

“DIGITAL CLASSROOM”: AN INNOVATIVE TEACHING AND LEARNING METHOD FOR GIFTED STUDENTS

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Abstract

Gifted students are a group of students with specific and unique learning needs. Due to their uniqueness, the students always face problems in mainstream educational system. Teachers to this population of students need to be creative and innovative in preparing their teaching plan, to ensure that the learning process is going to be effective to the students. This paper discusses the ‘digital classroom’ concept which is implemented at the Malaysian National Gifted Center – also known as Pusat PERMATApintar™ Negara, established at Universiti Kebangsaan Malaysia – as an innovative teaching and learning method to teach identified local gifted students. The teachers integrate the use information technologies such as the electronic mail, social media, and online portals as medium to effectively teach the students. In comparison to the conventional way of teaching, this methodology creates a borderless classroom which enables the students to freely explore knowledge without limit or boundary.

Keywords: Teaching and Learning, Innovation, Gifted Students

Introduction

The life challenges in today’s world require varieties of complex alternatives and solutions. Spencer (2011) in his paper entitled “Global Issues of the 21st Century and United Nations Challenges” had outlined seven salient challenges of the world citizens living in the 21st century comprises of: (1) conflicts and honour; (2) group identity and governance; (3) standard of living and global prosperity; (4) optimization of innovation through STEM and education; (5) human relation and individuality; (6) human rights and obligation; and (7) respect and moral judgment. As such, the world needs leaders, who are visionary, and whose ideas exceed their own life span. Individuals like Albert Einstein, Isaac Newton, Thomas Edison, Winston Churchill, Mahatma Ghandi and even Nelson Mandela are examples of those leaders and visionaries who leave their mark in this world with their creative ideas of saving the world beyond their time. Although, they were never identified as gifted individuals during their time, but the legacy of their works indicate otherwise. The questions to be pondered are: (1) how do these individuals gain so much knowledge about what is needed for the citizens of the world? (2) Did their formal or informal education prepare them for what is needed to help the world be a better place?

Gifted individuals are the assets of any nations and civilizations; hence, society will always benefit from the offering of these individuals. When groom from young, these individuals will transcend their giftedness to another level to produce knowledge for the new frontiers that will solve problems of the 21st century such as global issues, financial crisis, and political instability. Gifted individuals are not a homogeneous group of people, and therefore provision needs to be responsive to their individual needs. Concomitantly, in term of learning, gifted students need access to broad, balanced and challenging curriculum as well as pedagogical approaches that have the potential to change their lives and prepare them to face challenges lie ahead (Davis, Rimm, & Siegle, 2011; Goodhew, 2009; Gosfield, 2008; Smutny 2003; Eyre & Lowe, 2002).

Research works that examine the effectiveness of special educational program for gifted students have provided evidences to show that such programs benefited the students, especially when the programs are developed based on strong theoretical and empirical foundations (Ng & Nicholas, 2010; Kevin, 2005; Van Tassel-Baska, 2005; Bernal, 2003; Castellano & Diaz, 2002; Shore & Delcourt, 1996; Olenchak & Renzulli, 1989; Epstein, 1979). When given nurturing learning environments, these students developed talents in various areas besides from their academic talents. Researches have also shown that these special individuals benefited from special teaching approaches. Strategies such as the '*differentiated*' teaching approaches or the computer assisted independent learning approaches have been said to intensify the learning capacity of the gifted learners (Van Tassel-Baska, Quek & Feng, 2006; Gross & Van Vliet, 2005; Van Tassel-Baska, 2003). In other words, the traditional approaches to teaching or the 'chalk and talk' classroom-based teaching is seen as unhelpful and has adverse effect in the teaching and learning processes of gifted students.

