Engaging Digital Natives Through Social Learning

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ABSTRACT

Digital natives account for a substantial portion of the total enrollment in higher education. This calls for significant educational reforms because traditional education systems do not cater to the needs and interests of digital natives. The most effective way that both students and instructors can benefit from this paradigm shift is to integrate technology that is appropriate to the cognitive learning patterns of the digital natives into the curriculum. This paper builds upon previous research in technology/personality theory and specifically attempts to provide examples of technology that will address the instructional needs of digital natives. Further this paper provides empirical evidence of the impact of technology integration on the learning outcomes of digital natives. In this study, the authors explored the impact of targeted technology on academic performance in three businesses courses. Three functional technologies were used by the authors to build engaging course content, efficiently manage course content, and to interact with digital native students. This study found that these technologies can assist digital natives in the learning process and lead to better academic performance.

Keywords, of the Abstract:
e-learning, digital natives; technology; learning styles, academic performance.

1. INTRODUCTION

The term digital natives was popularized by Prensky [5] as a way of defining someone who has grown up immersed in digital technology and is technologically adept and engaged. It is claimed that digital natives have certain characteristics that are different from previous generations which have developed because of their intensive exposure to computer games, online videos, and other popular digital technologies [6]. This has a significant influence on their personalities, including their attitudes and approaches to learning. In 2002, the Center for Educational Statistics had predicted that by the year 2013, digital natives would account for 75% of the total enrollment in higher education. This calls for significant educational reforms because traditional education systems do not address the needs and interests of digital natives. The most effective way that both students and instructors can benefit from this paradigm shift is to integrate technology that is appropriate to the cognitive learning patterns of the digital natives into the educational setting.

A recent study of a sample of college freshmen explored the prevalence of the characteristics of digital natives and their relationship to technology use [7]. The results of that study showed that there was a moderate correlation between students' pattern of technology use and their personality characteristics. However the relationship between technology use and learning was reported as complex and less deterministic. This paper builds upon Thompson's theory and specifically attempts to provide examples of technology that can be integrated in a curriculum that will address the instructional needs of digital natives. Further this paper provides empirical evidence of the impact of technology integration on the learning outcomes of digital natives.

2. LEARNING STYLES OF DIGITAL NATIVES

As result of their upbringing and experiences with technology, digital natives have a particular learning style that differs from earlier generation of students [1]. There are several studies that have reported on the characteristics of the digital natives and each study provides a slightly different list of essential characteristics [5, 6, 7]. However, there is much overlap between these characteristics and they may be generalized as in Table 1.

Outside the classroom digital natives use a variety of social networking and media technologies like TV, Internet, gaming consoles, various mobile devices like phones and tablets [3]. They also typically have access to some or all of these technologies in their home environment. One study found that 61% of digital natives favor incorporating more technology into their courses [4]. This may be attributed to their short attention spans, their familiarity with technology, their penchant for multi-tasking and their comfort with diversity.

Technology offers a variety of innovative ways to engage students inside and outside of the classroom so that they become active, self-paced, and empowered learners. It can be used to energize knowledge acquisition, discussions, and problem solving, while at the same time empowering students to manage their learning through self-paced activities that can be accessed according to their flexible learning lifestyle. Thus, educational technology extends the learning space beyond the classroom and provides organization and focus to content engagement on the student's flexible schedule.

Table1: Characteristics of Digital Natives

Characteristic	Description
Technology Infused Learning Environment	Expect technology to be part of the landscape of learning. Like to learn in an environment that uses technology to enable them to acquire knowledge, be more connected and be more productive.
Flexible Schedule	Prefer to learn in flexible, personalized and customized schedules. They prefer an informal learning structure and their learning is unconstrained by time and space.
Short Attention Span	Possess a short attention span. They have a craving for speed and an inability to tolerate a slow-paced environment.
Immediate Feedback	Expect immediate feedback and "payoff" for effort.
Collaborative Learning	Prefer to learn in a collaborative environment. They exhibit a preference for teamwork and connectivity to peers.
Active Learning	Prefer learning through activity rather than reading or listening.
Mobile Devices	Display a near universal adoption of mobile devices like smartphones, tablets etc. – the more portable the better.

This paper identifies three functional technologies that were used by the authors to build engaging course content, efficiently manage course content, and, to interact with digital native students. The technologies were integrated in three different Business department courses. The benefits of the tools employed in this study are that they are free, they are independent of any learning management system, they are easily integrated within a course or a curriculum without technical support and they are easy to learn and use both for faculty as well as for students. These tools have the potential for supporting student learning in creative and innovative ways, while keeping them engaged and interested. Using these technologies not only allows the instructor to adapt their teaching styles to suit the learning styles of digital natives but these technologies also have a positive impact on student learning outcomes

3. TECHNOLOGY SUPPORTING LEARNING STYLES OF DIGITAL NATIVES

Content Creation: PowToon
There are several tools available for course content creation that are free and independent of a learning management system. This study employed PowToon. PowToon is a web based application that is used for creating presentations and animated videos with a cartoon like feel. It lets the instructor incorporate humor and visual appeal into the micro-lectures. The instructor has the option to upload music or use pre-recorded music, characters and props to prepare lessons. Each frame/slide in PowToon is preset to 10 seconds and an additional 10 seconds can be added to each. The free version is limited to five minutes per presentation, an unlimited number of presentations can be created, and they can all be shared and viewed online through the PowToon site.

PowToon is a creative alternative to PowerPoint slides and allow for short, engaging content delivery accessible to students on their mobile devices. They can be used to highlight important or difficult topics within a course or to reinforce learning. PowToon is able to bring concepts alive for students, hold their attention and help them retain information. With technologies like these, learning can be flexible, customized and unconstrained by time and space, all the while capturing the attention of digital natives.

