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# Today's Digital Classrooms: The Impact of Technology on Students' Studying in CamEd Business School

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## ABSTRACT

As technology becomes increasingly common in every aspect of our lives today, from the way we communicate with people, collaborate with them, the way we entertain ourselves and to the way we do research, it is inevitable that technology should also be incorporated in our studies. This research paper focuses on the impact of technology (classroom management tools, laptops and mobile devices, WI-FI in the classroom, Google apps, and E-books etc.) in the classroom as perceived by both students and lecturers. The research was mostly carried out through surveys, one for lecturers and another for students, and the findings were analyzed and compiled. Overall, students felt favorably towards the use of technology in the class. They found collaboration tools, and Google classroom beneficial to their learning experience. It is concluded that students would like lecturers to provide more online practices and provide links and other references that support the learning that takes place in the classroom, but students claimed E-books were the least popular aspect of technology in the classroom; agreeing with some other results from similar studies. And, several students requested print copies of reference textbooks be made available alongside the E-books.

**Keywords**: technology, collaboration tools, classroom, Google classroom

***Relevance to Business and Finance Educators:*** Learning through technology and collaboration teach students and lecturers to think more precisely and makes it essential to think strategically. They spark student communication and the exchange of student ideas. The secret of an IT-based instructional classroom and e-learning platforms is a culture of student centered learning. The digital classroom is not only about the implementation of technology but also about changing how tertiary educators teach and how students in today's higher education learn.

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# Introduction

With the increased availability and affordability of digital technology, it has become increasingly common for classrooms to go paperless. Instead of traditional books, printed assignments, textbooks, and handouts are digitized and uploaded to platforms like GoogleClassroom for students to read on their laptops and/or phones. Dataworks, a California based tech/educational research company suggests in an article on "*What Does Technology in the Classroom Mean?"* that this is not just a passing educational phase, but instead is part of a key transition taking place in education:

> Essentially, the classroom is slowly moving from a print environment to a digital environment. Like the business world over the last 30 years, the education world is now making this transition. With an array of digital tools in the classroom, teachers and students are finding ways to learn more, learn faster, and learn easier – while still learning the essential skills that are needed to be an educated citizen. Fluency in the three R's – reading, 'riting, and 'rithmetic – is still primary but they have now added a D – for digital fluency (Neer, 2014).

Furthermore, an Internet Report through an infographic presentation by the University of Cincinnati (2019) Online Masters degree program on how technology is transforming the classroom indicates a high percentage of teaching benefits as outlined as follows:

- 74% of teachers say technology motivates students to learn,
- 74% of Pre-K through grade 12 teachers say technology enables them to reinforce and expand on content,
- 65% of teachers say technology allows them to demonstrate something they can not show any other way,
- 48% of teachers use technology for online lesson plans,
- 45% use it to give students access to web-based educational games or activities.

There must be certain reasons why IT-based instruction indicates these benefits. Some school of thought is of the opinion that it is just the effects of digital presence in and around everything we do today and others assume that it is the 'cool' digital culture of today's generation. The book "*Education and Technology:Key Issues and Debates"* provides a detailed look at the arguments surrounding technology in the classroom. It suggests that both internal and external factors to education are contributing to the pressure on educators and administrators to change the way they have done things in the past, and instead to question how digital technologies in the classroom can improve student engagement, teacher efficiency, and collaboration. The pressure to increase IT-based instruction in the classroom, they say come within and outside the realm of education. Selwyn (2017), provides a valuable context for the rapid changes observed in classrooms as technology in classrooms increases.

Indeed, the inevitability of digital change in education is justified usually along a number of different lines. The first is the idea that digital technology has clear potential to change many aspects of education for the better. In other words, there is an 'internal' imperative for the increased use of digital technology within educational settings. The second is the belief that the rise of digital technology elsewhere in society necessitates corresponding changes in education. Selwyn (2017) further points out that the general digitisation of society acts as an 'external' imperative for the increased use of digital technology in education. The third is the sense that technology heralds an inevitable 'disruption' to the educational status quo ( p. 43).

