An Introduction to Flipping the Classroom

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Introduction

In 2007, Jonathan Bergmann and Aaron Sams, two secondary school chemistry teachers from Colorado, USA, began video recording their lectures and sharing those videos with students before the students came to class. Although Bergmann and Sams have stated the theory behind their practice predates their work in 2007, it is commonly understood that the use of flipped learning in K–12 settings began with Bergman and Sams (Noonoo, 2012). In the last decade, "flipping the classroom" has grown in popularity. From K–12 to university settings, across content areas, and with different populations of students culturally and developmentally, flipped lessons have become a more consistent and accepted pedagogical practice.

This book is intended to provide examples from around the world as authors from eight countries share original research and synthesize others' research to explain the impact flipping the classroom has had across a wide variety of educational settings and with a spectrum of learners. We will highlight how flipping is being used with a wide variety of students including those with special needs and second language learners; we will showcase how it is being used with medical professionals and business school students; we will highlight tools that are currently being used in educational settings as well as future implications for the flipped

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classroom. Flipped instruction has been tried and tested and the evidence suggests that this method increases student motivation in different types of courses. Furthermore, with this new approach, the professor/teacher is able to recognize low-performing students as well as cater to different ability group students more easily than through traditional instruction.

Although there is still a paucity of research on flipped learning due to its nascent state, coupling existing research with the learning sciences, cognitive education, and practical cases from the classroom, we are beginning to understand why flipping can be beneficial for learning. In addition, we are also starting to understand *how* to flip lessons most effectively and why flipping the classroom should be considered a pedagogical practice in most learning environments. While we have a lot to learn, the following chapters from both researchers and practitioners provide us with examples to consider as we plan impactful, meaningful learning experiences for learners.

Book Organization

The table below shows the organization of the book and may be helpful as you are starting to read. This book highlights the theoretical and practical successes of flipping the classroom for the twenty-first century. We have deliberately chosen a wide variety of countries, topics, and age levels so that you are able to pull ideas from a wide range of teacher experiences. It is not necessary to read the book cover to cover—instead, we encourage readers to find chapters that are most appropriate for their own purposes. That being said, we have found that some of our best learning has come when we have explored strategies and techniques outside our own subject area. We encourage you to explore the entire book after you have dug deep into the chapters that are aligned with your own subject matter.

The book is split into three main sections. The first section comprises of Chaps. 1, 2, and 17. Chapters 1 and 2 explore what flipping the classroom is and the evidence-based practices on how to flip. Chapter 17 will look at the future of flipping and what may be coming next in the field. The second section, Chaps. 3–9 discuss flipping the classroom in different subjects at the primary and secondary levels. This section may be especially helpful for teachers or teacher trainers. Finally, Chaps. 10–16 look at flipping the classroom for adult learners in both educational and professional development settings.

There are two types of chapters—Synthesis (S) chapters and Research Report chapters (RR). Synthesis chapters include highly comprehensive literature reviews combined with data from the authors to support best practices and share practical tips. Research report chapters follow usual journal article guidelines, reporting the process and outcomes of studies on the use of flipped learning in the authors' classrooms.

Chapter	Country	Topic	Type
Primary and secondary learning			
1	USA	What is flipping?	S
2	USA	Instructional support: how to flip	S
3	USA	Math classroom	RR

