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Abstract

This study examined the effects of the flipped classroom (FC) on overall learning in an undergraduate educational psychology course. Learning in the FC at the different levels of learning in Bloom's Taxonomy (BT) was also investigated. We predicted that students in the FC would learn more than students in the traditional class and that students in the FC would initially score higher on items assessing lower BT levels (LL), but as they get more FC experiences would score higher on items assessing higher levels of BT (HL). Results indicated that there were no differences in exam scores between the traditional and FC sections. Students in the flipped sections scored higher on LL than on HL items in exam 1, but performed better on HL items than on LL items in exam 2. Implications and limitations of the study, as well as directions for future research, are discussed.

Educators concerned with effective teaching in higher education have advocated for the use of the flipped classroom to increase student-centered, active learning (Bergmann & Sams, 2012; Hussey, Richmond, & Fleck, 2015). The flipped classroom can take many forms. It generally involves providing experiences that traditionally take place in the class (e.g., lecture) outside of class, usually via online lectures that students view prior to the class meeting. On the other hand, experiences that traditionally take place outside of class (e.g., homework) occur in the classroom (Bishop & Verleger, 2013; Hussey et al., 2015; O'Flaherty & Phillips, 2015; Peterson, 2016; Pierce & Fox, 2012).

While the conceptual literature on the flipped classroom pedagogy points to its potential for improving several outcomes, including student perceptions of course effectiveness and student test scores (Bergmann & Sams, 2012; Hussey et al., 2015), empirical research has provided mixed, albeit somewhat positive, evidence for the effectiveness of flipping the classroom in increasing the levels of these outcomes (DeLozier & Rhodes, 2017). A review of the literature on the flipped classroom in higher education concluded that while there is strong indirect evidence of its effectiveness, there is still a lack of consistent direct evidence of its effectiveness (O'Flaherty & Phillips, 2015). Similarly, an examination of the literature (Hussey et al., 2015) and a more recent literature review (Chen, Lui, & Martinelli, 2017) both concluded that while, overall, students seem to have positive perceptions of the flipped classroom over the traditional classroom, the effects of flipping the classroom on student learning are inconsistent and inconclusive. These inconsistencies may have resulted from the differences in the types of courses that the flipped classroom pedagogy is applied in. They may have also resulted from the different levels of learning, higher vs. lower order, that are assessed when measuring student learning in a flipped classroom.

The Impact of Flipping Psychology and Other Social Science Courses

The effectiveness of the flipped classroom probably varies depending on the type or subject matter of the classroom that is flipped. Most of the available literature reports on the effectiveness of flipping the classroom for STEM courses, which address a lot of technical information, such as Math, Chemistry, Biology, Medicine, and Nursing, (ex. Foertsch, Moses, Strikwerda, & Litzkow, 2002; Fulton, 2012; Guy & Marquis, 2016; Hao, 2016; Ichinose & Clinkenbeard, 2016; Lax, Morris, & Kolber, 2017; McNally et al., 2017; Pierce & Fox, 2012; Peterson, 2016; Strayer, 2012). These studies generally report that the flipped classroom is associated with improved learning outcomes.

There are only a few studies that reported on flipping a social science course in general or a psychology course in particular. Two studies, Peterson (2016) and Wilson (2013), have examined the effectiveness of flipping psychology statistics courses and reported higher academic achievement in the flipped class compared to the traditional class. Another study that examined the effectiveness of flipping a physiological psychology course also reported higher grades in the flipped course than in the traditional course (Talley & Scherer, 2013). However, both psychology statistics and physiological psychology are essentially STEM courses rather than social science courses.

One study that examined the effects of redesigning a large introductory psychology course to utilize a flipped model reported a significant increase in academic performance in the redesigned course (Hudson, Whisenhunt, Shoptaugh, Rost, & Fondren-Happel, 2014; Hudson et al., 2015). However, another study that experimented with using online video lectures coupled with an in-class learning session for four chapters in introductory psychology reported no advantage for the flipped format over the traditional format (Jensen, 2011). A third study that reported on flipping an introductory psychology course (Roehling, Luna, Richie, & Shaughnessy, 2017) reported mixed results for the effectiveness of the flipped class pedagogy.

