The use of digital technology for technical learners: A teaching and learning view

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Abstract

Now a day's student often discussed to as the "digital generation," use an inspiring assortment of technological tools in a wide variety of ways. Though, the results stated here propose that students choose additional old-fashioned instructional technology for effective appointment and learning. Instructors, though, choose the use of Course-learning technology offer by their colleges. In addition to this possible incongruity between liking of teachers and students, the study discovers that there are massive variations in preferences and usage across disciplines, in particular, business and economics instructors and students having a powerful technology preference than students and instructors of the life science and fine arts. Keywords: Instructional technologies, digital technologies, teaching, learning, digital natives.

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Introduction

Now a day's students is defined as technologically shrewdness and the most visually sophisticated of several generations, with technology as acquainted as a knife and fork to this group (Stamats, 2008). Though, it was stated freshly that college students are learning less and less and, not astonishingly, this technological proficiency is too effortlessly seen as the offender in the demise of teach (O'Brien, 2010). For example, parents and teachers might assume that students are spending a lot of time nowadays on the world of Web 2.0 communicating with groups via Blogging, Facebook, and tweeter or in virtual world interrelating with gamers around the domain playing the latest Madden. If students are studying less and less because of technology, then teachers have unsuccessful to connect the electronic infrastructure so as to generate an environment for learning and teaching (Ives & Jarvenpaa, 1996). According to D'Aloisio (2006), settings if students are made conscious of the direct relationship between the skills they obtain in the lecture hall and the transferability of those skills in business, they may be interested to take part actively in their learning. Technology may really be a confident effect in generating a new information revolution. Instead of using technology for only its entertainment and social value, students can study to use instructional technologies as a skill set for the forthcoming and, in doing so, learn more professionally. That is, less time spent learning will be due to the fact that teachers and students have attached technology in such a way as to enable efficiencies in both the out-of-

class and in-class procedures (e.g., spell checking documents, electronic library access, and electronic exchange between teacher and student and amongst group members). With reference to the album, Munuera, Peterson, and Cunningham (2002), "any new instructional technology should let a student to learn additional, learn quicker, and/or learn easier" (p. 14). Given the duality of the instructional technology, in that it wants to be accepted by both students and teachers to achieve its full prospective, the present investigation seeks to improved under- stand, instructional technology as a pedagogical tool in learning's and teachings. As such, examining the two studies presented here, try to capture usage from the views of both faculty members and students and, in doing so, relate instructional technologies to student appointment in the subject subject/course and learning results. Primarily, we offer an over-view of educational scholarship associated with technology usage in the marketing teaching space. We then present the outcomes of the two separate investigative studies. Lastly, we use these preliminary results to find areas for future thought.

Technology in the Marketing Schoolroom

Malhotra (2002) accompanied in the novel millennium by presenting a meaning of instructional technology, "Instructional technology comprises software and hardware, techniques and tools that are utilized indirectly or directly in assisting, attractive, and improving the efficiency and effectiveness of learning, teaching, and practicing marketing, awareness" (p. 1). Peterson et al. (2002) presented a comparable meaning, "Instructional technology comprises electronic and non-electronic and electronic instruments, tools, and methods that are used in the delivery of course materials and/or in a 'backroom' support capacity" (p. 9). Technology has now become a monotonous constituent of the teaching space and educational methods in the overall (Nuldén, 1999). Scholarship in marketing education has lectured instructional technology from two viewpoints. The broad viewpoint looks at overall addition trends with respect to technology in the classroom and if this technology presence has had constructive outcomes of learning and teaching. The second, narrower angle has been the reporting of how particular Web 2.0 technologies have been used in the marketing classroom via online activities and projects. An overview of some of the more recent results in each of the areas is provided here.

