The Influence of Multiple Intelligence Theory on Web-Based Learning

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Abstract

Distance learning represents a growing educational opportunity for many students. Learning institutions have responded by increasing the number of distance learning programs. This article will review the relationship between multiple intelligences and online education. The review will provide an overview of MI theory and online education. It will then compare MI influence in a traditional and online setting focusing on group dynamics, education, curriculum, and the relationship between MI and online education. An understanding of how MI impacts these various categories can help instructors and students create a learning environment conducive to providing a rewarding educational outcome.

Keywords: multiple intelligence, web-based learning, online education, distance learning, Multiple intelligence design

Introduction

Few people leave such significant impressions on the lives of others than teachers. A good teacher can provide academic success and a rewarding educational experience. A less qualified teacher may provide academic success but will not provide the same quality educational experience and cause frustration for the student. The drive for academic success while maintaining a quality educational experience should be the goal of distance learning programs but is often not the reality (Summers, Waigandt, & Whittaker, 2005). As the popularity of distance learning increases, the impact of good and bad teachers using good and bad teaching strategies on a student's post-secondary learning experience will be necessary to study. A significant factor in improving academic performance and providing a quality educational experience is the application of the multiple intelligence theory.

The purpose of this review is to examine the relationship between multiple intelligence theory (MI) and online education. Specifically, the review will discuss multiple intelligences, online education, and the impact MI has on online education. The review will follow the following format: (a) an outline of multiple intelligences theory, (b) online education, (c) MI influence on traditional and group dynamics, (d) MI influence on traditional and online education, (e) MI influence on traditional and online curriculum, and (f) the relationship between MI and online education.

For the purposes of this study, the term distance learning will encompass education which takes place off-campus via an appropriate vehicle: internet, video streaming, and computer technology (Waits, Lewis, & Greene, [NCES], 2003). Online education represents curriculum presented mostly online but closely resembling traditional course objectives (NEA, n.d.). Multiple intelligences will be defined as those outlined by Howard Gardner.

Literature Review

Literature Search

Using the key words *online learning*, *distance learning*, *multiple intelligences* as a search field yielded a very small number of results in Wilson Web database and Academic Search Complete. The multiple intelligence theory has been studied and researched for over twenty years, but very few studies have

been conducted comparing online learning and MI. The majority of the statistical information came from two sources found at the National Center for Educational Statistics (Sikora, & Carroll, [NCES], 2002). The National Education Association (NEA) also provided significant information (n.d.). All references are journal articles with the exception of the training manuscript found at the NEA website and the government reports found at NCES. The following literature was reviewed.

An Outline of Multiple Intelligences

Howard Gardner produced the seminal work in the field of multiple intelligences which culminated with his 1983 book *Frames of Mind.* The book introduced multiple intelligence theory and the idea that the different intelligences are closely linked (Gardner, 1993). Multiple intelligence theory states that people learn differently. An instructor who teaches to an individual's intelligence strengths will provide a more productive learning environment and produce a more receptive student. As the number of distance learning programs increases so too will the competition between educational institutions to enroll the online students.

Gardner's original theory claimed that every human being possessed seven intelligences: linguistic, logical-mathematical, musical, spatial, bodily kinesthetic, interpersonal, and intrapersonal intelligences. He stated that a person with a high linguistic intelligence would have a strong ability to learn languages or use language to manipulate their environment. Writers and poets would all require a high degree of linguistic intelligence. A person with a strong logical-mathematical intelligence will be adept at using numbers and detecting patterns. This person might also approach problems logically, will use deductive reasoning, and will have skills that would serve a scientist or mathematician well (Smith, 2002).

Musical intelligence is shown through skill in musical performance and composition. Musical and linguistic intelligence contain very similar types of structure, and a person who has a high musical intelligence may also have a high linguistic intelligence. Bodily-kinesthetic intelligence involves the use of mental abilities to control and coordinate body movements; any type of successful athlete or performance artist should possess a high bodily-kinesthetic intelligence. Spatial intelligence and bodily-kinesthetic intelligence share the same relationship as musical and linguistic intelligences-- a person found to possess a high intelligence in one often has a high intelligence in the other. Spatial intelligence is the ability to recognize and use the patterns of a space. This skill is particularly important to airplane pilots and sea captains; any use of successful navigation is a demonstration of spatial intelligence (Smith, 2002).