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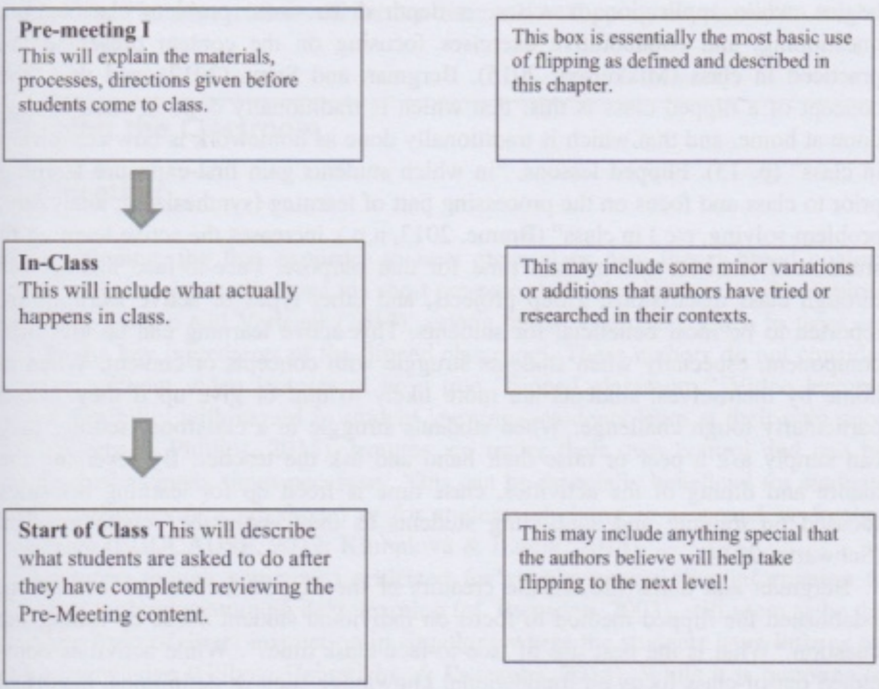
Chapter	Country	Topic	Type
4	USA	English and language arts	S
5	South Korea	Korean english language classroom	RR
6	USA	Physical ed	S
7	USA	Diverse learners	S
8	USA	Computer science classroom	S
9	China	Secondary classroom	RR
Higher education and adult learning			
10	USA	Flipping at university level	S
11	Germany	Accounting	RR
12	Sweden	Business administration	S
13	England	Teacher training	S
14	England	Biomedical sciences	RR
15	Singapore	Ethics and communication for medical doctors	RR
16	Singapore	Flipping medical education	RR
17	USA	The future of flipping	

In every chapter except for Chaps. 2 and 17, you will see the following figure which should help explain the process for flipping the classroom for that particular content and context.



Definition of Flipping the Classroom

The Flipped Learning Network (2014) defined flipped learning as:

"A pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter." (p. 1). The vast majority of examples from flipped learning classrooms indicate that direct instruction usually takes the form of videos that are reviewed outside of class followed by traditional "homework" that is completed during class time with the teacher present. However, it is important to understand that the definition does not require that particular approach.

Moran and Milsom (2015) expand on the Flipped Learning Network's definition by stating that:

> (a)lthough there is no one particular model to the flipped classroom, Pearson and the Flipped Learning Network (2014) described a few key characteristics of flipped learning. First, instructors must be selective in what they require the students to learn on their own and what is best processed within the classroom through active learning strategies. Another characteristic is a shift from a culture that is teacher centered to one that is student centered. In essence, the instructor is focused on best meeting the needs of each individual student. A final characteristic is the importance of a flexible environment that allows instructors to address various student learning styles (p. 33).

The essential components, therefore, entail content being delivered before class begins, while application exercises, in-depth discussions, problem clarification, questioning, and collaborative exercises focusing on the content presented are practiced in class (Mikkelsen, 2015). Bergman and Sams (2012) said that "the concept of a flipped class is this: that which is traditionally done in class is now done at home, and that which is traditionally done as homework is now completed in class" (p. 13). Flipped lessons, "in which students gain first-exposure learning prior to class and focus on the processing part of learning (synthesizing, analyzing, problem-solving, etc.) in class" (Brame, 2013, n.p.), increases the active learning of students if teachers use in-class time for that purpose. Face-to-face interactions through class discussions, group projects, and other types of active learning are reported to be most beneficial for students. This active learning can be a critical component, especially when students struggle with concepts or content. When at home by themselves, students are more likely to quit or give up if they face a particularly tough challenge. When students struggle in a classroom setting, they can simply ask a peer or raise their hand and ask the teacher. By reversing the nature and timing of the activities, class time is freed up for learning activities focused on training and supporting students as they apply the course material (Schwartz, 2014).

Bergman and Sams (2012), the creators of the flipped method of instruction, established the flipped method to focus on individual student needs by asking the question "What is the best use of face-to-face class time?". While activities completed out-of-class focus on foundational knowledge such as definitions, historical data, etc., Kemp and Grieve (2014) note that students prefer to complete traditional homework activities face-to-face rather than online or at home as engagement, immediate feedback, and interactivity is naturally more present. It is important to note that proper flipped implementation goes well beyond simply changing the order of our class delivery. If we want to truly engage our students and create an authentic flipped experience, it is important to understand how to design the entire course as pre-class and in-class activities need to be carefully integrated and aligned with the intended learning outcomes (cf. Biggs & Tang, 2011).

