Flipping for Diverse Learners

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Pre-meeting I
Students assimilate and process new information via video lectures and classroom readings.

Flipping allows students with disabilities or second language learners to access the content multiple times- not just once like in a typical lecture- and have time to process the information a their own speed.

Start of Class
Teachers can provide students time to ask questions instead of quizzing them immediately. This helps the student and the teacher realize where the students are in their understanding.

It is important that teachers provide materials that are accessible for individuals with disabilities including captioned videos and, if necessary, alternative forms of text. Many products including Microsoft Office, have accessibility checkers built into their products that are easy to use.

In-Class
Application exercises, generally requiring student collaboration. Teachers can also provide application exercises that are individual for students with anxiety or social fears that make group work challenging.

Teachers provide resources in other languages that are specific to individual students. Teachers can also provide multiple resources about one topic so students can find a resource that works for them.

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Introduction and Background

The most important tenet of special education is the idea that all instruction is based on the individual needs of the learner. In the classroom, educators are tasked with practicing pedagogy that will provide additional supports and services to those students whose disability interferes with their academic, emotional, and social progress, as well as to those students whose needs cannot be met in the general education classroom. The notion of special education grew out of the realization that all children have the right to learn and are entitled to an education. Recently, as the world's borders shrink and the global economy continues to grow, countries around the world are increasingly aware of the need to educate students with disabilities to learn alongside their typically developing peers—to be included, as much and as often as possible.

In the United States, the federal definition of special education is:

(1) …specially designed instruction, at no cost to the parents to meet the unique needs of a child with a disability, including

  (i) Instruction conducted in the classroom, in the home, in hospitals and institutions, and in other settings; and
  (ii) Instruction in physical education.

(2) Special education includes each of the following …

  (i) Speech–language pathology services, or any other related service …;
  (ii) Travel training; and
  (iii) Vocational education (Individuals with Disabilities Education Act, 2004).

Students with disabilities are a diverse group of students with one thing in common: the presence of one or more conditions that impede their ability to benefit from instruction in the general or mainstream classroom. Special education instruction should be learning-focused and driven by the individual student's learning needs. With the diversity that is common in inclusive classrooms, students with disabilities need additional support and services to access and learn curriculum. Nevertheless, promoting high expectations should be a central tenet for all students. Although students with disabilities face learning challenges, we believe all students can learn and the flipped method of instruction can help with that process.

Although flipped instruction is a novel method of instruction with very limited research conducted on its use with students with disabilities, it can be paired with well-established frameworks to further enhance the learning of students with disabilities. Furthermore, many of the components of flipped instruction overlap with best practices in special education. With continued research on the topic, we believe that this method of instruction will prove to be especially beneficial for students with disabilities.

This chapter began by providing a visual representation of what flipped instruction could look like with diverse learners. Next, a brief overview of special education is provided, followed by a literature review of the current research on the flipped method of instruction in special education and how the flipped method of instruction aligns with common characteristics of students in special education. Next, a framework and instructional practices that can be used to integrate flipped instruction into classroom practice are provided. Finally, the chapter ends with a brief conclusion and implications for the future use of flipped instruction in special education.

Literature Review

This section examines the existing literature base on the use of flipped or inverted instruction with students with disabilities, and the challenging factors which may explain the paucity of current research on the topic. The ways in which flipped instruction can be used with students with disabilities vary and depend on a range of factors including the disability category or type, the severity of the disability, the level or degree of inclusive instruction a student receives, attitudes toward assistive technology, the content area, school culture, and available resources.

Much of the research on flipped instruction, in general, has focused on the higher education setting (Abeysekera & Dawson, 2015; Lo, Hew, & Chen, 2017). A review of the literature on the flipped instruction and special education yielded no empirical research articles and one case study that used keywords related to special education (inclusion and learning disabilities) but yielded only anecdotal evidence. Furthermore, literature reviews on flipped instruction in K–12 published in the last 2 years report (2016–2018) very limited research. To date, only 15 empirical studies have been published about K–12 flipped classroom. None of the articles included students with disabilities (Lo & Hew, 2017). Lo et al. (2017) report that less than 10% of all flipped classroom instructional research occurred in a secondary setting, and less than 3% in the elementary classroom. The results of these K–12 studies are promising, with significant improvement results reported in 6 of the 15 studies, no reports of a detrimental or inferior effect of the flipped method of instruction on student achievement. However, due to these limitations and the fact that the lion's share of research on the effectiveness of the flipped method of instruction takes place in a college or university setting, where the participation of students with disabilities is significantly less likely, it is difficult to ascertain the true effectiveness of the method for students with disabilities.

