

Relationship Between Readiness and MI Components

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Abstract: In this study, the researcher used 375 students of level 1 and 2, studying in Shiraz. The instruments in this study were ICT dimensions questionnaire and MI components questionnaire. Before the study, the researcher was sure that sentences were clear for students and there was not any ambiguity for students. There were two phases in procedure: the first phase was obtaining permission from the relevant authorities and the second phase involved distributing the questionnaires among respondents. Pearson's correlation coefficient was used to analyze data.

Key words: ICT dimensions questionnaire, MI components questionnaire, multiple intelligences, readiness, data

INTRODUCTION

Gardner (1993)'s vision includes a school rich in evaluation. The roles of "assessment specialists" and "student-curriculum broker" are made to help in the abilities and interests of the students in the school and the community. Assessment in Gardner's ideal school becomes the focal feature of the educational systems with the focus away from standardized tests and toward the search for authentic problem solving or product-fashioning skills (Gardner, 1993). This assessment includes 15 procedures of documents on score sheets, observation, checklists, portfolios and tape recordings and is done over the course of a year (Gardner, 1993). In MI teacher-centric mode, the teacher is in control of the information and is solely responsible for how much information is to be disseminated to the students, thus rendering the learning mode passive. This traditional "chalk-and-talk" mode of teaching is still widely used in many institutions of higher learning but currently, there is a move toward creating a constructivist-learning environment in such institutions. Now, in this perspective, the role of the teacher moves away from being the sole expert or dispenser of knowledge and information in the class to becoming a facilitator to the students and a guide to help them achieve their learning objectives.

One question is why MI is important in ICT topics? Each part of this ideal system, rich in multiple intelligence, operates with the other parts to achieve the goal of promoting the building of learner knowledge. Like MI, ICT is a supported learning. A supported learning is the focus on both aspects of learning and knowledge transfer with special emphasis on experiences and future developments within the area. Moreover, ICT supports user environments where existing environments can be

enhanced and new ideas implemented, tried out and evaluated (Christiansson, 2004). ICT support us in bringing together aesthetic as well as scientific considerations, allowing us to overlay knowledge and meaning with skill and competence. Teachers can, for example, enable students to design in ways that demonstrate perspectives difficult to create in classroom spaces which reveal new ways of seeing; they can bring serious research more easily into creative writing or they can incorporate story treatments into science using multi-media to enrich and stimulate better learning outcomes.

Educators agree that there is a wide range of ability levels among students in any given classroom. Today, a major concern in education is to meet the learning requirements of the students. Educators agree that there is a wide range of ability levels among students in any given classroom. Their talents are not identified and often they are all expected to learn in the same way (Christison, 1998). Learning is the acquisition of the knowledge of a skill, skills and/or experiences (Tracey and Richey, 2007). According to regarding constructivism, learners are "constructors" of knowledge when they require and experience a learning situation and are ready to act according to those requirements. Learners develop understanding for themselves in ways that vary, sometimes quiet piercingly; from other learners.

Here a question is raised: why is the traditional method not effective? Traditionally, the teacher is assumed the role of source of knowledge or the only content expert in the class, who teaches according to the principles of the directed instruction method. Such teacher-dominated teaching is very common in classrooms today, rendering students as passive receivers of instruction. Often this type of instructional practice leads to practice and highlights lower levels of

learning (Clark and Mayer, 2003). Other researchers reviewed the USA national data on classroom practices from 1980-1990 and found that the use of teacher-centered components characteristically increased from the elementary to secondary level.

Another question is why Multiple Intelligence (MI) is important? Barker and Moroz (1997) found evidence that student-centered components had improved at the elementary level over the course of the past century and those middle schools were beginning to use these components. Oswald outlines, however that while teachers use a variety of activities, techniques and strategies expansively in schools today, schools have much more inflexible organizational structures and are less likely to move towards student-centered components. Traditionally, teachers have used verbal-linguistic and logical-mathematical techniques in their teaching, paying no attention to individual differences among students.