Differences Due to the Different Types of Assessment Used

The different types of assessments used to evaluate student learning might yield different results with respect to the effectiveness of flipping the classroom in increasing student learning. Not all test questions are of the same type. Some questions may be focused more on knowledge, while others may be focused more on comprehension or application. Bloom's taxonomy, which categorizes levels of cognition in the learning process, begins with *remember* and *understand* at the bottom levels of the learning process, and progresses through *apply*, *analyze*, *evaluate*, and finally *create* at higher levels of the learning process (Krathwohl & Anderson, 2010).

Different teaching methods may help students improve performance on different types of questions. The lecture component of a class may facilitate the ability to understand, which is a lower level of learning in Bloom's taxonomy. Class discussions, in-class application activities, and analyses of case studies, on the other hand, may facilitate the ability to apply and analyze, which are higher levels of learning in Bloom's taxonomy (Bauer & Haynie, 2017; Chen et al., 2017; Krathwohl & Anderson, 2010). Thus, from a theoretical perspective, it would be reasonable to expect the flipped classroom

to demonstrate improvement on higher levels of learning as the course progresses through the semester.

The Current Study

This current study aimed to replicate and extend the literature on effective methods for teaching social science courses by examining the effectiveness of the flipped classroom pedagogy in a semester-long educational psychology course. In addition, this study examined student performance on two types of test questions: questions that test students' ability to understand information and questions that test students' ability to apply information.

Specifically, this study examines the following research questions:

1. How do the students' test scores in the flipped educational psychology class compare to the students' test scores in the traditional educational psychology class?
2. Do students in the flipped classroom perform better on *apply*, *analyze*, and *evaluate* types of exam questions than on *remember* and *understand* types of exam questions?

Method

Participants

The students who participated in the flipped classroom were 136 undergraduates enrolled in six sections of educational psychology in a private liberal arts college in the Midwest. The students were enrolled in the educational psychology course during the following 4 different semesters: Spring 2015 (one section of 11 students and one section of 16 students), Fall 2015 (one section of 28 students), Fall 2016 (one section of 28 students and one section of 21 students), and Spring 2017 (one section of 32 students). All sections were taught by the same instructor and received identical multiple choice exams. The sample was predominantly Caucasian. Sixty-two percent of the participants were females, and 38% were males. The average age of the sample was19.5. The majority of participants (75%) were in their sophomore year of college.

As a comparison group, we used test score data from 43 students (51% male and 49% female) enrolled in two traditional lecture sections of the educational psychology course in Spring 2014 (i.e., one section of 25 students and one section of 18 students). Both of these comparison sections were taught by the same instructor who taught the flipped sections. They also read the same textbook, and were given the same multiple-choice tests given to students in the flipped section. In order to use somewhat similar sample sizes, when comparing test scores between the traditional and flipped classroom, the test scores of the 43 Spring 2014 students (the comparison sample) were compared to the test scores of the Spring 2015 and Fall 2015 students only (i.e., 55 students in the flipped classroom sample).

Measures

Data used for this study were comprised of the scores on the course exams and a short survey to collect demographic information from students in the flipped classroom. The purpose of the demographics survey was to collect information on the gender, ethnicity, and class standing of the students in the sample. Students in the comparison group did not complete the demographics survey. However, the comparison group could be reasonably expected to have comparable demographics to the flipped classroom group as no changes occurred in the college's curricular

requirements or enrollment between Spring 2014 and Fall 2015 that would result in significantly different demographics between the two groups.

Three exams were given throughout the course, an easier one in the first month of the semester, a more difficult one in the second half of the semester, and a final one at the end of the semester. The second exam is considered more difficult because it covers more material (10 clusters vs. eight for exam 1, and 7 for exam 3), and the material covered in it tends to be more novel for students than the material covered in the other two exams. Moreover, Exam 2 consistently, across all sections and semesters, yields lower mean scores than the other two exams. All exams included only multiple choice questions and were scored as a percentage of correct responses. The first and third exam had 83 questions each while the second exam has 100 questions. Because of extra-curricular involvement in college events that typically take place at the end of some semesters, many students enrolled in the course in the fall do not take the final exam at the regularly scheduled time and instead take a make-up exam at a different time. This procedure meant that the data from the last exam were less complete (n = 102) than data from exam 1 (N = 137) and from exam 2 (N = 136). In addition, the differences in the variability of scores on the third exam, but not on the first or second exam, between the traditional (SD = 19.51) and flipped classes (SD = 11.78) were large. These differences were statistically significant at p = .004, as indicated by Levene's Test for Equality of Variances. For that reason, only the first two exams were used in the data analysis.