The results of the lone case study (Villanueva, 2016) on effects of flipped instruction on elementary students' motivation to learn sixth-grade mathematics did not include relevant information related to student achievement, but Villanueva did report several anecdotal findings that are important for educators interested in implementing the flipped method of instruction. She noted that to get and keep student attention, students' strengths, needs, and interests should be used to create the instructional lessons. Student feedback was essential, especially as the study was implemented—Villanueva relied on student feedback to edit content and create additional lessons in her study. Two specific benefits were mentioned: the increased ability to work one-on-one with individual students or small groups, and a greater ability to differentiate content and instruction based on individual student needs. Furthermore, the researcher noted her own increased familiarity with the content and lessons that were used in the study.

On the other hand, Villanueva (2016) noted several drawbacks in her work. First, although the researcher was familiar with the structure of the flipped classroom, she found that her ability to stay true to the intended structure was limited by students' inconsistent access to the Internet at home, unexpected events during the school day, limited access to technology or a full set of technology tools, and increased lesson planning and preparation time. Further, some students' motivation to learn waned after the video instruction ended, and they were unable to connect the content from the videos to in-class assignments. The results of this study are not inconsequential, but since the researcher did not collect specific achievement data for the students with disabilities in the class or the specific methods of differentiation that were used, generalization to the larger body of students with disabilities is again limited.

Characteristics of Students with Disabilities and the Alignment with Flipped Instruction

Students with disabilities have academic and behavioral difficulties that result in them requiring more time and support to master learning objectives and meet the cognitive and social/emotional demands of school. Overall, students with disabilities have varying degrees of difficulties with general cognitive skills and processing that manifest as problems with perceptual skills, memory, thinking and reasoning, generalization, attention, motivation, problem-solving, and conceptualization. For example, students with autism spectrum disorders often struggle with academic, social, and/or emotional skills while students with more significant or severe disabilities may have limited mobility, severe intellectual disability, and limited communication skills. Because a flipped approach to instruction begins by examining students' needs and, by design, provides the additional time (with both the content and the educator) students with disabilities often need to master learning objectives, the approach has many beneficial elements for this group of students.

Flipped instruction opens avenues of learning by maximizing the time that students spend in the physical classroom and provides a range of interactive activities designed to promote active learning. This is particularly relevant for students with disabilities who attend school systems where the focus is on high-stakes testing and academic achievement. Many of these systems are moving away from traditional special education instruction that only occurs in a resource room and now provide a majority of instruction in inclusive or mainstream settings. Keeping students engaged and focused, particularly in an inclusive setting where students can be functioning two or more years below their grade level, is a common struggle. However, the flipped method of instruction promotes collaboration and active learning which, when structured properly, also promotes student engagement and provides students with disabilities opportunities to interact and learn from their peers (Villanueva, 2016).

Furthermore, flipped instruction can be used to addresses a common limitation of traditional classroom instruction that is especially poignant for students with disabilities—students' inability to translate lecture content into information that can be used to apply and demonstrate knowledge (Bergman & Sams, 2012). Since this method of instruction personalizes learning and recognizes that not all students come to class ready to learn, it is an ideal method to use when teaching students with disabilities. The use of video, a key component in flipped instruction, provides educators with numerous opportunities to help students with disabilities learn new information and generalize the new skills and knowledge into practice. Beyond providing students with disabilities with the opportunity to watch the instructional videos repeatedly, flipped classrooms allow room for varied and differentiated forms of instruction, essentially, quality instruction with real-life connections that are necessary when building an understanding of new knowledge. For example, educators who practice the flipped method of instruction can create online tutorials or add dimensions to traditional video content that students can watch repeatedly. This embedding of like short summaries or checks for understanding allows educators to scaffold student learning. Videos can also provide highly visual students with many opportunities to "see" concepts that are dull and flat in text. Finally, presenting material through video can augment traditional, grade-level text. Since many students with disabilities, especially those with learning or intellectual disabilities, struggle to read and comprehend grade-level text, this method can increase student comprehension of critical content.

From an economic standpoint, flipped instruction is a cost-efficient approach to instruction as this method utilizes technology resources that many schools already use. In the past, educators often had to use fragile, costly, and difficult-to-use specialized assistive technology to meet the needs of students with disabilities. In addition to the cost of the device, many of these specialized assistive technologies isolated and stigmatized the students with disabilities. Now, with flipped instruction educators can maximize the use of mainstream technology, such as mobile devices, apps, and cloud-based computing and choose the best tools to present information in ways that are most meaningful to students. Essentially, educators are able to create specialized and individualized instruction with little to no cost to their district while still meeting the legal requirements of special education.