The traditional teacher-centered instruction technique is called direct instruction. The teacher provides the students with much of the information they need, often through lectures, explanations, examples and problem solving activities. The MI approach encourages teachers to pay more attention to intellectual ability. It enables teachers to see that visual arts, music and dance can be just as valuable to students' understanding of the world they live in as traditional academic subjects can. Numerous teachers have applied aspects of MI theory in their classrooms and schools (Armstrong, 2009). As a result of a promising and in-depth study, though a small scale study with only a few participants, Armstrong (2009) concludes that students will develop a passion for exploring truly profound ideas. Gardner writes: "The design of my ideal school of the future is based upon two assumptions. The first is that not all people have the same interests and abilities, not all of us learn in the same way. The second assumption is one that hurts; it is the assumption that nowadays no one can learn everything there is to learn" (Gardner, 1993).

Research on learning has shown that students learn differently that is they process and represent knowledge in different ways that it is possible to diagnose learning styles and that some students learn more effectively when taught with preferred methods (Smeets and Mooij, 2001). However, observing and identifying learning characteristics are difficult. That is why traditional questionnaires and psychometric tests are used to assess and diagnose learning characteristics. MI theory has received much attention over the past 20 years (Stanford, 2003). Almost 80 years after the first intelligence tests were developed, Gardner (1993) challenged the notion that intelligence is something that can be objectively measured

and reduced to a single quotient or score. Maintaining that our culture has defined intelligence too narrowly, Gardner proposed in *Frames of* (Stanford, 2003) seven basic intelligences, since then the eight one has been added. MI concepts are a psychological theory that addresses what the brain does with information. It defines intelligence as the capacity to solve problems or fashion products that are of value. It states that there are eight different ways to demonstrate this intelligence with each having its own unique characteristics, tools and process that represent a different way of thinking, solving problems and learning. Its use in the classroom has been significant (Stanford, 2003).

Statement of the problem: At present, teachers and students use ICT to search the data bases for different purposes such as finding the sources, getting information about educational programs, getting updated regarding social and economic. Not using ICT on the part of the students and also lack of skills, knowledge and background in using ICT, leads to problems such as: disability in communication in this new era, inability in choosing the suitable field of study and occupation an increase in the teaching time, rise of educational expenses and a decrease in learning pace of the students (Samimi and Arab, 2011). ICT presents new methods of learning, hence, they should have the ability to take advantage of these tools and otherwise the country will face an inefficient cycle of incompetent teachers and students. The components of MI (linguistic, musical, logical-mathematical, bodily-kinesthetic, spatial, interpersonal, intrapersonal, naturalistic and spiritual which has tentatively approved the existence of existential intelligence) are a significant factor in the teaching process (Samimi and Arab, 2011). Teachers and students' knowledge of and attitude to different intelligence types and the ways of using them in education, in conjunction with ICT is of great help to the teaching-learning process (Mosenson and Johnson, 2010). The variety of intelligence types and capabilities of student enable him/her, based on his/her potential, to learn fast and durably and help him/her reach the goals of the educational system which is training students to become active and self-reliant.

Objectives: To make the teachers aware that by using MI potentials and abilities in conjunction with ICT dimensions skills they will be able to play a significant role in the process of teaching their students.

Research questions: Is there significant relationship between readiness and MI components?

Significance of the study: Multiple intelligences are the constructor's tools, helping learners determine its designs or types in the process of knowledge construction. Therefore, incorporating MI into ICT can help learners in the process of building knowledge. The finding of the study emphasizes the importance of diversity in learning as social learning experiences and further suggests that MI theory is a viable way for students to confront with instruction that is not aligned with how they learn best. This study can provide information on the type of support particularly appropriate for integration. Successful ICT integration is defined as using MI as a tool for processing information, when ICT has extended the thinking of the students' learning of ICT subject-content (Samimi and Arab, 2011). With the help of multiple intelligence, students will be able to discuss, analyze and evaluate concepts in ICT-based subjects.