For each of the items in the first two course exams, two raters independently coded them as either lower or higher on Bloom's Taxonomy. Lower-level items included items that tested *Remember* and *Understand*. An example of a lower-level item is "What is the lowest value possible for a correlation coefficient?" Higher-level items included items that tested *Apply*, *Analyze*, *Evaluate*, and *Create*. An example of a higher-level item is "A researcher reports that students who have the highest test scores in school tend to be more involved in extracurricular activities than are other students. What type of research must have been conducted?"

The initial percentage of agreement between the two raters was 87.2%. In order to assess initial interrater agreement above and beyond chance, Cronbach's Kappa was calculated. Results indicated substantial interrater reliability, with Kappa = .74 (Viera & Garrett, 2005). To determine which category, higher or lower, to assign each exam item to, the two raters then discussed each of the items which they coded differently and were able to arrive at an agreement regarding the best coding to use for each of them. An examination of the frequencies of the final item codings indicated that 36% of the items on exam 1 and 47% of the items on exam 2 were coded as higher-level items.

Procedure

The traditional version of the course involved a lecture on the topics of the day and a related homework assignment that students were asked to complete on their own. Homework typically involved responding to case studies that require students to use the topics of the day to help understand and resolve the case. The flipped classroom pedagogy was implemented by having students read the assigned textbook pages, review relevant power-point slides prepared by the instructor, and watch relevant instructional videos before the class meeting.

During the class meeting, students typically engaged in a variety of activities. Examples of activities include reviewing the main points in the readings, presenting on applications of the readings to teaching and learning, reflecting on the relevance of these readings to their own lives and personal development, discussing case studies related to the assigned readings, and completing small-group exercises related to the readings. Both the traditional and flipped sections met twice a week in the afternoon. Each class meeting was 100 minutes long.

After approval to conduct the study was obtained from the college's institutional review board, students were provided with an informed consent form on which they indicated whether they agreed to have their data be included in the research or not. To minimize coercion, the instructor was not in the room at the times when the informed consent and demographic survey data were collected and students were assured by the teaching assistant who collected them that the instructor will not have access to them until after the final course grades are posted. None of the students declined to provide consent. After final course grades in a given semester were reported, data were coded and analyzed by the researchers. The IBM SPSS Statistics software-version 24 was used to conduct all data analyses.

Results

Study Question 1: How do the students' test scores in the flipped educational psychology class compare to the students' test scores in the traditional educational psychology class?

Table 1

Exam 1 Sample Size, Mean Percent Correct, and Standard Deviation for Traditional and Flipped Classrooms

Group	*N*	*M*	*SD*
Flipped	137	79.71	11.58
Traditional	43	82.40	10.78

Table 2

Exam 2 Sample Size, Mean Percent Correct, and Standard Deviation for Traditional and Flipped Classrooms

Group	*N*	*M*	*SD*
Flipped	137	79.71	11.58
Traditional	43	82.40	10.78

Tables 1 and 2 present the sample size, average percent correct, and standard deviation of scores on each exam for both the traditional and the flipped classrooms. To test for statistically significant differences in exam scores, independent samples t-tests were conducted. Results indicated that the differences in the means for both exam 1 and exam 2 were not statistically significant, with $t(178) = -1.35$, $p = .180$ for exam 1, and $t(177) = -1.01$, $p = .316$ for exam 2 . Thus, student achievement on course exams was not related to whether the course was taught using the flipped classroom pedagogy or not.

Study Question 2: Do students in the flipped classroom perform better on "apply", "analyze", and "evaluate" types of exam questions than on "remember" and "understand" types of exam questions?

Paired samples *t*-tests were performed in order to examine the differences in scores on exam 1 versus exam 2 as well as the difference in scores on items measuring lower versus higher levels of learning on Bloom's Taxonomy. Not surprisingly, overall scores on the more

difficult exam 2, which was given toward the end of the semester, were lower (M = 73.84, SD = 10.85) than the overall scores on the easier exam 1, which was administered toward the beginning of the semester (M = 79.63, SD = 11.58), $t(135) = -7.95$, $p < .001$. However, when performance on items testing higher levels versus lower levels of learning on Bloom's taxonomy were examined in each exam, the results revealed than not all test items followed the same pattern as the overall test scores.

