Multiple Intelligence Theory and Technology

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Educators must continue to investigate how students learn. Teachers need to use technology in the classroom to reach and support our varied student population and use their distinctive learning styles and strengths to make learning more memorable to each individual student. When teachers incorporate both the theory of multiple intelligences and technology, students find their classroom experiences stimulating and motivating. The purpose of this paper is to examine ways teachers can implement technology in the classroom to match up each of the multiple intelligences with effective technology learning tools.

INTRODUCTION

It is essential for teachers to remember to adjust traditional teaching methods in order to consider the needs of all students. Teachers must also change the way in which technology is used in the classroom since students need to obtain twenty-first century skills in technology, and global societal awareness. According to Gardner, "Americans have overly emphasized technical aspects of education by using it mostly for testing and measurement while neglecting the social or wider community elements computers can bring to the classroom which had always been an important part of education", (Gardner, 2006, p.206). Teachers need to implement technology in the classroom for more than just drill, and practice exercises.

Many educators know that different students learn in many different ways. Gardner says that people acquire knowledge in different ways and that they have competencies in each of the nine intelligences (Gardner, 2006). Teacher can give their students a multiple intelligence survey to assess students' strong and weaker intelligences. The theory of Multiple Intelligences and technology supports with the present understanding of the human brain. In Gardner's view, the same ideas that inspired the development of the computer also brought about an uprising in our understanding of learning, teaching and the manner in which the human brain functions. He refers to the behaviorist theory in the way people learn is through a series of sequential reinforcements. Many computer programs do give instant feedback to their users. He compares the human brain to computers because both can store, manipulate information, and use symbols, and solve complicated problems (Weiss, 2000). Research has shown

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students are most motivated to learn when they are doing school lessons where they have some previous talent or knowledge.

The use of technology in the classroom can level the playing field for those who may be otherwise limited due to disabilities in many ways like word processing programs help them with spell and grammar check. On the other hand Gardner points out," Technology can often appeal to many students but the content can be too rich or too cluttered for many students with attention difficulties so that these learners can not focus on what is truly central to the concept under investigation", (Gardner,2000,p.208). This is where the human aspect of teaching is needed, teachers need to continually monitor there students progress while they are using technology. Gardner points out the benefits of technology," Computer technology puts all the information in the world at one's fingertips, no longer do we have to spend hours hunting down a source. Thus people will achieve "cultural literacy", (Gardner, 2000, p.44). Computers can make the world seem smaller because people from all over the world can share information, learn, and problem solve together in cyber space.

Students need to be actively engaged in their own learning to become better problem solvers and obtain critical thinking skills. Technology has changed the expression and function of modern society. Technological innovations have allowed fluency across all cultures because computers can now translate different languages for us to read what people are saying around the world. Also, computers allowed us an increased ability to gather information, storage it for later use (Adams, 2004). Now

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classrooms all over the world can interact and problem solve together. Our world has become technologically advanced, and our classrooms are progressively following the same advancements. The teacher should remain the primary instructor, but new technology and resources are changing how teaching and learning occurs.

Inquiry Statement

Can technology really help students learn, and does it meet the needs of varied student learning styles and multiple intelligences?

Hypothesis

It is my belief that if teachers implement both the theory of multiple intelligences and technology, and not just use computers for drill and practice exercises; students will find their classroom experiences stimulating and motivating.

Review of Related Literature

Howard Gardner's research in the area of multiple intelligences suggests that all students learn things in different ways. He listed nine intelligences: linguistic, logical–mathematical, spatial, musical, bodily–kinesthetic, interpersonal, intrapersonal, existentialist or Spiritual. The list of multiple intelligences, suggested by Gardner is:

- Logical-mathematical, which deals with numbers and logic.
- Verbal/Linguistic, which deals mainly with words.

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- Bodily-kinesthetic, which deals with body movements and the handling of objects
- Musical, which deals with rhythms and melodies.
- Visual/Spatial, which deals with pictures and images.
- Interpersonal, which deals with understanding other people and working with them.
- Intrapersonal, which deals with the inner self and one's feelings.
- Naturalist, which deals with classification and understanding phenomena of nature.
- Existentialist or Spiritual, which deals with the big questions of life and harmonizing.

Gardner further explains the multiple intelligences, and how each of us has varying amounts of each of these intelligences. "Even as all humans possess and exhibit these multiple intelligences, the intelligences also serve to distinguish from one another. Individuals possess varying amounts of these intelligences and combine and use them in personal ways. Just as we all look different and exhibit different personalities, we all possess different kinds of minds", (Gardner, 1991, p.81). It would be interesting to first ask students to state what intelligence they think is their strongest then give them an intelligence survey to see if they were correct about their strongest intelligence.