Literature review

ICT readiness: Readiness is the degree to which a community is prepared to participate in the Networked World (Lou, 2010). It is gauged by assessing a community's relative advancement in the areas that are most critical for ICT adoption and the most important applications of ICTs. When considered together in the context of a strategic planning dialogue, an assessment based on these elements provides a robust portrayal of a community's readiness.

The value to a community of assessing its readiness lies in evaluating its unique opportunities and challenges (Lou, 2010). Most communities will not be uniformly ready across all evaluation criteria. The result is not a simple "yes" or "no" but rather a complex map or detailed snapshot of a community's potential. A community may be well poised for some applications of ICTs but unable to use others. The scope and detail of the Guide's output makes it a powerful tool for identifying a community's strategic priorities for participating in the Networked World.

Multiple intelligences: Gardner (2004)'s theory of multiple intelligences provided new conditions to understand IQ and created a strong view to the educational process. Moreover, it has many important functions in education system (Eisner, 2004; Hoerr, 2011). Gardner is challenged the traditional concept of intelligence as a single constant. He define intelligence as bio-psychological potential to process information that can be in a cultural situation leads to solve problems or create products that are valued in a culture.

Gardner uses evolutionary biology, anthropology, psychology, neuroscience, psychometric, arts and

humanities to present new findings and makes cross-cultural comparisons to present eight criteria that are necessary to provide classified intelligence. These criteria include: the ability to split up with brain damage, developmental history, neurological operation or set of operations neurological identification, encryption or a symbol system, a distinctive developmental history, presence of scientists, geniuses and other exceptional individuals, supported and confirmed by experimental psychologists and psychometric findings.

According to these criteria, Gardner in his book frames of mind defines seven distinct intelligences including verbal intelligence-linguistic, mathematical-logical, visual-spatial, bodily movement, musical, interpersonal and intrapersonal. In 1995, he added naturalistic intelligence as the eighth intelligence. Gardner, also suggests other possible intelligence as spiritual intelligence that define as human ability to answer as basic questions about the definition of intelligence. This kind of intelligence has not yet been yet for failing to meet the criteria of psychological and neurological empirical evidence.

Although, the theory of multiple intelligences not addressed, only for teachers, psychologists are the target audience but it is eagerly accepted by the many teachers. Gardner argues that children have different unique abilities which well correspond with internal feelings of teachers that students learn in different ways.

From Gardner point of view the main challenge of the current millennium is whether these ability and differences will become the center for teaching and learning. Or we continue same behave to the all students. The theory of multiple intelligences offers new ways to improve the process of teaching, learning and assessment (Barrington, 2004). In the following study we will further explore the concept of intelligence, from Gardner's view.

Doing research on multiple intelligences, Gardner (2004) integrated psychometric, growth-oriented, cognitive and cultural approaches and presented a new theory. Gardner believes that human decency is formed set of abilities, talents or mental skills to be called intelligence. When in a situation emerges a difficult, a set of intelligences of a person work together to to solve the problem somehow or create a product (Gardner, 1993). Gardner in the theory of multiple intelligences tried to push the human potential beyond of IQ. He was skeptical to the validation of distinction students from learning environment and determine individual intelligence.

Instead, Gardner believes that intelligence has high relevance to analyze problems and enjoy the environment and the actual performance. Gardner's theory is created profound change in the concept of

intelligence. This is because he expanded the parameters of intelligent behavior in such a way that to include various aspects of human activity.

Gardner presented a new concept of intelligence. This new concept is in stark contrast with old accepted theory of intelligence which knew intelligence as linear sense and believe that IQ measured through tests. Gardner defines intelligences as the ability to solve problems in one or more valuable cultural or social status.