Broad Viewpoint

Educational scholarship has inspected instructional technology generally with esteem to tool usage and results of such usage. Usage-wise, Peterson et al. (2002) lead two small-scale, investigative studies to see the applications and views of instructional technology in the university teaching space. In their survey of 50 marketing professors, almost two third of the replying professors used some form of instructional technology in their teaching space, with Ms-PowerPoint slides stated most often. This result was consistent with what the authors found in their 260 replies in a comparative review of students registered in a preliminary marketing course in which the most helpful technologies were supposed to be those associated with the in-class projection of graphic helps. Throughout this same time frame, Ferrell (2002) and Ferrell survey student who was exposed to university teacher using teaching space technology such as Ms-PowerPoint. Their examining effort was future to gauge student insights of instructional technology use ("overused," "not overused") in the classroom. Most students (ratio of 2:1) in their study felt that PowerPoint technology was not overworked in the teaching space. These comparable results are not astonishing assumed the time frame for the educations, as instructional technology was in its beginning. Ms-PowerPoint (or related projection offerings) was

displacing outdated above transparency usage at that time. From a result's valuation viewpoint, Ueltschy (2001) discovered the use of technology in the teaching space comparative to rise in student learning, participation, and pleasure and found that interactive technology had positive results in all three areas. Laterally these lines, Clarke, Flaherty, and Mottner (2001) Examined whether or not there were changes between student assessments of instructional technologies and their insights about learning, aptitude to find a job, and predictable job performance. A total of 12 instructional technology tools was assessed compared to the three student results. The authors stated that students apparent 8 of the tools to meaningfully affect learning, 10 tools to meaningfully affect their skill to get a profession, and 7 tools to significantly affect predictable profession presentation. More in recent times, Robinson (2006) help and support for the relationship between instructional technology usage and positive results. The interesting twist in his investigation was that prospects of presentation results led to positive arrogance toward instructional technology usage. That is, as students apparent that new instructional technology would raise the chance of goal accomplishment, they were more expected to have an optimistic attitude toward the technology. This is reliable with results by Hunt, Eagle, and Kitchen (2004), who found that a positive attitude toward instructional technologies was the major analyst of student preferences for technology-based learning systems. Basically, these findings help the notion that instructional technologies can help as the resources to reaching personal goals per the educational procedure (D'Aloisio, 2006). Though studies such as the ones stated here thin toward positive viewpoints toward instructional technologies, Strauss and Hill (2007) discovered student fulfillment with web-based instructional tools. In their study, almost one half of marketing students did not hold web-based instructional technology for learning in old-style teaching space. This requests the query as to whether or not students wish easiness in their use of instructional technology tools or even if there is a saturation point at which more tools request too much time and energy for the knowledge added in the end.

The Teacher and Technology

In the mid-2000, Cengage learning involved in an investigative research project to improve comprehension how teachers use technology for learning and teaching. An exclusive review was directed to a suitability example of teachers at colleges and universities across India in an effort to understand how they pass their time preparing for and otherwise delivering and administering their teaching tasks. The survey was administered to faculty across a wide variety of disciplines (per the company's traditional demarcation of disciplines): social sciences, mathematics and science, humanities, vocational, and business and economics. The survey resulted in 1,617 working replies. Initially, the data were explored to regulate if there were differences among the various academic disciplines with respect to instructional technology. Based on the results of the survey, the traditional specializations do not differentiate in their desires when it comes to course materials. That is, professors from social sciences to business and economics have almost identical utility values (i.e., preference for use) with respect to the following:

- **Method of Delivery**
  Print instructional material
  Combination of print and electronic
  All electronic

- **Customization**
  No customization
  Select ordering of material
  Eliminate unused/unassigned material
  Select publisher content and ordering material Integrate third party content
  Integrate own content
- **Reference Content**
  Related reference content with search capability No integrated reference content
  Predetermined set of reference materials Tool to build reference content into the syllabus
  - **Student Experience**
    No student-focused technology Minimal, simple student tools
    Advanced technology-based course management tools
  - **Professor Experience**
    No technology-based course management tools Minimal, simple teacher tools
    Advanced technology solutions for teachers