Generally, effective teaching and learning brings out the satisfaction of all members of the learning community. Regardless of whether one is teaching students with an average IQ or teaching students with extremely high IQ, the satisfaction derived from the teaching processes is achieved when the strategies or approaches used are able to alleviate students' academic potentials, instil curiosity to deepen their knowledge and heighten their thinking process. Studies have also shown that effective teaching strategies have rippling effects on students' academic performance (Wenglinisky, 2011; Ames & Archer, 1988). The findings also suggested that effective teaching strategies promote creative learning among the students. Learning not only takes place within a creative classroom environment, but the learning processes also expanded beyond the four walls using various teaching strategies including computer assisted learning technologies and open lab of various subjects (Pintrich & De Groot, 1990). Such creative approaches to teaching will alleviate students' interest in the subject matter, develop critical and innovative thinking in problem solving, and develop students' intrinsic motivation/aspiration to learn (Maimun, Abdullah, Melor, Shah Nizam, Noriah & Tajul, 2011; Noriah, Melor, Saemah & Zuria, 2010). In other words, creative teaching and learning approach will support holistic development of students' identity.

Concomitantly, this paper will discuss a specific pedagogical approach in teaching gifted students that go beyond the traditional teaching approaches of 'chalk and talk'. The approach known as '*digital classroom*' – the concept of learning via internet in open lab set up – is being implemented at Pusat PERMATApintar™ Negara, Universiti

Kebangsaan Malaysia. This computer-assisted independent learning approach will be discussed as one of the effective teaching technique that can be applied by the educators of gifted students.

Learning Characteristics of Gifted Students

Debate on defining giftedness has been long and arduous (Gagné, 2004; Renzulli, 2005; Tomlinson, 1999; Gross, 1989). None of the theoretical expert on giftedness has come to an agreement on how to clearly defined giftedness. Renzulli's (2005) definition of giftedness is defined as the interaction between three factors indicated by the overlay of the three elements (high ability, task commitment and creativity) is seen by many as being too simplistic, while Gagné's (2004) expressed giftedness as a shift from gift to talent and looking at natural abilities in various forms that can be transformed into talent by systematic training. Gagné's (2004) proposed four domain areas of giftedness which include intellectual ability, creativity, socio-affective and sensorimotor. DeHaan (1957) on the other hand suggested six domains in which individual might excel including intellectual ability, creative thinking, scientific ability, social leadership, mechanical skills and talent in fine arts.

However, many agreed that to define giftedness from just an intellectual ability or intelligent quotient (IQ) is too linear and one-dimensional. Nonetheless, it is a useful index of the discrepancy/gap which exists between the mental age and the chronological age of gifted students. Identifying and understanding the IQ of a gifted student will help us understand the mental processing that happened between a normal, moderately and extremely gifted individual. Silverman (1989) suggests that any gifted child with IQ score of 145 and above should be given different educational pathways because it directly affects the nurturing of exceptional talents. It is easy to stereotype and sideline those who may not conform to our own definitions of "normal". For instance, Thomas Edison, whose teachers said he was not up to learning anything, went on to become one of America's most prominent inventors and changed the way we live today with his invention of "the electric light bulb". Inevitably, gifted individuals bring with them ensemble of talents that are rare and not usually identified in their peer group. Many of them have been wrongly diagnose and have received educational provision that is not supporting their learning needs. Thus, it is important that we understand how best to identify these distinctive individuals. Early identification of these individuals, complemented by the right learning environment, support and educational program, could result in them contributing to the betterment of our nation.

The gifted students are, above all, individuals with unique personalities, interests, and desires. Consequently, these personal unique traits have direct impacts on their learning needs. According to Sayler and Brookshire (1993), one of the earliest indicators for gifted students is that they walk and talk at an early age. They also have large and advanced vocabulary and some started accumulating the large vocabulary at a very tender age. They learn rapidly and easily and read at an early age. These gifted children also demonstrates a great appetite for books and reading and are able to entertain themselves for large blocks of time, reading or staring at a book (an indicator of their interest in the content even before they are able to read by themselves). As such they display a long attention span. According to Sayler and Brookshire (1993), one of the earliest indicators for young gifted learners is that they walk and talk at an early age. They also have large and advanced

vocabulary and some started accumulating the large vocabulary at a very tender age. They learn rapidly and easily and read at an early age. These gifted children also demonstrate a great appetite for books and reading and are able to entertain themselves for large blocks of time, reading or staring at a book (an indicator of their interest in the content even before they are able to read by themselves); as such, they display a long attention span. Furthermore, they are also able to readily retain a large amount of information, consistently organize, sort, classify and group things, and name them accordingly, and possess a heightened sense of curiosity (Frasier, Hunsaker, Lee & Mitchell 1995; Dunn & Price 1980). All in all, as being summarized by Tuttle and Baker (1980), gifted learners' common unique traits are as follows:

- a. well-developed powers of abstraction, conceptualization, and synthesis
- b. deep understanding of cause and effect relationships
- c. quick understanding of similarities, differences, and anomalies.
- d. fluent thinking, generating possibilities, consequences, or related ideas
- e. flexible thinking, using many different alternatives and approaches to problem solving

Given the definition and the characteristics of these gifted learners, it is then fair for them to receive education that will meet their unique needs. Research works on gifted students in mainstream education systems found out that their classroom experiences were claimed to be too slow, full of repetitions, focused on memorizing instead of mastering the knowledge, and lacked of opportunity to explore anything out of the syllabus (Kanevsky & Keighley 2003; Gallagher, Harradine & Coleman 1997). As mentioned earlier, gifted learners will not benefit from the traditional teaching approach of 'chalk and talk'. Such techniques allow limited amount of information to flow from the teacher to the students, and the flow is very linear in fashion (Grasha, 1996). This limitation can be frustrating to gifted learners whose capacity to absorb information surpasses their normal peers and even average adult. Their continuous hunger for knowledge and their capability to consistently seek new information to meet their level of curiosity demand that we offer them a different kind of teaching and learning experiences. Teachers of gifted learners need to readjust their teaching techniques that might involve the shift of pedagogical paradigm from the traditional approaches to probably one that is electronically or internet-based. Hence, in the era of information and communication, the teaching and learning methodologies for gifted students shall incorporate all of the recent technologies available in order to optimize their potential to the fullest.

'Digital Classroom' as an Innovative Teaching and Learning Method for Gifted Students

The era of globalization spurs information overload, since information can be downloaded from different sources regardless of geographical location. One only has to google to find information on various topics that would answer any questions about the world and the elements surrounding it. This online world's constant flux of information is seen as kingdom of knowledge for gifted learners whose ability to learn independently requires knowledge search beyond the textbook. However, the propensity of benefiting from the vast knowledge of information is limited when students are involved only in the traditional method of learning vis-à-vis learning using computer technology that promotes academic satisfaction among these gifted students.

Traditional teaching methods such as the ‘talk and chalk’ technique, and classroom lecture, might only allow limited amount of information to flow from teachers to students depending on the amount of knowledge acquired by teachers. This flow of teaching identified as linear teaching by Grasha (1996), put the burden for seeking the knowledge and imparting it to the students, on the teachers as its main source of information. The more knowledge the teachers acquires, the more information will be disseminated to the students. However, the human mind (in this case the teachers) can only store certain amount of information and this limitation can be very frustrating to gifted and talented students who constantly seek vast amount of new information to meet their learning needs. Gifted students’ ability to learn also varies with their IQ. As such, teachers will have to constantly gather new and varied information and diversify their sources of information. Thus, both teachers and students will feel the pressure in terms of:

- a. it will overburden the teachers who constantly have to seek new information beyond the text books when they also have management, supervision and advising activities to do
- b. the teachers (as an individual) will not be able to think of all the information and the source of that information, and as such, will miss some of the information that is required for the learning process. Inevitably, they will revert back to the text book or reference books (because it is the easiest thing to do!)
- c. students will develop passive learning and wait for teachers to provide the information. Such students will not be able to develop higher order thinking and will lack the ability to critically analyse and manage information, necessary skills for today’s learning process.
- d. students will not develop ownership towards learning. Learning becomes premeditated process rather than a creative process that brings joy to the inner curiosity of one’s learning needs
- e. the students’ potential will not be pushed to its optimum

The points mentioned above demarcate the need for teachers to adjust teaching technique that involves expanding their classroom beyond its four walls. However, the paradigm shift in the pedagogical context requires complex adjustments and substantial rethinking of the ways in which classroom is defined, the many ways classroom is physically organized, the amount of time spend for teaching and learning, the teaching and learning skills for both teachers and students, teaching materials, and the choice of teaching strategies.

