Flipping Chaos: Evaluating the (Over)use of Digital Resources with a Large First-Year Undergraduate/Freshman Class

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A Senior Teaching Fellow in Psychology discovers that less is more when it comes to flipped classrooms.

Introduction

The flipped classroom model was first introduced and described by Bergmann and Sams (see Bergmann and Sams 2013, 120–90). In recent years, the flipped classroom model has gained popularity to enhance student engagement and learning outcomes. When implementing a flipped classroom, students are asked to prepare for class by reviewing pre-recorded lectures and engaging in related activities before attending in-person classes. This preparatory review allows for an active student-centred application of knowledge during in-person classes as opposed to a passive teacher-focused transmission of knowledge. For this reason, I decided to flip my lectures during fall of the 2022–23 academic year so that the in-person classes could provide activities that consolidated knowledge and were more fun and engaging than a traditional lecture. Despite its promise, the flipped classroom model can sometimes fall short in practice, as was the case during the sessions I delivered during the Fall 2022 semester. In fairness, this experience was more my failure than a failure of the technique! In my classroom, students faced challenges with working in groups due to the large room and noisy environment, as well as technical difficulties with the unreliable Wi-Fi. The use of multiple digital tools also added to the confusion and digital fatigue experienced by students. In light of these challenges, my account aims to reflect on the failure of the flipped learning approach in this situation, and offers insights and recommendations for future implementations.

Using the Flipped Classroom Approach

I opted to adopt the flipped classroom approach for a cohort of undergraduate university students in their first year of studying psychology. There are approximately five hundred students in the class, with only one lecture theater on campus that can accommodate a class of this size.

Students were invited to view lecture videos and engage with supplementary learning materials in the virtual learning environment before attending an in-person session on campus. During the in-person sessions, the aim was to consolidate students’ understanding of the lecture content through various interactive activities. At the start of each in-person session, I would begin by providing a brief overview (5-10 minutes) of the lecture content for that week. There was then an opportunity for students to ask questions or seek clarification, either verbally or via a Wakelet (a digital curation tool) QR code. I used various interactive activities to engage students and support their learning of the material. For example, students were invited to, in groups, find the absolute thresholds for vision, hearing, taste, touch, and smell and post to Wakelet. For signal detection theory, students were presented with real-world scenarios and invited to identify what a hit, miss, false alarm and correct rejection would mean in that scenario, for example, “a medical technician is examining a scan looking for evidence of a tumour. In groups, come up with a description of what a hit, miss, false alarm and correct rejection would mean in this situation.” Again, students would be invited to post their thoughts in an online platform such as Google Jamboard, Padlet, or Wakelet. To explore colour perception, students were invited to, in small groups, find out more about one visual colour illusion from a list provided. They were then asked to

share their illusion, along with an example and brief explanation, in an online platform such as Google Jamboard, Padlet, or Wakelet. I also administered interactive quizzes during the in-person sessions using Vevox, a polling app. Students accessed the quiz via a smartphone or laptop and the question types varied between multiple choice, wordcloud, true/false, ranking, text response, star rating, and identifying the correct part of an image (e.g., clicking on the correct part of an image of an eye when asked to identify the retina). A variety of activities were employed during in-person sessions. At each in-person session, my aim was to consolidate and apply knowledge in an active and engaging way.

Reflections and Future Plans

The higher education sector is undergoing a significant shift, with universities moving away from traditional on-campus teaching models towards online and blended learning. This trend has the potential to increase accessibility in higher education, as evidenced by studies such as Verdinelli and Kutner (2016, 353–368). However, the transition to online and blended learning can pose challenges, particularly for students attending university for the first time. In the current context, attendance was a concern as the lecture videos were all made available via the virtual learning environment and only around half of the cohort attended the in-person classes. The shift to a flipped classroom approach was delivered during the first in-person academic year post-COVID, and many students had recently graduated from high school, with expectations that may have been different from the blended learning model. With hindsight, it may have been too soon for a full transition to flipped lectures. These students were easily distracted and, in many cases, unwilling or unable to engage, leading to a one-sided interaction during lectures.

When using the assigned interactive tasks during our in-person sessions, I found that the level of difficulty and challenge was appropriate. The problem I had was with student focus. With too many independent tasks, towards the middle and end of the session, student focus dwindled and there was less engagement with the tasks, less interaction with me (i.e. I would ask questions of the group that were unanswered, perhaps because the tasks had not been completed), and students generally seemed more distracted, perhaps fatigued or bored with the interactive tasks they were being asked to engage with. In future, integrating tasks into a more traditional lecture would provide a balance between the passive teacher-focused transmission of knowledge that 1st year undergraduate students might be more familiar with from the school environment, and the active, independent student-centred application of knowledge that is expected from university-level study. The traditional lecture sees the lecturer stand in front of the class and deliver content in a mostly one-sided transmissive way. Embedding pauses in the lecture to introduce short interactive quizzes and activities would provide a direct application and consolidation of the material immediately following content delivery. This approach allows students to test their own knowledge and understanding in an engaging manner and receive immediate feedback.

It is also important to consider the readiness and expectations of students when transitioning to online and blended learning models. Understanding the unique experiences and needs of these students can inform strategies to support their engagement and academic success. In future classes, I plan to integrate the peer-learning activities into a more traditional lecture. That is, present some lecture material then pause for an activity, followed by the presentation of more lecture material, then an additional activity, and so on.

The in-class tasks I developed often required students to work together to discuss `problems’ such as signal detection theory scenarios, or finding and describing a visual illusion; however, the lecture theater in which the class was held was a tiered lecture theater with fixed seating which made it difficult for students to work in groups. This is something that must be considered prior to delivery, and activities adapted to suit the environment.