On exam 1, students gave correct answers on a higher percentage of items testing lower levels of learning on Bloom's Taxonomy (M = 82.10, SD = 11.28) than items testing higher levels of learning on Bloom's Taxonomy (M = 76.29, SD = 13.32), $t(134) = 7.58$, $p < .001$. This pattern was reversed on exam 2 where students gave correct answers on a higher percentage of items testing higher levels of learning on Bloom's Taxonomy (M = 76.26, SD = 13.53) than items testing lower levels of learning on Bloom's Taxonomy (M = 71.11, SD = 13.12), $t(134) = -6.80$, $p < .001$. Thus, as depicted in Figure 1, while performance on items measuring lower levels of learning decreased significantly from exam 1 to exam 2, t (133) = 11.38, $p < .001$, mirroring the trend in overall test scores, performance on items measuring higher levels of learning remained stable from exam 1 to exam2, $t(133) = 0.29$, p= .977, even though exam 2 was harder and covered more material. See Figure 1.

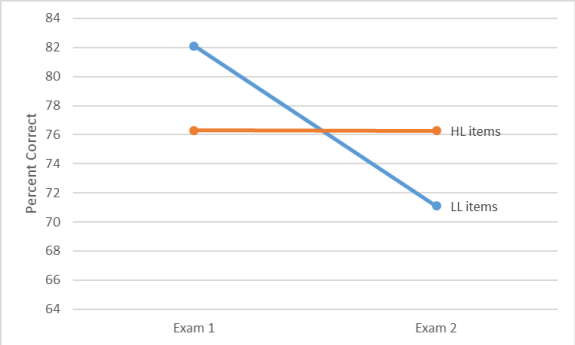

Figure 1. Performance of students in the flipped classroom on exam 1 and exam 2 items measuring lower levels of learning (LL items) versus higher levels of learning (HL items) on Bloom's Taxonomy.

Discussion

The results of this study suggest that there are no differences between the flipped and the traditional introductory-level psychology classroom in overall test scores. Within the flipped classroom, an examination of student performance on individual exam items indicated that this pedagogy seems to facilitate higher levels of learning on Bloom's taxonomy. One possible explanation for our finding of the lack of effect of flipping the educational psychology classroom on student achievement would be the degree to which there is a goodness-of-fit between the flipped classroom pedagogy and various types of course content. Roehling, Luna, Richie, and Shaughnessy (2017) suggested that the flipped classroom pedagogy may be less suitable for social science courses that cover a lot of content and more suitable for courses that cover technical information and require a lot of in-class exercises and hands-on lab-type activities such as STEM courses, statistics courses, and research methods courses.

A survey of students enrolled in a flipped sociology class revealed that only 53% of the students agreed or strongly agreed that the flipped classroom would suit their needs, and 50% of the students gave a neutral response to the statement "I want to be involved in a flipped classroom" (Forsey, Low, & Glance, 2013). While students appreciated the flexibility of the flipped classroom, they were also concerned about the loss of the communal feeling and opportunity to have values challenged that a face-to-face lecture affords. As a result, the

researchers concluded that social science courses may also benefit from the lecture format more than the flipped classroom format because of the larger opportunity to discuss the subject matter as a community. (Forsey et al., 2013).

Moran and Young (2015) pointed out that the flipped class may be less effective in courses that involve a lot of discussion, whereas they may be more suited for STEM courses "where yes or no answers are more applicable." Additionally, as Hamdan, McKnight, and Arfstrom (2013) and Yarbro, Arfstrom, McKnight, and McKnight (2014) suggested in their reviews of the flipped learning literature, the flipped classroom pedagogy may not be generally suited for introductory courses because students in these courses may not have developed sufficient expertise and interest in the subject matter to benefit from the classroom activities and discussions.

Our analyses of students' performance on items related to lower versus higher levels of learning on Bloom's taxonomy suggest that the flipped classroom pedagogy may be more effective in facilitating higher levels rather than lower levels of learning. These results are in line with the findings from another study that examined student performance on anatomy test questions at different levels of Bloom's taxonomy (Morton & Colbert-Getz, 2017). These researchers found that students in the flipped anatomy course performed better than students in the lecture course on *analyze* test questions, while performance on other types of exam questions was not significantly different between the flipped and the lecture courses.

