



# EXTENSION OF A REVIEW OF FLIPPED LEARNING

WRITTEN BY

Jessica Yarbrow, George Mason University

Kari M. Arfstrom, Ph.D. Executive Director, Flipped Learning Network

Katherine McKnight, Ph.D. Pearson's Center for Educator Learning & Effectiveness

Patrick McKnight, Ph.D., George Mason University



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## INTRODUCTION

As a relatively new model of instruction, educators understandably desire evidence that the Flipped Learning model has a positive impact on important student outcomes, including achievement and engagement. To meet this need, the Flipped Learning Network™ (FLN), with the support of Pearson and researchers at George Mason University, completed a comprehensive review of relevant research—both theory and empirical evidence—in June 2013. Currently, the amount of rigorous, empirical research on the effectiveness of the Flipped Learning model is limited but growing. In this 2014 extension of the literature review, we review studies published recently to provide educators with the most up-to-date information about the Flipped Learning model. PDF copies of the 2013 literature review, along with a shorter-form white paper and two-page executive summary, are available at [www.flippedlearning.org/research](http://www.flippedlearning.org/research)

## GROWTH IN THE INTEREST OF FLIPPED LEARNING

Since the first release of the literature review (2013), a staggering number of educators have sought out information on Flipped Learning through the FLN's online community of practice, attending webinars, trainings or other events, and requesting information. Local, national and international reporters have contacted the FLN and written stories for print, radio and TV. Reporters from national television affiliates, international media and print press and radio have all done stories of teachers and students using this method. A small sampling of the media coverage can be found at [www.flippedlearning.org/Press](http://www.flippedlearning.org/Press)

In a joint survey titled “Growth in Flipped Learning: Transitioning the focus from teachers to students for educational success,” conducted by the FLN and Sophia Learning in February 2014 and released in May 2014, the term “Flipped Learning” was recognized by 96% of teachers, an increase from 74% two years prior when a similar study was conducted. The number of teachers who indicated they had flipped a lesson during the school year went up from 48% in 2012 to 78% in 2014. Of the teachers who do flip, 96% say they would recommend it to a colleague.

Another indicator of growth is the FLN's community of practice, referred to as “The Ning” after the platform upon which it is housed. The Ning has grown from 2,500 members in January 2012, to 10,000 on June 19, 2013 at the 6th annual conference, to more than 20,000 members as of May 29, 2014, a few weeks prior to the 7th annual event. Once on the website, educators join groups based on grades, subject or other organizing themes. They participate in discussion forums by asking questions and answering those from their peers. More information can be found at <http://flippedclassroom.org>

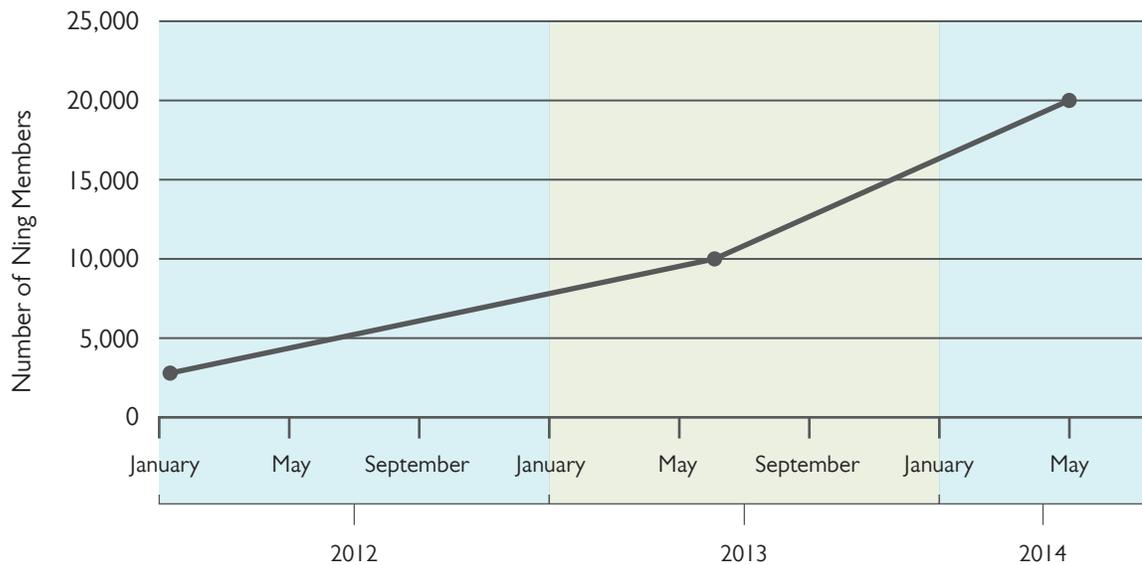


Figure 1. Flipped Learning online community growth over two years.

In 2012, one book was published on the topic: *Flip Your Classroom: Reach Every Student in Every Class Every Day* (ISTE) by Jonathan Bergmann and Aaron Sams. In 2014, the number of books published on the topic grew. These authors published a second book titled *Flipped Learning: Gateway to Student Engagement* (ISTE). Other books published in the past two years include the following:

*Flipped 2.0: Practical Strategies for Flipping your Class*. Compiled by Jason Bretzmann.  
(The Bretzmann Group, 2013)

*Flipping Your English Class to Reach All Learners: Strategies and Lesson Plans*. By Troy Cockrum.  
(Routledge, 2014)

*Time for Learning: Top 10 Reasons Why Flipping the Classroom Can Change Education*. By Kathleen P. Fulton.  
(Corwin, 2014)

*Critical Assessments of the Flipped Classroom Experience*. Edited by Abigail G Scheg. (IGI-Global, 2014)

Although not a scientific measure, a search in Google in June 2014 resulted in 244,000 hits for the term “Flipped Learning” and 1,690,000 links for “flipped classroom.” Using the same terms in Google Scholar, the number of hits resulted in 314 and 2,530, respectively.

