and CBL.

Despite the fact that computers are now common in classrooms, and many students are technological “natives,” there is a potential to underutilize CBL while designing instruction. The purpose of the current research discussion is to better inform how computer-based instructional design can be used as a motivational strategy. According to Smith (2010), student motivation is one of the major problems faced in the American educational system. Computers are used heavily in popular and gaming culture and may be embraced by teachers and instructional designers as a path to motivating learners to engage in the learning process. An understanding of how students of all ages view computer use can be advantageous for designing course materials that grab their attention.

### **Suggestions for Teachers**

Teachers understand the popular use of computers. It may be less clear how to harness this popular media to increase student engagement in the learning environment. Teachers can embed motivational theory into their instructional design, making motivation a focus of course planning. Grounding this process using ARCS model and Maslow’s humanistic theory serves to orient the instructor to the broader psychological needs of the unmotivated student in order to better service their learning needs.

Further research on computer-based instructional design should focus on specific aspects of instruction that motivate the student learner. Researching how students use computers in their home-life may better inform the educational practice. Using computer-based learning to encourage fun and exciting ways to learn may yield more intrinsic and extrinsic motivation. Another emerging research topic is the study of video and computer gaming and their crossroads with instructional gaming as a motivational strategy.

### **Conclusion**

Computer-based learning has a broad potential for improving motivational and instructional design. Teachers can apply the ARCS model of motivational design in order to evaluate current and potential strategies for motivating

students. Through the lens of humanistic theory and Maslow’s hierarchy of needs, instructional designers can both utilize proven motivational strategies and meet the needs of their learners.

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