Student Perceptions of the Use of Technology in Teaching: Towards a Positive Learning Experience

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Introduction

In working towards achieving successful educational outcomes, we as educators need to identify and be constantly cautioned against the potential pitfalls in teaching and learning. These pitfalls can include: new teachers in (and having to adjust to) a novel environment, teachers spending too much time on one student/group whilst neglecting the rest of the class, and failing to engage in effective long-term and/or daily planning (Kizlik, 2012). These pitfalls can be potentially "punishing" for students. In an interview recorded in Sharpe (2012), students perceived unjust treatment by teachers as one of the root causes of unhappiness, resulting in them feeling embarrassed and humiliated. We think that these "punishing" feelings—while they may only manifest subtly through silence, passive engagement or the shrugging of shoulders (Chong, 2006)—should not be overlooked.

We face a similar situation in higher education. In our quest to achieve success in the area of teaching and learning in tertiary institutions, we as educators need to be careful when it comes to dealing with potential pitfalls. In higher education, teachers arguably become learning facilitators rather than intellectual authorities (Sternberg, 2012). Tapscott (2009) attributes this "shift" in the teacher role to "young people (who) are forcing a change in the model of pedagogy, from a teacher-focused approach based on instruction to a student-focused model based on collaboration" (as cited in Sternberg, 2012, p. 576).

It is particularly crucial to note that as students make this immediate transition to a more independent learning system that emphasises collaborations at the higher education level, this experience may inevitably lead to students feeling neglected by the system (Ashworth et al., 2006). This is due in part to a few factors:

- larger class sizes that students experience in higher education (increasingly so in institutions such as the polytechnics and universities);

- academic staff who are now preoccupied with multiples roles beyond teaching might be perceived to lack concern for undergraduates.

These feelings of neglect can, in our view, be "punishing" for students.

Technology in Teaching & Learning in Singapore

There were policy aims formulated in 1997 to develop Singapore's institutions of higher education into world-class institutions, and for Singapore to become the "Boston of the East", with Harvard University and Massachusetts Institute of Technology serving as role models (Tan, 1999). The government sought to change the way students learn, by encouraging greater self-direction, independent learning, and creativity, in order to meet the needs of a global information economy. One way to help students attain these learning outcomes is by making use of educational technologies (Ziguras, 2001). In order to gain a better understanding of student reactions towards the implementation of educational technologies in a higher education setting, we conducted interviews with extant students and student alumni from the Faculty of Arts and Social Sciences (FASS). Based on our interviews, some examples of technology being applied to teaching and learning at NUS which students have cited in the interviews include e-learning, the Integrated Virtual Learning Environment (IVLE), webcasts/podcasts, and classroom clickers.

As we discussed earlier, in our quest to achieve successes in teaching and learning, educators need to exercise care about avoiding and/or addressing potential pitfalls when it comes to using technology in teaching. In a similar vein, technology used in higher education can, in our opinion, fetch benefits when they are applied judiciously. However, they can potentially induce punishing sentiments if we (unintentionally) misapply them on teaching and learning platforms. We proceed, in the following sections of this article, to report the benefits and potential pitfalls associated with using technology in teaching and learning which we gathered through our interviews. We particularly propose recommendations (e.g., solutions, suggestions) with the goal of circumventing these potential pitfalls. We seek to raise an awareness about potential pitfalls such as the ones we report, in hope that the use of technology in teaching and learning can ultimately be a yet maximally fruitful endeavour.

Our Study

12 students from FASS who are pursuing/ have pursued different areas of studies were interviewed using online surveys. They were first asked how technology has, based on their own experiences, been applied to teaching and learning in NUS. Of particular pertinence to our present discussion are the following two questions which we posed to our interviewees:

1. Has the use of technology in teaching supported and/or enhanced your learning experiences? If so, how so?

2. Has the use of technology in teaching impeded, been detrimental to, and/or felt like it was punishing for your learning experiences? If so, how so?