Interpersonal intelligence is the ability to "read" people and understand their motivations or desires. People with high interpersonal intelligence will be able to work successfully in groups, and nearly any profession that has any sort of interaction with other people will require a certain degree of interpersonal intelligence. Educators, salespeople, and political leaders all need to develop interpersonal intelligence. The last of Gardner's original domains is intrapersonal intelligence, and it can be represented by the capacity to understand oneself and appreciate one's feelings. People with accurate views of themselves will have a high intrapersonal intelligence--it may not manifest itself in any one specific job description but can be found with anyone with an understanding of who they are on the inside (Smith, 2002).

Online Education

Post-secondary distance learning programs represent a growing market for students seeking course credit. According to the National Center for Educational Statistics (NCES) in 2000-2001, 56% of 2-year and 4-year degree-granting institutions offered distance learning opportunities with 12% planning to offer courses in the next three years (Sikora & Carroll, 2002). The NCES also states that 63% of those institutions offering distance learning courses offer graduate level programs (NCES, 2003). In 2000-2001, nearly 3,077,000 students reported enrollment in some type of distance learning educational program (Waits et al., 2003). Li and Irby cite similar statistics and point to a United States Education Department report claiming enrollment in distance learning courses reached 2.9 million in the same timeframe (2008).

The rapid growth of students enrolling in online courses and the corresponding increase in revenue represents a compelling reason to develop learning opportunities and to further research this educational medium (Li & Irby, 2008). As the demand for distance learning options increases so too will the need for sound pedagogical choices by the offering institutions (National Education Association [NEA], n.d.).

Evaluating and accounting for the different intelligences will be a critical component of sustaining this growth. Online education standards provide a framework around which a quality online program can be built.

The push to meet the demand of online enrollment has prompted the NEA to outline eight online course design standards that help "take full advantage of the power of the online environment" (p. 6). The standards state that the courses should be instructor-led, student-centered, collaborative, flexible, and promote communication and technology skills. Further, the standards assert that communication should also be clear and concise, account for different learning styles, and use the latest best practices (NEA, n.d.). The task of creating an online course can be daunting, especially for those instructors who instruct for the first time. Often, instructors new to this medium will attempt to fit "their current curriculum into an online format without consideration of how to utilize the technology in the most effective ways" (Summers et al., 2005, p. 235).

Traditionally taught courses require substantial alteration to be effective in an online environment (Hill, Wiley, Nelson, & Han, 2001). Further, an internet based learning environment should focus on course design, assignments, and student evaluation (Hill et al.). Course design should allow for the creation of a learning community through the formation of small student groups and effective communication among the students and with the instructor (Tallent-Runnels et al., 2006). Changes in web-based assignments should reflect the more connected nature of online learning (Hill et al.). Greene and Land (as cited by Tallent-Runnels et al.) found guiding questions and procedural scaffolding increased student focus and encouraged project development. Prompt feedback and assessment of student learning are critical factors regardless of learning environment (Tallent-Runnels et al.). Online instructors are encouraged to focus on the real world application of course material and promote the growth of practical skills in their students).

The Influence on Traditional and Online Group Dynamics

Rarely do any of the intelligences operate independently and often are, "used concurrently and typically complement each other as individuals develop skills or solve problems" (U.S. Department of Education [USDE], 2005, p. 13). MI can also work across a group of students. Peers with similar strengths can work together successfully because they view issues from a common perspective. Students with different intelligences can learn their strengths and weaknesses and can be complemented by other students working in the group. In either case, all those involved will strengthen their interpersonal and intrapersonal intelligences. Successful group cooperation is the keystone of distributed intelligence (a communal ownership of gathered knowledge). Information is spread among the group so that no single person is held accountable for the entire body of knowledge found in the group (USDE).