Traditional classroom has always been defined as a learning set up involving a provided space within the four walls of a learning environment. Effective learning is said to take place within this confined space and learning is done in a linear fashion. Students are not allowed to explore beyond the space for fear of distraction to themselves or others. This traditional classroom will not go well with the learning behaviours of any gifted students whose explorative behaviours require them to venture beyond the point of the four walls. To them, classroom is borderless. They might want to communicate with a Nobel Award winners in the United States, or discuss and share findings of their research with a professor from Harvard, or discuss certain issues of their interest with another gifted student from another country. In this digital age, such communication can easily be

done using emails or any of the social media provided online (Facebook, Twitter, and Instagram etc.) as displayed in Figure 1.

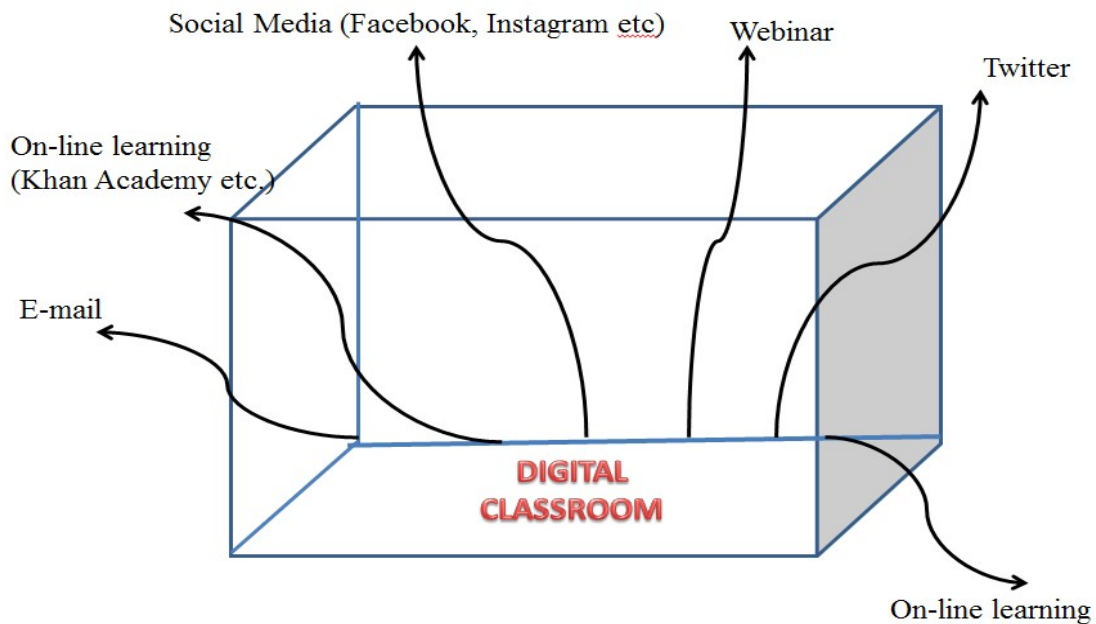


Figure 1 - The 'Digital Classroom' Concept

On-line learning such as the one provided by Khan Academy has also emerged. As shown in Figure 2, both students and teachers can literally learn from such websites without going to school. On-line learning allows teachers to have a virtual classroom, select topics that help students understand the subject better, monitor students' progress, and assess students understanding. It even gives answers to students' assignment. Khan Academy also offers free video that discusses topics from mathematics to economy. In other words, it is like having your own classroom in your own home. And best of all, the on-line learning program is free.