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Here, we provide examples of the interviewees' qualitative comments:

Elements that promote learning:

- "Webcasted lectures are very useful in my opinion. It allows us to 'attend' the lectures once again to take note of those learning points that we missed in the actual lecture." (Year 3, Psychology major)

- "The online portal makes the learning experience for the students very convenient as it is literally a one-stop platform to get all the information you need. Module requirements, class roster and timetable, reading materials and lecture notes can all be found in the portal." (Year 3, Political Science major)

- "If there is not enough time to discuss a certain topic or issue during class time, it helps to take it out of the classroom onto the online forum, where there can be more in-depth discussion." (Alumnus, History major)

Elements that impede learning:

- "For some modules…, assessment for class participation includes participation on the online forums as well. Thus, at times, students have resorted to posting opinions that might not be relevant to the topic at hand itself. They would think that number of posts [per se] will correspond to the grade that they would get for class participation, often leading to spamming." (Year 3, Political Science major)

- "… our tutorial was catered for the students to spend the time on Second Life [a virtual platform]. Personally, I don't think this was necessary since it does not aid in the learning of any particular concepts taught in the module. It seems pretty redundant in my opinion." (Alumnus, Economics major)

- "For some lecturers who do not employ the use of PowerPoint slides appropriately and effectively, they may copy and paste a lot of information (from the textbooks) on to slides and present wholesale from the slides, and this may cause students to feel like they are not benefitting from attending classes because they can just print out the hand-outs and skip classes." (Year 4, Psychology major)

We consolidated the interviewees' comments and coded them into a number of categories; we also subsumed related code categories under broader groupings. First, students reflect on whether technology in teaching has provided rewarding learning experiences:

Table 1a. Student responses to whether technology in teaching has enhanced their learning experiences

Groupings	Codes	Students' Consolidated Comments
Consolidation in Learning	**Repeat**	"Webcasts enable, in a sense, repeated lecture attendance to clarify concepts." (Alumnus, Economics/Psychology)
	Recapitulation	"Webcasts provides a recapitulation of lectures, thus allowing for full attention and processing of information during actual lecture rather than busy taking notes." (Alumnus, Economics major)
	Revision	"Podcasts assist in the revision process, and help develop listening skills." (Alumnus, History major)
	Remedy	"Webcasted lectures enable one to note learning points that have earlier been missed during class." (Year 3, Psychology major)
Convenience in Learning	**Easy Access**	"The intranet system allows easy access to learning materials and post doubts on forums." (Year 2, Economics major); "Allows for easy access for future references." (Year 3, Political Science/ German)
	Quick Communication	"Convenient, efficient information acquisition." (Year 3, Psychology major); "With the click of a button, the online portal is convenient to access much information, and good for communication purposes." (Year 3, Political Science major)
Empowered Learning	**Bridging**	"PowerPoint slides and visual aids bridge teaching and learning." (Year 3, History major); "Visual aids like PowerPoint presentations and visualizers help bring learning points across." (Year 3, Political Science major)
	Clarity	"PowerPoint and videos enable information to be presented in concise and interesting formats that add value to the learning experience." (Year 4, Psychology major); "Visual learning is the key to students' grasping of complex concepts on PowerPoint." (Year 2, Economics major)
	Captivation, Enhancement	"Technology helps to deliver materials better and enhances students' learning experiences by adding more variety to mundane teaching materials." (Year 3, Psychology major); "Visual aids enhance students' understanding of a concept." (Year 3, Psychology major)
	Practicality	"The learning of SPSS (statistical) software helps students to get practical hands-on experience." (Year 4, Psychology major)
Interactivity in Learning	**New Platform**	"Online forum is an alternative platform for students to participate in discussions." (Year 3, History major)
	Extension	"Online forum provides the time needed for extended discussions and allows for in depth discussion through further research." (Alumnus, History major)
	Monitoring	"Clickers are convenient for monitoring the classes' progress." (Year 3, Psychology major)
Organized Learning	**Consistency, Intensive**	"Technology helps in organization. For language acquisition, technology helps in providing regular and intensive learning." (Year 3, Political Science/German)
	Facilitation	"Facilitates learning through easy accessible information, and useful for revision in organization and efficiency." (Year 1, Literature/Religious Studies)

In this next cluster of qualitative comments, students reflect on whether technology in teaching has impeded their overall learning experience. We also proposed some recommendations to overcome these negative experiences:

Table 1b. Student responses to whether technology in teaching has impeded their learning experiences