Overall, respondents had a higher utility value for more rather than less technology when it came to technology solutions for both students and teachers. Additionally, instructors placed a high utility value on having a mixture of print and electronic instructional materials. A key finding in this phase of company research was that there did not appear to be differences across disciplines with respect to utility values of various teaching components. Teaching tasks were also explored in this phase of the research. That is, what do instructors see themselves doing when it comes to the act of teaching and what role, if any, does technology play in educational activities? Responses from the survey provided seven categories of educational activities: (a) course planning, (b) course management, (c) teaching, (d) assignments, (e) assessment, (f) grading, and (g) overall general needs. Technology arose as the most challenging task when it came to course planning and course management. That is, instructors noted the challenge in using technology to construct their courses and to engage in their university's online course management systems. Teaching-wise, instructors could complete the process of teaching without the necessity of learning new technologies (once the course was developed and maintained on the university e-system), yet technology was viewed as useful for developing interactive teaching material. In general, learning new technologies was seen as a challenging task in the overall act of teaching, but it was not viewed as of particular importance with respect to assignments, assessment, and grading. Interestingly, technology did not appear as unique greatest important tasks in any of the seven categories of educational activities. In sum, this phase of the company research sought to identify differences, if any, in needs across disciplines and (b) better understand the work process engaged in by instructors and determine particularly challenging tasks within the workflow process. The need and challenge of instructional technology were evidenced in both aspects of

the research project. Another stage of exploration, discussed next, focused specifically on instructional technologies and included both faculty and students in the research.

Student and Instructors: Technology Use, Appointment, and Learning Results

Citing studies examining technology and its linkage to learning outcomes, Peterson et al. (2002) stated,

One of the utmost outstanding, yet disturbing, observations is that, despite the vast number of studies that have been conducted in attempts to evaluate the effectiveness of various instructional technologies used in higher education, no definitive conclusion is possible as to whether instructional technology generally pays positively to student learning. (p.13)

Seeking to provide vision into instructional technology use and learning outcomes, Cengage Learning, in conjunction with adventures in late 2009, conducted a survey of both instructors and students to explore their perspectives on digital technologies in the classroom.

Table 1. Instructor and Student Preferences for Technology by field

Field	Instructor	Student
Engineering	63%	72%
Business	62%	65%
Education	52%	44%
Social sciences	52%	58%
Humanities	44%	36%
Physical sciences and math	45%	60%
Life sciences	30%	57%
Fine arts	24%	49%

There were 760 students and 300 instructors who finished the inspection. Because of the proprietary nature of the research, the data and analyses cannot be presented here in their entirety. However, adventure's is an industry leader in higher education research, and the data collection procedure and subsequent analytical methods followed rigorous research protocol. For each group of respondents (students and instructors), up to three sets of output were produced, depending on the question: (a) frequency table, (b) cross-tabs, and/or (c) cross-tabs, including a chi square or Fisher's test where appropriate.

The major research questions pursued were the following:

1. How do technology preferences differ between students and instructors?
2. What are the student and instructor perceptions of technology use, technology support, and the effectiveness of digital tools?

Technology Preferences

Mc Corkle et al. (2001) recommended that "whereas some professors follow the variations in [business] technology with hesitancy and discomfort, their students are saying 'I want additional more' with prepared intemperance and willing experimentation" (p. 16). As such, the goal of the questions linked to technology preferences was to distinguish the degree of need for the use of technology in the act of learning and teaching. In addition to shrewd changes in the preference for technology between students and teacher students, possible changes amongst disciplines and between genders were also discovered. General, 52% of the student defendants favored a "great deal" of technology in courses related with 46% of the instructors. Though, there were changes by discipline and gender. As display in Table 1, there was substantial variation of instructor and student preferences for technology based on field of study. Though maximum students and instructors in engineering and business favored a great deal of technology, there were vast changes between instructor and students Preferences in the Life Sciences and Fine Arts as well as enough variances between preferences in the Math and Physical Sciences. The overwhelming mainstream of instructors in the Life Sciences and Fine Arts do not favor to teach a course using a countless deal of technology, yet almost one half of the student defendants in these fields would prefer to take a course that uses a great deal of technology. Although the instructor and student preference differences are not as large as in the Physical Sciences and Math, there were also notable differences between the preferences of these two groups. Gender-wise, a larger proportion of men preferred to take courses that used a good contract of technology when compared with women ($p < .01$). This discovery is not surprising given the number of studies that suggest a disparity by gender with respect to computers and technology (Kim & Bagaka, 2005). For example, a study by ECAR revealed that 52% of male college students perceived themselves to be early adopter of technology versus only 23% of female college student (Salaway, Caruso 2009 Smith). Gender did not play a statistically important role in decisive instructors' preferences for teaching a course that uses a good deal of technology. With variances in technology preferences between students and teachers, across disciplines and between genders, the research question in the Cengage /adventure's study went outside generalizations to discover support, use, and preferences for specific digital tools by instructors and students.

