Exploring Theories Related to Technology-Based Learning for Pupils with Special Educational Needs with Visual Impairment

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ABSTRACT:

In conducting this study, there are four (4) learning theories that underlie the study. Among the learning theories are Multiple Intelligence Theory, Dale's Cone of Experience, Iceberg Model, and Technology Acceptance Model. This study was conducted based on the theory of multiple intelligences. This concept was expressed by Howard Gardner in 1983. Dr. Howard Gadner is a famous educational and psychological figure. Howard Earl Gadner was born on July 11, 1943. Intelligence is defined as the perfection of the mind to think, understand, cleverness, intelligence and ingenuity. IQ intelligence is an indicator and prerequisite to a person's academic qualifications. Studies have expanded the idea of multiple intelligences to cover multiple dimensions. According to him intelligence is not something that can be inherited but is influenced by aspects of the environment, culture, educational opportunities, food and others. The theory of multiple intelligences has an important impact on education. Multiple intelligences can be developed to a competent level and improved through education and training.

1. Introduction

Verbal linguistic intelligence is the ability to think using words, mastery of language, speaking skills and understanding of complex language. According to Kamus Dewan Bahasa (2005) fourth edition verbal is meant as oral and words, while linguistics means the scientific study of language. Linguistic intelligence has an important role in language learning (Hali, 2017). It involves speaking, writing and language acquisition activities. Individuals with verbal linguistic ability can understand communication and information whether in oral or written form. Even with this ability, individuals are able to give meaning, interpret and delve into hidden matters. According to Armstrong (2009), verbal linguistic intelligence is the intelligence to understand the structure, sound and meaning of language. Linguistic verbal intelligence also presents the potential of individuals in storytelling, debates, lectures, writing scripts, writing books, learning foreign languages fluently, arguing and memorizing (Adediwura, 2007).

This is because they have verbal memory and are able to understand syntax and structure (Gardner, 1993). Among the careers suitable for individuals with verbal linguistic ability such as lawyers, book and script writers, speakers, radio presenters, moderators, politicians and linguists. In the dimension of schooling, students with this tendency are more suitable to use oral learning methods such as project paper presentations (Aslina & Erni, 2016).

In the learning aspect, the role of planning PdPc activities according to the needs of the eight intelligences pioneered by Gardner. Teachers as facilitators need to be creative and innovative in planning teaching methods and interventions that suit the learning style of autistic students. This effort can identify the potential of students and give understanding to the task of teaching and learning. Based on this theory as well, Gardner explained that each individual has at least eight different intelligences consisting of verbal linguistic intelligence (VL), logical mathematical intelligence (LM), visual spatial intelligence (VR), body kinesthetic intelligence

(KB), musical intelligence (MZ), intrapersonal intelligence (IA) and naturalistic intelligence (N) (Armstrong, 2002).

2. Literature Review

Mathematical logical intelligence is closely related to an individual's ability to reason, think logically, abstractly and numbers. Individuals who tend to think conceptually, recognize patterns, patents and analyze problems logically. Even individuals with this intelligence also show an interest in activities that take the form of adventure exploration. These individuals are able to think inductively and deductively to solve problems and think critically (Rohani et al., 2015). Mathematical logic intelligence allows us to see the relationship between non-alphabetic things such as shapes and symbols to solve problems that are considered scientific (Saphie et al., 2020). These skills are highly needed by individuals such as architects, mathematicians, statisticians, engineers and scientists. Therefore, students with this tendency should use group discussion learning techniques.

Visual spatial intelligence involves the manipulation of information in the form of visual diagrams or symbolic forms (Christensen et al., 2016). Individuals with spatial visual intelligence are also good at using puzzles. They are able to recount their experiences and make connections between objects and space. This intelligence can be expressed as the potential to recognize broad space patents such as pilots, navigators and astronauts (Ayavaca et al., 2017). In addition, this intelligence is also closely related to the ability of individuals to understand more limited and subtle patterns such as sculptors and surgeons, architects, chess players and graphic designers. Students with this intelligence are suitable for using learning methods based on physical teaching aids (Dale, 1969).

Kinesthetic learning style is a person's ability to process information physically using hand, body and expression movements (Grynszpan et al., 2017). Body kinesthetic is related to the ability to coordinate body movements, control body balance and interpret body information. Gardner (1993) explains that this intelligence includes the ability to manipulate objects with a keen sense of time. These people can manipulate objects precisely because they have a strong unity of mind (Gardner & Moran, 2006). This can be seen in mental and physical skill activities. Careers that suit individuals with this intelligence are dancers, sportsmen, actors, police officers, soldiers, gymnasts and construction workers. In the school context, appropriate learning methods for students with this tendency are demonstrations (Ghavifekr et al., 2016).