The remainder of this paper discusses the new definition of Flipped Learning, and offers the eleven new indicators for educators to self-assess their classroom engagement in Flipped Learning. The extended review then outlines the changing perceptions of teachers, administrators and students from the past year. Finally, the paper summarizes new research on Flipped Learning with data from K-12, higher education and businesses. It concludes with concerns about Flipped Learning.

## DEFINITION OF FLIPPED LEARNING

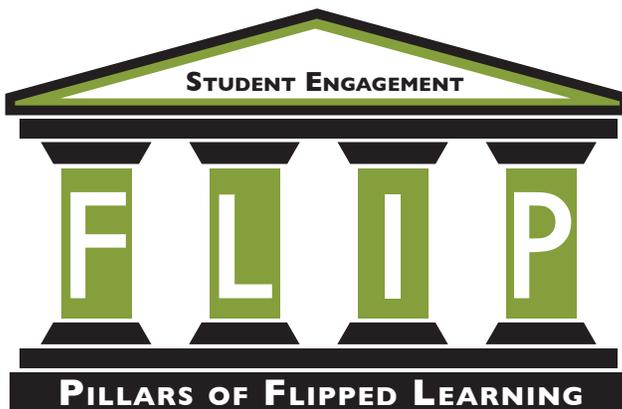
Because of confusion in the literature, the governing board of the FLN, all experienced flipped educators, composed a formal definition of Flipped Learning and released it in March 2014. The terms “flipped classrooms” and “Flipped Learning” are not synonymous and it is a common mistake usually perpetuated in the opening paragraph of articles written on the topic. What is often defined as “school work at home and home work at school” is overly simplistic and does not cover the range of active engagement within a flipped classroom using a Flipped Learning approach. A Review of Flipped Learning was written to dispel some of the myths promulgated by the media, researchers and often educators (Hamdan, McKnight, McKnight, & Arfstrom, 2013).

As stated in the definition of Flipped Learning, a flipped class can, but does not necessarily, lead to Flipped Learning (FLN, 2014). Many teachers may already flip their classes by having students read text, watch supplemental videos or solve additional problems outside of class—maybe as homework—during study hall or on the bus to a game.

Flipped Learning is defined 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.” (FLN, 2014). By moving from a flipped class to actively engaging in Flipped Learning, teachers are able to implement new or various methodologies into their classrooms. It frees up class time, allowing for more individual and small group instruction.

## FOUR PILLARS OF F-L-I-P™ AND ELEVEN INDICATORS

At the same time that the board of directors for the FLN released the formal definition of these terms, they also added eleven indicators to the previously published The Four Pillars of F-L-I-P™. As reported in the original literature review (2013), the pillars that teachers must incorporate into their practice include:



FLEXIBLE ENVIRONMENT  
LEARNING CULTURE  
INTENTIONAL CONTENT  
PROFESSIONAL EDUCATOR



This year, added to the pillars were eleven indicators for educators to use as a self-assessment, or for administrators or coaches to use when guiding the integration and implementation in their schools and districts (FLN, 2014).

A few examples of these eleven indicators are:

- F.2 – I provide students with different ways to learn content and demonstrate mastery.
- L.1 – I give students opportunities to engage in meaningful activities without the teacher being central.
- I.3 – I differentiate to make content accessible and relevant to all students.
- P.2 – I conduct ongoing formative assessments during class time through observation and by recording data to inform future instruction.

The document can be found in Appendix A.

## CHANGING PERCEPTIONS FROM TEACHERS, ADMINISTRATORS AND STUDENTS

As reported in the original literature review from June 2013, a number of surveys and articles have been conducted and published as this method matures and as more teachers add it to their practice. Following is a summary of feedback from various stakeholders.

### TEACHERS

In early 2014, the FLN and Sophia Learning conducted an online survey of the flipped field with 2,358 educators responding to 36 questions.<sup>1</sup> This survey merged question sets that the FLN and Sophia had used in independent surveys they each conducted in 2012, so that growth in perception and practice over the two years could be derived. Perceptions of experiences, grades and subjects taught in a flipped method were noted.

The 2014 survey confirmed what was learned in 2012 that on average, eight out of ten flipped teachers have more than six years of experience; in fact 42% of flippers have been teaching for 16 years or more. Teachers who are flipping their classes are not necessarily only new-to-the-profession teachers, or those with a high degree of computer skills and comfort with technology.

In the same survey, the span of grades and subjects also expanded from the previous two years. While high school flipped teachers in math and science were still in the majority (33% and 38%, respectively), there was a significant increase in English/language arts teachers who were flipping their classrooms up from 12% in 2012 to 23% in 2014. In 2012, the surveys did not address other subjects; however in 2014, flipped teachers reported for social studies (18%), technology and computer sciences (17%) and world languages (7%), with a handful of art, music and physical education teachers rounding out the group of subjects represented. One out of ten teachers received their own professional development in a flipped fashion.

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“I like that it gives me time to conference with students ... It’s more one-on-one time I have with them. Before, they’d be working on their homework at home. I’d see the finished product but not how they got there. At the very least, this gives me the opportunity to be able to fix mistakes before it’s too late” (Chipp, 2013).