These three factors - an internal drive to make learning more efficient, an external drive to ensure that students are prepared for the world beyond the classroom (well equipped to be responsible citizens), and an unknown future as technology threatens the traditional idea of the classroom as it's existed are driving forces behind many of the changes taking place in classrooms around the world. (Selwyn, 2017).

## CamEd, Background on the use of Technology in Classroom

CamEd, a business school in Phnom Penh, Cambodia is driven by these stated factors. For the past five years, CamEd Business School has been prioritizing the role of technology in its classrooms. The introduction of eBeam solutions in 2014 was by itself the digital transformation starting point. That was when CamEd classrooms' learning experience of sharing, editing and saving classroom real-time work over the internet became prominent. And in 2015, WACOM solution was introduced as a replacement for the eBeam. Wacom Cintiq creative pen, display screens, and internet access were installed in all of the classrooms, and lecturers could write directly on the screen with the creative pen. The school's Academic Management System (AMS) was enhanced to include profile management system, attendance management system, and score management system. IT-based instructions were conducted with ease, and all the teaching notes including the lecture slides were stored real-time in the school backed up server directly from the classrooms and lecture halls. In addition to these, the school introduced and started using Google apps like Google Drive, Google documents and spreadsheets, Google classroom, and Google forms to support lecturers and students collaboration in the classroom and outside of the classroom thereby increasing CamEd students' motivation to learn. Currently, all CamEd lecturers have a personalized digitally compliant (Apple or Microsoft) tablet used for school work during and after lectures. These tablets are connected over a high speed wifi mirrored to the state of the art HD displays in virtually all the classrooms/halls with fantastic real time video recording tools that is remotely logged on to as the lecturer begins a class. All these significant transformation has changed the conventional classrooms into a multi-functional collaborating learning spaces that are both different and exciting in CamEd. The introduction of Google classroom, the use of smart displays, and more recently the transition from paper books and examinations to e-books and computer based exams in early 2019 have not only been implemented to help students improve their responsibility as active learners, it has also helped them understand study materials, retain their collaboration with peers, and effectively communicate with their lecturers. Hence, this research paper seeks to reflect on the transition taking place in CamEd from the print based environment to a primarily digital environment, by reporting on the various types of technology that lecturers are using in the classroom, their perceptions on the use of these digital tools and also seeks to report on the impact technology is having in CamEd classrooms as reported by students and then benchmark these responses with other studies written on the subject, especially as it pertains to tertiary institutions.

## Literature Review

Several books, articles, and empirical study has been written and conducted on the impact of technology in the classroom. Looking at a few of them in this review will shed some light to the positive perceptions of the different writers on this subject. According to Costley, in his paper on '*The Positive Effects of Technology on Teaching and Student Learning'*, today's students live in an advanced technological world. He emphasizes that a majority of students use some form of technology on a daily basis including; texting, social networking, and web surfing. Students see these types of technologies as useful and extremely enjoyable. "These very same students that are accustomed to these types of technologies will relate to using technology at school. If their learning environment mirrors the ways in which they engage with the world, they will excel in their education" (Costley, 2014). Costley established

his positive view on a 2009 published article written by Amy Christen on *'The Significance for Adopting Technology in the 21st Century Classrooms'*, where she explained that -

- instruction must be synchronized more closely with the ways students live and interact outside the classroom.
- Curricula must address the soft skills required in today's global, information-driven workforce.
- Technology and pedagogy must be better integrated and that
- Educational institutions must look for partners that can add to their pedagogical strengths and help shore up their weaknesses (Christen, 2009, as cited by Costley, 2014 p. 28).

Among the many studies that have shown the benefits of using IT-based instructions in classroom is a publication monograph titled *"Higher Education in the Digital Age - moving Academia Online".* In chapter two of this book: Making education better: implementing pedagogical change through technology in modern institution, Peter Bryant states that "successfully integrating technology and the practices arising from digital engagement and communications into teaching and learning can offer transformative possibilities for programmes and disciplines within higher education institutions" He further explains that "how institutions leverage this potential is influenced by the extraordinary nature of learning in the digital age and the critical importance of understanding how students and faculty acquire and co-create skills and knowledge for modes of work that perhaps don't exist today." (Bryant, 2018, p. 37).