Perceptions of Use, Support, and Digital Tools

Students and instructors were asked their perceptions of use of instructional technology in the classroom. From the instructor's viewpoint, 61% of the instructors perceived that at least 75% of the students used instructional technology effectively. Likewise, 65% of the student respondents thought that at least 75% of the instructors used instructional technology effectively. Of these students, 63% preferred to take a course with a "great deal" of instructional technology, and student preference for technology in a course was related to the perceived effective use of instructional technology by the instructor ($p > .01$). However, there may have been a self-selection bias in that students who preferred instructional technology opted for courses where it was used a great deal and, therefore, likely used more effectively. There were no statistical differences across disciplines or across GPAs in student perceptions of effective use of instructional technology by instructor. Support. Although perceived use was comparable, there

were differences between instructors and students in the perceptions of support. There was a statistically significant relationship between student preference for technology use in a course and perceived support offered by instructors ($p > .01$). Additionally, although 65% of the instructors thought that students were tech savvy, only 42% of the student respondents felt that instructors provided students with adequate training and support in the use of instructional technology. This find- ing corroborated results from an ECAR multischool survey in which "barely a third of the students said that most or almost all of their instructors provided them with adequate training for the IT in their courses" (Smith et al., 2009, p. 17).Critically, although today's college students are immersed and fluent in digital media, this proficiency may not necessarily transfer to proficiency in the use of instructional technology. This is consistent with Robinson (2006), who reported that not all students have the same level of ability and confidence when it comes to technology. Thus, a student may understand that a particular instructional technology would be useful but may not have the expertise to use the technology and, therefore, will need training and support as made avail- able by the classroom instructor.

Digital tools. There are a variety of digital tools in the marketplace. For purpose of this study, the digital tools were segmented into three product groups: traditional digital tools (e.g., websites, e-mail, Microsoft Office, PDFs, instant messaging), social and interactive digital tools (e.g., Facebook, Wikis, blogs, podcasting, simulations, games, virtual worlds), and course/learning digital tools (e.g., online quizzes and tests, lecture-capture, whiteboards, virtual classes, course/learning management systems). The differences between instructor requirements and student use frequency and experience with various digital tools are displayed in Figure 1.Both students and instructors were then asked about the perceived effectiveness for each of the three types of digital tools (Table 2). There were some interesting differences between students and instructors with respect to the perceived effectiveness. Whereas 73% of the students found traditional digital tools to be effective, only 52% of the instructors thought they were effective teaching tools. Yet whereas 55% of the instructors believed that course/learning digital tools were effective teaching tools, only 30% of the students thought they were effective. However, students and educators had similar perceptions of effectiveness for social and interactive digital tools. Instructors were asked about their perceptions of the impact of digital tools on student learning and engagement. Seventy-eight percent of the instructors thought that student engagement in a course had improved as the use of digital tools increased. Of the instructors who believed that engagement levels had improved, there was a strong correlation with perceptions of learning; with 87% believing that learning out- comes had improved as well ($p > .01$). However, instructor preference for technology played a significant role in the perception of improved engagement and learning ($p > .01$). That is, instructors who preferred a great deal of technology in courses they taught were, on average, more likely to believe that student engagement levels and learning outcomes have improved. The instructors who believed that engagement activities and learning outcomes improved were queried as to the digital learning tools most required or strongly recommended to their students Table 3 shows the percentage of