This intelligence is influenced by the ability to discriminate and express feelings through music. Individuals with musical intelligence can think according to patterns of rhythm and sound (Gardner, 1993). They have a strong appreciation for music and are knowledgeable about music theory, composition and performance. Individuals with this intelligence are more likely to use the power of the right brain than the left (Kuttler et al., 2015). Music became part of their lives. Singing, dancing and playing musical instruments are part of their daily routine. Gardner (1993) divided three aspects of musical tendencies covering technical aspects of music such as rhythm, tone, harmony and spirit. Second, he identified music with more mysterious, emotional and creative musical power. Next, music is presented as a logical builder that explains the logical thinking of music. Among the careers that suit this intelligence are musicians, singers and dancers. Therefore, in school, students with musical inclinations should be exposed to artistic and cultural activities (Mitchell, 2014).

Interpersonal intelligence includes the ability to understand the feelings, motivations, habits and desires of others (Gardner, 1993). Individuals with this intelligence like to socialize with others and have high confidence. They can communicate well, understand the feelings, habits and wishes of others. In addition to that, interpersonal intelligence is also the ability to see differences in other people's emotions, motivations and desires (Metler, 2014). Intrapersonal intelligence is the ability to understand and adapt to self-reflection (Armstrong, 2004). Individuals strive to understand themselves and recognize their own strengths and weaknesses. Every action taken is based on an understanding of themselves. In addition, with the ability of intrapersonal intelligence, individuals can recognize the feelings experienced such as sadness and happiness. Thus it can be concluded that intrapersonal intelligence is a branch of intelligence that has the ability to understand oneself as well as others. In the school context, appropriate learning methods for students with this tendency are such as being involved in guidance and counseling clubs (Eren, 2013).

Naturalist intelligence is closely related to the ability to recognize flora and fauna and understand the relationship between species (Gardner, 1993). Individuals with this intelligence are concerned and sensitive to environmental life such as mountains. They also have a deep interest and loving attitude towards animals, plants and the universe. They have a sensitive feeling towards the environment and prefer to spend time with nature (Fidelia, 2015). In addition, individuals with this intelligence also have a high sense of curiosity and are

able to develop new ideas and are far-sighted. Individuals with naturalistic intelligence are also able to use their abilities productively, such as being involved in animal husbandry and biological sciences. The appropriate learning method for naturalistic intelligence is to use practical learning or hands on learning such as gardening and making science experiments (Kondakci et al., 2015).

3. Discussion

It is clear that the learning approach based on Multiple Intelligence Theory can be applied in the PdPc of autistic students. Based on Multiple Intelligence Theory can give an impression that the teaching and learning process is able to create a conducive and harmonious atmosphere. This is in line with the concept of mind development and integrated curriculum aspects recommended by the Malaysian Ministry of Education. The harmonious integration of multiple intelligences in PdPc can stimulate brain development and connect neuron cells in the brain. Then this can give birth to a generation of skilled, balanced and harmonious people intellectually, spiritually, emotionally and physically. Every student has different potential that can be nurtured. Therefore, diverse learning methods should be applied in PdPc at school in accordance with the ability of students, especially students with special needs. Special education teachers need to be more sensitive to the needs of special students. Learning methods should be designed in accordance with the abilities of diverse students, especially students with autism. Teachers are also encouraged to diversify their teaching strategies according to the students' level of inclination.
Dale Experience Cone

The effective use of BBM can stimulate students' desire to learn optimally. Interesting learning can increase student motivation and give an understanding of learning objectives. In relation to that, Dale (1969) has introduced a theory based on Dale's Cone of Experience (Cone of Experience) which focuses on the learning process using abstract materials based on certain levels. BBM is a medium of information delivery. Learning begins with concrete experience. Dale (1969) further explained the teaching and learning process depending on the use of BBM and appropriate teaching techniques. This can help give students an understanding of easier solutions. The learning process needs to start from concrete material to abstract material in order to facilitate the process of receiving information. In addition, according to him, the use of technology-assisted BBM also has the potential to increase students' mastery of the teacher's teaching. In this regard, Dale (1969) explains the three levels of experience that are identified, which are the levels of involvement, observation and symbolization.

I. Level of involvement - concrete experience is the real basis for student involvement in learning. For example, in the subject of life skills, teachers use gardening materials such as vegetables and gardening tools as auxiliary materials. Therefore, students can experience gardening for themselves.
II. Observation stage - at this stage the concrete experience will decrease. Students act as observers of real events. Among the appropriate activities such as demos, media displays, tours, photo slideshows. In the context of learning in the classroom, teachers often use multimedia media as an effective media. The use of technological materials can create a conducive learning environment.

III. Symbolization stage - students experience abstract learning such as interpreting verbal and visual symbols. The use of verbal symbolic media can help students interpret abstract information. However, at this stage the learning objectives will only be achieved if the students already have existing knowledge.