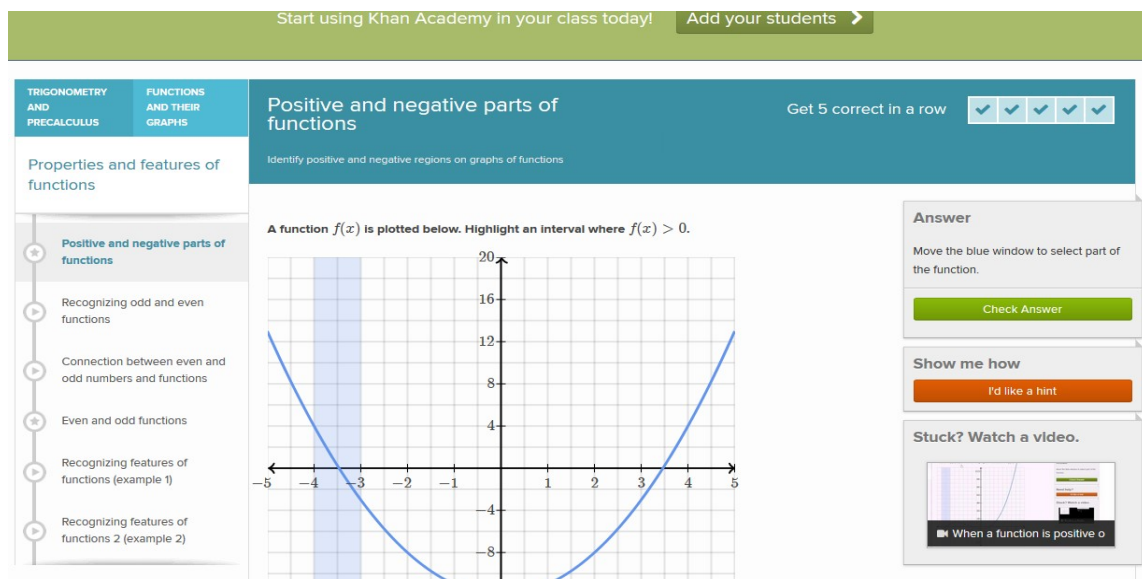


Figure 2 - Example of interactive interface in Khan Academy portal

Gifted students, regardless of their geographical location can also have access to courses offered by Ivey league universities. Such courses are offered through the Massive Open On-line Course (MOOC) web-based classes that offer students selfpaced learning in their subject of choice. The MOOC, as displayed in Figure 3, provides opportunity for gifted and talented students, who are still in high school and have no access to high level courses offered by universities near their school, to challenge their cognitive ability and sit in a virtual class with individuals who are chronologically more matured than them. Students can learn at their own paces, and choose courses of their interest.



The image shows a screenshot of a MOOC course page from Wharton University of Pennsylvania. The course title is "Analyzing Global Trends for Business and Society". The page includes a "Watch Intro Video" button, a "Join for Free" button, and a "Course at a Glance" section listing 7 weeks, 3-4 hours of work per week, and English language. The "About the Course" section discusses global trends and the 21st century.

Figure 3 - Example of interactive course offered in MOOC website

Digital or electronic classroom mediated communication supports both synchronous and asynchronous communication (Noriah, Siti Rahayah, Ressen & Aidah, 2002). Synchronous communication reflects communication between two or more people that are connected to each other via internet, and communicating at the same time with each other. On the other hand, asynchronous communication reflects a communication where only one person can communicate at a time (*i.e.* telephone answering machine and email) in different combinations such as when one person is working alone accessing information, or when one person is communicating with many others, and when many people are communicating with many other people at different times. Synchronous communication through Webinar or Web conferencing or interactive conferences, allows students from various geographical locations to discuss and share information. It allows real time point-to-point communications as well as multicast communications from sender to many receivers. Webinar offers data streams of text-based messages, voice and video chat to be shared simultaneously, across geographically dispersed locations.

Conclusion

The 21st century learning community has taken the learning process to another level beyond the physical classroom environment. It is now a common practice for students, gifted and non-gifted, to search information through the internet. By using internet or what the writer defined as the electronic classroom or computer assisted classroom, the interaction expands beyond the allotted time and geographical boundaries. Because of

their unique ability to absorb vast amount of information and process the information in a very quick manner, gifted students need knowledge more than what the standard curriculum to offer. Without doubt, internet use as part of the source of teaching and learning becomes compulsory element to today's classroom learning features.

The traditional classroom also provides limited space for learning, where students can only interact with their course-mates and the lecturer who teaches them. This space can only be expanded if the students themselves take the initiative to interact with people outside the learning boundary. However, 'digital classroom' naturally provides the extra space for gifted students to interact with individuals outside the classroom (within and outside the campus) via chat room, e-mail, on-line conferencing or Webinar, video conferencing, and other computer mediated communication methods. This promotes diversity in knowledge gain, and inevitably will deepen the students' understanding on the subject matter. It also helps the students to manage information appropriately and thus making 21st century learning more effective.

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