

Multimedia Meets Multiple Intelligences: Teacher Preparation for the New Millennium

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A recently developed survey posed the following question: Are your teachers required to demonstrate technology skills for new or continued employment with your district? If technological competency is to be considered a decisive factor regarding teacher employment, then it is the responsibility of every teacher education program to provide the necessary training. The National Educational Technology Standards (NETS) Project, a program that concentrates on preservice teacher education as a division of the International Society for Technology in Education (ISTE), has defined specific concepts, knowledge, and skills considered essential in order to apply technology in educational settings [1]. Preservice teachers participating in their preparation programs are expected to demonstrate competency in the following categories: Technology Operations and Concepts; Planning and Designing Learning Environments and Experiences; Teaching, Learning, and Curriculum; Assessment and Evaluation; Productivity and Professional Practice; and Social, Ethical, Legal, and Human Issues. Requisite proficiencies range from using technology tools and information resources to increase productivity, promote creativity, and facilitate academic learning to examining acceptable use policies for the employment of technology in schools, including strategies for addressing threats to security of technology systems, data, and information. The availability of diverse multi-media based technology in the academic arena promotes a re-evaluation of traditional methodological strategies to now include concepts that promote the recognition of various categories of potential intelligences.

The concept of multiple intelligences is one that most educators acknowledge exists, but also one that many educators confess that they know little about. The theory of multiple intelligences was developed in 1983 by Howard Gardner, Hobbs Professor of Cognition and Education at the Harvard Graduate School of Education. Multiple intelligences theory holds that each person has abilities of varying degrees in several different and discrete areas. This is in contradistinction to general theories of intelligence that have been advocated during the past century. Beginning with Binet in 1904, the search for a reliable way to measure intelligence has been on-going. But what is intelligence? The prevailing idea about intelligence has been limited to expressions of verbal, analytic, or mathematical abilities. This has been quantified through the use of standardized intelligence tests that purport to measure individual reasoning skills.

General theories concerning intelligence commenced with Spearman's identification of "g", or general intelligence in 1927. This general intelligence was supposed to exist across all learning situations. Guilford proposed 180 different types of intelligence in 1968, by combining six types of mental operations, five types of content, and six types of products. Sternberg [2] advocated a tri-archic theory of intelligence in 1990 encompassing intelligence, wisdom, and creativity.

The theory advocated by Gardner in his 1983 book, *Frames of Mind* [3] was that each individual had capabilities or potentialities in seven distinct areas: linguistic, musical, logical-mathematical, spatial, bodily-kinesthetic, interpersonal, and intrapersonal. Another area of intelligence according to Gardner in his 1993

book, *Multiple Intelligences: The Theory in Practice* [4], is designated the naturalist. Further possible areas of intelligence were explored by Gardner in his 1999 book, *Intelligence Reframed* [5]. These intelligences were spiritual, existential and moral. However, after extensive discussion, Gardner [5] felt unable to add the spiritual, existential, and moral intelligences to his current framework. This paper will explore the eight multiple intelligences that currently compose Gardner's theory and examine their relationships to educational technology.

The key to understanding multiple intelligence theory is to understand that each person has strengths and weaknesses in each of these areas, as well as a uniquely individual combination of abilities from all intelligences. These intelligences are dynamic in nature rather than static, that is, they are capable of changing over time.

1. The present spectrum of multiple intelligences:

1. Linguistic

"Linguistic intelligence involves sensitivity to spoken and written language, the ability to learn languages, and the capacity to use language to accomplish certain goals" (p. 41) [5].

2. Musical

"Musical intelligence entails skill in the performance, composition, and appreciation of musical patterns" (p. 42) [5].

3. Logical-mathematical

“Logical-mathematical intelligence involves the capacity to analyze problems logically, carry out mathematical operations, and investigate issues scientifically” (p. 42) [5].

4. Spatial

“Spatial intelligence features the potential to recognize and manipulate the patterns of wide space (those used, for instance, by navigators and pilots) as well as the patterns of more confined areas (such as those of importance to sculptors, surgeons, chess players, graphic artists, or architects)” (p. 42) [5].

