

2018

## Using Undergraduate Learning Assistants to Aid in Course Redesign

Jeffrey Pavlacic

*University of Mississippi*, pavlacicj@gmail.com

Megan Culp

Summer Harvey

Christie Cathey

*Missouri State University*

Erin Buchanan

*Missouri State University*

Follow this and additional works at: <https://scholar.utc.edu/mps>



Part of the [Psychology Commons](#)

---

### Recommended Citation

Pavlacic, Jeffrey; Culp, Megan; Harvey, Summer; Cathey, Christie; and Buchanan, Erin (2018) "Using Undergraduate Learning Assistants to Aid in Course Redesign," *Modern Psychological Studies*: Vol. 23 : No. 2 , Article 2.

Available at: <https://scholar.utc.edu/mps/vol23/iss2/2>

This articles is brought to you for free and open access by the Journals, Magazines, and Newsletters at UTC Scholar. It has been accepted for inclusion in Modern Psychological Studies by an authorized editor of UTC Scholar. For more information, please contact [scholar@utc.edu](mailto:scholar@utc.edu).

## Abstract

Research has identified potential difficulties for students enrolled in large classes. Large classes reduce opportunities for faculty-student interaction, which may predict decreased learning, retention rates, and student performance. It is therefore important to increase opportunities for faculty-student interaction. One successful tactic for increasing this interaction in large classes involves the utilization of undergraduate peers as class assistants. This manuscript describes the implementation of Undergraduate Learning Assistants (ULAs) in large sections of *Introductory Psychology* at Missouri State University, utilizing data collected prior to this manuscript. Further, this manuscript is a review of the implementation of ULAs at Missouri State submitted by students who have served in the position. ULAs mentor students, act as facilitators between the instructor and students, and lead study sessions before each unit exam outside of the classroom. While multiple positive outcomes have been observed by means of data collection and student feedback pertinent to learning outcomes and academic success, students also rated the ULAs and their study sessions as effective. Additionally, higher levels of course staff-student interaction has also been observed. Although related work has been published regarding the specific target domains of course redesign, this manuscript provides readers with information on how to implement ULAs with respect to each of the delineated target areas.

*Keywords:* Large classes, faculty-student interaction, undergraduate assistants

## Using Undergraduate Learning Assistants to Aid in Course Redesign

### **Challenges with Large Classes**

American university and college classes are increasing in size, and these increased enrollment rates force universities to increase class sizes to save money (Scott, 1995; Hornsby, 2014). Attending college may lead to numerous positive outcomes, such as cultural competence, general individual well-roundedness, and job skills (Rampell, 2015). For example, in a longitudinal study conducted yearly by the Cooperative Institutional Research Program (CIRP), students rated various reasons that they hold for choosing to attend college. In the 2014 CIRP survey, students indicated that they attended college primarily “to be able to get a better job” (86.1% of respondents) and figured that college would help them “to make me a more cultured person” (46.6% of respondents; Higher Education Research Institute, 2014). Regardless of the etiological reasons that students chose to attend college, increased enrollment in higher-education institutions affects introductory level courses, which may in turn inhibit students from achieving these aforementioned goals (Rampell, 2015; Stanley & Porter, 2002).

Although not directly related to higher-education institutions, junior high schools and higher education institutions alike have recently begun generating contexts in the classroom conducive to increased student engagement (Elliot, Combs, Huelskamp, & Hritz, 2017). Unfortunately, large classes decrease opportunities for faculty-interaction; this notion has been well-documented in recent literature (e.g. for a detailed explanation, see Cuseo, 2007; Elliot et al., 2017). Theorists have traditionally posited that this lack of meaningful interaction is due to an unspoken agreement between instructors and students, wherein each agrees not to communicate with each other in a large class (Kuh et al., 1991). As a result, universities have

experienced negative outcomes with these large classes, such as limited opportunities for faculty-student interaction and decreased retention rates.

Faculty-student interaction is crucial for the student and the institution (Cuseo, 2007; Elliot et al., 2017). Retrospectively, students who interact more with faculty have traditionally reaped the benefits of this type of interaction (Pascarella & Terenzinini, 1997), such as personal development (Lau, 2003; Pascarella, 1980) and higher levels of academic achievement (Kim & Sax, 2009); however, a lack of student-faculty interaction seems to lead to negative effects, such as increased student withdrawal rates (Twigg, 2013), as well as students becoming passive recipients of information and thus not performing well (Fenollar, Roman, & Cuestas, 2007). Researchers and professors have sought to improve opportunities for faculty-student interaction through the use of undergraduates as teaching/learning assistants.