Forms of multiple intelligence

Linguistic-verbal intelligence: Linguistic-verbal intelligence including sensitivity to spoken and written language, the ability to learn and the ability to use language to accomplish certain goals. Nicholson-Nelson adds more information to this definition. From their point of view intelligence include facilitation in the creation of linguistic concepts while Armstrong defines intelligence as “the ability of effective use of words, either orally (for example, the storyteller, preacher or politician) or in writing mode (playwright, editor or journalist). Gardner extended all these definitions by adding the point that intelligence is used your native language and other languages to express that what is in your mind may be to understand is by the others.

Logical-Mathematics intelligence: This intelligence includes the ability to deductive reasoning, recognize and manipulate in patterns. These kinds of intelligence are used by individual who are examining the issues in the scientific way. Hoerr defines this intelligence as the ability to maintain a chain of reasoning and pattern recognition and sequence.

Visual-spatial intelligence: Spatial intelligence refers the ability to show the internal world of the mind. The way that a chess player or sculptor represents the real world marked. Gardner IQ ability to create space-visual representations of the world and to transfer this representation intellectually.

Musical-rhythmic intelligence: This kind of intelligence involves improvement in the performance, composition and appreciation of musical patterns. Gardner and Chomsky define musical intelligence as the ability of thinking to the music means the ability of hearing of patterns, recognize them and perhaps manipulate and remember them. Hoyer indicates that this intelligence is sensitive to rhythm, melody and resonance. Nicholson-Nelson's added this story that this intelligence includes emotional reaction to emotional implications of these musical factors.

Bodily-kinesthetic intelligence: Bodily-kinesthetic intelligence is defined as your ability to use the body or parts of it such as the hands, fingers and arms to solve a problem or create a product. This form of intelligence involves the potential productivity of all or part of the body and taking objects skillfully. Nicholson-Nilsson explain that intelligence involves using the body's to solve the problems, identify objects and convey ideas and emotions.

Interpersonal intelligence: This intelligence reflects individual's ability to understand others (i.e., intentions, motives, interests, hidden goals of them) and thus to work effectively with others. From Gardner point of view, interpersonal intelligence is one of the most important intelligence which all people ever need but if you're a teacher, clinician, salesperson or politician, this intelligence is a priority. Individuals who have dealt with people in the environments need to have interpersonal skills.

Intrapersonal intelligence: This intelligence includes the ability to understand oneself (i.e., interests, fears and self-empowerment). This intelligence also includes the use of information effectively in regulating individual's life. Intra-personal Intelligence helps people to understand him/herself, for example who are you? Or what do you want to do? How do you react to the issues? And what do you tend to get attracted. We're attracted toward those who have a good knowledge from themselves because people do not tend to be complex and dependent. They can do what they want. Also they want to know what they cannot do. However, they want to know where to go if somebody need help.

Naturalist intelligence: The latest official intelligence, of Gardner's theory identified as naturalist intelligence which is associated with nature. This intelligence is the ability to detect and classify the numerous plant and animal species in an environment (Hoerr, 2011). Naturalistic intelligence is considered the human ability to distinguish living things (plants, animals) and sensitivity to other features of environment (clouds, rock formation). This ability was clear valuable to our ancestors (the hunters and farmers) and has continued up to now (such as botany, chef) and has become a central point. In addition, it seems that most of our conceptual society includes naturalistic intelligence which may distinguish among cars, sneakers, kinds of building and would like to find the roles. Kind of valuable pattern recognition in certain special sciences may also be sourced of naturalistic intelligence.

Significance of multiple intelligence in education: The theory of multiple intelligences has been widely accepted in education in which that supports the main its objectives. The objectives are: to verify differences among students and foster their unique features and capabilities (Eisner, 2004). This approach is very effective for many teachers because it offers a model for them to work on something that they believe in and that is all children are capable. Many of us have learned to focus on curriculum in which that is designed and taught. Curriculum change and reform in a way which is consistent with the needs of students. Teachers who are using this theory, instead of relying on the language filter to demonstrate writing skills and their information can give students the opportunity to demonstrate their ability to use what they have learned. Students can use their spatial intelligence to design; they also can use physical-movement intelligence in a response or create a display.