A group separated by time and distance, as can be the case with online learning, may lose some of this group synergy. Interpersonal strengths may be diminished, while intrapersonal intelligences become more valuable. The individual should be aware of intelligence strengths and weaknesses before participating in an online class to avoid a disappointing and frustrating experience. The instructor should also be aware of the strengths and weaknesses of the students in the class. Often, an instructor will evaluate non-verbal cues to determine whether true comprehension has occurred. Distance learning does not always allow for this type of informal evaluation and can lead to academic issues. Traditionally, students who struggle to comprehend information may be labeled as less intelligent or less motivated than those who perform well academically. An instructor who has limited personal contact with the students may not be able to present information in a manner that allows the use of a strong intelligence.

Multiple Intelligence Influence on Traditional and Online Education

The impact that multiple intelligences has had on education has been debated since the theory's introduction in the 1980s. Gardner has steadfastly maintained that he did not develop this theory as a means for student education. Instead, the theory evolved from research Gardner conducted concerning the relationship between brain damage and cognitive development (Gardner, 2003).

Often, MI theory is pressed into a traditional framework of student success. Under this traditional model, a student either masters the information or does not and therefore labeled "smart" or "dumb". MI requires

that educators view students from a different perspective by perceiving them as "potentially smart in a number of ways" (Moran, Kornhaber, & Gardner, 2006, p. 23). The goal should be identifying--then tapping into--those intelligences which will allow students to learn using their strongest intelligence.

Information regarding intelligences can be valuable to both the teacher and the learner. In an online environment, the teacher and learner share a more equal responsibility for the educational outcome. The student may be required to develop weak intelligences in order to meet the requirements of the class and practice appropriate time management. The teacher is responsible for presenting material in a way that is consistent with the learner's strongest intelligences. This may require an additional investment of time to structure a traditional curriculum around an online framework.

Multiple Intelligence Influence on Traditional and Online Curriculum

Attempting to fit a traditionally taught curriculum into an online format can produce academic success but lead to disappointing student experience (Summers et al., 2005). The curricular implications of MI represent a fundamental shift in how curriculum is viewed and used according to a more traditional model found in most public schools. Gardner insists that any attempt to "cover everything" will almost ensure that the material is forgotten shortly after it has been tested. He promotes a "less is more" perspective that offers a deeper understanding across fewer subjects, and he suggests identifying concepts early in a student's education, then defining the type of end result an educator wants to see demonstrated by that student. These important concepts are visited and revisited throughout the student's education and at the same time building toward a successful and rewarding end result. This type of spiral curriculum, "in which rich, generative ideas are revisited time and again across a student's career in school" (Gardner, 2006, p. 128), would involve significant vertical alignment and communication among the teachers.

Online curriculum should be framed to meet the needs of distance education students. A crucial part of meeting the needs of students is understanding the various intelligences enrolled in the class. Once an instructor has a clear understanding of how the students learn, a plan can be implemented to help the students achieve the academic goals. As online enrollment increases the focus on providing a quality online curriculum will determine a program's success or failure.

The Relationship between Multiple Intelligences and Online Education

MI research in a traditional setting has shown that teaching to individual strengths can benefit learners who may process information in a different way from peers (Moran et al., 2006). Standardized multiple intelligence tests can reveal some information concerning an individual's strengths but may not provide a complete picture of that person's abilities. The different intelligences a person possesses can interfere, compensate, or enhance one another. Rich experiences offer opportunities for students to strengthen intelligences and promote learning along several dimensions (Moran et al.). Research is needed to determine if an online environment can provide the type of opportunities a student may need to develop a weak intelligence.

What remains unclear is how students who process information differently will perform in an online educational environment. Those students who have strong visual/verbal intelligences will perform well in an online class, because the majority of the information is transmitted via written instructions. A student who does not possess strong interpersonal intelligence and avoids social settings but has a strong linguistic intelligence would enjoy the online environment. The student would be able to carefully select words and craft written assignments without the interference of social apprehension (Moran et al., 2006).

Does MI change to meet the demands of an online educational setting? Research concerning multiple intelligences and the ability to change and apply them in an online setting also remains unclear. Students in traditional classroom environments have shown the ability to compensate for weaker intelligences through the successful application of stronger intelligences. The same may hold true for online learning, but further study is required before attributing similar characteristics to that of a traditional educational setting.