### **Models Utilizing Undergraduates as Assistants**

One opportunity to increase faculty-student interaction involves utilizing undergraduate assistants as a means to increase interaction (Benjamin, 1991). Different conceptualizations of this method have been implemented. For example, Egerton (1976) implemented a model that used undergraduate students as assistants while teaching them how to be effective in a classroom setting. Specifically, undergraduate assistants who had previously performed well in an introductory psychology course were invited to assist the instructor in helping to grade papers and help reduce the ever-increasing staff-student ratio. Additionally, undergraduates have been used to help facilitate group discussion within classes. Groccia and Miller (1988) used undergraduates to facilitate discussions in learning groups. This use of undergraduates led to improved student performance as well as overall satisfaction with the learning experience. As an aside, giving undergraduates the opportunity to facilitate discussions reduces the workload for

the instructor. Dividing large classes into smaller discussion-based groups is also prudent, as students are generally more comfortably providing feedback in smaller groups (Boeding & Vattano, 1976).

Another, more general method measured the outcomes observed from the utilization of undergraduate student leaders. Researchers compared the effectiveness of the use of student leaders as facilitators. Each facilitator lead a training workshop geared towards student interaction. Evaluations measuring student attitudes towards the class, test scores, and participation in discussions were higher in the classes utilizing undergraduate student leaders (Arbes & Kitchener, 1974). Last, in other approaches, teaching assistants lead study groups outside of the classroom. Mendenhall and Burr (1983) used this approach in order to personalize the large class size with smaller groups. In their study, students taught a small group session once a week, where the undergraduate teaching assistants would help to facilitate a group discussion. Students would engage in activities designed to help them better understand the material, and the undergraduate assistant would act as the main facilitator. Missouri State University recently adopted Undergraduate Learning Assistants (ULAs) as part of its *Introductory Psychology* course using past research as the basic foundation for development. This implementation was part of a larger course redesign, and an overarching overview of this process is warranted in order to understand why ULAs were effective. A methodological approach designed to advise universities willing to implement undergraduate teaching assistants is presented. Specifically, this manuscript suggests ways in which ULAs can be incorporated into target areas that measure student and course success.

### **Overview of Course Redesign at Missouri State University**

The implementation of course redesign for *Introductory Psychology* originally aimed to address four target areas: course drift, student engagement, academic performance, and course completion and perception. These target areas were identified by five full-time psychology faculty members at Missouri State University. These faculty members served as a course redesign committee of all stages, ranging from initial planning to implementation (Drab-Hudson et al., 2012). The last traditional lecture-style course of introductory psychology occurred in the Fall 2011 semester, and the first redesigned blended-style the following semester. After a trial semester with one section of the redesigned course, all sections of introductory psychology were switched to the new teaching implementation. As mentioned, the components of the course redesign were pragmatically chosen as a means of addressing the four target areas (Hudson et al., 2015). While the logistics of course redesign were important, results have already been published focusing on the redesign process specifically (e.g. see Drab-Hudson et al., 2012, Hudson, Whisenhunt, Shoptaugh, Rost, & Fondren-Happel, 2014, or Hudson et al., 2015). As such, this article focuses primarily on the implementation of ULAs at Missouri State University. Specifically, the following manuscript will better explain the process, implementation, and significance of additional course staff. However, to provide a comprehensive overview and enhance clarity, we also focus on each component of course redesign, its outcomes, and how ULAs contributed to these target areas.

### **Incorporating ULAs**

To create additional course staff, two new roles were created: Senior Learning Assistant (SLA) and ULAs. These roles created a three-tiered hierarchy within the course, ordered in terms of least-to-greatest authority: ULAs, SLAs, and the course professor. The SLA was typically a graduate student or per course faculty, and their primary responsibilities were that of

managing grades and assisting the full-time faculty instructor. Under the SLA, six undergraduate students had the roles of ULAs. Each of the ULAs were designated to oversee a group of about 55-60 students enrolled in the course, to sit with in class and assist throughout the semester. A team of eight people in each introductory psychology section assisted both the course instructor and enrolled students by offering multiple portals for support throughout the course. As part of the initiative, the overall enrollment of the course was doubled to 300 students, but the course contact and staff contact hours were increased through increased staff. Therefore, the student-to-faculty ratio decreased from 150 to one in the traditional model to 43 to one in the course redesign model (Drab-Hudson et al, 2012). Still, despite the reduction in student-to-faculty ratio, course size was still increased due to accommodate the ever-changing increase in enrollment. This change parallels the Egerton (1976) model where undergraduate teaching assistants were incorporated primarily to help instructors with the workload. While increased staff eases the burden on instructors, the implementation of ULAs at Missouri State University also played a role in each of the aforementioned target areas.