*Ed Ventry,  
Niagara Falls High School, NY*

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“It was this one teacher and one conversation that shifted my thinking and prompted me to change my approach. And it is working. I wouldn’t go back to the other way” (Phillips, 2013).

*Katie Christie,  
Runyon Elementary School, CO*

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“I have seen quiz grades go from in the 60-70 range, to now my students are consistently scoring in the 80-90 range on those same kinds of quizzes, same level of questions” (WNCT 9, 2013).

*Nicki Griffin,  
South Central High School, NC*

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<sup>1</sup> See [www.flippedlearning.org/survey](http://www.flippedlearning.org/survey) for infographic based on survey results.

## ADMINISTRATORS

During the fall of 2013, 403,000 K-12 students, parents, teachers, administrators and community members participated in the 11th annual Speak Up online surveys facilitated by the national education nonprofit organization, Project Tomorrow® in conjunction with the FLN. The national data findings from the surveys were released in early 2014. For the second year in a row, specific questions were asked of students, educators and administrators on Flipped Learning and use of videos in the classroom.<sup>2</sup>

The survey found that 25% of principals and superintendents stated Flipped Learning had a significant impact on transforming teaching and learning, surpassing games and mobile apps at 21% and online professional learning communities with 19% as the leading indicator of this transformational process in their schools and districts. Although digital textbooks and online classes have been part of the digital learning environments for a longer period of time, a similar number of district administrators are favorable to Flipped Learning as a transformative agent in the classroom.

The national research also indicated that 40% of administrators said they were interested in “trying Flipped Learning” this year in their classrooms and schools. Administrators are challenged by the implementation of many new digital learning initiatives in the classroom; teachers need new training to implement these approaches successfully in the classroom. School principals’ interest in Flipped Learning, however, transcends their concerns about their current teaching staffs. When asked to identify the technology experiences they think pre-service teachers should have before getting a teaching credential, 41% say that these teacher candidates should learn how to set up a Flipped Learning class model.

## STUDENTS

Of the more than 180,000 middle and high school students who participated in the Speak Up 2013 surveys, almost three-quarters agree that Flipped Learning would be a good way for them to learn, with 32% of those students strongly agreeing with the idea. As the Speak Up data has documented with other new digital learning trends, the student interest in new classroom models often precedes teacher or even administrator interest or exploration (Project Tomorrow, 2014).

As Project Tomorrow (2014) has reported for several years in Speak Up reports, today’s students in many ways serve as a “digital advance team” for educators. Teachers and administrators should take student interest in Flipped Learning very seriously. Students’ reflections on how technologies are being used in their classrooms are often an indicator about emerging adoptions. Such is the case with the use of online videos by students to support their learning process. Representative of the increasing role of video use within classroom instruction and teacher comfort with that media, middle and high school students reported an increase in their use of videos as part of their learning process from 40% in 2012 to 60% in 2013. The increase occurred for use of both online and teacher created videos.

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“I prefer flipped math over traditional math, because it better allows me to find where I have trouble at home and actually get help with it at school” (Svan, 2014).

*Cade, first-year high school student*

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“In class it was just adding to the knowledge you had and adding color to it and seeing it in different situations. I wish more classes were like that” (Chung, 2014).

*Jill, junior in college*

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<sup>2</sup> See more at [www.flippedlearning.org/research](http://www.flippedlearning.org/research)

# SUMMARY OF RECENT RESEARCH ON FLIPPED LEARNING FROM K-12 AND HIGHER EDUCATION

## FLIPPED LEARNING IN K-12

This section highlights many different experiences with the Flipped Learning model in several K-12 schools including Niagara Falls High School (NY), Ashland Middle School (MA), Bullis School (MD), Madeira School (VA) and a public high school in rural Louisiana. These experiences are noteworthy because they document comparisons between student achievement in Flipped Learning classes and traditional lecture classes.

### Niagara Falls High School (NY)

Math teachers Ed Ventry and Amy Kilmer at Niagara Falls High School (NY) flipped their classes in 2013 in hopes of using class time for more applied activities and individualized instruction. They discuss their experiences in an article with the Western New York Regional Information Center (2013). With support from a district coach and technology integrator, Ventry and Kilmer recorded lectures and posted them on a district sponsored online collaborative platform. They also supplied students with guided notes to complete while watching the videos outside of class time. Students then worked on “homework” problems in class where the teachers were able to discuss problems with students as they encountered them. Students were able to get real time assistance from their teachers without waiting for help the next day.

Ventry and Kilmer were encouraged by their students’ performance on the Regents Examinations (a New York State standardized test). After implementing the flipped approach, 83% of students in the honors Algebra II/Trigonometry class passed the Regents exam (with a score of 65 or higher) compared with 71% the year before, and 35% of honors students achieved mastery (a score of 85 or higher) compared with 14% the previous year. Likewise, in the general Algebra II/Trigonometry class, 55% of students passed the Regents exam compared with 35% the year before, and 7% of students achieved mastery compared with 4% the previous year.