Giles stated that when teachers use multiple intelligence theory in the classroom, it has many advantages. Some of the benefits include:

- All types of intelligence are valued equally
- Work provided by students needs to arise in partnership with parents and the community
- Students have to show more ideas about self-worth based on their ability
- Students will develop genuine problem-solving skills

Some researchers argue that accepting the theory of multiple intelligences by the learning community is because of the set of logical reasons, some of them include: the theory confirmed the idea of teachers that students learn in different ways. This will encourage teachers to discuss circumstantial evidence in the classroom. This theory is a complementary learning theory such as constructivism and zone of development proximal. This theory shows all activities that have been used so far in the field of education. Such as problem-based learning, subject units, learning centers and combined approach which has been proposed by Gardner. Finally, his theory provides a framework for the classification and recognition of educational activities.

MATERIALS AND METHODS

Participants: Based on the purpose of the study, the population for this study is all Technical Vocational students of level 1 and 2, studying in Shiraz, Iran. For the first phase of the current study, educational districts were chosen as the main cluster. The male and female students

studying level 1 and 2 in (2nd and 3rd year) in each given schools in educational districts which were selected based on random sampling were 375 students.

Instruments: There are five questionnaires used as the instruments for students and an interview protocol for teachers as follow:

ICT dimensions questionnaire: The researcher distributed 5 sets of questionnaires among Vocational Technical Schools in Shiraz Iran. Set one examines students' competencies and readiness in terms of ICT, composed of two parts: demographic information (with 4 questions) and qualifications (with 8 questions). Set two examines students' background in relation to ICT use. This set is made up of demographic information and background (with 14 questions). Set three investigates students' skill which is comprised of demographic information and skill with 8 questions. Set four investigates students' knowledge and same another questionnaire is comprised of demographic information and ICT knowledge.

MI components questionnaire: In terms of the MI components questionnaires, the MI components questionnaire called SEVAL (Self Evaluation of Seven Useful Abilities) developed by Osborne and Osborne was modified, adapted and used in the present study. Set five investigates Multiple Intelligences (MIs), composed of demographic information and MIs (with 70 questions).

Procedure: In order to collect the data, the researcher visited the universities and distributed the questionnaires to the vocational technical students that were selected as the sample. Before distributing the questionnaires among the targeted respondents, the procedures and the ethics of conducting research were closely observed and complied by the researcher. In particular two types of research procedures were carried out, the first being obtaining permission from the relevant authorities. The second procedure involved distributing the questionnaires among respondents.

RESULTS AND DISCUSSION

The research question: Is any statistically significant relationship among multiple intelligences and Readiness? Pearson's correlation coefficient was used to test this question. The results obtained can be seen in Table 1.

As it is shown in Table 1, there is no statistically significant correlation at the five percent level ($p > 0.05$) among any of components of multiple intelligences and readiness.

Research hypothesis: There is a significant relationship between the multiple intelligence dimensions and ICT components.

Pearson correlation was used to test this hypothesis. Summary of findings related to this question are presented below.

Among multiple intelligence dimensions logical and mathematical intelligences were significant in 1% level ($p > 0.01$) and naturalist and verbal linguistic and spatial intelligence were significant in the level of 5% ($p > 0.05$). it means that they have significant relationship with skills. Other dimensions of MI were not found any relationship with skills.