Moreover, one other area of incredible benefits is in the aspect of student assessment. Technology-based assessment is commonly defined as an adaptation of online and technology-based testing that is engaging, interactive, and better reflects the world students live in every day (Pearson Education, 2017). Technology-based assessment (TBA) is adopting online systems, applications and software to assess students' progress, work and performance individually and in groups. There are several other ways this can be helpful, such as in enabling peer and self assessment, real time and automated feedback. The efficiency, variety, flexibility and quality of implementing assessment is primarily improved by TBA.

## The Present Study

The present study seeks to extend the existing literature on the subject of the impact of technology in the classroom in several key ways. First, the study constitutes its findings from mostly CamEd's students and lecturers perspective on the use of technology daily, and on the use in the classroom. Secondly, the study seeks to check on preferences and perspectives from students and lecturers alike, analyzing the findings for the future use of transforming CamEd into a multi-functional IT-based learning environment. And thirdly, compare the results of the findings with that of similar progressive institutions who share the same concept of turning conventional classrooms to digital based classrooms. This is notable because of the current digital prioritization taking place in CamEd Business School.

## Methodology

The sample consisted of 200 students and 21 CamEd Business School lecturers/professors. Students and lecturers were asked to complete a questionnaire made available via Google forms. The survey was made available to students online between the dates of May 5, 2019 and May 29, 2019. The majority of students (160) who replied are CamEd Business School students. The survey was open to university students internationally and received responses from twenty-five students who attend other universities here in Phnom Penh.. There were responses from students at UmassLowell, in Lowell MA and from University of Portland, Portland Oregon, all in the USA. An additional 13 students chose not

to provide a name of their university. Approximately, half of the student participants who completed the survey, are Year 1 students. Thirteen percent of student participants chose not to provide a year, 2 students named themselves as ACCA candidates. Six percent were in Year 4, and the remaining students are evenly split between Years 2 and 3. Sixty two percent of the participants were female, a participant chose not to reply on gender and the remaining 38% were male. Lecturers at CamEd were also asked to participate by completing a questionnaire designed for lecturers. The student questionnaire was mainly multiple choice and two short answer questions, whereas the lecturer's questionnaire was only multiple choice.

The student questionnaire asked about daily technology use, preference for different kinds of technology in the classroom and included two short answer prompts: 'Tell us one thing that your institution can do with technology to enhance your academic success' and 'Tell us one thing that your lecturers can do with technology to enhance your academic success'. The lecturer questionnaire included questions about class size, beliefs about technology in the classroom and other observations. The themes of this paper are informed by the students' answers to the short answer questions.

# Findings and Discussions

## Students:

### Daily Internet Use

Students were asked about their daily technology use outside of the classroom. About half the students reported spending 1-2 hours a day on each homework, social media, and other uses. While some of these activities probably overlap this potentially an additional 6 hours a day online use outside of classwork.

### Overall Experience

Almost 60% of participants gave a 4 or a 5 out 5 for their "overall technology experience at school". Eighty percent of participants agree or strongly agree that "technology has helped them engage in the learning process" and 56% report "that they are getting more actively involved in courses that use technology." These results are not surprising and are supported by other studies that show students engage better with lessons including technology. As Ed Circuit reports:

> Several studies have proven that the incorporation of electronic devices like laptops, cell phones and tablets can significantly improve student enjoyment in the classroom. Technology makes teaching more dynamic. Instead of reading from textbooks or listening to their teacher, students are encouraged to learn proactively, participating more in lessons and collaborating with peers (EdCircuit, 2018).

### Mobile Devices and WI-FI

Smart phones and laptops were the most frequently used devices on campus. 82% of the 200 participants reported using laptops and 73% reported using smartphones. Tablets are used by 12% of participants. A high percentage (86%) of students reported being satisfied or very satisfied with the level of support provided for mobile devices in the campus. It is not surprising with a high number of mobile devices being used on campus, that students' felt that faster WI-FI was key to their academic

success. When asked "What one thing that your institution can do with technology to enhance your academic success?" Many students requested faster and stable Wi-Fi.

