

Adaptation of the Flipped Classroom (FC) Design to Higher Education in the Age of Digital Disruption

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Abstract: In the midst of digital distractions in higher education classrooms, where students are constantly distracted by personal technologies, such as smartphone, personal computer, and social media, scholars have studied the flipped classroom (FC) design and tested it against conventional lecture pedagogy, which appears to contradict present-day college students' diminishing attention span and their irresistible urge to engage with digital distractions in classrooms. The author discusses the pros and cons of the FC design.

Key words: flipped course, pedagogy, technologies, distractions, education

JEL code: M

1. Introduction

Education is always about individuals' pursuit of continuous improvement, and it is a passport to the future that allows them to prepare for it today. What education promises can only be actualized in the future; however, those who are investing in education do gain psychological benefits from a sense of achievement and a sense of being prepared for an uncertain future. Education enables one to strive toward their passions by shaping their viewfinders of seeing our world and their philosophies of understanding themselves and others. It is no coincidence, therefore, that education has also been regarded as the apparatus for reaching a state of enlightenment — being advanced and learning necessary information, knowledge, or spiritual awareness (Jianfu, 2009) — while educated individuals have always been respected for their rigor, drive, and persistence in learning (Bahtilla & Xu, 2021).

In fact, learning is different from being taught. "Being taught" is based on an expectation of what others will do for us within the confines of their influence, such as being taught by a teacher in a classroom. On the other hand, learning is a much more powerful and proactive concept, embracing an expansive and inclusive perspective of what, where, from whom, and how a student will learn. In other words, being taught is limited to the passive process of imparting knowledge, while learning is about the proactive process of acquiring knowledge (Ivory, 2021). Despite the expansive nature of learning, the primary delivery mechanism of education has been lecturing since the ancient times of Greek philosophers, which requires students to pay close attention to lectures while being taught at classes. However, research shows that an average attention span of 15-20 minutes is often observed among typical college students at the beginning of a class, and that attention span declines steeply afterward (Sakar et al., 2020; Wilson & Korn, 2007). Other research even suggests that college lectures should

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adhere to the 10—15 minutes attention span that is characteristic of modern-day college students (Bradbury, 2016). Being a passive learning, lecturing often bores students, and they tend to disengage with the course materials (Sakar et al., 2020). Even worse, powered by personal technologies, such as smartphones, personal computers, and social media, students' distractions have increased steadily with constant smartphone notifications, urges to engage in online shopping, or digital conversations with their peers consuming their attention (Schneider 2018). In addition, students' pre-class foundational knowledge acquisition often assists them in deepening their understanding by combining the gained knowledge with exposure to applicational knowledge (Moravec et al., 2010; Strelan et al., 2020), hence losing pedagogic effectiveness without the students' preparation and attention. In the age of digital distraction, students' over stretched attention often disrupts their information absorption during in-class lectures; besides their seemingly hectic lives do not guarantee their pre-class knowledge exposure (Sandbox, 2020). The plethora of social media and smartphones leading to shrinking attention spans of college students and the culture of instant gratification have become the most formidable obstacles against college classrooms.

Consequently, lecture and class-wide discussions inherently contain a fatal flaw: instructors assume that everyone who attends classes wants to learn, investigate, and explore knowledge. Many instructors do find their teaching rewarding with students who ponder their own contributions to class discussions and demonstrate their understanding of course ideas. Nevertheless, most college students view coursework as little more than a sequence of hurdles on their paths to desired jobs and lifestyles, while only a minority appreciate classes as an opportunity to learn, investigate the complexities of our world, and explore the realm of knowledge (Clydesdale, 2021). Especially among high school students, college is a means to an end, getting a job (Selingo, 2018). Thus, while only a minority of students are willing to spend time and effort to learn and explore, most students may care about grades but balance them against other priorities, such as employment, family, relationships, extracurricular activities, or other classes that they find more valuable. At the same time, some students may orient their week around hedonic events, such as sport games or other gratifications, with minimal effort to meet academic requirements (Clydesdale, 2021).

Therefore, lectures with an expectation of voluntary active learning and contribution to class discussions are not only ineffective with those who view certain courses as “hurdles” to pass, but also inefficient as a primary education method, making traditional lectures increasingly irrelevant for this era. Hence, the proposal of adopting the flipped classroom (FC, hereafter) design is worth considering in order to educate contemporary college students whose motivations to pursue higher education have become more diverse than ever.

