Teaching strategies for polygons and tessellations textbook or computer research ...

Technology, Internet

Teaching Strategies for Polygons and tessellations: Textbook or Computer?

Literature Review:

One of the outright elements that make computers a distinct criterion is the fact that it has high benefits for learners with special needs. Computers continue to prove extremely beneficial to students with certain limitations in speech, audio, and motor. Students with such special needs could use alternative devices (input and output or assistive technologies) to facilitate interaction with computers. This will also enable them do things, which could not accomplished normally and independently. They especially benefit from acquiring access to on-demand and patient tutors that allow them work at their respective paces. The goals achieved through the use of computers enhance their self-esteem as it provides them with increased senses of engagement and control with the world (DiSessa, 2001). The internet also provides them with quality knowledge for their geometry equations and the students can be in touch with their teacher or friends through internet. The internet can also enable them earn a means of livelihood later.

Computers also help geometry students to take adequate control of their experiences through setting their own paces and selecting the levels of challenge that they feel comfortable. Computers also help them use plenty of their senses in terms of extracting information (Parsons & Oja, 2012). Computers fascinate students and help them draw full attention to geometry, which usually results in deeper concentration and focus. Adversely, computers also enable the students learn through making creations through helping them gain hands-on understanding and knowledge

as they make up stories, paint, and build forts, increase their skills (Farrell, 2002). Through master computers, geometry students are able to build positive attitudes with respect to technology that pays sufficient dividends for the better part of their lives.

Unlike textbook learning, computers will benefit geometry development through establishment of fundamental skills. In this case, good educational software will enable geometry students to develop as well as practice a wider range of skills (Rosdahl & Kowalski, 2007). For example, it can facilitate them learn, about shapes, letters, colors, numbers, and rhythm in relation to simpler geometry problems. Good software also helps geometry students develop a thorough understanding of effect and cause, procedural thinking, higher order problem solving, as well as creative expression. Currently, a wide range of multimedia technology is made available for geometry students and its results are amazing (Hinkel, 2011).

The students get to have better control of their emotional skills. Through intensive usage of computers in geometry classes, students develop both self-esteem and self-confidence as they rapidly master computer skills and apply computers in making things happen. This raises their success levels as well as increasing their span of knowledge (Schneider, Gersting & Miller, 2009). They also get to improve on their social skills. In a setting of a geometry classroom or at home when parents or friends are available, students often prefer to work with their partners over working alone and this leads to an increased development of social skills (Rosdahl & Kowalski, 2007).

Geometry computer technology is a clear indication of the impact that it has

had on the education sector. It is through computers that imparting education has been made easier and more interesting than ever before. A large amount of data is storable in them, owing to the extensive memory capacities of such computers. They also enable quick and accurate processing of data with less or no instances of error in processing (DiSessa, 2001). The element of network computing aids quick communication as well as enabling uninterrupted web access. The aspect of storing documents in form of soft copy on computers (instead of hard ones) aids save paper. The advantages of computers in geometry primarily include quick data processing, storage of information, audio-visual aids in teaching, access to the internet, better presentation of information and quick communication between parents, teachers and students.

Teaching geometry via computers plays key roles in modern education systems. Unlike textbook learning, students find it much easier to make quick and instant references to the internet as compared to searching for very specific information in huge books. As a result, the process of learning geometry has surpassed learning from the prescribed curriculum textbooks (Shelly, Cashman, & Gunter, 2007). The internet is a larger storehouse of information, which is easier to access. When it narrows to the issue of storing retrieved information, it is quicker done on computers as compared to maintaining hand-written notes.

In geometry, computers are one of the most brilliant aids in teaching. Online geometry education has generally revolutionized the education sector. Computer technology makes the aspirations of distance learning closer to reality (Shelly, Vermaat, Quasney, Sebok & Freund, 2011). Unlike in the

former education systems (which used institution textbooks), education is not limited to classrooms anymore. Thanks to computers, this industry has reached everywhere. Physically distant locations are made closer because of internet accessibility (Schmidt, 2004). Therefore, even if geometry students and teachers are not physically present in the same premises, learning can still take place as they can communicate with one another very well. There are various online educational courses in relation to geometry whereby the respective students are not necessarily required to attend these classes or be present physically for lectures (Schneider, Gersting & Miller, 2009). Both teachers and students can easily learn from the comfort of their homes as well as adjust timings through their convenience.