Content Delivery: Blendspace
Blendspace is a free web tool for instructors to collect, annotate and organize digital resources in one place to form a bundled, interactive lesson for digital natives in an e-learning environment. With a free account one can create a "canvas" and easily pull in other material like videos, web links, documents and images either from the web or from one's own computer. Then the instructor can make this multimedia canvas available to students by using one URL. Blendspace also gives the instructor the ability to incorporate multiple choice quizzes into lessons. Consequently, Blendspace is more than just a tool for sharing information, it can be used to assess a student's understanding of material that is presented in the canvas. Blendspace can even automatically grade the assessments if the correct answer choices are made available.

The Blendspace canvas can contain micro-lectures from PowToon, YouTube videos or other documents simply by dragging-and-dropping these elements onto the canvas. Since all of this content is managed using one URL, this is very convenient for students, as all of their material is contained within one space.

Blendspace facilitates an active learning environment preferred by digital natives. Micro-lectures and videos replace classroom lectures and consequently class time can be repurposed for more active and experiential learning. It facilitates a self-paced learning environment where learning can occur unconstrained by time and place. Digital natives can customize their learning experience through self-directed knowledge acquisition. Faculty can efficiently and seamlessly manage their digital content and

students can experience unfettered access to a montage of learning material that satisfies their personal and individualized learning needs.

Student Interaction: Kahoot
Kahoot is a free game based social learning tool. Using a hand held device or a computer, with Internet access students can join an interactive game by entering a unique PIN and user name. The game created by the instructor can be a quiz with a timed response and point system, or it can be a single close-ended question that can lead to open discussion or debate. The questions, created by the instructor, are displayed on a shared screen and answered on the individual devices. Kahoot can be adapted for various learning styles by including pictures and videos. Kahoot allows digital natives to use their handheld devices and creates a competitive spirit in the learning process. By displaying the questions and answers on a shared screen it gives them the instant feedback that they desire.

4. IMPACT OF CHANGING TEACHING STYLES

Recognizing the need to adapt teaching styles in order to reach digital natives, the authors incorporated the above mentioned technologies into their courses from Fall 2014 to Fall 2015 i.e. over a period of three semesters, with the expectation that these technologies would help to improve the students' academic performance and encourage them to participate and be engaged with the course.

In order to test this hypothesis the authors designed a quasi-experimental study. Data was collected from Fall 2012 to Fall 2015 over a period of 6 semesters. During Fall 2012, Spring 2013 and Fall 2013 each of these courses were taught in the traditional format. These classes were designated as Traditional Classes (TC) where no technology was used other than Blackboard, the learning management system offered by the institution. These classes were treated as the control group. From Fall 2014, the authors incorporated the technologies mentioned into all of their classes. They continued to do this for three semesters through Fall 2015. These classes were designated Technology Enhanced Classes (TEC), and they were treated as the experimental group.

For both TC and TEC, each course was taught using the relevant textbook for that particular course, same set of reading assignments, outside resources and same set of homework assignments. Assessments were exactly the same in both types of classes, each having the same number, type and level of difficulty of questions. Assessments were administered exactly the same number of times in each class. The difference between TC and TEC was the modality of instruction and use of technology to enhance the learning process.

Data was collected over a period of six semesters by each instructor in their TC and TEC. Average test scores were based on tests and quizzes and any graded portfolio of student work over the semesters. In order to compare student academic performance in TC vs. TEC, the authors used a two-sample t-test to assess the possibility of a difference in the means of TC and TEC. Mean tests scores of all traditional classes and mean test scores of all technology enhanced classes were calculated. The question then is if the mean test scores in TEC is higher than in TC. The comparisons of means and the tests of difference in means are shown in the Table 2 and Table 3.

Table 2: Descriptive Statistics

Types of Classes	M	SD	Std. Error	n
TC	72.7	10.8	1.132	91
TEC	76.1	9.6	1.006	91

Table 3: Paired t-test Results

Mean TC-Mean TEC	SD	Std. Error	df	t-value
3.4	10.22	1.07	180	2.2446

* $p < .02$

Testing at a 5% level of significance, the evidence suggests that there was a significant improvement in the mean score in a technology enhanced class as compared to a traditional class. Effective learning occurs when teaching styles are aligned with students' learning styles. Teaching technologies can be incorporated into courses or curriculum and can play an important role in students' ability to learn and perform better academically. When integrated and used properly, these technologies can assist the digital natives in the learning process and lead to better academic performance.

5. CONCLUSIONS

The majority of learners in classrooms today are digital natives – a category of learners who tend toward independence and autonomy in their learning styles. For them, learning occurs beyond the boundaries of a traditional brick and mortar classroom. They expect to be able to choose what kind of education they buy and what, where and how they learn [2]. Born between roughly 1980 and 1994, the digital natives have already been pegged and defined by academics, trend spotters and futurists. They are technologically savvy and carry an arsenal of technology in their mobile devices. They are smart but impatient and expect results immediately. They are eager participants in the learning process and would prefer experiential learning vs passive learning. They also prefer a collaborative learning environment where they can interact with their peers. As educators, we seek to assist students in knowledge acquisition for the purpose of obtaining jobs, being informed global citizens and becoming well-rounded productive members of society. This study demonstrates how academic performance of digital natives can be improved through the use of free and easy to use technology. As digital technology advances and the digital native population continues to grow, instructional methods must also continue to evolve to meet the needs of our students.

6. REFERENCES

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