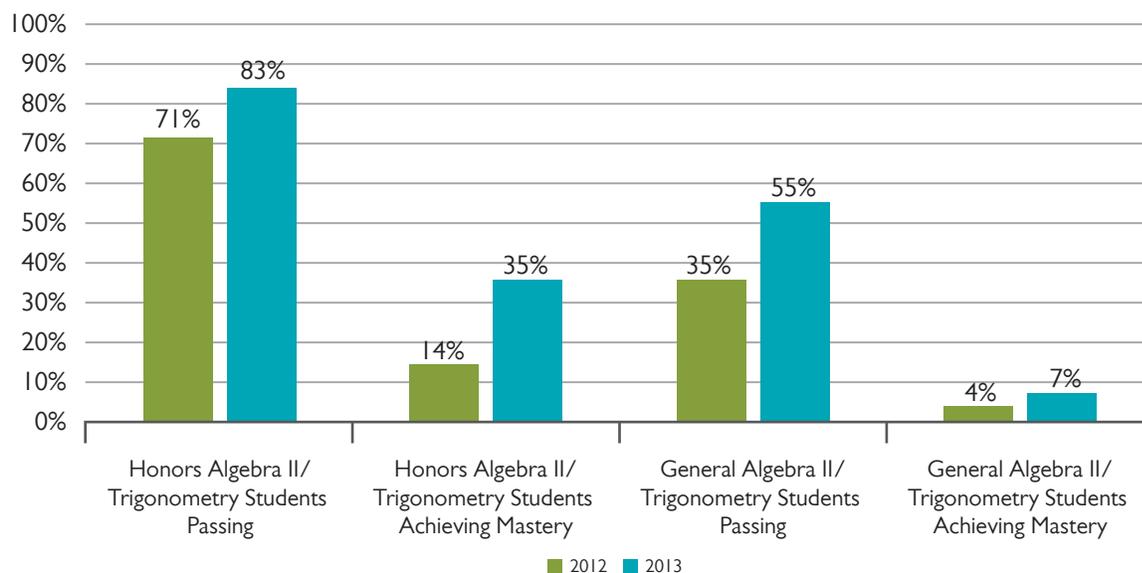


Figure 2. Student achievement increases at Niagara Falls High School.

### Ashland Middle School (MA)

Although more often used in science, math and technology classes, the Flipped Learning model has also been applied in the context of a middle school French class (Dill, 2012). Ellen Dill compared the performance of two seventh grade classrooms at Ashland Middle School (MA) as part of a project for her Master of Education program. Dill compared these classes during a two-week period when one class received flipped instruction while the other received traditional lectures. In the flipped class, students watched video lectures outside of class and participated in project-based learning and workbook assignments in class. While homework completion rates were similar for both sections before introducing the flipped model (79.8% vs. 79.1%), homework completion increased over the two-week period in the flipped class (to 98.7%) but remained fairly constant in the traditional class (at 81.4%). Homework in the flipped class differed from that in the traditional class, which may explain some of the differences in completion rate. In particular, homework for the flipped class involved watching the videos, taking notes and completing tasks related to class projects while homework for the traditional class consisted of workbook assignments.

Dill also assessed student performance on a French grammar quiz and written assignment before and after the flip. In the traditional class, average scores on both the grammar quiz (75% to 76%) and written assignment (89.7% to 87%) remained fairly constant; in contrast, students in the flipped class scored better after the flip on both the grammar quiz (78% to 88%) and written assignment (87.3% to 92%). Dill noted in her report that she had fewer disciplinary actions based on disruptive behavior (such as verbal warnings and detention) in the flipped class compared to the traditional lecture class.

### Bullis School (MD) and Madeira School (VA)

Mother and daughter, Stacey and Wendy Roshan (2012), discussed their experience with the Flipped Learning model on CNN's Schools of Thought blog. Stacey Roshan, an AP Calculus teacher at Bullis School, MD, decided to flip her course by having students watch videos outside of class, using a detailed note taking process, and then using class time for students to work individually and in small groups on calculus problems. Stacey was encouraged by her students' results on the AP exam after flipping her course. She stated the proportion of students who scored a 4 or a 5 on the AP exam increased from 58% the previous year to 78% after the flip (Roshan & Roshan, 2012). After flipping, no students scored below a 3. Inspired by Stacey's success with the Flipped Learning model, her mother, Wendy Roshan, a math teacher at the Madeira School, VA, implemented it in her first year teaching AP Calculus. She also reported success, stating that after the first year of flipping 80% of her students scored a 4 or 5 on the AP exam (Roshan & Roshan, 2012).

### Public High School, Rural Southwest Louisiana

Not all the evidence suggests that the Flipped Learning model always increases student achievement. As part of an unpublished dissertation, Kevin Clark (2013) implemented Flipped Learning in two 9th grade Algebra I classes at a public high school in Louisiana for seven weeks, the equivalent of one grading period. Students watched video presentations and listened to instructor-created podcasts outside of class and spent class time working on hands-on and real-world applied mathematical problems. Students scored on average 80.83 on the end-of-unit test, which did not significantly differ from the scores of students in a traditional lecture class (80.00) who took the same exam (Clark, 2013).

## FLIPPED LEARNING IN HIGHER EDUCATION

Instructors and professors at many universities, including the University of British Columbia, the University of Memphis, the University of North Carolina, Chapel Hill, Texas A&M University, Capital University, Georgia Institute of Technology and Harvey Mudd College have started incorporating elements of the Flipped Learning model into their classes. This section outlines the empirical evidence from these endeavors, documenting the impact Flipped Learning has on student achievement and engagement.

### University of British Columbia (BC)

Faculty at the University of British Columbia, including 2011 Nobel Laureate Carl Wieman, examined the impact that flipping a section of Introduction to Modern Physics had on student learning. By assigning students readings and quizzes outside of class, class time was reserved for applied and interactive activities and peer discussion, which the authors thought would enhance conceptual mastery of the material. Professors Deslauriers and Wieman (2011) compared the performance of students in the flipped section with that of students taught using a traditional lecture format the year before. At the end of both sections, students took the Quantum Mechanics Concept Survey (QMCS), a measure of quantum mechanics knowledge which was a topic heavily featured during the course. Students in the flipped section scored significantly better on the QMCS (85% vs. 67%) suggesting that the Flipped Learning model has a positive impact on student learning. The professors found no difference between the sections in retention of the quantum mechanics knowledge when students retook the QMCS six or eighteen months later.