Distance Education:

Distance education has also received impetus from computers. In geometry classrooms, computers have facilitated effective presentation of information. Here, presentation software such as PowerPoint and animation software such as Flash are among the most popular aspects that can prove to be of great help to geometry instructors while delivering lectures (Floridi, 2010). Further, computers go a long way in facilitating audio-visual representation of information. Therefore, computers make the learning process more interactive and interesting. Teaching geometry through computer-aided means adds the element of fun to education. Today, teachers rarely use chalk and board. Instead, they bring along presentations on a flash drive, which they plug into a computer in the geometry classroom, and the lesson begins. There is color, there is sound, there is movement making the same

old information come forth in a very different way and the aspect of learning becomes more fun (Shelly & Cashman & Gunter & Gunter, 2007). The not-so-interesting lessons are converted into interesting due to new effects (audio-visual). As a result of the visual aid, difficult geometry concepts can be easily explained and illustrated in better ways. Things become much easier to follow due to the application of computers in geometry classes.

Unlike in the use of textbooks, geometry students are able to attend courses from anywhere, at anytime. This only means that parents are in a position to reach out to their children and sit down to class. Similarly, students who are working are also able to attend classes despite what kind their work schedule is. In addition, folks who often travel for pleasure or business can participate in geometry classes from any part of the world, which has internet access. Further, online learning promotes student-centered teaching approaches. Here, each student has a distinct way of learning which works best for them (Bastable, 2008). While some easily learn through visual means, others perform better as they learn by doing. Unlike for textbook materials, which are locked in the library, geometry course materials are made accessible 7 days a week 24 hours a day through the internet. Geometry students acquire the ability to read and re-read comments, discussions, explanations and lectures. Usually spoken material in geometry classrooms pass the students by because of boredom, missed classes, tiredness or a number of distractions.

In online environments, attendance to geometry classes is only clear if the students actually participate in the classroom discussion. In the end, this aspect increases the interaction of students and diversity of opinions as

everyone gets a say and not just those who are most talkative (Floridi, 2010). Online geometry instructors influence the students with practical knowledge and this could be done from any area across the globe. Further, it allows students to expose their knowledge that cannot be acquired in textbooks as well as making them see the ways in which class concepts can apply the knowledge in real business situations (Bastable, 2008).

The application of the internet towards attending class, communication and research information affects geometry students with various skills through the use of technologies that are critical to workers later in subsequent centuries and the business community at large which works with global colleagues and across time zones. Online participation is less intimidating as compared to classroom settings (Schneider, Gersting & Miller, 2009). The aspect of anonymity offers students with level playing fields which are undisturbed by bias which results from age, gender, race and seating arrangements. Students can think longer about theirs want prior saying and adding their comments upon thorough scrutiny. In traditional classroom settings, the conversations could go way past the points, which students want to comment (Neto & Brasileiro, 2007). The fact that online institutions usually provide chat rooms for various informal conversations between students (where geometry students bios as well as non-class discussions are held), there seems to be increased camaraderie and bonding over traditional textbook class environments.

The online environments make geometry instructors more approachable. Geometry students are able to talk openly with their teachers with the use of online chats, in newsgroup discussions and email, without necessarily having

to wait for office hours, which are not as convenient. The options for communication provide enhanced contacts between geometry instructors and students. Development of online course allows the application of broad spectrums of geometry content. Geometry students are in a position to access the school’s library through their personal computers for various e-book content, research articles and other material having to worry that such material has been checked out already (Sawchuk, 2003).

Methodology:

The discussion of the impacts of using computers in learning geometry was conducted on two classes, A and B. In class A, computers were used to facilitate the learning of geometry for a period of not more that fifteen days. On the other hand, class B extensively used textbooks to learn geometry. Holding that both classes had 40 students each and that the geometry teachers were equally qualified, the variations of the results can only be based on the student responsiveness to the criterion used. The students were also exposed to the same topics under geometry. At the end of the 15 days, a test was administered to identify the variations in performance.