- Wi-Fi should be faster
- I hope my institution can improve the internet speed because sometimes I can't connect to the internet, and I have to use my personal data to connect to my laptop when I have to work in class.
- Provide a better Wi-Fi speed especially a separate Wi-Fi for a class of ASA as we really need a fast speed to catch up while learning Quickbooks

When asked "Which resources/tools do you wish your instructors used less or more?" students rated Learning systems, free web based content, and search tools, the highest. E-Books scored the lowest. (See Table 1). On a scale where 5 = more, 3 = neutral 1 = less all of the technologies ranked between 3 and 4 and E-books were the lowest at 2.74.

**Table 1: Technologies as Requested by Students**

| Technology | Mean* |
|---|---|
| Search Tools | 3.91 |
| Learning systems | 3.85 |
| Free web-based content | 3.81 |
| Lecture Capture | 3.8 |
| Collaboration Tools | 3.51 |
| Social Media | 3.47 |
| Educational Games | 3.41 |
| Non-keyboard Interface | 3.22 |
| E-Books | 2.74 |

*Scale 5 = more to 1= Less.

## Technology Readiness

In 2001, "Digital Natives, Digital Immigrants" Mark Pensky coined the phrase "digital native" to describe the incoming students from kindergarten through college freshman. He describes the ways that these students have been surrounded all their lives with the tools and toys of the digital age, and how this has shaped their preferences and needs.

As the use of digital technology becomes more and more mainstream in university classrooms, institutions and lecturers must not assume all students possess "digital literacy" simply because they are considered "digital natives." and should ensure that students are equipped to fully engage with the technology as needed.

According to the questionnaire only 54% of students reported feeling adequately prepared to use technology needed in their courses and 68% wished they had been better prepared to use basic software programs and applications when starting college (e.g., MS Office, Google apps, etc.). Other comments reflected this and were aimed at ensuring all students have prerequisite knowledge to access technology, or technological skills. Some of the students' responses are presented as follows in their own sentences:

- ➔ Make it easier (for students), provide a flash which contain all the lectures and includes the exercise practice to the students. Because some students they are not really convenient with using the technology and another obstacle.
- ➔ School should have 1-2 hours to teach all the students with the way how to use the technology better than before and faster than before.
- ➔ Provide some extra course about technology.

## Communication with Peers

Technology has been continually changing the way people communicate at a rapid pace for the past 20 years, and these changes have had a profound impact on the college classroom. By using collaboration tools like Google apps, social media sites like Facebook, or even WhatsApp, there are multiple new ways to be connected to each other. Overall, students reported that technology has had a positive influence on their communication with peers.

- 86% percent agreed with the statement that "technology has helped me communicate basic messages."
- 63 % agreed or strongly agreed with the statement that "Technology has helped me understand what other people were trying to communicate to me."
- 62% of students agreed or strongly agreed with the statement that "technology has helped me learn something from other students."
- 60% of students agreed or strongly agreed with the statement that "technology has helped me receive feedback from others right away."
- 54% of students agreed with the statement "technology has helped me explain my ideas in specific terms."
- 41% agree or strongly agree that "technology has helped others learn something from me.

## Communication with Lecturers

Technology is certainly changing the way students and teachers communicate. Technological opportunities mean that teachers are no longer limited to office hours, and impromptu after class conversations.

Clear online communication with professors are among the top answers to the question "What is one thing that your instructors can do with technology to enhance your academic success?"

Some of the students' comments include:

- ➔ Communication with students by replying chat on the other apps such as Telegram, Messenger, and so on for necessary information.
- ➔ Be able to respond back to students when they ask questions via any social media or email.

- ➔ Create groups online (Facebook groups), and allow all students to contact the instructors, and the instructors can also send information that relates to class through this group.
- ➔ Remind us every time there's a deadline or a makeup class or list clearly about which subject when they release the score, since we have so many things to catch up, sometimes it's confusing.

It is interesting to note that students are looking for answers to questions, or are looking to clarify short clear pieces of information like deadlines or test scores. It seems that this access to information is helpful to students and they are requesting more of it across the board.

Some examples of online communication between students and lecturers include answering questions, and receiving feedback. Instead of having to wait to see a lecturer during a scheduled office hours students are finding that online access to lecturers is helping them get timely feedback and access the lecturers more easily.