Results from past studies suggest that the flipped classroom approach has a variety of positive impacts on students participating in this pedagogical approach. Galway et al. (2014) and Crews and Butterfield (2014) mentioned factors such as the interactivity between students and the instructor, a class structure which supports flexibility, organization, and a format that has clear expectations all positively influencing the learning experience for students. Using the flipped model, social interaction among students is encouraged, making it easier to learn from each other and support peers (EDUCAUSE, 2012). Students also feel more empowered and responsible for the learning process as they work toward the mastery of the material (O'Flaherty & Phillips, 2015). Other researchers have found several factors that are key in aiding student's retention such as the ability for students to transfer knowledge, consistency throughout the activity/course, social presence of faculty and peers (Boston & Ice, 2011), small-group assignments, having a strong instructor who is able carry out different facilitating roles, and interactive face-to-face meetings (Wegener & Leimeister, 2012). Each of these factors is evident in a well-designed flipped classroom. The next section will further discuss how flipping the classroom works.

Flipping the Classroom

Pre-meeting

When flipping, the first exposure to new material or new theory-based content outside of class is usually done via short pre-recorded video lectures or via required readings. Bishop and Verleger (2013), among others, claim that video lectures are one of the key ingredients of the flipped classroom. These authors do not consider designs without video lectures to be a true "flipped classroom." Video lectures allow flexibility with regard to student learning—students learn at their own pace (O'Flaherty & Phillips, 2015), lectures are under their own control and can be re-watched as many times necessary. This can be especially beneficial for students with disabilities (e.g., dyslexia) or for students studying in a second or foreign language (EDUCAUSE, 2012; Klimplová & Barcik, 2015).

Lectures, though sometimes criticized for simply transmitting information to students without promoting deep learning (cf. Ramsden, 2003), still seem to be the primary form of direct instruction in situations where the students have little or no prior knowledge (Gilboy, Heinerichs, & Pazzaglia, 2015). While it is tempting to simply record lectures and place them online for students as part of the pre-meeting material, it is important to note that a boring lecture online *is still boring*. Therefore, it is important to consider the length of the video, the style of video, and the willingness of the lecturer to be creative with video production. The most popular forms of flipped videos seem to be screencasts or voiceovers on traditional PowerPoint slides. Research is inconclusive on the best format for these videos but it is recommended that videos do not last more than 15 min as students prefer shorter video lectures (Beatty & Albert, 2016). Video lectures that are between 3 and 12 min have also been used to provide effective flipped lessons (Klimplová & Barcik, 2015; Lancellotti, Thomas, & Kohli, 2016).

In addition to video lectures, traditional flipped learning also includes supplying the students with course readings. If reading the course literature is regarded as essential, then the video lectures should not cover all of the concepts, models, and theories presented in course literature, because students seem to prefer learning by watching over learning by reading (Bishop & Verleger, 2013; Klimplová & Barcik, 2015). Therefore, video lectures should be designed more as a guide for reading and increasing curiosity rather than as explanations of everything stated in the literature (Klimplová, 2016).

An equally important but often overlooked feature for deeper learning to occur is to make the purpose of the pre-content clear to the audience. Educators who champion the flipped methodology tout its unique marrying of behaviorist (Skinner, 1974) and constructivist ideologies, which augur well with the desire to translate "didactic education" to "clinical practice performance" (Hawks, 2014, p. 264). However, in order for these ideologies to converge, it is important that the instructional intent is clear. This is especially true when utilizing video, readings, or other activities since the teacher is not there to answer questions in person about the relevance. The content must be explained but it is equally important that the teacher explains why the content is important.

In addition to learning content, there may be other pre-class activities that students are required to do before coming to class. They may be required to participate in online discussions, post questions or comments regarding the content, case studies to be analyzed, or quizzes to be completed (Klimplová, 2016; Butt, 2014). Quizzes can be used to hold students accountable for watching the video, reading the course material, or learning the content presented. Short quizzes used as a pre-assessment can test their understanding (Zappe, Leicht, Messner, Litzinger, & Woo Lee, 2009) as well provide the teacher with additional information to deliver more relevant content to students during class time.

In-class

Whether in traditional formats or a flipped learning method of delivery, in-class activities should always be steered by the intended learning outcomes, reflect students' studying needs, and promote active learning focused on key course concepts (cf. Albert & Beatty, 2014).