### **Recruitment of ULAs**

Each ULA was invited to apply for the position if they had earned an A or B in the introductory psychology course. The application included questions about why they want to be a ULA, why they would be effective, and how enthusiastic they were about the idea of assisting in this class. Each applicant included faculty references, and these references were asked to provide brief thoughts on the acceptability of the applicant as a ULA. Each applicant interviewed with two introductory psychology professors for final selection.

### **Training of ULAs**

After being selected, a two-day training session occurred for the upcoming semester. During this training, new and experienced ULAs learned about the duties and responsibilities required of each of them in and out of the classroom. For example, ULAs learned how to take attendance and record it online, how to send appropriate emails to students, and what a typical study session should look like. This training was not only informative, but it was also a way for the new ULAs to learn from and engage with the experienced ULAs who they will be working with all semester. ULAs were also enrolled in a special course, *Teaching of Psychology*, for course credit. This class met regularly throughout the semester to discuss introductory psychology course progress, effective study session techniques and other feedback from fellow ULAs and the course instructor. In addition, individual instructors typically held weekly meetings with their own teams of ULAs and the SLA to discuss class meetings and activities, which provided the additional benefit of cohesiveness within each class's staff.

### **Impact of ULAs in Course Redesign Target Areas**

**Course Drift.** Prior to course redesign for introductory psychology, the class had great variability across sections in enrollment, course content, and materials. Because of a combination of the class size and the sizable student-to-teacher ratio (150:1), course content was communicated exclusively through lecture. Further, final course grades were determined based solely on performance on multiple choice unit exams (Drab-Hudson et al, 2012). With the implementation of the course redesign, course drift was addressed in three main ways: by transitioning from a traditional lecture to a hybrid course design, by the creation and utilization of common course materials, and by the implementation of additional course staff (Hudson et al., 2014).



Hybrid or blended courses occur when essential course materials are often learned outside the classroom, and students perform work related to the course in and out of the classroom, using class time to review learned information (Tucker, 2012). This type of classroom can often be called a flipped design, as traditional lecture materials are offloaded to outside the classroom. Common course materials were created by the course redesign committee, such as a specialized Introductory Psychology textbook (Drab-Hudson et al, 2012). As a result of these changes implemented to address course drift, the class became standardized across all sections: each class had the same assignments, course requirements, and grading criteria, and followed the same syllabus, structure, and calendar (Hudson et al., 2014). To prevent variance in classroom settings across course sections, all sections were equipped with the same number of course staff: one faculty member, one SLA, and six ULAs as described above. Introductory psychology was often the first blended course that a student would enroll in for their college career, and, therefore, many students had questions at the beginning and throughout the duration of the semester about how to set up and use the online course resources (Hudson et al., 2014). ULAs served as mediators between the students and the professors for this issue, so the professor did not have to field questions and emails regarding the technical setup of the online materials. As students are generally more comfortable providing feedback and answering questions in small groups (Boeding et al., 1976), this aspect of course redesign helped students to have their questions answered.

**Student Engagement.** To increase student engagement with course material, the use of clickers was implemented into the course. Clickers are hand held devices that allow a student to answer a posed question during class, with live results presented to the class. Students completed knowledge checks and quizzes, participated in experiments and demonstrations, and provided

evidence of whether they understood lecture materials (Hudson et al., 2014). Clickers were essential in achieving greater in-class student engagement and contributed to increased student learning (Drab-Hudson et al, 2012). ULAs were present during class time to help students learn how to work their clickers, as well as troubleshoot issues.

Prior to the implementation of these additional staff members, there was only one faculty member in a classroom of approximately 150 students, leading to a low amount of faculty-student interaction. This faculty member could be either an adjunct professor or a full-time faculty instructor (Drab-Hudson et al, 2012). To increase student engagement directly with course staff, ULAs were not only present for each class, but also seated near an assigned group of students. Each ULA was assigned a group of 55-60 students. These students would sit together during class time. This structured seating allowed the ULA to learn student names, take role, and be in close contact with their assigned group. The ULAs would additionally email absentees after each class to let them know the content that was missed and to remind them that they could seek help if needed. Inside the classroom, students could ask the ULA who oversaw their group any questions they had about the material, rather than every student in the class relying solely on the singular faculty member. One goal of incorporating the ULAs into the classroom was to allow the students to feel welcome and comfortable. Furthermore, the additional staff members in the classroom allowed for a greater diversity of classroom activities than a single faculty member would be able to coordinate (Drab-Hudson et al, 2012).