### University of Memphis (TN)

Although not a direct assessment of retention, Ruddick (2012), in an unpublished dissertation, suggests that the Flipped Learning model may have a positive impact on student performance in subsequent courses within a major. In the fall of 2011, instructors at the University of Memphis flipped two sections of CHEM 1100, Preparation for General Chemistry, designed to prepare students for the foundational chemistry course. Of the students who took the flipped sections of the preparatory course, 73.7% received a grade of C or better in General Chemistry, compared to 48.4% of students who took traditional sections of CHEM 1100, and 52.5% of all students taking General Chemistry. These findings suggest that implementing the Flipped Learning model in CHEM 1100 better prepared students for later chemistry courses.

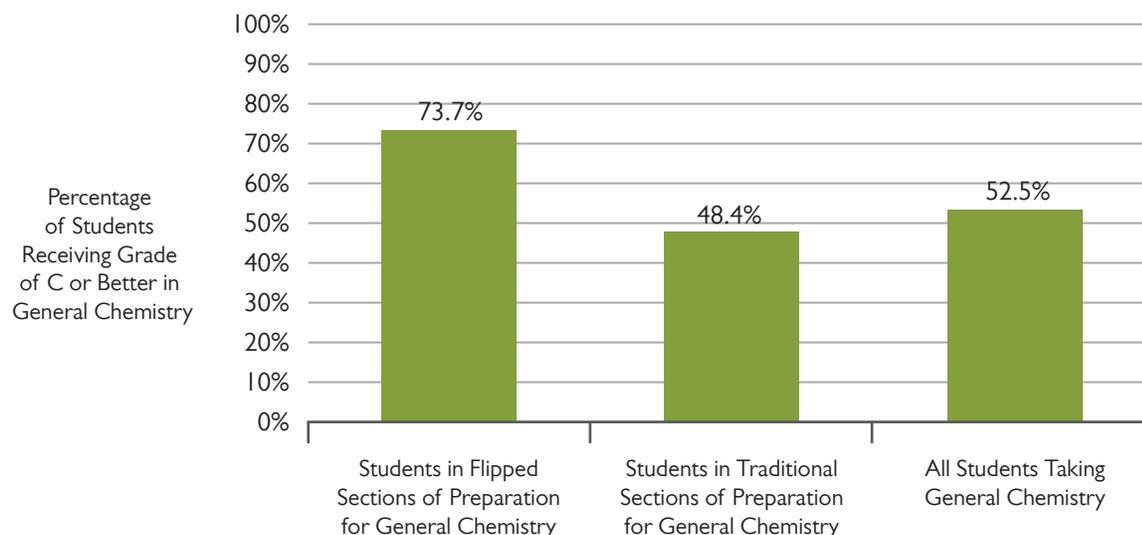


Figure 3. Flipped preparatory chemistry course increases student achievement in subsequent chemistry course.

### Texas A&M University (TX)

The flipped classroom has also been evaluated in the nursing program at Texas A&M University. Missildine and colleagues (2013) hoped that by providing students with videos and lectures to watch outside of class instructors could spend class time on case simulations and activities that were relevant to the real world practice of nursing. Over three semesters, students in two health-nursing courses were taught with different modalities. Students were either taught with classroom lectures; classroom lectures plus access to video-recorded lectures outside of class; or with a fully flipped model where students watched video outside of class and spent class time on interactive activities. On average, students in the flipped sections scored slightly higher on course examinations (81.89) than students in either the traditional lecture (79.79) or traditional lecture plus video lecture (80.70) sections. Over the course of the study, Missildine reported that an additional 47 students received passing grades in these courses as a result of the changes. Despite the increase in student achievement, students in the fully flipped sections were least satisfied with courses, which the researchers believe may result from perceptions of increased workload in the flipped sections (Missildine et al., 2013).

### Capital University (OH)

Wilson (2013) implemented a partially Flipped Learning model in an undergraduate statistics course for social science majors at Capital University in Ohio. Because students learned the material outside of class by reading the textbook and utilizing online resources, the instructor spent less class time on direct instruction through lecture. Students instead spent class time working applied problems focusing on the real world application of statistics. Students performed better in the flipped sections and demonstrated enhanced statistics knowledge compared to those in sections taught using a traditional lecture format the previous year. In the flipped sections exam scores increased, on average, 6.73 points compared to the previous year while final grades in the course increased, on average, 9.99 points.<sup>3</sup> An important caveat to consider regarding final grades is that the grading structure in the flipped section differed from previous semesters. The instructor introduced new graded assignments in the flipped sections, such as group homework representing 20% of students' grades, which may account for some of the differences in final grades.

Students in all sections also took an independent statistical knowledge test administered at the beginning and end of the semester. While students in the flipped and traditional sections scored similarly (10.03 and 9.77, respectively) at the beginning of the semester, at the end of the semester, students in the flipped sections scored significantly higher (18.00 vs. 16.00).<sup>4</sup> Students also had positive impressions of the Flipped Learning model. Based on student evaluations, Capital University provides a percentile rank for each course comparing student evaluations with other similar courses (i.e., social science courses). The percentile rank for this statistics course increased from 47.20 before the flip to 56.75 after the flip indicating that students were more satisfied with the Flipped Learning model.