2. Literature Review: Flip Classroom (FC) Design

Traditionally, in a lecture-based class design, course content is acquired in class, while applied learning takes place outside of class via homework assignments or class projects. The FC design reverses the traditional dynamic: students are accountable for acquiring knowledge out of class by gaining first-exposure learning prior to class via lecture videos, assigned readings, or other online videos or resources. Then, class hours are dedicated to applicational activities of knowledge facilitated by instructors while students work together. In other words, students are engaging with lower levels of cognitive work, like gaining knowledge and comprehension, outside the classroom while their in-class hours are repurposed for higher levels of cognitive activities such as application, analysis, discussion, and problem solving, guided by their instructor and with the support of their peers. This

approach reverses the order of the first exposure to new materials before coming into the classroom, hence the term flipped classroom (FC) or inverted classroom (IC) design (Fang et al., 2022; Sarkar et al., 2020; Strelan et al., 2020).

Theoretical underpinnings of the FC can be traced back to the constructivist theory of knowledge, which postulates that knowledge is a state of understanding, resulting from continuous interactions between learners and their environment (Sohrabi & Iraj, 2016; Woolfolk, 1993). Entrenched in a series of learning theories (Dewey, 1998; Piaget, 1972; Vygotsky, 1978; Bruner, 1990), the theory states that learners are active participants in their learning journey. Learners' knowledge is constructed based on their experience and incorporation of new ideas and prior knowledge, which leads to the development of a unique understanding of the newly synthesized knowledge (Fox, 2001; Sfard, 1998). In addition, while students construct and synthesize knowledge via collaborative learning, they also learn by teaching others. As the Roman philosopher Seneca stated, "While we teach, we learn", students can learn more effortfully when they teach others. This phenomenon is referred to as the protégé effect (Chase et al., 2009), and it postulates that direct teaching benefits students' learning and raises their own self-efficacy and self-esteem (Koh et al., 2018; Paul 2012; Rienovita et al., 2018). An FC environment transforms a formerly direct instruction-oriented room into a pedagogical space where a group engages in dynamic interactive learning (Odell, 2018). As learners' continuous engagement with the subject and interactions with others via peer and/or collaborative learning and teaching are crucial for effective FC learning (Fang et al., 2022), the FC design aligns well with the constructivist theory of knowledge, providing the relevant theoretical framework as the next mode for an effective higher education.

The flipped classroom (FC) has been broadly adopted in elementary and secondary education since 2000, while college-level business courses have been slow to adapt (Sarkar et al., 2020). Among its benefits, the FC model allows students to engage in collaboration based active learning (O'Flaherty & Phillips, 2015), improving their learning outcomes (Bransford et al., 2000; Freeman et al., 2007). Other research reports that students improved exam scores and achieved more efficient course content learning, allowing them to perform better in their overall course assessment due to the enhanced motivation to learn (Peterson, 2016). Instructors were able to improve optimization of time, with some instructors being able to cover additional topics that were not feasible under the conventional lecture model. Given the model's core idea of students' self-learning, instructors reported that more time was dedicated for more personalized and diverse teaching and learning processes (Bouchrika et al., 2019; Colomo-Magaña et al., 2020). From an institutional perspective, the FC model adapted classes showed higher retention rates than other hybrid classes, potentially being contributed by their structure, which keeps students engaged and motivated (Sakar et al., 2020; Hossein-Mohand et al., 2021).

Nevertheless, the FC model is not free of its challenges. First, the model is likely to increase workload for the instructor vastly, as it involves significant time and effort to rethink course structure and prepare both pre-class and in-class activities (Sakar et al. 2020). Although some instructors reportedly managed to add additional topics to their classes (Bouchrika et al., 2019; Colomo-Magaña et al., 2020), instructors may need to decrease the course content, considering that the FC model is inherently associated with greater student participation, dialogue, and coordination.

Second, as the FC model requires careful coordination of course activities, communication to students regarding expectations and content integration is critical. As much as it can both accommodate coordination of pre- and in-class activities, students might resist such a transition from being passive in a lecture to actively involved in class. Meanwhile, some students may not be prepared for their classes at all (University of Waterloo

2022). Other researchers claimed that some students did not benefit much from an FC environment compared to traditional lecture model (Boeve et al., 2017; McLaughlin et al. 2013), while other studies reported students' complaining on an FC pedagogy due to overwhelming workloads and lack of time to understand course content in an FC environment (Foster & Stagl, 2018; Missldine et al., 2013; McLaughlin et al., 2013).