A teacher used the multiple intelligence theory to teach his students. Campbell organized his third grade classroom in Washington, into nine learning centers, each dedicated to one of the nine intelligences. The students spent about two-thirds of each school day moving through the centers for fifteen to twenty minutes at each center. Every day began with a lecture of the present subject. While the students were at each station a timer was set. The students were in groups of three or four at their centers. Each student went through all nine centers. The students learned through movement, wrote songs built

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models, made group decisions, problem solved together, read, wrote, and illustrated all in one school day. A research project was preformed in his classroom to assess the outcome of this multi-intelligence curriculum. A daily journal was kept by the teacher with entries recording the following:

- general daily comments
- a daily evaluation of how focused students were
- an evaluation of the transitions between centers
- an explanation of any discipline problems
- a self-assessment - how the teacher's time was used
- tracking of three individuals previously identified as students with behavior problems.

In addition, a Classroom Climate Survey, and a Student Assessment Inventory of work at the nine centers was given nine times during the year, and a Center Group Survey was administered different times during the year. The research data revealed the following:

1. *Discipline problems were considerably reduced.* Students who were earlier known to have severe behavior problems showed rapid progress during the first six weeks of school.

2. The students develop greater responsibility and independence throughout year. The students developed their own projects, collected their own resources and materials, and made well-planned presentations.

3. Cooperative learning skills improved in all students. Most of the center work was collaborative. The students became skilled at helping each other, sharing leadership in different activities, listening to each other comments.

4. *All the students' new skills across the curriculum.* In the fall, most students expressed only one center as their favorite or felt more confident. By year's end, every student identified at least six centers which were favorites and felt more skilled. The students made multi- intelligence presentations of independent projects including songs, skits, visuals, poems, games, surveys, puzzles, and group participation activities.

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5. *Academic achievement improved.* Test scores were above state and national averages in all areas. The end of the year test showed a high retention rate of all the students (Campbell, 1996).

The research study showed the students' learning of new skills improved. His student's were motivated and learning increased significantly. The students developed

responsibility and independence as they took an active role in shaping their own learning experiences. His study showed the multiple intelligence theory with different center stations used worked with success. The way the previous study used multiple intelligences worked in the classroom was interesting but what I want to know is how a teacher can implement the multiple intelligence theory using technology. Integrating technology into the classroom has in many ways changed the organization of teaching and learning. In many ways, the lessons designed to incorporate technology can meet the needs of various learning styles and multiple intelligences.

I did find an interesting research in my literature research where educators are concerned about student learning because according to studies from the National Center for Education Statistics, Fourth- and eighth-grade US science students showed little if any measurable differences in achievement from 1995 to 2003. Professors of pre-service teachers at **San Diego** StateUniversity decided to conduct a research of having the pre-service science teachers come up with lessons for students that include digital media and pod casting in their science methods course.

Pod-casting is the abilility to download audio files from the internet for playback on portable audio players. One of the benefits of pod-castings is that students can listen

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to or watch content at their own speed, when and where they need it. Pod-casting is not as difficult as it might sound. The content must be on the internet or student work needs to be saved to the internet. Then you hook the ipod or mp3 player to the computer and download the content. The content can be audio, video or both depending on player it is being downloaded onto. Pod-casting could be used in the classroom for book talks, science logs and art critiques, etc.

Results from a survey of more than 80 students in their science methods revealed that pod-casting had a considerably optimistic impact on the pre-service science teachers' abilities, and attitudes about teaching science. Ninety-five percent of the students felt their knowledge and understanding of children's thinking improved and that they are aware of a wider variety of teaching strategies improved due to pod-casting (Yerrick, 2006). This study showed an improved per-service teacher motivation was improved by using technology it would be interesting to see improved motivation of students in classrooms using this technology for science and other subjects. It would also be interesting to see how many different multiple intelligences that could be tapped into by using digital medias and pod-casting.

Critical Analysis of Related Literature

There is not a lot of research in the area of multiple intelligence theory but I couldn't find an actual research study where the theory was used along with technology. I

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found loads of useful ideas where teachers are using it in the classroom, but no actual data where it was recorded over a period of time.

Gardner advises teachers to think of ***technology*** as a tool, "It's merely a tool we can use to educate, but one that shouldn't dictate educational goals. Teachers need to ensure that adequate technical assistance is provided so that the ***technology*** is deployed effectively" (Weiss, 2000). More research and teacher training need to be preformed and conducted in this area. As more technology is add to classrooms across America it will be interesting to watch how students can tap into their different intelligences through the use of technology.

Conclusion

It is essential to expect excellence from students and use multiple strategies to help them achieve their full potential. We are so caught up with standardized tests, we forget that to learn is to expand ones horizon or potential. The teaching strategies presented outline how to enhance student performance by combining new technologies with time-tested teaching methods. The important idea to remember is that all people learn in different ways, and we need to take that into account when designing lessons. Teachers have different teaching styles and techniques. Their individual style tends to be closely connected to the way in which they learn better. There is not one teaching method that will work for all learners. Since all learners are different, we must provide a variety of teaching methods to better match the variety of learning styles that students bring to the classroom. I believe my hypothesis is correct because when teachers

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incorporate technology in the classroom it taps into all kinds for the students multiple intelligences.