It is likely that the traditional lecture classroom facilitates the ability to understand and remember, while the flipped classroom, which involves a lot more classroom discussions and application exercises, facilitates students' the ability to apply and analyze the course material (Bauer & Haynie, 2017; Chen et al., 2017; Krathwohl & Anderson, 2010). Thus, as suggested by Lo, Hew, and Chen (2017) as well as by O'Flaherty and Phillips (2015), it is important to examine the effects of flipping the classroom on the different levels of learning as tested by different types of exam questions, and more studies should attempt to do so in the future. In conclusion, this study suggests that teachers of courses, such as educational psychology, where it is important that students learn at higher levels because they will need to apply and analyze course-related information in their teaching careers, might find the flipped classroom pedagogy to be particularly helpful.

This study had some limitations that stemmed from the fact that is was based on action-research. In hindsight, it would have been ideal to have item-by-item exam data in the traditional lecture sections of the course. These data would have allowed comparison between the traditional and flipped classroom sections on performance on higher and lower levels of learning on Bloom's taxonomy. However, because at the time that the traditional sections were taught, the instructor had not considered using a different pedagogy, the item-by-item data were not collected. In addition, this study would have benefited from an analysis of the final exam data. Much of these data were missing due to various end-of-the semester events and engagements on our campus that made it difficult to collect complete and detailed final exam data. Finally, it would have been ideal to use course exams that are all at the same level of difficulty throughout the semester. This procedures would have allowed for the detection of an actual increase in scores on the exam items that measure

higher levels of learning and would have made the evidence for the flipped classroom's effect on higher levels of learning even more compelling.

Future researchers would be advised to consider these limitations as they plan their own studies on the flipped classroom. Specifically, comparisons of the performance of traditional and flipped classrooms on items at different levels of Bloom's Taxonomy and comparisons of performance across three or more different exams are needed. The use of exams that are similar in difficulty would help researchers discern improvements in higher-order learning across the semester.

References

Bauer, A., & Haynie, A. (2017). How do you foster deeper disciplinary learning with the "flipped" classroom? How do you foster deeper disciplinary learning? *New Directions for Teaching and Learning, 151,* 31-44. doi: 10.1002/tl.20247

Bergmann, J., & Sams, A. (2012). Flip your classroom: Reach every student in every class every day (1st ed.). Eugene, OR: International Society for Technology in Education; Alexandria, VA: ASCD.

Bishop, J. L., & Verleger, M. A., (2013). The flipped classroom: A survey of the research. 120th ASEE Annual Conference & Exposition, 6219.

Chen, F., Lui, A. M., & Martinelli, S. M. (2017). A systematic review of the effectiveness of flipped classrooms in medical education. *Medical Education, 51,* 585-597. doi: 10.1111/medu.13272

DeLozier, S. J., & Rhodes, M. G. (2017). Flipped classrooms: A review of key ideas and recommendations for practice. *Educational Psychology Review, 29,* 141-151. doi: 10.1007/s10648-015-9356-9

Foertsch, J., Moses, G., Strikwerda, J., & Litzkow, M. (2002). Reversing the lecture/homework paradigm using eTEACH web-based streaming video software. *Journal of Engineering Education, 91,* 267-274. doi: 10.1002/j.2168-9830.2002.tb00703.x

Forsey, M., Low, M., & Glance, D. (2013). Flipping the sociology classroom: Towards a practice of online pedagogy. *Journal of Sociology, 49,* 471-485. doi: 10.1177/ 1440783313504059

Fulton, K. (2012). Upside down and inside out: Flip your Classroom to improve student learning. *Learning & Leading with Technology,* 12-17.

Guy, R., & Marquis, G. (2016). The flipped classroom: A comparison of student performance using instructional videos and podcasts versus the lecture-based model of instruction. *Issues in Informing Science and Information Technology, 13,* 1-13. doi: 10.28945/3461

Hamdan, N., McKnight, P., McKnight, K., & Afrstrom, K. M. (2013). A review of flipped learning. Flipped Learning Network. Retrieved from www.flippedlearning.org/review.