5. Bodily-kinesthetic

“Bodily-kinesthetic intelligence entails the potential of using one’s whole body or parts of the body (like the hand or the mouth) to solve problems or fashion products” (p. 42) [5].

6. Interpersonal

“Interpersonal intelligence denotes a person’s capacity to understand the intentions, motivations, and desires of other people and consequently, to work effectively with others” (p. 43) [5].

7. Intrapersonal

“Intrapersonal intelligence involves the capacity to understand oneself, to have an effective working model of oneself-including one’s own desires, fears, and capacities-and to use such information effectively in regulating one’s own life” (p. 43) [5].

8. Naturalist

“Gardner defines a naturalist as a person who recognizes flora and fauna plus other consequential distinctions in the natural world and uses this ability productively. In our culture the term *naturalist* is applied to people who have an outstanding knowledge of the living world” (p. viii) [6].

2. Multi-media technology meets multiple intelligences

The current culture of multi-media technology allows for many interactions between technology and multiple intelligences. Jonassen [7] advocated the use of computers to support meaningful learning through cognitive tools styled “Mindtools”. Mindtools are computer applications that require students to think in meaningful ways, or through the use of critical thinking to produce representations of what they know.

Roblyer and Edwards [8] state, “Gardner’s theory meshes well with the trend toward using technology to support group work. When educators assign students to groups to develop a multimedia product, they can assign students roles based on their type of intelligence. For example, those with high interpersonal intelligence may be the project coordinators, those with high logical-mathematical ability may be responsible for structure and links, and those with spatial ability may be responsible for graphics and aesthetics, (p. 66).”

Multi-media and multiple intelligences coordinate to create opportunities for both individual as well as group learning. In the case of Drury University’s teacher preparation program, multimedia applications are stressed at both levels-

personal and group. This allows for a synergistic confluence of multiple intelligences. On the one hand, individuals will draw upon their strengths in each of the eight intelligences to create a product. Conversely, a group project is enhanced due to each individual bringing into the mix a unique blend of intelligences that interact with the intelligences of the other group members. The result is the same, the whole is greater than the sum of the parts.

Multi-media technology, in particular, is a wonderful vehicle for allowing the expression of multiple intelligences. Armstrong [9] correctly ascribed the potential applications of multiple intelligences theory with computer technology. While somewhat dated, his list of software to activate multiple intelligences (p. 160) serves as a template for the exponentially expanding varieties of software available to educators today. With the rapid increase of software, both in sheer volume as well as complexity, applicable to each of the eight areas of multiple intelligences, there seems to be no limit to the integration of multi-media technology and multiple intelligences.

3. Drury University and multi-media efforts in teacher preparation

Drury University has established a renowned teacher education program. In the teacher education program students are required to complete five foundational courses, including one in technology along with their methods courses. The foundational course for educational technology at Drury University is EDUC 200, Technology in the Classroom. This is a three hour introductory course in educational technology enabling participants to explore a number of

technologies that can be used in the classroom. The course is focused on three areas: how to operate the technologies, how to use the technologies to enhance personal productivity, and how to use technologies in a learning/instructional environment.

The following projects are required for successful completion of EDUC 200:

Microsoft Word projects:

- Letter of Introduction sent via e-mail
- Olin Library Book Order and Review
- Software Evaluation Sheet
- Internet Lesson Plans
- Internet Contract Sheet
- Final Project

Microsoft Publisher Activities:

- Bookmark/Calendar/Certificate/Card
- Internet activity brochure

World Wide Web projects:

- Internet Lesson Plans
- Olin Library Book Order and Review
- Internet activity brochure
- Letter of Introduction sent via e-mail
- Weekly e-mail correspondence

Microsoft PowerPoint projects (multi-media):

- Power Point Presentation- Autobiography
- Power Point Presentation- Lesson Plan
- Final Project

Various projects:

- Gradebook Program
- Software Evaluation
- Current Event Presentation
- Inspiration by Inspiration Software
- Field experience component
- Field experience reflections
- Portfolio

As this list indicates, the dominant programs used in EDUC 200 are Microsoft Word, Microsoft Power Point, Microsoft Publisher, and the World Wide Web. Some of the projects are not multi-media based; however, the Microsoft Power Point projects along with the World Wide Web projects constitute a large portion of the student's final grade. Several of the projects are listed in more than one area since they contain components requiring more than one product. The focus of this paper is on multi-media applications and how the theory of multiple intelligences can be integrated with these technologies. Each of the multi-media projects required in the EDUC 200 course will now be examined and correlated to the appropriate multiple intelligence.

1 . Microsoft Power Point presentation-Autobiography

This project requires the student to develop a multi-media presentation using the Microsoft Power Point software. This presentation incorporates images, text, sound, and animation in a multi-sensory experience. The students create a series of slides detailing their life experiences. They are required to format backgrounds, text, color schemes and transitions between slides. A minimum of eight slides is required. Students are at liberty to bring images from home to scan and incorporate into the presentation. They can also utilize digital cameras or

bring in digitized images on disk to personalize their presentation. Some students choose to download images from the Internet to represent stages of their lives.

Musical selections from CD or downloaded from the Internet provide for individual expression. The finished product is then presented to the class.

Software applications utilized: Microsoft Power Point and the World Wide Web

Multiple intelligences utilized: linguistic, musical, logical-mathematical, spatial, bodily-kinesthetic, intrapersonal

2. Microsoft Power Point presentation-Lesson Plan

This project is similar in nature to the Microsoft Power Point Autobiography. For this project, students must select a specific grade level, a subject area (mathematics, language arts, social science, or science) and identify a particular behavioral objective within those parameters that they wish to teach to the class. Many students make use of the numerous lesson plans available on the World Wide Web and find one they can modify.

Students develop a multi-media presentation using the Microsoft Power Point software to assist them in teaching their lesson to the class. They are required to create at least eight slides and incorporate images, text, animations, and sound. Each slide must have transitions and backgrounds. Students are encouraged to make use of downloaded images from the Internet along with incorporating hot links to specific web pages within their Microsoft Power Point presentation. The student also uses the Microsoft Word program to write out their lesson plan using an eight step format. The lesson is then taught to the class.

Software applications utilized: Microsoft Power Point, World Wide Web, and Microsoft Word

Multiple intelligences utilized: linguistic, musical, logical-mathematical, spatial, bodily-kinesthetic, intrapersonal, naturalist

3. Final project

This project requires the student to identify a personal theme of interest to them and develop Internet based activities for their students to accomplish. This project is divided into three parts: a Microsoft Word document giving instructions for accomplishing the internet activities, a Microsoft Power Point presentation on their theme, and a group review process.

The first task is for the student to identify a personal theme of interest (e.g. popcorn, butterflies, space exploration) and conduct an Internet search to locate web sites containing information and activities related to that theme. The student then identifies twenty specific activities for the user to complete or questions for the user to answer. The general rule of thumb is that at least five different web sites must be used in the activity. Some of the things that can be used for activities are filling out surveys, answering questions, playing on-line games, printing out information, or completing on-line activities. The student then creates a Microsoft Word document giving step-by-step instructions to the user to enable them to complete the theme-based activities. These instructions must be clear and explicit.

The second part of this project involves the creation of a multi-media presentation using the Microsoft Power Point software. This presentation would

be used by the student to stimulate interest in the theme on the part of their prospective students. This presentation requires a minimum of five slides incorporating graphics, text, and sound. The presentation is made for the class.

The final project also includes a group review process through which the students submit their Microsoft Word document to other members of the group and these reviewers attempt to complete the activities. Groups then meet to discuss any problems they encountered and make recommendations for improvements.