Discussion

Little research has been conducted on MI and online learning and has yielded mixed results. Some research indicates that students taking online courses will perform as well as their traditional, face-to-face counterparts (Liu, 2007). However, conflicting data concerning the educational experience have surfaced and highlights this instructional concern. For example, one study claims that academic success of online and traditional students varied little, but the traditionally taught courses provided a more satisfying experience for the learner (Summers et al., 2005). The results of a different study found that "students learn as much from an online tutorial as from traditional in-class instruction and that they are satisfied with online instruction" (Nichols, Shaffer, & Shockey, 2003, p. 385).

Distance learning can present issues not found in more traditional educational settings. For example, technical problems can create a great deal of frustration for both the student and instructor. Real technical issues could be the cause of late or missing assignments or could be an excuse used to avoid academic repercussions. Online students must realize that "for distance learning to be successful, online learners must assume greater responsibility for their own learning than students in the traditional classroom setting" (Coombs-Richardson, 2007, p. 72). The increased responsibility places more emphasis on the learner to have an understanding of their MI strengths and weaknesses.

Online education has rapidly gained favor with many students. As generations reared with available internet access and online communication enter college, the focus on providing a quality educational experience will intensify. Post-secondary institutions see the need to offer online coursework and have responded by adding more online options. This trend, while increasing course availability, may be doing a disservice to the students with intelligences that are not compatible with an online learning environment.

Limitations

The lack of studies comparing multiple intelligences and online education represents a significant limitation of this review. The multiple intelligence theory has had a significant impact on educational practice found in a traditional classroom setting, but little has been done to study MI in the online classroom. Now that more students are using distance learning to achieve academic goals, the use of MI in the online learning environment is critical. The recent increase in online programs coupled with the subsequent increase in online enrollment may prove to be catalyst for an explosion of research focused on MI and distance education.

Implications for Theory

Multiple intelligence theory represents an evolving framework for educators. Gardner points to colleagues who have suggested additional intelligences including sexual, digital and attention. He claims that individual judgment plays a large role in determining what counts as an intelligence and what does not (Gardner, 2003).

Implications for Further Research

Multiple intelligences have been studied in a traditional classroom setting for over twenty years. Online education provides a new medium in which to test the ideas put forth by MI. The impact of MI on group dynamics through the lens of online education could provide important insights into how we interact via the Internet. The ability to carefully select words before responding to an email can be a powerful motivator for a person who has a strong intrapersonal intelligence but a weak interpersonal intelligence. A kinesthetic learner may need to develop additional intelligences if the online course requires a great deal of sitting and reading while a visual/verbal learner could quickly excel.

Hybrid courses offer the flexibility of online coursework with the face-to-face interaction found in a traditional classroom. Professors can post information to be read and can engage in discussion when the class meets. Students in hybrid and online classes are expected to take more responsibility for their educational outcomes since the professor cannot function as the motivating element (Mansour & Mupinga, 2007). For this reason, understanding one's multiple intelligence strengths and weaknesses represents a vital part of online achievement.

As the competition between educational institutions increases, a study comparing the programs would be valuable. The nature of online education deemphasizes geographic barriers to higher education. Students can enroll virtually anywhere around the world provided that they have access to the internet. A study examining the pull factors universities can use to attract online students would be a valuable technique to evaluate an online program.

Conclusion

Integrating multiple intelligences into education represents a key component to student success regardless of the presentation method. An instructor who gears course material to address the needs of multiple intelligences will encourage academic success and promote a quality learning experience. An online learner must realize the significant role learning styles play in the educational process and would benefit from understanding individual strengths and weaknesses. An online instructor faces the challenge of addressing the various intelligences in order to provide a quality learning experience for all types of learners. The learner has a responsibility to appropriately apply strengths in an effort to produce the desired learning experience. Further research is necessary to determine how multiple intelligences are influenced by an online learning environment. By sharing educational responsibility, online learning creates a stronger partnership between the instructor and the learner.

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