

Emerging Technologies

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Emerging technologies are defined as newly evolving technologies, which involves new ideas, knowledge, tools and techniques. These are not necessarily new technologies but can also be old ones with a potential of becoming a new trend. Emerging technologies are constantly updating and upgrading and has capability of either being successful or unsuccessful. These technologies are constantly under a process of development, and may go through a cyclic process of research and expansion.

Technology is used distinctively in education, especially in distance education these days. Distance education is becoming easily accessible, interesting, and manageable. New technology offers a wide choice in both synchronous and asynchronous learning. Due to a wide variety of research, inventions and options in technology, distance education will soon become compatible with traditional face- to- face education.

Here are some of the Emerging Technologies as listed in Horizon Reports (Horizon Report 2010 and Horizon Report 2011). These technologies will likely become popular in the field of education and corporate world in the next one to five years.

1. Mobile Computing

This category includes portable computing devices like smart phones, laptops, notebooks etc. These compact devices are lightweight and offer a connection to the Internet world either through Wi- Fi networks or through a direct phone signal. Many academic

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institutions are already using mobile computing devices and are getting satisfactory results. Many more are developing curriculum accordingly. According to Horizon Report (Horizon Report, 2010), mobile computing devices are likely to become popular in the next one year or less.

2. Electronic Books

Electronic Books (or simply e-books) are gaining popularity over paper books very rapidly. Easy storage, compact nature, easy accessibility, affordability and wide variety are some of the key characteristics that making them popular. Amazon Kindle was the only option to read e-books. Nowadays a wide range of mobile computing devices such as iPad, Android tablet, and a variety of smart phones offer an access to e-books. Some specialized models like Sony Reader and Nook by Barnes and Nobles are also available with an extensive collection of e-books. According to the market research, readers buy more e-books and more frequently, as compared to paper books. Nowadays, electronic books are gaining popularity in academic world too. Many colleges and universities across the nation are trying to build their syllabi around academic e-books. Easy access and sharing, note taking, uploading, upgrading are the popular features amongst students. According to the Horizon Report (Horizon Report, 2010), time to adoption is two to three years.

3. Gesture -Based Computing

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Motion based computing is getting popular according to the Horizon Reports (Horizon Report 2010 and Horizon Report 2011). Nintendo introduced a gaming console called Wii. Players can virtually interact with each other or with a computer by using a motion sensor. Designed to deliver a realistic experience, virtual games require a real movement and provide a feedback via controller vibrations. Smart phones have similar applications and interactions are motion based. Many educational and professional fields are already using gesture based computing. Students at MIT have developed a program based on motion based interactions (<http://www.threegear.com/>), which helps understand the mechanics of an engine through color sensing motion detection. Medical students learn details of surgery and anatomy, while deaf children use it to communicate with their non-deaf parents. Motion based games are also used by senior care organizations to demonstrate and conduct some light exercise activities for the elderly people. Time to adoption, according to Horizon Report (Horizon Report, 2010) is four to five years.

4. Game Based Learning

Learning through games is not an entirely new concept in education world. (Veletsianos, G., 2010). Simple paper pen based games, or classroom quizzes and competitions are still some effective games for learning. Now the focus has moved to the digital world. Role-playing games or massive multiplayer games are getting popular. New gaming consoles and gesture based game systems such as Nintendo Wii and Sony Playstations make these games much more interesting as well as more challenging. Educators are using digital

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games for open source leaning and students are enjoying it. Learning through games is already a popular option in the field of engineering, music, language learning as well as in nursing. The full use of game based learning is expected three to five years from today (Horizon Report, 2011).

Analysis of two Emerging Technologies

Electronic Books

Electronic Books (e-books) are gaining major popularity in educational and non-educational area. The ranking of e-books was mid horizon (potential to become a popular Emerging Technology in two to three years) in 2010 Horizon Report. In the latest Horizon Report (Horizon Report, 2011), e-books are bumped up as near horizon (has a better prospective) which, means they have a potential to become a successful Emerging Technology in one year or less.

Characteristics

Some of the key characteristics of E- Books are as follows:

1. Opportunities

E-books are reliable and expandable, hence are gaining popularity and have more opportunities over paper books.

2. New technologies

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New ways and technologies are being researched and developed to read e-books.