In-class time in the flipped classroom is often devoted to applying the concepts/model/theories that students have learned through the materials provided before class. Activities which allow for problem-solving or case analysis, group discussions, peer-learning, and student-led activity are critical to the learning experience. The role of the teacher is to help students clarify content and monitor their progress and level of understanding. The teacher's role is to be a "guide on the side" instead of a traditional "sage on the stage" (King, 1993).

During in-class time, social interaction among students should be encouraged, making it easier to learn from each other and support peers. While circulating and facilitating the lesson, teachers can spend more time with each student individually and provide guidance, detect errors, provide individualized instruction, update content, and offer extension learning opportunities for those who are working "beyond the content." Classroom time can, thus, be used more effectively and creatively (Fulton, 2012). Results from various studies show that the implementation of the flipped classroom leads to increased levels of student understanding of the relevant concepts (Zappe, Leicht, Messner, Litzinger, & Woo Lee, 2009; Strayer, 2012), increased interest and engagement, improved communication skills, critical thinking, and increased preferences for working in teams (O'Flaherty & Phillips, 2015 for the scoping review of recent research on the flipped classroom).

Participation in class is important for achieving intended learning outcomes, but students also need to prepare before the class for in-class activities. Zappe et al. (2009) point out "[s]tudent success in active learning examples in flipped classes depends on students' level of preparation for class" (p. 5). Students must have the background knowledge if they are going to participate in deeper class discussions and activities. Lack of preparation by some students can be a challenge for teachers as they organize activities and manage group work while engaging diversely prepared students. Butt (2014) recommends to have "informal extension activities available in-class to those who feel they are being held back by those who haven't done sufficient pre-preparation" (p. 41). Therefore, it is important to both offer incentives and hold students accountable for pre-class activities.

Best Practices for Flipping the Classroom

One of the main reasons that flipping has become so popular in the last decade is due to the accessibility and usability of technology. Flipping the classroom encompasses the basic transmission of information asynchronously (often online) so that learning in class or on the ground (in work-based settings) is contextually relevant. It is not uncommon to encounter real and lasting challenges with regards to the use and management of technology (Moraros, Islam, Yu, Banow, & Schindelka 2015). Teachers need to make sure they are offering lessons via technology that are accessible and understandable by students. Students need to learn to voice their own concerns if they are unable to access online lessons due to varying availability of infrastructure, resources, access, and training for the use of technology. Not all individuals are able to operate at levels of ease in order to harness technology for teaching and learning. It is important that students are taught self-advocacy skills as part of the flipped curriculum and then provided ample opportunities to practice those skills.

In addition to struggling with technology, there are other considerations as well. As with all disruptive paradigms, the learning curve for flipping the classroom can be steep for students and faculty. Time management is of concern as learners have to learn how to discipline themselves to be knowledgeable about the subject matter and well prepared before going to class. As with self-advocacy, self-discipline must be taught and practiced while both students and faculty need to display flexibility and adapt behaviors for optimal results. Time, effort, money, and motivation are recurring obstacles in effecting any change in behavior. However, if we create a safe and supportive blended learning environment and provide rationale behind the change in pedagogy, we can often help students accept this new format of instruction.

Bergman and Sams (2012) make it very clearly that flipped learning is not only about using video to provide direct instruction; flipped learning is about maximizing the amount of time spent actively learning for deeper engagement and understanding. Teachers using the flipped model move away from teacher-led instruction where learners spend the majority of their time note-taking to a format where the assimilation and processing of new information before lessons allows for sense-making and application of the content with a teacher-facilitator present to assist. Providing learners with content beforehand allows them to reflect on the learning in their own space and time. Allowing time in class to question, consider, discuss, and apply is deeper learning and can be useful with all ages and content.

Tools to Consider

One of the key components to flipping the classroom is the use of technology. The multitude of tools available can provide powerful learning experiences if used correctly but can also be intimidating for both teachers and students. While you were learn more about general instructional design in Chap. 2, in this section we will highlight 15 different tools popular among educators as they flip lessons for their students. There are multiple other great tools as well and some will be highlighted in the following chapters. However, if you are considering flipping your classroom and are unsure how to get started, these tools can provide a starting point and they offer features that are beneficial while you flip the classroom.

Brainpop is a series of educational websites with thousands of animated movies combined with quizzes and related materials for multiple subjects. The student watches the required video first on Brainpop, then takes an accompanying quiz or learns from mind maps about the topic. Brainpop also provides possibilities for students to create their own games which may help increase their creativity as well as their understanding of the topic (Brainpop, 2018).