### Georgia Institute of Technology (GA)

Day and Foley (2006) compared the impact of the Flipped Learning model on student performance and perceptions in a Human-Computer Interaction course at the Georgia Institute of Technology. They flipped a standard lecture course such that all but three class lectures were moved online and were watched outside of class. The videos combined were nine hours in length, so the class met less frequently (seven fewer class meetings) to control for time spent on task. During the remaining class meetings, students spent time engaged in hands-on learning activities including small breakout group discussions, presentations, and design critiques. The performance and perceptions of students in this flipped section were compared to students in a standard lecture section. Students in the flipped section performed significantly better on the semester project and final course grades—88.23% vs. 79.95% (Day & Foley, 2006). While students in the flipped section scored higher on both the midterm (86% vs. 82.44%) and final exams (87.53% vs. 83.60%), these differences were only marginally significant. Finally, students in the flipped section were generally satisfied with the format, and their attitudes towards the format became increasingly positive over the course of the semester.

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3 The authors do not specify the total number of possible points for the exam scores or final grades.

4 The authors do not specify the total number of possible points, but they do indicate that the test included 25 multiple choice questions.



## University of North Carolina - Chapel Hill (NC)

The Flipped Learning model has also been successfully applied in a graduate school setting. Over the course of three years, Dr. Mumper at the University of North Carolina's Eshelman School of Pharmacy has evaluated the impact of flipping Basic Pharmaceutics II (a first year pharmacy school course). In 2011, he taught the course using a traditional lecture style that he had used for years, then in 2012 he experimented with flipping the course. The graduate students watched video-recorded lectures outside of class and spent class time taking quizzes on handheld devices, working on applied problems, and making presentations to their peers on their readings. Average final exam scores increased significantly from 160.06 (out of 200 points) in 2011 to 165.48 in 2012 (McLaughlin et al., 2014).

In a separate article (McLaughlin et al., 2013), the researchers compared final exam scores of students taking the course at satellite campuses (13 students in 2011 and 22 in 2012) and found no significant differences. These findings may be partially attributable to the small sample size of satellite students. In an Atlantic article titled "The Post-Lecture Classroom: How will Students Fare?" by Robinson Meyer (2013), Dr. Mumper reported that he taught the flipped class again in 2013 and final exam scores increased by an additional 2.6% (about 5 points).

Student evaluations also highlight aspects of the Pharmacy course relevant to student performance and engagement. After taking the flipped section of the course, students indicated that learning content prior to coming to class, applied in-class activities and in-class discussions were more important for their learning (McLaughlin et al., 2014). Self-reported attendance also increased compared to the previous semester. These findings suggest that the fundamental elements of the Flipped Learning model were visible to students and that students recognized the positive impact they had.

## Harvey Mudd College (CA)

As with K-12 education, not all of the research on implementing the Flipped Learning model in higher education settings supports its effectiveness. Lape, Levy, and Yong, professors at Harvey Mudd College, have embarked on a multi-year study of the impacts of the Flipped Learning model on student achievement in STEM courses. This study is supported by a federal grant from the National Science Foundation. As of the second year of their study, they have found no significant differences in student learning between newly developed flipped classrooms and their traditional, yet interactive, lecture classes (Lape et al., 2014). Given their findings, these researchers highlight an important consideration for future research on the Flipped Learning model: the question isn't whether this model is or is not effective, but rather, under what conditions can it be most effective. Making blanket statements oversimplifies the complex education process that is impacted by student, teacher and institutional factors (Lape et al., 2014). The Flipped Learning model clearly shows promise, so the next step is understanding how teachers can apply it in ways that are most beneficial for students.

## BUSINESS RESEARCH ON FLIPPED LEARNING

Not only are K-12 schools and institutions of higher education conducting their own research on Flipped Learning, but companies and other professional organizations are also doing their own survey work, often in conjunction with a non-profit organization. For example, this extended literature review is a joint effort between Pearson and the FLN and George Mason University, and the survey mentioned above was a project of the Sophia Learning and the FLN.

A report released in May 2014 by Tagoras, a consulting firm specializing in the global market for lifelong learning, surveyed trade and professional associations about learning trends. Out of 157 organizations that responded to a question about new learning approaches, 5.3% of the organizations indicated they were currently providing Flipped Learning for continuing education and professional development, and 10% said they planned to offer this in the next twelve months. The survey was sponsored by Digital Ignite and draws on data collected in a survey conducted in late 2013.