Universal Design for Learning

Hehir (2009) called Universal Design for Learning (UDL) "the bridge between general and special education" (p. 7) and noted that UDL reduces the barriers in education and opens educational doors to all students. The UDL framework is based on scientific insights into how people learn and promotes the use of accessible and inclusive instructional approaches that meet the needs and abilities of all learners. Three principles guide UDL implementation:

1. Provide multiple means of representation—this principle is based on the idea that learners access information through different intake channels, so instruction should be flexible and varied. An example of providing multiple means of representation is using podcasts instead of or in addition to the traditional direct instruction video used in the flipped method of instruction.
2. Provide multiple means of expression—learners vary in their ability to demonstrate understanding, as such, this principle refers to the multiple ways students can express their understanding material. One example of multiple means of expression is providing students with the option to create a video compilation project instead of taking an essay test.
3. Provide multiple means for engagement—this principle refers to the multiple ways to engage students in learning. Essentially, students are motivated to learn for different reasons and also vary in the activities that keep them engaged. An example of multiple means of engagement is providing the option to learn a concept through a simulation as opposed to reading about the concept in a text (Meyer, Rose, & Gordon, 2014).

UDL grew out of the architecture and urban planning movement of universal design of the 1970s. This movement is responsible for developments like curb cuts in sidewalks and automatic doors. Although these design structures were originally created to help individuals in wheelchairs, they are also useful for people on bicycles and mothers pushing baby strollers. Essentially, the urban planners were removing the barriers to mobility for one group and wound up making mobility easier for all individuals. Educators who use UDL promote the inclusion of all students by removing the barriers to learning that are common in traditional instruction. They begin by identifying students' strengths and weaknesses and examining how students' needs may impede learning. Next, educators review the instructional materials, learning activities, and assessment methods and finally plan instruction with the flexibility that allows all students, regardless of their unique learning needs, to access the content and demonstrate their understanding.

One of the many benefits of flipped instruction is that the format (watching lectures as homework and participating in in-class activities) promotes engagement and allows students to take control of their learning. Flipped instruction utilizes technology to engage students in the lesson and then scaffolds the content. This process increases the likelihood of learning and provides the student with the necessary background knowledge to actively participate in the next day's in-class activity. The method also promotes collaboration, interactive learning, and allows the student to direct his or her learning. These instructional characteristics also overlap with the teaching methods and techniques associated with UDL. Specifically, UDL and the flipped method of instruction have four common characteristics: (1) flexibility as the core component of instructional approach and practices; (2) meaningful use of technology through groups of networked learners; (3) opportunities to extend learning through Internet-based knowledge and activities; and (4) encourages communication and interactions with students, often through the use of information and communication technology (Dinmore, 2013).

Students with disabilities benefit from educators who utilize a flipped/UDL instructional approach for several reasons. First, practitioners recognize that not all students learn best from traditional lectures and can create and present lesson content through instructional videos. UDL even extends this benefit with the use of video captioning and can provide students who struggle with instructional videos by providing access to other direct instructional resources (access to text, podcasts, problem sets, and other activities). The flipped/UDL approach promotes self-efficacy in students. When students are given choices and the ability to self-select resources, they are not only learning and practicing self-efficacy but also engaged in the learning process. Another aspect of this instructional approach that is beneficial for students with disabilities is the elimination of traditional homework. Because traditional homework requires students to complete tasks at home with limited guidance and support from their educator, the cognitive demands associated with recalling information can be excessive and lead to failure. However, through the support found in the structured in-class activities, collaboration with peers and educator guidance, and increased access to additional resources, students with disabilities are more likely to find success. Table 7.1 lists components of the flipped classroom, their corresponding UDL principles, and some UDL resources that can be used to learn and demonstrate skill mastery.

Table 7.1 Integrating UDL into the flipped classroom

Flipped classroom component	UDL principle	UDL resources for learning
Digital lectures	Multiple means of representation	Online chats, content rich websites, mini video lectures, podcasts, digital presentations
Digital activities	Multiple means of engagement	Games, simulations, interactive manipulatives, videos, visuals
In-class review/discussions	Multiple means of representation	Activate/provide background knowledge, recognize patterns/critical features/relationships, guide information processing, maximize transfer, and generalization
In-class activities/projects	Multiple means of expression	Blogging, podcasts, social networking, digital presentations

Negorski (2015)