Software applications utilized: Microsoft Word, Microsoft Power Point, and the World Wide Web

Multiple intelligences utilized: linguistic, musical, logical-mathematical, spatial, bodily-kinesthetic, interpersonal, intrapersonal, naturalist

5. Specific utilization of multiple intelligences through multi-media

The multi-media projects required in the EDUC 200 class enable the student to use various areas of intelligence. This section describes some specific utilizations of each of the eight multiple intelligences identified by Gardner.

1. Linguistic

Each of the projects in EDUC 200 requires the student to use written and oral language skills. Each of the Microsoft Power Point presentations contains text and there are Microsoft Word documents required in the lesson plan presentation and the final project. Each of the projects requires the student to give an oral presentation.

2. Musical

While not overtly required, each project allows the student to utilize musical selections to facilitate moods and experiences. In the lesson plan presentation and final project students can choose music topics for their themes.

3. Logical-mathematical

The capacity to analyze problems logically is required in all of the projects assigned in EDUC 200. In the lesson plan presentation and final project students can choose mathematics for their themes.

4. Spatial

Each of the projects required in EDUC 200 features a need to recognize and manipulate patterns. To create multi-media presentations using the Microsoft Power Point software students must be able to discriminate spatially and to integrate colors, graphics, and texts in a balanced format.

5. Bodily-kinesthetic

This intelligence is usually thought of as referring only to sports or athletic activities, but it also requires the use of a person's body or parts of a body to fashion products. In the field of multi-media presentations it requires the use of the hands to create the text documents and the Microsoft Power Point presentations. Students must also demonstrate coordination to present their slide shows while delivering their oral presentations.

6. Interpersonal

This intelligence is utilized primarily through the presentation of finished products in EDUC 200. It is used to the greatest extent during the group review process for the final project.

7. Intrapersonal

This intelligence is utilized during each of the required projects for EDUC 200 but probably to the greatest extent during the Microsoft Power Point autobiography assignment. In this assignment students utilize the capacity to understand oneself, including personal desires, fears, and capacities. This assignment is the one most students look forward to the least and actually enjoy the most.

8. Naturalist

While not explicitly required in any of the assignments for EDUC 200, the naturalist intelligence is utilized to some extent by students. In particular, students who select a science theme for their lesson plan presentations or the final project could be expressing and utilizing the naturalist intelligence.

Educators are being asked to extend their knowledge of basic computer skills, Internet applications, and software operations to now include specific hardware use, technological trouble shooting and maintenance in conjunction with classroom technology integration. The International Society for Technology in Education (ISTE) has endorsed a four-tier competency format to address preservice teacher training through performance indicators and endorse national standards for the use of technology in the classroom. Creating guidelines to

promote technological proficiency is a productive step. However, it is essential to include supportive pedagogy and methodology that promotes a positive educational experience for all students.

References

- [1] International Society for Technology in Education. (2001). Technology Performance Profiles for Teacher Preparation (National Educational Technology Standards for Teachers - NETS•T). [On-line]. Available: <http://cnets.iste.org/index3.html>
- [2] Slavin, R.E. (2000). Educational Psychology: Theory and Practice (6th ed.). Boston: Allyn and Bacon.
- [3] Gardner, H. (1983). Frames of Mind: The Theory of Multiple Intelligences. New York: Basic Books.
- [4] Gardner, H. (1993). Multiple Intelligences: The Theory in Practice. New York: Basic Books.
- [5] Gardner, H. (1999). Intelligence Reframed: Multiple Intelligences for the 21st Century. New York: Basic Books
- [6] Glock, J., Wertz, S., and Meyer, M. (1999). Discovering the Naturalist Intelligence: Science in the School Yard. Tucson, AZ: Zephyr Press.
- [7] Jonassen, D.H. (2000). Computers as Mindtools for Schools: Engaging Critical Thinking (2nd ed.). Upper Saddle River, NJ: Prentice-Hall, Inc.
- [8] Roblyer, M.D. and Edwards, J. (2000). Integrating Educational Technology into Teaching (2nd ed.). Upper Saddle River, NJ: Prentice-Hall, Inc.
- [9] Armstrong, T. (1994). Multiple Intelligences in the Classroom. Alexandria, VA: ASCD.