- 90% agreed or strongly agreed with the statement "technology has helped me keep track of course news or announcements."
- 60% of student participants agreed or strongly agreed with the statement "Technology has helped me ask my instructors questions."
- 57% of student participants agreed or strongly agreed with the statement, "Technology has helped me get feedback from instructors in a timely manner."

The number of students who feel technology has helped them "discuss" topics with their lecturers drops slightly when compared with the quicker communication mentioned above. It seems likely that with the slightly more complicatedness of discussion verses a quick question, that face to face interaction is still preferable.

- 55% of student participants agreed or strongly agreed with the statement, "Technology has helped me discuss course topics with my instructor."

While there are clear benefits to communicating via text, and via social media, relying too heavily on technology also has its drawbacks. A staff from TeachThought, an organisation dedicated to innovation in education through growths of outstanding teachers advocates this view in an article on their site, "*How Technology Is Changing How Teachers Communicate With Students".* She comments on the dangers of relying too heavily on online communication. "When people become addicted to texting, messaging or blogging and forget that the point of it all is to make connections with other humans, then they can become isolated, no more connected," she says (Draxler, 2017). One CamEd student commented that online communication was negatively impacting their experience, "I can ask instructor easily through mail or chat but it seems to have a bad influence on my personal communication (face to face)." The trend seems to be that the more complicated the communication, the less helpful technology was perceived to be.

Finally, technology seems least helpful in helping students approach their lecturers or develop personal relationships with their lecturers. While much can be communicated quickly and conveniently via a short email or various text options we mustn't undervalue the impact of knowing a teacher and being able to relate in a healthy teacher-student dynamic.

- Only 55% of student participants agreed or strongly agreed with the statement, "Technology has helped me view my instructors as approachable."
- Only 45% of student participants agreed or strongly agreed with the statement "Technology has helped me understand my instructors' expectations."

- Only 41% of student participants agreed or strongly agreed with the statement, "Technology has helped me develop a personal relationship with my instructors"

## Google Classroom

Students felt that Google classroom was particularly beneficial, and this was mentioned several times specifically as a means for communication that students felt was underutilized.

- ➔ We use google class as a tool for E-learning whenever we have problem or don't understand anything we can message our instructor there.

One frequent request was for lecturers to post notes or slides to Google classrooms for review, especially for students who were unable to make it to class.

- ➔ Sending his/her brief notes/summary to Google Classroom
- ➔ Post everything in google sheets after finishing lecture (for calculation class)
- ➔ Upload the lecture notes on classroom after we finish the class. So when we miss something we can look at the lecturer's notes.
- ➔ Send the file or notes that he/she has noted to students, in case someone missed some part of it.
- ➔ Keep posting notes by the lecturer every day in the online classroom, so those who are absent are able to catch up with the class.

In addition, Google classroom and other collaboration tools were among the technologies that students request lecturers use more often in class. Learning management systems like Google Classroom rated high with almost 59% of students requesting more of this type of technology in the classroom. Online collaboration tools also rated fairly high with 54% of students requesting more of them. Foremost amongst them is Google Classroom. The benefits of using Google Classroom can not be overemphasized. First, Google Classroom is a free, blended learning platform that offers a variety of benefits for both students and teachers. Whether one offers a 1 to 1 class or 1 to many student classroom, Google Classroom can elevate the classroom's productivity and can take workflow management to a greater level. Secondly, it allows lecturers to see the real-time progress of their students, and work is never lost since Google Classroom is cloud-based storage and not in a hard drive. And thirdly, it allows teachers to ask questions and facilitate online discussions by using the "Create Question" feature to post a question to the classroom stream. This feature also allows a teacher to set it to private so only the teacher can see the responses, or allow students to respond to one another (classroom.google.com, 2017).

## Recorded Lectures

It is not uncommon for students to also be working and or managing family responsibilities, with such a busy schedule and a heavy academic load to manage, student request fast access to high quality recordings of lectures. 66% of students requested lecturers provide access to recorded lectures. These are some of the comments from students:

- ➔ It will be better if LSC send the recorded video after the class ended or at most a few days later. So that the absent students can learn the lectured lesson as if they come to school like the others. Moreover, if the quiz starts the day after the last session lecturer just taught students will also feel confident to do their quiz.
- ➔ Recorded videos are helpful when students are absent or misunderstand something

- ➔ Record the lesson with clear camera to take the clear video.