Finally, unless in-class activities are created to encourage true peer collaboration, students often appear to opt for a divide-and-conquer approach, splitting intended group tasks among team members, despite the underlying theory of FC pedagogy striving to generate knowledge comprehension and synthesis via interpersonal interactions with peers as well as interactions with course knowledge. Collaboration often allows a group's collective expertise and skills to be leveraged further, thus potentially enabling interdependent collaborators perform better than their counterparts with more capable individual team members (Dittmann et al., 2020; Dittmann et al., 2021). In addition, though learning occurs via interactions with ideas and knowledge, individuals generate and synthesize new knowledge via interpersonal interactions. Interactive peer learning in a group setting, such as asking and answering questions, engaging in discussions, and reviewing solutions, has been reported to improve students' comprehension of topics (Chen et al., 2018) while generating better outcomes and performance (Umopathy & Ritzhaupt, 2017). Nevertheless, such socio-constructivism oriented learning can be absent under students' divide-and-conquer approaches in an FC environment. In fact, not all tasks require collaboration. Even in a company setting, 20% to 35% of value-added collaborations are often contributed by only 3% to 5% of employees. While those few collaborators' contributions are valued, with high demand, it often increases their workload and causes negative impacts on their personal performances (Cross et al., 2016). Most U.S. organizations are not structured to reward skilled collaborators and have been permeated with the culture of valuing individual performance, which focuses all their energy and resources on individual star performers (Dittmann et al., 2021; Groyberg, 2011). Despite the inherent benefits of interdependent collaboration, students' tendency to choose a divide-and-conquer approach in an FC environment may need to be coordinated with more adamant cultural shifts in U.S. organizations.

In fact, the FC environment prompts students to be mentally active and engaging. Nevertheless, being passive in a lecture is easier and less intimidating, as other scholarly works reported students' dissatisfactions toward FC environment and preference to traditional lecture structure compared to FC setting (Burke & Fedorek, 2017; Zappe et al., 2009). Although students often highly value an active and deeper learning experience and find it more meaningful (Smith, 2008), such significant mental effort of switching their mode of learning would likely cause cognitive strain and prompt them to resist by becoming vigilant and suspicious, as the principle of cognitive ease suggests (Kahneman, 2013).

3. Discussion

Overall, the flipped classroom (FC) is not a silver bullet that can remedy the modern-day college classroom wherein students and instructors are both struggling to combat the plethora of personal communication technologies and declining attention span. Nonetheless, the merits of this approach potentially outweigh its likely drawbacks. The approach itself can create an enabling classroom environment for college students whose future careers will require higher levels of collaboration with others, mentoring subordinates, and training junior employees, which essentially requires teaching and stimulates synergic creativity that utilizes and builds others' ideas on top of their own. Based on the author's observations, modern-day college students are increasingly

becoming silent collaborators who feel comfortable cooperating digitally on shared Google Docs while sitting side by side in silence. While their compiled paragraphs and sentences may address their group tasks in a divide-and-conquer fashion, discussions and conversations could infuse more synergy into their learning and provide sparks of ideas that might emerge in seemingly random ways. Evidently, one cannot hear others' thoughts in silence, nor comprehend them fully.

At the same time, some students may experience difficulties in breaking away from a pattern of passive learning where they simply listen to instructors, hence mistakenly believing that learning only occurs when instructors lecture them or doubting the worth of their tuition when instructors do not lecture. During the author's ongoing refinement of the FC design, reading assignment quizzes were administered to evaluate students' reading readiness and establish foundational knowledge for more in-depth discussions. Despite the intentions of the FC model for more interactive and engaging learning, some negative course evaluation comments noted that the students felt they were being tested before being taught, while others had difficulties in regarding teaching other students and consequently raising their grades as part of their own learning process. In some sense, communicating the purposes of the FC model to students cannot be more emphasized for its successful execution.

To conclude, the FC model has tremendous potential to become an effective educating modality in the age of constant digital disruption amid the struggles to retain students' attention. It may not tame students' fears of missing out (FOMO) on their smartphone notifications and notebook computers during classes. However, it can create an environment, enabling them to practice modern day professions that value human creativity and interpersonal collaboration over simple mechanical tasks. Menial tasks can be carried out by technologies, such as artificial intelligence and machine learning. Some work can potentially be mimicked and replaced by such technologies. Nevertheless, human creativity and synergic collaboration still have a much longer shelf life before being replicated by such cognitive technologies.

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