Reflection

The review of literature about the theory of multiple intelligences has increased my knowledge base because it made me better understand more how each of us have multiple intelligences. The literature showed me how to incorporate technology in the classroom while keeping the multiple intelligences in mind when designing lesson plans.

Studying the literature reviews built toward my doctoral Study because my doctoral study is about Assistive Technology. I have studying about different types of Assistive Technology, the history, and how school can get funding for Assistive technology. Since I conducted this research I now have more information, evidence and the theories that prove that technology can benefit special needs students and help level the education field more for these students because concepts and subject matter is presented visually, and is also explained verbally. Technology can also level the educational field by allowing special needs students to use adaptive keyboards, screen readers, switches, touch screens and voice recognition (Davis, 2008). These assistive devices help special educations students successfully learn and communication with technology in areas where they may not been able to before.

Application

We should consider ways that technology can help all students learn. The computer can help students develop individual skills, allowing for differences in learning

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styles and abilities. Some students may require extra assistance in subject areas. Computer aided tutoring can offer them extra instruction. One of the most important benefits of computer aided instruction is that it allows students to work at their own pace. Here are the explanations of the multiple intelligences and some technology based

activities and lessons that I plan on using in the classroom to build on my student's intelligences:

Instructional strategies that work for linguistic learners must focus on self-expression. Since linguistic learners are very comfortable speaking, I would have them give presentations on their learning in a form of projects. **These students would benefit from using** word processing programs, because these programs can help teach language, writing, editing, and rewriting skills. Students with a strong linguistic intelligence would enjoy a project such as a class poem because Linguistic learners would embrace this learning opportunity because they can use their verbal skills to express an abstract concept.

For the logical-mathematical learner I would encourage them to use databases and spreadsheets in their projects and presentations. Since these programs would allow these students to calculate and organize data. Logical learners also excel at inquiry-based projects. These students would enjoy being presented with a problem and then given resources to solve it. A definitive answer is what these learners seek. There are a variety of computer programs that teach logic and critical thinking skills, even in game formats which can be motivating to students. Database programs can help students explore and organize data and information.

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Interpersonal learners interact well with society and can be labeled in as the talkers. Students would enjoy working with others on the computer; in groups of two to four would be ideal group sizes. Allowing the students to work in groups reinforces skills such as cooperation and communication. The computer can encourage cooperative learning in any subject area. Interpersonal learners are exceptionally aware of the feelings and motives of others around them and are also especially good at starting discussions and encouraging participation from other classmates. They enjoy creating products that allow them to express themselves to an audience. Presentations, e-mail projects, and videoconferencing inspire these students. These learners are more focused on people and their opinions. I could use a simple statistics lesson to tap into these learners strengths. A group of interpersonal learners can use numerous online survey tools to create a test for other students. This lesson could focus on their communication and creative strengths because the topic can be whatever they like. Once the other students have taken the survey, the group can create a visual representation of the results.

Intrapersonallearners are characterized as self-motivated and learn through metacognitive processes. For these learners I would use computer based journaling, concept mapping, and Internet. Another idea I could use in the classrooms is to have the students create blogs about topics of their interests since they allow students to express their thoughts and feelings in a different way. Students still create a self-reflective piece in a generally self-paced environment; however, it can then be successfully shared with

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others. A blog provides a channel for students to share their work and might lead them to participate in a writing contest.

Spatial learners would benefit from makingdigital andvideo-camera projects. Computer-aided design andpaint programs can also maximize student's potential. Graphics programs can help develop spatial perceptions and help develop creativity by allowing students to create their own designs. Browsing the Internet and organizing files, folders, and directories on a computer involve some spatial understanding.

For the musical learners I would allow them toexpress themselves and learn through auditory means. Musical learners would benefit from interactive books, video and audio recordings, and audio notations. These learners adapt well to cross-curricular projects that can incorporate music. A good technology to use with musical learners is a software program that synthesizes music into waves. These students benefit greatly by using their musical talents to break down and rebuild melodies. Synthesizer software is affordable.

For the Bodily-Kinesthetic learners I would encourage them to express their ideas through movement. They would benefit greatly from creating video productions and virtual field trips since they would be able to move about while filming their presentation. These students do well whileusing a computer because computers require good eye-hand coordination. They students could benefit from joystick and other devices different from just using a mouse to control computer operations. These students need to manipulate their surroundings to achieve their maximum potential.

For the Naturalistic learners, I would encourage students to usecameras for create imagines in their presentations. They could use the cameras and video recorders to present a report about nature. They could do a presentation about the changes that occur during different seasons

For the Existentialist learner I would use problem-solving projects like why recycling is good for the environment or what students can do to help their communitybecause these learners arefocused on the big picture and why the world operates the way it does. Or I could have them report on how technologies have improved peoples lives because the nature of technology is existential. The use of technology continues to evolve how we look at ourselves. These students can research how Internet collaboration is changing the world around them.

These are only few examples of how I could use technology in my classroom to tap into students multiple intelligences. The possibilities are endless since technology advancements **continue to grow and more people are sharing their learning on the Internet daily.**

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