Also, when asked if students would likely skip classes if materials presented in class are available online, 50% disagreed or strongly disagreed, 25% reported being neutral, close to another 25% agreed or strongly agreed they would be more likely to skip classes.

Other research on the topic of whether lecture capture leads to increased attendance is mixed. One study at King's College London showed a significant decrease in attendance and achievement in one course, once lectures were recorded and made available online. The number of students who skipped class doubled to 40 percent. This in turn led to a significant drop in student attainment (Mckie, 2018).

However, a different study, showed no significant decrease in attendance when highlights of lectures were made available online. According to Havergal (2018), Computer scientists at Queen's University, Belfast who monitored the introduction of lecture captured on their courses concluded that it had not had a negative impact on attendance, and that students had instead used the footage to reinforce traditional learning. Both of these studies acknowledge that attendance is based on a variety of factors and while lower attendance is a risk of lecture capture, it nonetheless has significant benefits for students to be able to revise and review difficult concepts.

## Research

There is a Marshall McLuhan quote from fifty years ago, that continues to be relevant to today's students:

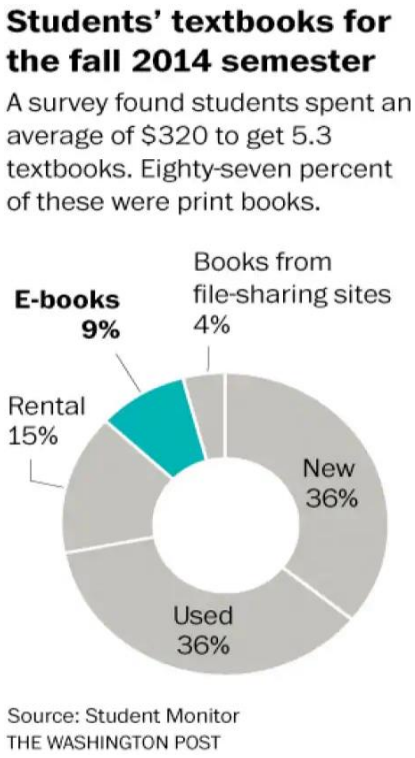
> The electronic environment makes an information level outside the schoolroom that is far higher than the information level inside the schoolroom. In the nineteenth century the knowledge inside the schoolroom was higher than knowledge outside the schoolroom. Today it is reversed. The child knows that in going to school he is in a sense interrupting his education. (McLuhan 1967, cited in Cremin, 1990, p.147).

While the students interviewed may or may not agree that going to school, "interrupts their education" they do request their professors assistance in locating quality online resources to help them practice new skills. Sixty-two percent of students requested lecturers provide additional support and exercises through free web based content such as YouTube or Khan Academy. This was also frequently commented on by students, with additional online practice being a common request. Some of the student comments included:

- ➔ When teaching, instructors can use many programs, websites, and videos to support the lesson and explain extra points which are important and can help students easily understand.
- ➔ Use YouTube examples
- ➔ Provide online practices and lessons
- ➔ They can teach us how to collect data from other sources and teach us how to use that data to complete our work.
- ➔ Give websites that can be a reference to the lectures to read.
- ➔ Get more outside-activities
- ➔ More practice exercises including on Kahoot and some other applications.

While the traditional model of teaching is that the lecturer, conveys his knowledge to his students – technology inside and outside the classroom is changing this, and helping students become increasingly active participants in their own education. One of the key benefits of technology for the participants has

been in the area of  using digital resources in order to extend their knowledge. For example, students might be prompted by their lecturer while in a study session to search or research statistics related to a




particular lesson, and with the right digital tools, students can conveniently and instantly get the result needed.

- 92% of participants agreed or strongly agreed that technology has helped me conduct research for class assignments.
- 86% of participants agreed or strongly agreed that technology has helped me investigate topics outside class time.
- 83% of participants agreed or strongly agreed that technology has helped me analyze data
- 81% of participants agreed or strongly agreed that technology has helped me reflect on course materials (e.g., readings, videos, etc.)