Edmodo is a learning and teaching platform on which the teachers can share lesson notes in digital format, with the help of its social network format. Both parents and students can access Edmodo. Apart from sharing lesson materials, teachers can also use the Edmodo platform to distribute assignments. Also, parents can create accounts to follow their children's progress. Students are able to upload their assignments independent from time and place, group discussions, and add comments on the lessons added previously (Edmodo, 2018).

Edpuzzle is an easy-to-use platform that allows teachers to make any video of their lesson. You can find video lessons created by other teachers with formative assessments included, adjust videos by embedding your own questions or audio during the video, and assign it to your students. When viewing the videos, students are not allowed to proceed unless they have answered the questions correctly. With Edpuzzle, you also get analytics: who watched the video, who didn't understand the lesson, and who completed the assessments successfully. Students can re-watch the video as many times as they need, at their own pace. You can comfortably check their progress from your account. By adding questions to videos or YouTube videos, you can have a good grasp of which sections might be problematic for students based on the answers collected. In this way the student is encouraged to watch the video more carefully, paving the way to greater progress (Edpuzzle, 2018).

Educreations is an application that allows each device to have their own whiteboard. On these whiteboards, teachers and students are able to create lesson materials. The created materials can be audio, video, or still images that are saved and shared as effective materials. Students can thus learn in entertaining ways as well as share their own information. In addition, Educreations has an interactive whiteboard function that allows electronic note taking in class via tablets; these notes can then be shared on social media or uploaded to other sharing platforms (Educreations, 2018).

Emaze allows users to incorporate video, audio, and text, offering unique potential for student engagement. Teachers and students can collaborate and share their work, convert their old presentations to an Emaze template, and make learning experiences can be viewed on multiple platforms. Apart from presentations, Emaze also facilitates the creation of websites, e-cards, blogs, and photo albums. It can also scaffold challenging activities through the incorporation of useful visual representations (Emaze, 2018).

Flipgrid is a tool through which teachers can create interactive video quizzes for their students. In return, students can answer their teachers' questions by making videos with the help of Flipgrid. As a result, students' can practice self-expression and communicate their understanding verbally (Flipgrid, 2018).

GoClass is a particularly useful platform for making lesson plans. Teachers can use the GoClass framework of Show, Describe, and Ask a Question, and videos, documents, and lesson materials can be shared easily via the tool. Apart from sharing their created questions with their students, teachers can provide students with immediate feedback by answering their questions individually or as a collective. GoClass provides functions for classroom management as well as showing student status on completion of assignments, current work on the platform, etc. (GoClass, 2018).

Google Classroom integrates various Google tools like Documents, Sheets, and Slides. Through the use of Google Classroom, students can enjoy the benefits of cloud sharing and prepare documents, presentations, and graphics without any subscription fees. Teachers can assign homework for students via Google Classroom. Both teachers and learners can communicate without using paper and, while at a distance, paving the way for students to experience cooperative learning. It is a medium that can be integrated into a perfect flipped classroom through the use of smart phones, tablets, and laptops (Google Classroom, 2018).

If teachers are not quite ready for Google Classroom, *Google Drive* can provide teachers and learners a place to store and share files of various formats through the cloud. Therefore, students can access materials wherever they are, and can work on collaborative projects simultaneously. Google Drive allows files to be created through tablets, smart phones, and laptops, and constantly accessible via any of these platforms. Students can prepare before the lessons and also participate in online discussions and information sharing (Google Drive, 2018).

Padlet allows teachers to prepare digital "boards" for students. Boards are essentially blank digital spaces which can be interactive or private. On these boards videos, texts, visuals, and files can be shared. Padlet can also be used in many lessons and fields such as social sciences, literature, foreign language learning, and technology (Padlet, 2018).

Pearltrees is a visual and collaborative curation tool that allows users to organize, explore, and share any URL they find online as well as to upload personal photos, files, and notes. The product features a unique visual interface that allows users to drag and organize collected URLs, and other digital objects. With Pearltrees, students and teachers can combine all the information related to a lesson on an online medium that can be accessed freely and via multiple platforms (Pearltrees, 2018).

Quizizz allows teachers to create quizzes or search through a database of previously created quizzes. Through these quizzes, students can compete with each other. This gamification approach can increase motivation and achievement by providing students constant opportunities for self-assessment. It also allows teachers to formatively or summatively assess students' learning. Quizizz can be accessed on smart phones, tablets, and other platforms, which allows learners to access content inside or outside the classroom (Quizizz, 2018).