Amazon Kindle is a popular device to read e-books. In a study by IDC, 48 % e-book readers preferred Kindle. (<http://www.brighthub.com/electronics/gizmos-gadgets/articles/123956.aspx>) Barnes and Noble have developed the Nook and there are many more devices like Cybook, BeBook, iPapyrus, Pocketbook, Sony Reader etc. Smart phones and 4G devices like iPad and tablets also have ability to read e-books. Digital books are becoming more realistic and content rich as technologies are developing. Ability to flip pages, graphics and multimedia make e-books more interactive.

3. Availability

E-books are available for purchase and distribution faster on the Internet as compared to paper books. Printing, assembly and delivery of paper books requires more time.

4. Accessibility

E-books are accessible from anywhere in the world with an Internet connection. Audio books are good option for the reading impaired.

5. Cost

Many e-books are free of cost. Many of them are available for lesser price as compared to paper books. Printing and publishing a paper book requires more money, labor and time.

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Updates are easier in e-books, which requires the cost of editing only and eliminates the cost of printing. E-books also reduce the paper waste and support the green environment.

6. Convenience

A computer, E-book reading devices or on Smart phones can store thousands of e-books depending on the memory of the device. For example, Amazon Kindle 2 has 2 GB internal memory (1.4 GB user accessible) and it can hold about 1500 e-books.

(http://en.wikipedia.org/wiki/Amazon_Kindle). This offers extreme convenience to the readers.

Use of e-books in education

E- Books have a bright future in the field of education. Due to their portability and cost effectiveness, they are very likely to become a necessity in future education. Many colleges and universities are using digital books. Many subjects like biology, Business, Education are already exploring e-text book options. UMU (www.umuc.edu), well known for offering superior online courses from certificates to PhD level, uses digital books for many courses successfully.

Challenges

There are some issues with e-books. Not all the students are familiar with technology. Some students are digital immigrants (Prensky, 2009), students who are new

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to technology and prefer the old fashion way through paper books. Copyright concerns present challenges to e-book publishers and writers which vary from country to country. Majority of text- book material is still in paper book format and the conversion to digital books will require some time and effort.

Game Based Learning

Games have always been a part of education. Prior to the digital age, learning games included simple paper and pencil games such as crossword puzzles and hangman. “Game based” learning is a classic example of an Emerging Technology. Education in the digital age recycles and uses the old technique of learning through games. Computer games are advancing in popularity, especially in younger generation and therefore is a promising technology in the next two three years. (Horizon Report, 2011)

Key characteristics of Game Based Learning

1. Popularity

Computer games are already popular amongst young generations. Most of the Role Playing Games (RPG) offer virtual reality and Massively Multiplayer Games (MMG) offer virtual socialization and competition.

2. Accessibility

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Mobile phones, smart phones, 4G devices like iPad and tablets or laptops offer many games to play. This offers players convenience of portability.

3. Technology

Professionals research and develop advanced games and techniques every day. Many game consoles offer gesture based motions. Nintendo launched Wii, which has motion based sensors. Players can have a 'real' game feeling in virtual world through vibrations and motion requirements. New upgraded and updated game consoles like Playstation 3 and Xbox keep consumer market up and running.

Use of Game Based Learning in education

Vast popularity of games cannot be neglected by educational experts. It's a fun and entertaining way to learn a new subject. Educators should take advantage of this latest technology and make a good use of it. It is an inventive way to teach course content through digital games. Modern students are inclined more towards technology, Internet and digital world. Game based learning will be able to offer a sense of virtual reality, social awareness, ability to solve problems and competitiveness.

Although, games are predicted to become popular in education in the next two three years, some institutions are already using them in the fields of Engineering, Music and Nursing. One great example could be of Smithsonian American Art Museum, which

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offers a game called Ghost of a Chance, which educates players through treasure maps, codes and texts.

Challenges:

Game based learning in digital form is still a new concept. It takes significant amount of time, energy, thoughts and creativity to develop a context based game. Not all students are interested or capable of playing an electronic game. The cost of production and development of such games may not be feasible. In addition, it can be challenging to develop an interesting game based on the course content.

Conclusion

Emerging Technologies offer exciting new ways and opportunities in educational areas. Some of them are easy to adopt, learn and develop and some are still establishing. Success of a particular technology highly depends on its usage, availability, cost, production and reliability. All the areas of education face to face, hybrid or online benefit and will continue to do so with the help of Emerging Technology.

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