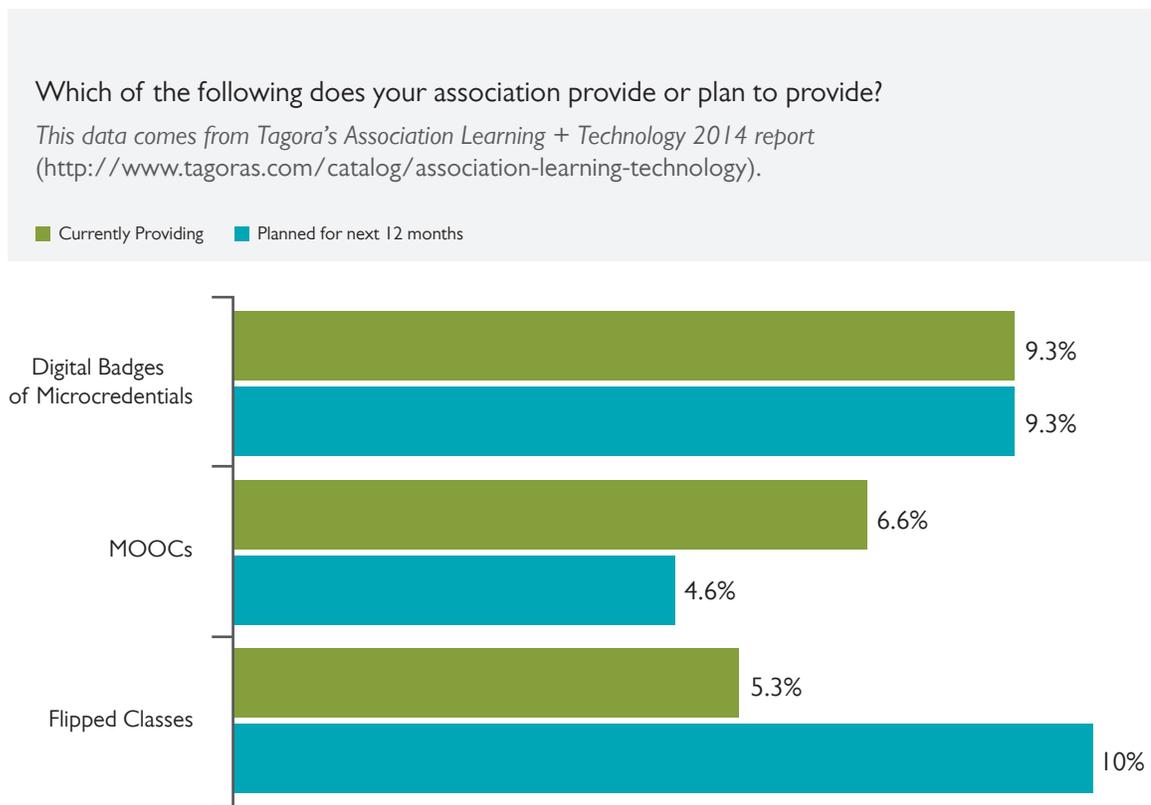


Figure 4. Business interest in Flipped Learning model. Adapted from *Experiencing the fringe: Flipping, microcredentials, and moocs*, by Tagoras & Digital Ignite, 2014.



The white paper, entitled “Exploring the Fringe: Flipping, Microcredentials, and MOOCs,” (2014) states that “flipping[learning] can also be particularly powerful for organizations in the business of adult continuing education and professional development because it can address three critical areas: marketing, business model, and learning” (p. 3). The report predicts continued growth in the flipped model as people continue to feel strapped for time and want to make best use of time spent with peers, teachers and facilitators (Tagoras & Digital Ignite, 2014).

In 2013, Sonic Foundry and the Center for Digital Education (CDE) surveyed 309 higher education faculty members about the Flipped Learning model, which they defined as “using some kind of technology to present what was previously conducted in person outside of class in advance of a classroom meeting” (Morris & Brown, 2013). A majority (56%) of respondents reported that they were either currently implementing or planned to implement the Flipped Learning model. Those using the Flipped Learning model generally viewed the experience positively with 57% saying that their implementation had been either successful or extremely successful and 83% reporting a positive change in their attitude toward teaching since flipping. Regarding student performance and perceptions, over 80% of teachers reported that after flipping they saw improved mastery of information, retention of information and student attitudes. The survey also assessed factors influencing decisions to implement the flipped classroom. The most commonly reported factors were an improved learning experience for students, availability of technology needed to implement the model and support for the flipped classroom in initial studies.

Kaltura, Inc. (2014) surveyed individuals from both higher education and K-12 schools about the use and role of videos in education. Respondents worked in a variety of contexts including teaching, IT and instructional design. Using videos within the context of a Flipped Learning model was fairly common with 48% of respondents reported using videos for flipping classrooms. A majority of respondents (57%) also believed that “flipped classrooms will become a standard teaching practice in higher ed.” Although not specific to the flipped classroom, respondents also reported on the impact of videos on the experience of learning and teaching. Respondents held positive views on the role of videos with 90% stating that videos improve the learning experience, 89% stating the videos have a positive impact on students’ satisfaction from the learning experience and 73% stating that videos increase teacher satisfaction from their teaching experience.

## CONCERNS ABOUT THE FLIPPED LEARNING MODEL

Teachers and site administrators continued to be in agreement that the following hindrances may be keeping them from flipping their classrooms: concern that students might not have “access at home;” needed instruction on how to “make” or “find high quality videos;” and how to “best utilize” the additional classroom time (Project Tomorrow, 2014).

But the overall drop in these concerns from the 2013 Speak Up survey results are stark indicators of ongoing acceptance of this teaching method. The percentage of teachers who were concerned about access to videos at home declined from 53% to 42% from 2012 to 2013, while school leaders declined from 47% to 29%. When asked about making videos, there was an equal decline from 27% to 19% and 33% to 25% for teachers and leaders, respectively. And for finding them, the percentage of teachers concerned dropped from 21% to 5%, and 31% to 28% for school leaders. While teachers remained unchanged in their request for instruction on how best to utilize videos in the classroom, the concern by administrators dropped from 31% to 9%. Five percent of administrators indicated they had provided training for teachers on flipped learning in the past year.

Another concern about the Flipped Learning model voiced by 75% of the educators in the Sonic Foundry and CDE survey (2013), is the time required to develop a Flipped Learning course. Dr. Mumper, who taught a flipped course at the UNC School of Pharmacy, estimated that developing and administering the flipped course took 127% more time than teaching it in a traditional lecture format, although this time commitment decreased during the second year of teaching the flipped course (McLaughlin et al., 2014). Faculty flipping an introductory economics course at Miami University reported that they spent two hours developing and another two hours recording each video lecture (Lage, Platt, & Treglia, 2000). Although not always an option, researchers (McLaughlin et al., 2014; Largent, 2013) suggest that this concern can be mitigated in college classes by including a graduate teaching assistant to help with the workload. Educators surveyed by Sonic Foundry and the CDE also reported the need for professional development and institutional support for the model, particularly regarding the switch to a student-centered orientation, as additional concerns (Morris & Brown, 2013).