Schooltube is a video hosting site like YouTube® but with a focus on educational and student-produced content. SchoolTube is a social network where students and teachers share videos, which can then be used as flipped classroom resources. Students and teachers can create their own channels and access other channels, with students improving their creativity through these videos and channels. Since the SchoolTube videos can be shared on many social networks, they can also be integrated to many other social networks (SchoolTube, 2018).

Screencast-O-Matic is a tool which allows teachers to record their computer screens. Teachers can thus make video lectures of the images on their screens or webcam recordings. Screencastomic has a free version for creating videos under 15 min and is a very valuable resource for getting started. Using Screencast-O-Matic, students can watch videos from social media outlets such as Youtube (Screencast-O-Matic, 2018).

Skillshare is an online learning community for people who want to learn from educational videos. Within Skillshare, an acquired skill can be shared with a community and this skill can be used in projects related to learning by doing. Therefore, the students can recognize the areas they had knowledge and skills which can cause them to contribute to the community. As well as the videos that the teachers and students can record, they can also improve themselves in any area they wish (Skillshare, 2018).

Conclusion

As you read the rest of the book, we encourage you to skip chapters, flip around, and find what is most relevant for your practice or research. The authors here all have extensive experience either flipping the classroom themselves or studying those who have flipped the classroom and will welcome your questions if you prefer to reach out to them. We understand how daunting something like flipping the classroom can be but hope that these examples from a variety of classrooms, at a variety of levels, on a variety of subjects will provide you with a spark to consider flipping your own classroom.

References

Albert, M., & Beatty, B. J. (2014). Flipping the classroom applications to curriculum redesign for an introduction to management course: Impact on grades. *Journal of Education for Business, 89*(8), 419–424. https://doi.org/10.1080/08832323.2014.929559.

Beatty, B. J., & Albert, M. (2016). Student perceptions of a flipped classroom management course. *Journal of Applied Research in Higher Education, 8*(3), 316–328.

Bergmann, J., & Sams, A. (2012). *Flip your classroom: How to reach every student in every class every day*. Washington, DC: International Society for Technology. in Education.

Biggs, J., & Tang, C. (2011). *Teaching for Quality Learning at University*. (Fourth Edition). Society for Research into Higher Education & Open University Press.

Bishop, J. L., & Verleger, M. A. (2013, June). The flipped classroom: A survey of the research. In *ASEE National Conference Proceedings*, Atlanta, GA (Vol. 30, No. 9, pp. 1–18).

Boston, W. E. & Ice, P. (2011). Assessing retention in online learning: An administrative perspective. *Online Journal of Distance Learning Administration, 14*(2). Retrieved December 13, 2018 from https://www.learntechlib.org/p/52638/.

Brame, C. (2013). Flipping the classroom. Vanderbilt University Center for Teaching. Retrieved [todaysdate] from http://cft.vanderbilt.edu/guides-sub-pages/flipping-the-classroom/.

Brainpop. (2018). Brainpop website. Retrieved September 19, 2018, from http://www.brainpop.com.

Butt, A. (2014). Student views on the use of a flipped classroom approach: Evidence from Australia. *Business Education & Accreditation, 6*(1), 33.

Crews, T., & Butterfield, J. B. (2014). Data for flipped classroom design: Using student feedback to identify the best components from online and face-to-face classes. *Higher Education Studies, 4*(3), 38.

Educause. (2012). 7 things you should know about flipped classrooms. Retrieved from https://library.educause.edu/resources/2012/2/7-things-you-should-know-about-flipped-classrooms.

Edmodo. (2018). Edmodo website. Retrieved September 10, 2018, from http://www.edmodo.com.

Edpuzzle. (2018). Edpuzzle website. Retrieved September 16, 2018, from http://www.edpuzzle.com.

Educreations. (2018). Educreations website. Retrieved September 10, 2018, from http://www.educreations.com.

Emaze. (2018). Emaze website. Retrieved September 21, 2018, from http://www.emaze.com.

Flipgrid. (2018). Flipgrid website. Retrieved September 1, 2018, from http://www.flipgrid.com.

Flipped Learning Network. (2014). Flip learning website. Retrieved December 13, 2018, from https://flippedlearning.org/.