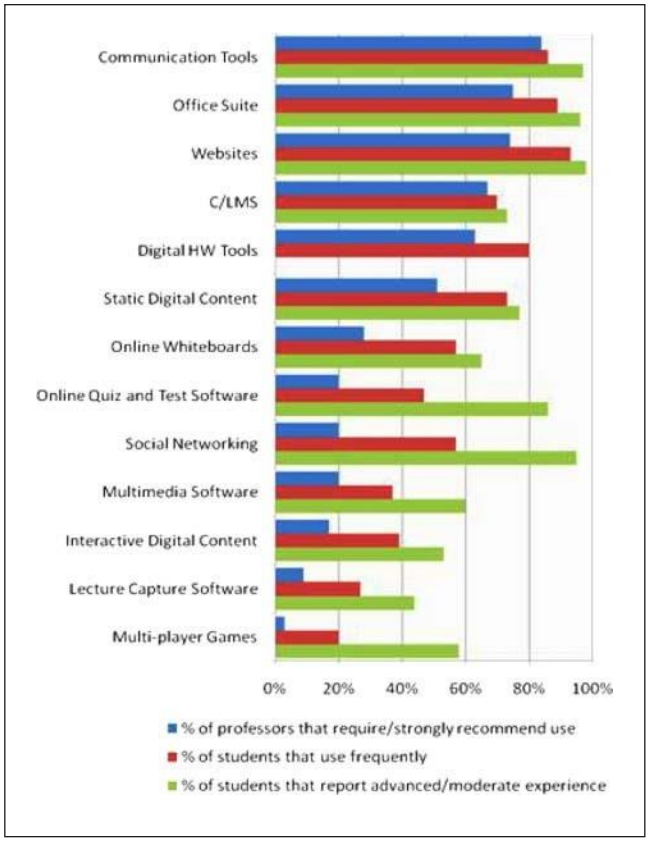

Figure 1. Digital tools: Professor Requirement and student use frequency and experience

Table 2. Instructor and Student Perceptions of Effectiveness

Digital Tool	Instructor	Student
Traditional	51%	72%
Social and interactive	44%	43%
Course/learning	53%	32%

These instructors who believe that each of the digital tools have an impact on student engagement and learning results for the course.

Fifty-eight percent of the student respondents believed that instructional technology engaged them in their course- work and helped them achieve learning results. There was a statistically significant relationship between instructor use and support of instructional technology and the proportion of students who found instructional technology to be engaging for the coursework ($p > .01$). Figure 2 show the relationship between instructor requirements of digital tools and students insights of engagement with regard to the various tools. Figure 3 shows the digital tool use frequency for the students who believed that technology helped engage them in their

coursework. Traditional digital tools were used most readily by highly engaged students, whereas course/learning and social/interactive tools were used less frequently ($p > .01$).

Table 3. Digital Tools: Instructor Perceptions of Engagement and Learning

Digital Tool	Engagement	Learning Outcomes
Communication tools	85%	85%
Websites	80%	81%
Office suite	75%	77%
Digital homework tools	75%	77%
Course/learning	71%	72%
Static digital content	54%	56%
Online whiteboards	35%	36%
Online quiz and test software	24%	27%
Multimedia software	24%	26%
Social networking	22%	26%
Interactive digital content	21%	24%
Lecture capture software	10%	11%
Multiplayer games	5%	5%

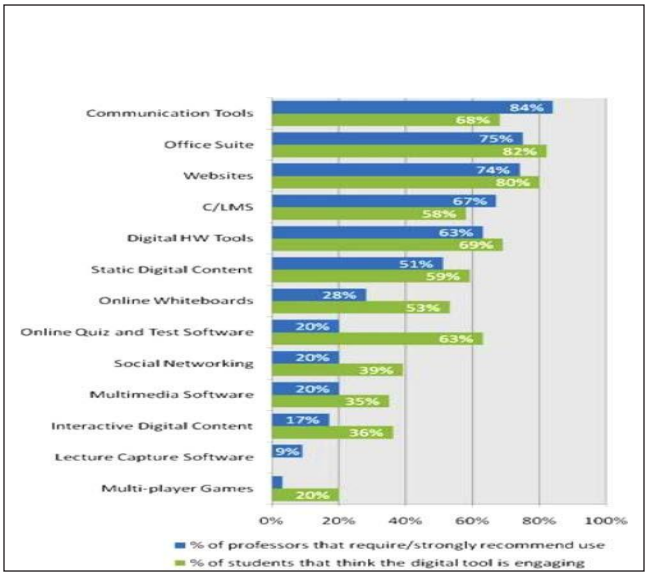

Figure 2. Digital tools: Instruction requirement and student engagement

This finding is particularly interesting since instructors perceived traditional tools to be less effective than course/learning and social and interactive tools.