## CONCLUSION

While continued research and evaluation is certainly needed, the studies reviewed in this document along with the original literature review (Hamdan, McKnight, McKnight, & Arfstrom, 2013) provide support for the efficacy and potential of the Flipped Learning model. Not only do many more teachers report successfully implementing the Flipped Learning model, but the initial empirical evidence is promising. In several of these studies the Flipped Learning model is associated with increased student learning and positive perceptions of the unique elements, such as presentation of material outside of class and increase in active learning activities.

Despite this support, the Flipped Learning model likely does not work in all contexts and there are understandable concerns about the time involved and fundamental shift in teaching style required. Research is needed on identifying the contexts in which the Flipped Learning model works best and how to most effectively apply the elements of the Flipped Learning model to enhance student learning. In addition, teachers would likely benefit from institutional support and professional development during the transitional period when implementing the Flipped Learning model. Despite these concerns and limitations, the Flipped Learning model represents an innovative approach to teaching with the potential to create active, engaged and learning-centered classrooms.



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# What Is Flipped Learning?

While often defined simplistically as “school work at home and home work at school,” Flipped Learning is an approach that allows teachers to implement a methodology, or various methodologies, in their classrooms.

To counter some of the misconceptions about this term, the governing board and key leaders of the Flipped Learning Network (FLN), all experienced Flipped Educators, have composed a formal definition of “Flipped Learning.” Explicitly defining the term may dispel some of the myths repeatedly promulgated by teachers, the media, and researchers.

These Flipped Learning leaders also distinguish between a Flipped Classroom and Flipped Learning. These terms are not interchangeable. Flipping a class can, but does not necessarily, lead to Flipped Learning. Many teachers may already flip their classes by having students read text outside of class, watch supplemental videos, or solve additional problems, but to engage in Flipped Learning, teachers must incorporate the following four pillars into their practice.

## Definition of Flipped Learning

Flipped Learning is 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.

flipped  
learning  
network

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*Reproducible PDF can be found at [www.flippedlearning.org/definition](http://www.flippedlearning.org/definition).*

*The Flipped Learning Network is a 501 (c) 3 with the mission of providing educators with the knowledge, skills, and resources to implement Flipped Learning successfully. The Four Pillars of F-L-I-P™ and the definition were written by the FLN's board members: Aaron Sams, Jon Bergmann, Kristin Daniels, Brian Bennett, Helaine W. Marshall, Ph.D., and Kari M. Arfstrom, Ph.D., executive director, with additional support from experienced Flipped Educators.*



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# The Four Pillars of F-L-I-P™

## F Flexible Environment

Flipped Learning allows for a variety of learning modes; educators often physically rearrange their learning spaces to accommodate a lesson or unit, to support either group work or independent study. They create flexible spaces in which students choose when and where they learn. Furthermore, educators who flip their classes are flexible in their expectations of student timelines for learning and in their assessments of student learning.

<b>F.1</b>	<input type="checkbox"/> I establish spaces and time frames that permit students to interact and reflect on their learning as needed.
<b>F.2</b>	<input type="checkbox"/> I continually observe and monitor students to make adjustments as appropriate.
<b>F.3</b>	<input type="checkbox"/> I provide students with different ways to learn content and demonstrate mastery.

## L Learning Culture

In the traditional teacher-centered model, the teacher is the primary source of information. By contrast, the Flipped Learning model deliberately shifts instruction to a learner-centered approach, where in-class time is dedicated to exploring topics in greater depth and creating rich learning opportunities. As a result, students are actively involved in knowledge construction as they participate in and evaluate their learning in a manner that is personally meaningful.

<b>L.1</b>	<input type="checkbox"/> I give students opportunities to engage in meaningful activities without the teacher being central.
<b>L.2</b>	<input type="checkbox"/> I scaffold these activities and make them accessible to all students through differentiation and feedback.

## I Intentional Content

Flipped Learning Educators continually think about how they can use the Flipped Learning model to help students develop conceptual understanding, as well as procedural fluency. They determine what they need to teach and what materials students should explore on their own. Educators use Intentional Content to maximize classroom time in order to adopt methods of student-centered, active learning strategies, depending on grade level and subject matter.

<b>I.1</b>	<input type="checkbox"/> I prioritize concepts used in direct instruction for learners to access on their own.
<b>I.2</b>	<input type="checkbox"/> I create and/or curate relevant content (typically videos) for my students.
<b>I.3</b>	<input type="checkbox"/> I differentiate to make content accessible and relevant to all students.

## P Professional Educator

The role of a Professional Educator is even more important, and often more demanding, in a Flipped Classroom than in a traditional one. During class time, they continually observe their students, providing them with feedback relevant in the moment, and assessing their work. Professional Educators are reflective in their practice, connect with each other to improve their instruction, accept constructive criticism, and tolerate controlled chaos in their classrooms. While Professional Educators take on less visibly prominent roles in a flipped classroom, they remain the essential ingredient that enables Flipped Learning to occur.

<b>P.1</b>	<input type="checkbox"/> I make myself available to all students for individual, small group, and class feedback in real time as needed.
<b>P.2</b>	<input type="checkbox"/> I conduct ongoing formative assessments during class time through observation and by recording data to inform future instruction.
<b>P.3</b>	<input type="checkbox"/> I collaborate and reflect with other educators and take responsibility for transforming my practice.



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