Logical/mathematical intelligence means the ability to use reason, logic and numbers. These learners think conceptually in logical and numerical patterns and in this sense making connections between different pieces of information. They have always been curious about the world around them asking many questions and they like to experiment. Problem-solving skills, segmentation and classification of information, working with abstract concepts and their relationships with each other, using long chains of reason to make local progressions, doing controlled experiments, perform complex calculations mathematics, working with geometric shapes are some samples of the ability of these individuals. They are interested in researches and computer programmers. In these jobs they will have much success. Results obtained in this study that a there was exist significant relationship between logical/mathematical intelligence and skills in information technology represent the importance of logical/mathematical intelligence in the acquisition of information and communication skills. The logical mathematical intelligence is a dimension of intelligence is considered in the most theories of intelligence as an important factor in the acquisition of knowledge and learning.

On the other hand, there is a significant relationship between verbal intelligence and ICT skills. This kind of intelligence is the ability to use words and language. From

Gardner point of view, these learners have highly developed auditory skills and are generally elegant speakers. Instead of pictures, they think in words. They have special ability in listening, speaking, storytelling, explaining, teaching, understanding the syntax and meaning of words, remembering information, convincing others to accept their point of view and analyzing language implementation. These skills may be a strength point for the acquisition of IT fundamental skills.

It was also determined that spatial intelligence was a significant relationship skills dimension of IT. This type of intelligence is the ability to perceive the visual. Learners with this type of intelligence tend to think in pictures and to obtain the information they need to create vivid mental images. They enjoy looking at the maps, charts, pictures, videos and movies. Other skills of this kind of people include: making puzzles, reading, writing, understanding charts and graphs, a good sense of direction, sketching, painting, creating visual metaphors and analogies (perhaps through the visual arts), manipulating images, constructing, fixing, designing practical objects, interpreting visual images. These skills have a decisive role to learn and acquire IT skills.

Another result of this study showed that the decay component of multiple intelligences only Verbal Linguistic significantly correlated with background in the level of one percent ($p < 0.01$). This result suggests that people with high verbal intelligence have investigated the background of information technologies very well. In fact, people with high verbal intelligence gain good knowledge about the world around them. This helps them to have a good knowledge about the field of information technology. Another result of this study was that to eliminate components of the multiple intelligences of only musical and knowledge intelligences, there was a direct relationship in one percent level ($p < 0.01$).

This intelligence means the ability to control body movements and handle objects skillfully. These learners express themselves through movement. They have a good sense of balance and hand-eye coordination (e.g., they have skills in playing with balls) through their interaction with the surrounding environment they are able to remember and process the information. This outcome is very interesting itself and is considered novel finding in this area.

In the field of cognitive abilities and information technology, little research has been conducted. Below presented some of the research findings with their conclusions. For example, Ebrahimzadeh, in his study examined the impact of ICT usage on strengthening verbal, spatial, interpersonal intelligence. The results of the study showed that ICT has positive impact on MI. This means that the use of ICT at a younger age is more effective in strengthening their intelligence.

Table 1: Pearson's correlation coefficient for multiple intelligence and readiness

Components of MI	r	Sig.
Verbal linguistic	0.020	0.697
Logical-mathematical	0.020	0.707
Bodily-kinesthetic	0.065	0.212
Interpersonal	-0.044	0.404
Musical	-0.021	0.688
Intrapersonal	-0.027	0.610
Existential	-0.047	0.366
Naturalist	-0.036	0.588
Spatial	0.016	0.761

**Correlation is significant at the 0.01 level (2-tailed)

Some researchers not found a significant relationship between gender, technology development and ICT integration. But he found high ICT integration among teachers. Campbell founding concerning vocational teachers in America showed that the level of ICT knowledge and skills of teachers is lower than average. Also a survey by Baker and Moroz (1997) was conducted in Malaysia showed that the level of ICT skills of vocational teachers about computers and their software is not acceptable.

CONCLUSION

By analyzing the data it was clear that there was no statistically significant correlation at the 5% level ($p>0.05$) among any of components of multiple intelligences and readiness.

LIMITATIONS

- The design of the study was descriptive/correlation in nature
- Limited number of vocational education students was selected in this study
- Sample in this study was limited to students in the Shiraz city
- Different aspects of ICT did not consider in this study

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