Groupings	Codes	Students' Consolidated Comments	Our Recommendations
Barriers to Learning	**A Hassle**	"E-Learning week is a hassle with little learning. Technology places a barrier between teacher and student, as the teacher was not present to correct mistakes or explain complexities." (Year 3, Political Science/German)	Learning objectives for e-learning should be clearly stated (and reiterated) to students.
	Lack of Real Interaction	"Potential for learning is lost when technology becomes a main medium of learning rather than a supplement to real-life interaction." (Alumnus, History major); "Less voluntary interaction between mentors and students reduces learning, while real-life interactions would have provided more insights." (Year 3, Psychology major)	Instructors could remain contactable at least electronically, and inform students so, in order to maintain interaction and offer clarifications and guidance on the subject matter. In particular, instructors ought to monitor these learning processes closely and intervene as mediators to effectively facilitate any online discussions.
	Lack of Mediator	"A lack of a mediator in online forums during tensed [*sic*] arguments is detrimental to learning goals." (Year 3, Political Science major)	
Apprehensions towards Learning	**Technology Failure**	"Technology failure (e.g., IVLE system breakdown) can cause frustration." (Alumnus, Economics/Psychology)	Instructors should be duly prepared (e.g., maintain backup plans) in the event these technological devices fail unexpectedly.
	Unfamiliar Technology	"Learning to use new technology (e.g., software, programs) is time consuming, and can be stressful and frightening." (Year 3, Psychology major)	Systematic guidance (e.g., scaffolding) by instructors would be necessary if learning new (difficult) software were requirements in certain modules.
Loopholes in Learning	**Overreliance, Imbalance**	"Having to rely on technology is imminent." (Year 2, Economics major); "Over-reliance on technology may lead to cutting down on traditional essentials (i.e. textbooks)." (Year 1, Literature/Religious Studies)	Students should be explicitly (de)briefed by instructors on the reasons for the use of technology at appropriate junctures, as well as the reason for juxtaposing technological with traditional pedagogical methods.
Disruptions to Learning	**Irresponsible Behaviour**	"Inappropriate and ineffective use of PowerPoint slides by pasting chunks of information from textbooks caused students to skip classes." (Year 4, Psychology major)	Prepare and use PowerPoint slides succinctly to avoid overcrowding of/ excessive information that can be a distraction during class instruction. Clear classroom rules and regulations should be set (and their motivations clarified) during the first lesson to establish mutual trust between teacher and students.
	Distraction	"Laptops used during classes or studying can be distracting as it is easy to multitask and do things concurrently but which are not related to the class material or discussions." (Year 3, Psychology major)	

Groupings	Codes	Students' Consolidated Comments	Our Recommendations
Deficiencies in Learning	**Limited, Redundant**	"E-Learning platforms are too limited to explain contrasts in scientific methods and theories for the social sciences." (Year 3, Political Science/German); "Virtual platforms (i.e., Second Life) did not aid in the learning of concepts and seemed redundant." (Alumnus, Economics major)	Instructors could state learning objectives to students clearly, and the motivations for using (or not using) particular technologies (e.g., clickers, online forums, e-lectures, technological device per se) on particular instances.
	Irrelevant Spamming	"Weekly forum participation "forces" students to have to chase after participation points." (Alumnus, Economics major; Year 3, History, major); "Tutorial participation points are awarded for online forum/blog posts places undue pressure on students and forces them to write even when they have not learnt anything." (Alumnus, History major); "Students resort to posting opinions on online forums that are irrelevant to topics, thinking that more posts will increase grades, often leading to spamming." (Year 3, Political Science major)	Specifically for online forums, instructors could clarify that it is not the number of posts that count for points/grades; it might also be worthwhile to explicitly explain the grading matrix in order that students have a clearer idea on how they are assessed, and to in turn minimise spamming of irrelevant posts and maximise learning.
	Unfair Assessment	"Compulsory use of technology for assessment (i.e., equating technology with creativity) may impede learning and be discouraging, as students are not fairly assessed on what has been taught/learnt." (Year 4, Psychology Year major)	Instructors could state learning objectives to students clearly, and the motivations for using (or not using) particular technologies (e.g., clickers, online forums, e-lectures, technological device per se) on particular instances.
	Time Wastage	"Electronic clickers do not increase learning and may be a waste of time." (Year 4, Psychology major)	

Reflections

In this article, we report qualitative feedback data gathered through interviews with past and present students from FASS concerning the use of technology in teaching and how technology impacted their learning experiences. We found that the use of technological devices in teaching can be highly rewarding when they are applied judiciously. At the same time, we highlight to instructors that the use of technology might, on occasion and in unintended ways, potentially lead to "punishing" pitfalls in learning. We then propose how these "punishing" feelings can be thoughtfully avoided. For instance, we think that it will be helpful if instructors could, at the least, provide clarifications to students with regards to the motivations behind their pedagogies, in order to illuminate the particular reasons for (not) using certain technologies/technological devices in their teaching activities and, in so doing, attain desired student learning perspectives, attitudes, and outcomes. It is our hope that this article would have raised an awareness for the need to use technology in teaching while carefully bearing in mind potential student reactions, so as to create maximally positive and student-centric learning experiences.

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