Hao, Y. (2016). Exploring undergraduates' perspectives and flipped learning readiness in their flipped classrooms. *Computers in Human Behavior, 59,* 82-92. doi: 10.1016/ j.chb.2016.01.032

Hudson, D., Whisenhunt, B., Shoptaugh, C., Rost, A., & Fondren-Happel, R. (2014). Redesigning a large enrollment course: The impact on academic performance, course completion and student perceptions in introductory psychology. *Psychology*

Learning & Teaching, *13*, 107-119. doi: 10.2304/plat.2014.13.2.107

Hudson, D. L., Whisenhunt, B. L., Shoptaugh, C. F., Visio, M. E., Cathey, C., & Rost, A. D., (2015). Change takes time: Understanding and responding to culture change in course redesign. *Scholarship of Teaching and Learning in Psychology*, *1*, 255-268. doi: 10.1037/st10000043

Hussey, H., Richmond, A., & Fleck, B. (2015). A primer for creating a flipped psychology course. *Psychology Learning & Teaching*, *14*, 169-185. doi: 10.1177/1475725715592830

Ichinose, C., & Clinkenbeard, J. (2016). Flipping college algebra: Effects on student engagement and achievement. *The Learning Assistance Review*, *21*, 115.

Jensen, S. (2011). In-class versus online video lectures: Similar learning outcomes, but a preference for in-class. *Teaching of Psychology*, *38*, 298-302. doi: 10.1177/0098628311421336

Krathwohl, D. R., & Anderson, L. W. (2010). Merlin C. Wittrock and the revision of Bloom's Taxonomy. Educational Psychologist, *45*, 64-65. doi: 10.1080/00461520903433562

Lax, N., Morris, J., & Kolber, B. (2017). A partial flip classroom exercise in a large introductory general biology course increases performance at multiple levels. *Journal of Biological Education*, *51*, 412-426. doi: 10.1080/00219266.2016.1257503

Lo, C. K., Hew, K. F., & Chen, G. (2017). Toward a set of design principles for mathematics flipped classrooms: A synthesis of research in mathematics education. *Educational Research Review*, *22*, 50-73. doi: 10.1016/j.edurev.2017.08.002

McNally, B., Chipperfield, J., Dorsett, P., Del Fabbro, L., Frommolt, V., Goetz, S., Lewohl, J., Molineux, M., Pearson, A., Reddan, G., Roiko, A., & Rung, A. (2017). Flipped classroom experiences: Student preferences and flip strategy in a higher education context. *Higher Education*, *73*, 281-298. doi: 10.1007/s10734-016-0014-z

Moran, C., & Young, C. (2015). Questions to consider before flipping. *Phi Delta Kappan*, *97*(2), 42-46. doi: 10.1177/0031721715610090

Morton, D., & Colbert-Getz, J. (2017). Measuring the impact of the flipped anatomy classroom: The importance of categorizing an assessment by Bloom's taxonomy. *Anatomical Sciences Education*, *10*, 170-175. doi: 10.1002/ase.1635

O'Flaherty, J., & Phillips, C. (2015). The use of flipped classrooms in higher education: A scoping review. *Internet and Higher Education*, *25*, 85-95. doi: 10.1016/j.iheduc.2015.02.002

Peterson, D. J. (2016). The flipped classroom improves student achievement and course satisfaction in a statistics course. *Teaching of Psychology*, *43*, 10-15. doi: 10.1177/0098628315620063

Pierce, R., & Fox. J. (2012). Vodcasts and active-learning exercises in a "flipped classroom" model of a renal pharmacotherapy module. *American Journal of Pharmaceutical Education*, *76*(10), 1-5. doi: 10.5688/ajpe7610196

Roehling, P. V., Root Luna, L. M., Richie, F. J., & Shaughnessy, J. J. (2017). The benefits, drawbacks, and challenges of using the flipped classroom in an introduction to psychology course.

Teaching of Psychology, 44, 183-192. doi: 10.1177/0098628317711282

Strayer, J. F. (2012). How learning in an inverted classroom influences cooperation, innovation and task orientation. *Learning Environment Research, 15,* 171-193. doi: 10.1007/s10984-012-9108-4

Talley, C., & Scherer S. (2013). The enhanced flipped classroom: Increasing academic performance with student-recorded lectures and practice testing in a "flipped" STEM course. *The Journal of Negro Education, 82,* 339-347.

Viera, A. J., & Garrett, J. M. (2005). Understanding interobserver agreement: The kappa statistic. *Family Medicine, 37,* 360-363. doi: 10.7709/jnegroeducation.82.3.0339

Wilson, S. (2013). The flipped class. *Teaching of Psychology, 40,* 193-199. doi: 10.1177/0098628313487461

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