Differentiated Instruction

Differentiated instruction is an instructional method that educators can use to provide students with a variety of options to learn new information (Good, 2006). When differentiating instruction, educators do not modify or alter the curriculum; instead, educators share the content differently by adjusting the levels of depth, complexity, and readability of the materials. Assessment is used to inform instruction and results are used to make strategic adjustments before, during, and after instruction. Educators commonly differentiate content through the use of graphic organizers, tiered assessments, supplementary materials, and with the use of varied texts. For example, when educators differentiate instruction based on tiered levels of complexity, they are able to address the students' range of needs including those at the introductory level and those at an abstract or advanced level. If you were teaching a class on rainforests and environmental issues, students who were at the introductory level would learn about rainforests and environmental issues and create a product that shows their understanding of the basic information on the topic. These students would create a product that *informs* others about the environmental issues associated with rainforests, whereas students who were at an advanced level would still learn about rainforests and environmental issues but their final product would demonstrate their ability or apply higher-order thinking, such as a presentation that *analyzed* different points of view on an environmental issue related to rain forests (Good, 2006; Tomlinson et al., 2013).

The beauty of differentiated instruction for students with disabilities is that it supports students with a range of disabilities, helps them retain content and skills, reduces the time students need to learn information, decreases the need for skill remediation, and provides students with options to demonstrate learning. Differentiation extends the concept of inclusion by providing a meaningful education for all students, from high-achieving gifted students to students with severe disabilities. Over the last decade, research on the benefits of differentiated instruction and students with severe disabilities indicates that this group of students learns as much or more when they learn in the general education setting (with appropriate supports) and that skill generalization increases (Lawrence-Brown, 2004).

The flipped-differentiated classroom is ideal for students with disabilities because educators can take advantage of the benefits of digital tools and resources to reach their students. First, part of the flipped model entails the creation of instructional videos. Not only are educators able to create instructional videos that are individualized for each student, he or she is also empowering her students to take ownership and control over their learning. Essentially, since students watch the videos on their own time, in their preferred environment, students are able to speed up, slow down, or rewind and re-watch the instructional videos as needed (Bergman & Sams, 2012). Next, the structure of the flipped classroom, specifically the interactions between educators and students, lends itself to be an ideal model of instruction for students with a range of disabilities. First, in a flipped-differentiated classroom, the educator spends a majority of the class walking around and interacting with students to address student questions and clear up any misconceptions about the content. Those students who demonstrate mastery quickly are able to move on and extend learning. Conversely, students who struggle to understand key concepts can receive modified assignments or a reduced quantity of work. For struggling students, this process of instruction and differentiation ensures that essential objectives will be learned without overwhelming and confusing students with more advanced topics and burying them with work that they do not understand.

Active Learning

One component of the flipped method of instruction is the use of active learning. Active learning in a flipped classroom is a student-centered approach in which the acquisition of knowledge takes place within the context in which it will be used. In the active learning process, students are engaged and actively constructing new knowledge by building new mental models of information, testing the validity of the models, and fixing the inaccuracies in the new model (Hardman, McKnight, McKnight, & Arfstrom, 2013). Active learning activities involve the use of hands-on academic activities that use multisensory instructional materials and learning experiences to engage students and maintain interest. These highly interactive lessons use small group activities with educator–student and student–student interactions. Extensive research has determined that active learning increases student learning and achievement (Michael, 2006; Prince, 2004), improves student academic performance (Chaplin, 2009; Freeman et al., 2007; Hake, 1998; Knight & Wood, 2005; Michael, 2006), increases student engagement, critical thinking, and attitudes toward learning (O'Dowd & Aguilar-Roca, 2009), and significantly reduces learning misconceptions (Akinoglu & Tandogan, 2006).

The concept of active learning is crucial for students with a range of disabilities. With the use of adapted techniques, technology, and even the support of a paraeducator, students with more severe disabilities can participate in interactive small-group activities and are able to complete independent tasks that reinforce previously learned skills. Some strategies that can be built into learning activities to ensure a student with severe disability's involvement in a lesson include: (a) using objects, pictures, and photos to support text passage or stories; (b) simplifying or providing summaries of stories and text passages; (c) using video clips, multi-media presentations, and e-books to motivate the student; (d) using graphic organizers, story boards, and manipulatives; (e) integrating technology into the lesson as much as possible, as appropriate; and (f) using personal, meaningful experiences to promote understanding (Sarathy, 2012).

Small-group work that is a common component of active learning in a flipped classroom also has benefits for students with social skill deficits. Social isolation is a common problem for students with emotional disturbance and/or autism, and can have a devastating impact on their wellbeing. Working with peers in small-group settings and in pairs provides this population of students with opportunities to practice appropriate social skills (i.e., asking for help, taking turns, and disagreeing politely). Moreover, as their social skills progress and their social isolation decreases, these students' impression of school and learning will improve, likely reducing their class disruptions and thus positively impacting classroom management (Jensen, 2005).