Overall, students appreciate and use digital tools in academic work more readily than instructors require. This is consistent with the suggestion that students want more instructional technology and are willing to experiment with such tools

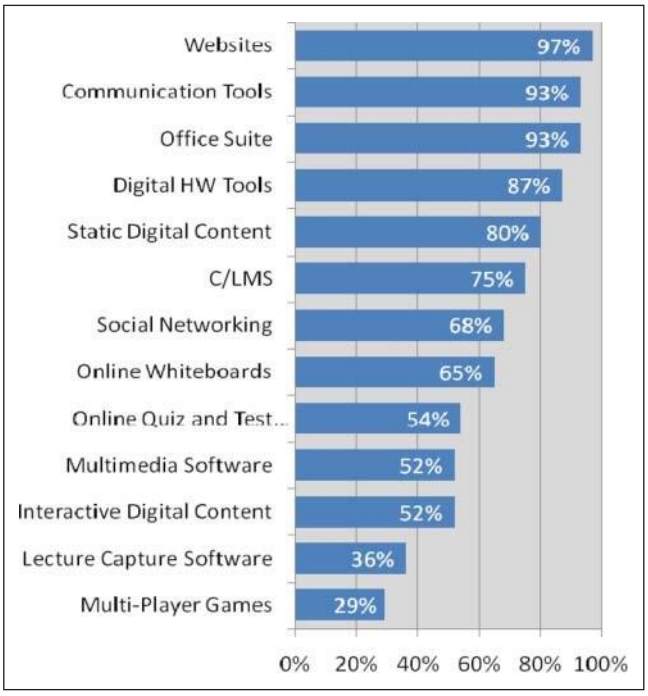

Figure 3. Digital tool use frequency by student

(McCorkle et al., 2001). Of critical importance, however, is that instructional technologies do appear to have a positive impact on learning and teaching. That is, students and instructors did perceive a positive relationship between instructional technology use and engagement in the learning process and in the outcomes of the process.

Summary

The findings of the two major research studies reported here contribute to our knowledge about instructional technologies from the viewpoints of both students and instructors. In general, it appears that students and instructors are eager to learn and teach with a variety of digital technologies. The research highlights issues and concerns in three major areas: disciplinary differences, metateaching demands, and tool sophistication.

Disciplinary Differences

Although faculty across disciplines exhibit similar utility values for various course materials, there are disciplinary differences in preferences for instructional technology. Unlike their colleagues in Engineering and Business, faculty of the Fine Arts and Life Sciences do not exhibit strong preferences for teaching courses with technology. However, these disciplinary differences were not evident among students. Thus, it appears that college students, regardless of discipline, are interested in instructional technology.

Meta teaching

Although students are willing to experiment and appear to want more when it comes to instructional technology, there is a caveat to their desires. That is, digital natives or not, students expect the instructor to offer support for use. Teaching (either taking up class time or extra time outside of class) will have to go beyond the boundaries of the pure subject material and will require teaching students how to work and learn with instructional technologies. Yet this type of meta teaching may be at odds with the fact that instructors did not see technology as one of the most important tasks in any of the seven educational activities identified in the first phase of this research. Teaching about the instructional technology would make technology an important educational task within all seven educational activities. Currently, it may be that technology is secondary to the more traditional tasks involved in delivering a course.

Tool Sophistication

Traditional instructional tools appear to be sufficient for student engagement. It does not look as if more sophisticated or advanced Web 2.0 digital tools are needed for enhancing the learning experience. Although college students may use these contemporary digital tools for communication and entertainment, they do not see them as necessary for learning. There may be a point of saturation in that students use contemporary digital tools for their personal benefit but do not expect to have to use them for educational purposes as well. Today's college students have grown up in a digital world of communications but may not have time over 4 short years of college to truly digest the value of contemporary digital tools as instructional technology. These students are willing, however, to experiment with more contemporary tools if the opportunity is provided to them and if the support to do so is available. The past decade has seen a plethora of research with respect to instructional technology. This study adds to the educational scholarship over the past decade by examining teaching and learning from the perspectives of the instructor and student dyad. The results of the two research projects contribute at the broad level of scholarly research with respect to integration trends in the classroom and their linkages to outcomes. More narrowly, the research denotes specific technological tools that are used and supported by instructors and students and links tool usage to student engagement and learning results.

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