Fulton, K. (2012). The flipped classroom: transforming education at Byron High School: a Minnesota high school with severe budget constraints enlisted YouTube in its successful effort to boost math competency scores. *THE Journal (Technological Horizons In Education), 39*(3), 18.

Galway, L. P., Corbett, K. K., Takaro, T. K., Tairyan, K., & Frank, E. (2014). A novel integration of online and flipped classroom instructional models in public health higher education. *BMC Medical Education, 14*(1), 181.

Gilboy, M. B., Heinerichs, S., & Pazzaglia, G. (2015). Enhancing student engagement using the flipped classroom. *Journal of Nutrition Education and Behavior, 47*(1), 109–114.

Google Classroom. (2018). Google Classroom website. Retrieved September 21, 2018, from https://classroom.google.com/.

Google Drive. (2018). Google Drive website. Retrieved September 2, 2018, from https://www.google.com/drive/.

GoClass. (2018). GoClass website. Retrieved September 8, 2018, from http://www.goclass.com.

Hawks, S. J. (2014). The flipped classroom: Now or never? *AANA Journal, 82*(4).

Kemp, N., & Grieve, R. (2014). Face-to-face or face-to-screen? Undergraduates' opinions and test performance in classroom vs. online learning. *Frontiers in psychology, 5*, 1278.

King, A. (1993). From sage on the stage to guide on the side. *College teaching, 41*(1), 30–35.

Klimplová, L. (2016). Reflections on flipping the classes in Business Administration and Management courses. In EDULEARN16 Conference, 4th–6th July 2016, Barcelona, Spain (pp. 2609–2618).

Klimplová, L., & Barcik, R. (2015). *NGL project: Sub-project "flipped classroom": Course "organization theory" (FÖ1039)*. Sweden: Dalarna University.

Lancellotti, M., Thomas, S., & Kohli, C. (2016). Online video modules for improvement in student learning. *Journal of Education for Business, 91*(1), 19–22.

Mikkelsen, T. R. (2015). Nursing students' experiences, perceptions and behavior in a flipped-classroom anatomy and physiology course. *Journal of Nursing Education and Practice, 5*(10), 28.

Moran, K., & Milsom, A. (2015). The flipped classroom in counselor education. *Counselor Education and Supervision, 54*(1), 32–43.

Moraros, J., Islam, A., Yu, S., Banow, R., & Schindelka, B. (2015). Flipping for success: Evaluating the effectiveness of a novel teaching approach in a graduate level setting. *BMC Medical Education, 15*(1), 27.

Noonoo, S. (2012). Flipped learning founders set the record straight. *The Journal: Transforming Education Through Technology*. Retrieved from http://thejournal.com/Articles/2012/06/20/Flipped-learning-founders-q-and-a.aspx?Page = 1.

O'Flaherty, J., & Phillips, C. (2015). The use of flipped classrooms in higher education: A scoping review. *The internet and higher education, 25*, 85–95.

Padlet. (2018). Padlet website. Retrieved September 25, 2018, from https://tr.padlet.com/.

Pearltrees. (2018). Pearltrees website. Retrieved September 10, 2018, from http://www.pearltrees.com.

Quizizz. (2018). Quizizz website. Retrieved September 25, 2018, from https://quizizz.com/.

Ramsden, P. (2003). *Learning to Teach in Higher Education* (2nd ed.). London: Routledge.

Schooltube. (2018). Schooltube website. Retrieved September 10, 2018, from http://www.schooltube.com.

Schwartz, T. A. (2014). Flipping the statistics classroom in nursing education. *Journal of Nursing Education, 53*(4), 199–206.

Screencast-O-Matic. (2018). Screencast-O-Matic website. Retrieved September 20, 2018, from http://www.Screencast-O-Matic.com.

Skinner, B. F. (1978). Reflections on behaviorism and society.

Strayer, J. F. (2012). How learning in an inverted classroom influences cooperation, innovation and task orientation. *Learning Environments Research, 15*(2), 171–193.

Wegener, R., Leimeister, J. M. (2012). Do student-instructor co-created learning materials lead to better learning outcomes? Empirical results from a German large scale course Pilot study. In: 45th Hawaii International Conference on System Sciences, HICSS, pp. 31–40.

Zappe, S., Leicht, R., Messner, J., Litzinger, T., & Lee, H. (2009). "Flipping" the classroom to explore active learning in a large undergraduate course. In Proceedings of the 2009 American Society for Engineering Education Annual Conference and Exhibition. Austin, TX: ASEE.