One student commented, “Please teach us how to collect data from other sources and teach us how to use that data to complete our work.” Another student commented, “Give students websites that can be a reference to the lectures to read.”
Indeed, 68% of students requested additional search tools to find references or other information online for class work.
These statistics  reflect the way that increased access to technology is shifting the traditional image of the classroom, with the teacher being the source of knowledge and the students grateful recipients. While these statistics are still from classrooms that fit a traditional model,  as students take more responsibility for their own education, the relationship between teacher and students shifts slightly.
These requests, both for instructors to provide quality links to other sources of information outside of class, and for additional online practice are indicative of a greater shift in the classroom that is made possible through additional technological resources. As technology allows students greater access to resources, students are able to take more responsibility for their learning. Purdue Online university understands this and describes this shifting of the role of teacher and student.

Technology has also begun to change the roles of teachers and learners. In the traditional classroom, such as what was depicted in de Voltolina's illustration by Purdue University Online (2019), the teacher is the primary source of information, and the learners passively receive it. This model of the teacher as the "sage on the stage" has been in education for a long time, and it is still very much in evidence today. However, because of the access to information and educational opportunity that technology has enabled, in many classrooms today we see the teacher's role shifting to the "guide on the side" as students take more responsibility for their own learning using technology to gather relevant information. Schools and universities across the country are beginning to redesign learning spaces to enable this new model of education, foster more interaction and small group work, and use technology as an enabler.

## E-books

E-books have their advantages, including being cost efficient, easier to transport, and providing the professor the ability to personalize their material. In spite of these advantages, print books continue to be the preference for college age students. According to an article in the Washington Post, textbook makers, bookstore owners and college students surveyed, all say millennials still strongly prefer print for pleasure and learning, "a bias that surprises reading experts given the same group's proclivity to consume most other content digitally" (Rosenwald, 2015). A University of Washington pilot study of digital textbooks found that a quarter of students still bought print versions of e-textbooks that they were given for free.

The figure below shows the result of the pilot study by the University of Washington.

The survey result on E-book conducted in CamEd tend to agree with the report on the study by the University of Washington. From the survey, E-books ranked lowest as the types of technology students would like lecturers to use more of in CamEd classrooms.

Some of the student comments on the topic of using E-books in the classroom included:

- ➔ Please print material over E-book or online documents. It has been used for centuries and I believe it won't likely to disappear anytime soon, because it is a necessity for classroom and learning experience.
- ➔ Sometimes, just because we can do it, does not mean we should do it. For me, I prefer text book and printed material over E-book or online documents.

Not all the comments on E-books were negative, one student found them beneficial, "With E-book, I can summarize lessons of lecture by typing, which is very beneficial for me to remember since I learn through practice and typing on the computer makes it faster for me to remember."

## Technology Use by Lecturers at CamEd

A small sample of lecturers (21 lecturers) completed a questionnaire on their professional backgrounds, perspective on technology use in the classroom and the frequency with which they use specific technologies. The participants ranged in teaching years from 1 year to 30 plus years. When asked about their preferred teaching methodology (62%) said they preferred an even balance between teacher directed and student directed learning. The average class size was more than 30 students. While four lecturers said they rarely or only occasionally used technology, the others' use ranged from frequently to almost always.

Lecturers were asked their opinion on the role of allowing student devices in the classroom. Overall, the lecturers' perspective of technology in the classroom was extremely positive.

- 58% agreed or strongly agreed that allowing students to bring their own devices in the classroom promotes student collaboration.
- 62% of lecturers agree or strongly agree that increased use of technology in the classroom promotes the development of communication skills, especially in writing, presentation and calculating (the use of Excel) skills.
- 76 % of lecturers agree that Increased use of technology in the classroom gives teachers the opportunity to be learning facilitators instead of information providers.
- 76% of lecturers agree or strongly agree that incorporating technology in the classroom motivates students to get more involved in learning activities.
- 57 % of lecturers agree that allowing students to bring their own devices in the classroom improves student learning of critical concepts and ideas.