It is clear that the concept of using BBM based on Edgar Dale's theory can be used by special education teachers. This theory is used as the basis for a scientific study of the use of BBM multimedia in the Pdpc of students with special needs, especially students with autism. Students need stimulation to learn. Interesting and appropriate BBM can increase student motivation to learn and understand the learning content. The use of interactive learning aids can provide varied stimulation to the brain. Dale's Learning Cone Theory is used as a reference
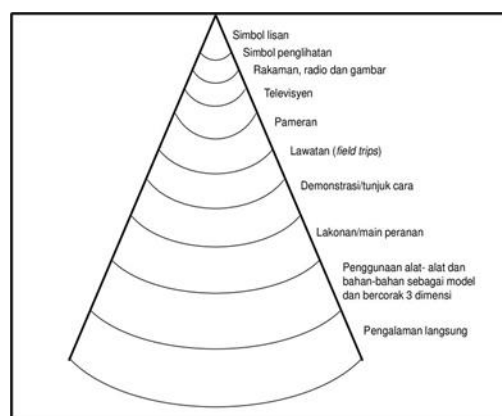

Figure 1: Dale Experience Cone

The Iceberg Competency Modelfor this study because this theory can explain and help study the stages of the learning process using BBM multimedia.
PdPc becomes more effective if the delivery process can be done effectively. A teacher can successfully create an

effective PdPc when the teacher can master sound pedagogical knowledge. Even responsible teachers are able to produce quality and excellent students. Thus, in order to achieve that desire, teachers need to be equipped with high competence when delivering teaching knowledge such as having knowledge, mastery of teaching pedagogy, use of teaching materials and good communication skills.The overall discussion theory continues with the Iceberg Competency Model proposed by Spencer and Spencer (1993) in his book Competency of Work. Spencer explains
the Iceberg Model which emphasizes knowledge competence and individual personality in the iceberg

model. According to him, individual knowledge can be improved through training. In Hasnah and Jamaludin's study (2017) defined competence as tasks and responsibilities performed by individuals and carried out responsibly, well, efficiently and effectively. According to him, the Iceberg Model is suitable to be used to study more deeply about the competence of teachers. Based on the Iceberg Model, building individual knowledge and skills is easier than personality. In the educational aspect, teacher competence is a combination of knowledge, skills, attitudes and personality seen in the implementation of teaching (Azhari & Zaleha, 2013).
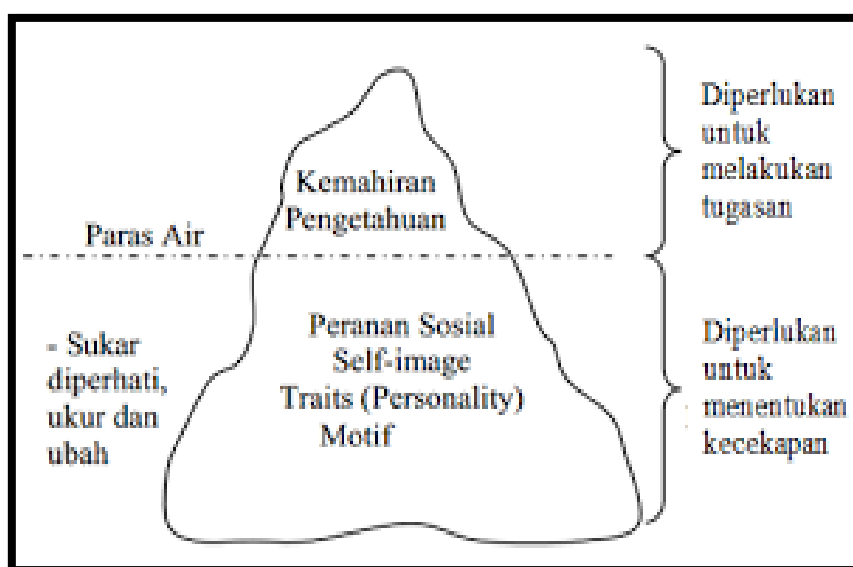

Figure 2: Iceberg Model (Spencer & Spencer, 1993)

In Figure 2 shows a block of ice The Iceberg Model shows a block of ice floating in the ocean. Ice blocks are divided into two upper and lower parts. According to Spencer and Spencer (1993) even though the ice block is seen to be too large, only part of the ice is seen floating and the rest is under the sea. Components that can be seen at the top of the iceberg such as knowledge competence and skills are above sea level while hidden components such as attitude, personality, thinking style, self image, organizational fit are below sea level. Therefore this theory is used as a basis for researchers to explain the level of knowledge and skills of teachers in the implementation of PdPc.

4. Conclusion

According to Dadan (2011), good understanding and trust of individuals can influence the decision to use technology. Generally, the Technology Acceptance

Model is formed through a comprehensive study of perceptions, beliefs, attitudes and external influences. These aspects encourage the behavior of individuals to accept technology for their responsibilities. This scientific study is based on the Technology Acceptance Model (Technology Acceptance Model) proposed by Davis (1989). TAM is the most widely accepted model because it has a lot of empirical support and is used in schools. In fact, the strategy and practice of its use have been well implemented. TAM has become an influential technology adoption model. According to Davis (1989), TAM is a model that focuses on user acceptance of technology based on the variables of perceived usefulness (PU) and perceived ease of use (PEOU) (Aslina Saad & Ernie Dharlya, 2016). In Figure 2.3 shows PU as the user's belief in the use of technology while PEU refers to the user's level of belief that the system used is easy to learn by oneself and effective. Based on this model, the researcher believes that teachers

who are skilled in the use of technology with limited constraints can support the learning medium at school. Teachers' acceptance of the use of technology-based multimedia BBM can effectively improve teachers' knowledge and skills and performance.

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