Another reason the flipped method of instruction is beneficial for students with disabilities is that active learning has been linked to higher rates of on-level instruction and positive learning outcomes. Research shows that the quality of learning associated with active learning leads to more frequent, positive contributions to the class and helps to create a classroom environment where students with disabilities feel comfortable to express themselves. Additionally, since this class environment encourages and values students' contributions, educators are able to monitor students' learning and clear up any misconceptions of the lesson (Bucalos & Lingo, 2005).

Priming

Priming provides structure and a level of predictability for students, enabling them to preview the new learning material and increasing their chances of success. Research indicates that one's ability to successfully learn and retain new information is largely contingent on: (a) the knowledge the student brings to the task, (b) the accuracy of that information, and (c) the degree to which the student accesses and uses that information (Bodie, Powers, & Fitch-Hauser, 2006). The flipped method of instruction uses the direct instructional videos that are viewed outside of class as a method of priming students for the active learning tasks that take place in the classroom (Bodie et al., 2006; Hardman et al., 2013).

Problem behaviors, poor sustained motivation, ineffective study skills, and an inability to sustain attention are common problems that negatively impact the academic and behavioral performance of students with disabilities. In order to reduce the likelihood that these behaviors will occur, researchers suggest using priming to prepare (expose) the student for the next lesson. In a flipped classroom, students are primed for learning by watching the instructional video as homework. Priming thus addresses the memory and strategy deficits that students with disabilities bring to tasks by alerting the learner to retrieve prior knowledge and prepares them for the learning tasks ahead. Essentially, priming the lesson provides a context for student performance during the following school day. Priming is often used with students with autism in inclusion settings as a method to reduce the problem behaviors and negative consequences that are associated with being held to the same academic and behavioral standards as their nondisabled peers (Koegel, Koegel, Frea, & Hopkins, 2003).

Flipped Instruction Examples

Let us imagine a student in Geometry class who needs extra time to process the information that she is learning. Her educational plan states that she should have 50% more time to complete assignments, have untimed and modified assessments, and sit toward the front of the classroom to alleviate distractions. Educators who implement the flipped method of instruction are able to provide this student with the accommodations she needs with ease. Since the student has access to the direct instruction video and is responsible for watching the video outside of class time, she is able to watch the instructional video as many times as necessary until she understands the concepts being presented. Since the flipped method of instruction maximizes face-to-face instructional time and improves educator–student interactions, educators are able to individualize learning, differentiate instruction as needed, check for student understanding, and make any corrections that may be needed.

In another scenario, students begin learning world languages in second grade. After 5 years of frequent practice, in seventh-grade Spanish class, the educator divides the class into three groups of students: those who have been at the school for several years and are fairly fluent Spanish speakers, those who have taken Spanish for several years but still struggle with the language due to an individual processing or learning disability, and those who have just transferred to the school and do not know any Spanish.

The educator is able to teach all three groups at the same time by implementing the flipped method of instruction and differentiating the presentation of the content according to the students' levels of fluency and types of needs. Educators create a flexible learning space where they move about the room, interacting with each group. Educators provide individualized and small-group instruction as needed and at the appropriate level. If a person were to visit the classroom, they would see a busy, interactive class where some students are watching a lesson, some students may be practicing conversation skills in Spanish, and other students might be working on grammar lessons, while others are taking an online assessment.

Conclusion

Given the range of academic and behavioral abilities in individuals with disabilities, effective strategies to reduce problems and limitations are essential for enabling students to meet their fullest potential. Effective tools for increasing success on all levels is critical if these students are to benefit from having access to and learning the general curriculum. While the strategies described in the chapter are just a few of the tools that have been used with success in improving behavior and academic performance of students with disabilities, the paucity of any empirical research on the flipped model of instruction and special education necessitates an immediate need for research on the topic.

In summary, the flipped classroom model of instruction continues to attract interest from educators around the world. Preliminary research indicates that this is a promising method of instruction that has positively impacted educators' job satisfaction and students' academic performance. This chapter describes how the flipped model's focus on individualizing learning for each student and maximizing class time is well matched with special education's goal of providing student-focused instruction that is based on the individual student's learning needs. Best practices in special education, such as Universal Design for Learning, differentiated instruction, active learning, and priming are discussed, along with the reasons that these practices and the flipped model of instruction could theoretically address the diverse needs of students with disabilities and positively impact their school experiences.

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