The performance was as follows:

B

On the other hand, the performance of class B was not as good. This is because the students who performed best are fewer and that there is a candidate who even under-scored. Clearly, this element is not only unacceptable but also tasking for the geometry instructors. The main

reasons for this performance are most probably due to the rigidity of the principles and concepts of geometry, which are considerably hard to comprehend. In addition, it is clear that irrespective of the variations in the development of favorable learning environments as well as ample information support, the students are deemed to have a hard time in negotiating their way to success. This can be improved through involving more resources in establishing a curriculum that offers dynamism of information and sustainability of arguments towards apprehending the uses of computers and the internet in improving the performance in geometry for class B.

Geometry students usually feel that they are actually able to listen to comments made by their fellow students. The fact that everyone gets chances to contribute, geometry students will be less irritated by those who over contribute as they can ask for better clarification of any of the comments that is unclear (Ivers & Pierson, 2003). Online geometry classrooms also enable team learning through the provision of chat rooms as well as newsgroups that are used for various meetings and joint work. These issues eliminate the problems of the mismatched schedules and finding meeting locations and the distribution of work for further review between meetings.

Geometry students can comment as often as they please as online learning allows them to attend class in fully awake statuses and avail themselves in convenient time block increments, rather than rigid the 2 or 4 hour time periods once or thrice a week for textbook classes. The fact that the geographic barriers are lacking in online learning, geometry students find a

larger diversity of course materials that could not be otherwise available to them in places where they live or work (Sawchuk, 2003). Evidently, this is especially the case for professional training like medical billing training and purchasing training as well as for students in more remote rural areas, which are not support colleges and vocational training centers.

The use of computer-aided learning improves the communication networks in geometry classrooms. Both geometry students and teachers are able to communicate with their fellow peers as well as access data banks from different parts of geographical positions and around the world. This is aimed at developing joint projects, exchanging information, or requesting advice (Shelly, Vermaat, Quasney, Sebok & Freund, 2011). In such a case, instead of expository presentations of geometry topics, the respective teacher could ask individual students, or teams of students, to conduct further research on the topics through exploring for relevant information the Internet. However, not all the information sourced from the Internet is reliable. However, such information, which is gathered in the real world, should be so that geometry students develop their critical and analytical skills. Usually, these skills are not developed in environments of high restrictions of typical textbook geometry classrooms, where much of the available information is filtered for them (Neto & Brasileiro, 2007). The teams of students in a given country are in a position to develop joint projects with other teams of students who are other countries through exchanging and comparing geometry data on contrasting or similar phenomena.

Apart from the simple narrations, instead of isolated classes, geometry students can communicate with different people and collect geometry

information from all over the world. Therefore, unlike textbooks, using computers in geometry classrooms increases the motivation of using analytical skills that are higher-level in schoolwork (Sawchuk, 2003). In addition, a communication channel for people from various countries enables them to break down generalization and could expand their intellectual horizons. Geometry teachers and instructors, who work in environments that are relatively isolated, are able to exchange freely information with their geometry peers (Ivers & Pierson, 2003). The can also receive advice from geometry experts from all over the world as well as download increasingly broad arrays of learning and teaching materials which the Internet makes available.

Field experiment compare the satisfaction and effectiveness associated with face-to-face textbook geometry learning with that of technology assisted geometry learning. Empirical evidence points out that the technology-assisted geometry learning effectiveness clearly depends on the category of target knowledge (Szeliski, 2010). Building on geometry experiential learning models, it is clear that technology-assisted learning extensively improves acquisition of knowledge among students, which demands reflective observation and abstract conceptualization (Parsons & Oja, 2012). However, but adversely affects the ability of obtaining knowledge which requires concrete experience.

In addition, computer assisted geometry learning supports vocabulary learning better as compared to face-to-face textbook learning even though it is comparatively not as effective in the development of listening comprehension skills. Further, based on the empirical tests, the perception of

ease of geometry learning and acquiring community support is significant prediction for both geometry learning effectiveness and geometry learning satisfaction (Farrell, 2002). The overall results are in support of the hypotheses as well as research models that suggest instructors need to consider distinct target knowledge in considering the technology-assisted geometry learning options. In addition, supportive learning geometry can make technology-assisted teaching easier for most students as well as increasing their levels of learning satisfaction.

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