In addition to the layout of the room proving problematic for the success of peer-learning activities, the large number of students in the room inevitably led to increased noise levels during group discussions,

which posed difficulties for students with sensory issues. In future, the sessions would work better if students were split into smaller groups in a room with flexible seating.

Additionally, the Wi-Fi was unreliable, which prevented some students from engaging with the online resources. Some students felt excluded if they were unable to provide a response electronically. This challenge was, however, a misunderstanding because it was possible for students to engage with the activity without relying on technology by noting the answers offline to test and consolidate their own understanding. To address these issues in future classes, I will make it clear that engagement with technology is optional and will clearly outline the alternative offline methods of engagement.

The integration of technology in education has been an area of interest and exploration for many educators, particularly with the advent of online and blended learning. In my own teaching practice, I utilize the polling app, Vevox, which facilitates real-time feedback and interaction with students during the lecture, and provides a welcome `pause' (Ruhl, Hughes, and Gajar 1990, 55–64) for students, as well as providing opportunities for engagement and collaboration. I have used Vevox successfully for many years. However, during a series of classes I delivered in Fall 2022, I made the mistake of introducing multiple digital tools into the in-person class sessions, including Vevox, Wakelet, and Google Jamboard. I had enthusiastically embraced technology to collect feedback during class on things that weren't understood; I set up online spaces for students to share the outcomes of their group discussions; I had a bank of online questions for them to engage with. As well-intentioned as these pedagogical measures were, the use of multiple digital tools proved to be confusing for students. They not only had to contend with accessing one online platform, but instead were being expected to juggle up to three different platforms during one in-class session. On top of this, they may also have been unable to access the online spaces due to the unreliable Wi-Fi. Sitzmann, Ely, Bell, and Bauer (2010, 281–92) showed that technical difficulties can impact learning outcomes and contribute to student attrition. Perhaps this explains the poor attendance in subsequent classes.

Conclusions

I made several mistakes in my application of the flipped learning approach. Firstly, I focused too much on technology-based activities such as digital quizzes and the use of online responses, and I relied heavily on various digital tools like Padlet, Wakelet, Vevox, and Jamboard. Additionally, I attempted to fully flip the classroom for students who may not have had enough experience with independent learning at the university level. The flipped classroom approach involves providing lecture content online and using in-class time for tasks that reinforce learning. Despite my best efforts, this approach was not entirely successful, and students experienced issues with digital access and fatigue. In hindsight, I realize that reducing the number of digital tasks during in-class time and limiting the range of digital tools would help alleviate digital fatigue. For example, instead of asking students to provide online feedback for a task, I could ask for verbal feedback in class. In the future, I plan to integrate elements of the flipped approach into a more traditional lecture-based method of content delivery. This integration could involve asking students to view a video introducing basic concepts before class, followed by a brief summary of the content at the beginning of the live session. Then, new related content could be introduced using a standard lecture delivery approach, broken up by interactive tasks that do not all rely on digital technology. This approach would offer a flexible learning environment that combines traditional lecture methods with the benefits of asynchronous and interactive synchronous learning. The interactive tasks used need not all be digital, reducing the potential for digital access issues or digital fatigue. In light of these experiences, I recommend securing an appropriate space and limiting the use of technology to one digital tool per session, reducing the potential for technical issues and limiting confusion or digital fatigue for students.

The flipped classroom approach offers many benefits to students such as supporting knowledge, skills and engagement (Murillo-Zamorano et al. 2019), providing a more interactive environment that is better

suited to twenty-first–century learning and work environments (AL-Shabibi and Al-Ayasra 2019: 96–127) and improving student learning performance (Akçayir and Akçayır 2018, 334–45). These are clearly benefits that educators would wish to retain and so incorporating elements of flipped learning into the classroom, even if the entire session is not flipped, will offer advantages to students.

References

AL-Shabibi, T.S., and Al-Ayasra, M.A. 2019. “Effectiveness of the Flipped Classroom Strategy in Learning Outcomes (Bibliometric Study).” *International Journal of Learning, Teaching and Educational Research* 18: 96–127.

Akçayir, G., and Akçayır, M. 2018. “The flipped classroom: A review of its advantages and challenges.” *Computers and Education* Volume 126: 334–45.

Bergmann, Jonathan, and Aaron Sams. 2012. *Flip Your Classroom: Reach Every Student in Every Class Every Day*. Washington DC: International Society for Technology in Education, 120–90.

Murillo-Zamorano, L.R., López Sánchez, J.A., and Godoy-Caballero, A.L. 2019. “How the flipped classroom affects knowledge, skills, and engagement in higher education: Effects on students′ satisfaction.” *Computers & Education* 141, https://doi.org/10.1016/j.compedu.2019.103608.

Ruhl, K.L., C.A. Hughes, and A.H. Gajar. 1990. “Efficacy of the Pause Procedure for Enhancing Learning Disabled and Nondisabled College Students’ Long- and Short-term Recall of Facts Presented through Lecture.” *Learning Disability Quarterly* 13: 55–64.

Sitzmann, T., K. Ely, B.S. Bell, and K.N. Bauer. 2010. “The Effects of Technical Difficulties on Learning and Attrition During Online Training.” *Journal of Experimental Psychology: Applied* 16 (3): 281–292.

Verdinelli, Susana, and Debbi Kutner. 2016. “Persistence Factors among Online Graduate Students with Disabilities.” *Journal of Diversity in Higher Education* 9 (4): 353–68.

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