Similarly, as stated by CampTechnoloy, "*Teaching with Tech survey 2018"*, 83 percent of faculty members at colleges and universities across the United States said technology has had an "extremely positive" or "mostly positive" impact on education in general. In addition, " Eighty-seven percent of respondents agreed that "technology has positively affected my ability to teach," while 83 percent said that "technology has positively affected my students' learning" (Kelly, 2018).

Lecturers were also asked which technologies they used in the classroom and how frequently.

- The majority of lecturers interviewed reported used online collaboration tools, 24% reported using them fairly often, 29% reported using them very often and 14% reported using them almost always.
- Lecturers were divided on how often they used cell phones (or other devices as part of a lesson) 52% reported using them very often or almost always.

## Conclusions

This paper sought to measure the impact of technology on education from mostly students perspectives. Overall, student experience with technology has been positive fostering more involvement and easing communication with lecturers. Some of the themes that came out of the student responses are noted here.

It is key to ensure that all students have the technological skills needed to manage the expectations in CamED Business School as only a little over half the students reported being prepared to use the technology required of them. Also students would like lecturers to make better use of collaboration apps such as Google Classroom and other social media sites to provide timely feedback and notify students of class specific deadlines. A common request from students was more online exercises and other quality links to continue their learning outside of the classroom. Another key request, from students was for class lecture videos to be of good quality, and be made available as soon as possible to help students who are not able to attend class to remain caught up on classwork and not fall behind in classes. Finally, E-books were rated the lowest among technology from the students perspective. This is supported by other studies reporting that students still prefer paper handouts and textbooks. Of course this is an outlier amongst the many other positive responses we received on the survey on the impact of technology in the classroom.

Not all the lecturers are onboard the transition from a conventional 'old school' way of teaching to this transformational innovative approach of teaching and instructing.

As CamED and other institutions continue to incorporate more technology into their teaching and classroom experience, it will continue to be of great importance to listen to student experiences and opinions to ensure that the full benefits are available to students, and that personal connections are maintained.

## Recommendations:

- Ensure that all students have the technological skills necessary to thrive at CamEd business school. Support should be provided either in the form of a dedicated class for freshman or a short tutorial during orientation to ensure all students have the technical knowledge and skills needed to succeed in the tech heavy courses.
- More if not all the lecturers should prioritize the use of technology in their classrooms. And more should be done to educate or persuade the conventional lecturers on the unavoidable, innovative educational trend.

- Encourage all lecturers to make use of the various collaboration apps/platforms available such as Google classroom, Canvas, Moodle, Kahoot,Youtube, and other social media apps to create discussion forums, provide feedback and notify students of class specific deadlines.
- Evaluate class lecture videos – ensure they are good quality and made available to students quickly to help students who are not able to attend class to catch up quickly.
- Lecturers should be encouraged to include both more online exercises and provide quality links to students to continue their learning outside of the classroom.

- Consider responding to student feedback and offer students the option of purchasing some textbooks in hard copy and providing some handouts in paper form.

## Limitations:

The lecturer sample size limits the scope of the results. Initially, it had been hoped that there will be correlations between lecturer's characteristics such as teaching experience, teaching style, and use of technology in the classroom. For example, did teaching experience impact preference for technology in the classroom?

However, with such a small sample size data, it was not reliable to look for any such correlations. A second key aspect of technology in the classroom is supporting lecturers in the use of technology in the classroom, and while beyond the scope of this paper, more research could be done into which factors lead to lecturers successfully incorporating technology in the classroom.

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# Appendix

To view all the data results and charts see the attached links

**Students Questionnaire (Appendix 1a)**

https://drive.google.com/open?id=1krIPUk_lYBQ0rxHBTkhx66ApEMlqyg8j

**Students response chart and analysis (Appendix 1b)**

https://docs.google.com/forms/d/1YR4TyQA3RC-sIDAa48Xkhova1Dv8doO5LV_Lj9rkOXg/view**Lecturers Questionnaire (Appendix 2a)**

https://drive.google.com/open?id=1ntICe4v-aaOg9ZVe0drousK-MFYdY3uQanalytics

**Lecturers response chart and analysis ( Appendix 2b)**

https://docs.google.com/forms/d/1EWFBbqaiWcSOuJqkCoHoFeVUoimxaokJ-kuwT6HztJw/viewanalytics