Outside of the classroom, one of the first duties for ULAs was to post an introduction letter to their group on Blackboard. This letter contained information about who the ULA is and inserted a word of encouragement about each student's success in the class. As posting an introduction letter was the first assignment for students as well, this task sought to help start the

semester off on a friendly, intimate note that reminded students they had a smaller cohort within the larger classroom. ULAs also sent out various emails to their group throughout the semester to remind students about exams, extra credit opportunities, or to simply encourage them during challenging weeks of the semester (e.g., midterm week). Each ULA also held a one-hour long office hour per week in MSU's campus tutoring center. It was typically a one-on-one tutoring session, which is a large contrast from the classroom that may make many students more prone to seek out the help they need.

**Academic Performance.** Traditionally, academic performance in introductory psychology was measured in two ways: via a departmental assessment and unit exams. The departmental assessment was conducted in a pretest-posttest format. Pretests were administered to students within the first week of the semester to test them over the general topics that were to be covered in the course. An identical test was administered as a component of the comprehensive final at the end of the course, to measure what students learned and retained throughout the semester. The test was originally developed in the 1990s by the Department of Psychology's Introductory Psychology Assessment Committee. This committee created a 30-item test to be used as a pretest-posttest measure for the course (Drab-Hudson et al, 2012). The unit exams were traditional, multiple-choice exams that were administered throughout the semester. Both academic performance methods of measurement (pretest-posttest and unit exams) were retained in the course redesign. The pretest-posttest process was not impacted by the course redesign, and the same measurement and temporal administrations were retained. The unit exams were standardized across all sections of introductory psychology, such that all test questions were randomly generated from a pool of test questions created by the course redesign committee. Four unit exams were given throughout the semester, with the last exam serving as a

comprehensive final. All sections of introductory psychology followed the same exam schedule (Hudson et al., 2014).

While it would be difficult to measure ULAs direct impact on exam performance, the ULAs were instrumental for study purposes. One of the ULAs' most important responsibilities was to lead four study sessions before each of the course's unit exams. The study sessions were 50 minutes in length and each session seated approximately 10-20 students. Students were required sign up for a study session for each exam. In addition to the open office hours, these required study sessions increased student contact hours with both the course staff and material. The ULA covered the main points of each chapter, quizzed students, and answered questions. The ULA asked the students multiple choice, application-type questions, which were similar in nature to the questions found on exams. The students had response cards with letters on them to hold up to answer each question, so these sessions were interactive for active learning. These study sessions increased the interaction with course material, which should lead to positive impacts on unit exam performance. This increase in engagement would not have been possible with one faculty member in a large classroom.

Academic performance was measured through final letter grade earnings and improved performance on pretest-posttests administered within the course. The combination of As and Bs earned in each semester was considered to represent academic success among enrolled students. Prior to the course redesign, 40% of students enrolled in the course earned As and Bs (8.9% As, 31.1% Bs). After the redesign, final course grades significantly increased to 56% (26.2% As, 29.9% Bs; Hudson et al., 2015). A brief, non-significant deflation of high letter grades occurred in the semester directly after the implementation to 34.7% (11% As, 23.7% Bs). However, the following four semesters all showed increases in high letter grades (Hudson et al., 2015).

The departmental pretest-posttest indicated improvements in performance as well. In the seven years prior to the course redesign, students' average percentage of improvement from the beginning of the semester to the end of the semester was 32% (Hudson et al., 2014). An immediate significant improvement in scores was seen from 37% improvement in Fall 2011 to 85% improvement in Spring 2012. In each of the subsequent semesters, the improvements from the pretest-posttest measures remained significantly different from the traditional lecture course in Fall 2011 and previous semesters. Course drift was also reduced, meaning that reduced variability in grades across different course sections and instructors was found as a result of the course redesign (Hudson et al., 2015).

**Course Completion and Perception.** The introductory psychology course at MSU generally had high drop, fail, and withdraw (DFW) rate. Historically, the DFW rate for the class was between 20 and 25% (Drab-Hudson et al, 2012). The implementation of additional staff for every section impacted DFW rates by allowing for greater interaction between course staff and enrolled students, through the channels of emails and in-class conversation, and at the ULAs tutoring sessions and study sessions prior to every unit exam (Hudson et al., 2014). Additionally, the switch from a traditional class to a blended class allowed for course staff to identify and help struggling students early in the semester. Previous research has shown that one method of decreasing DFW rates is that of early identification and helpful feedback provided to struggling students (Garcia-Sanpedro, 2012). The increased amount of course staff were able to monitor and provide constructive feedback on students' attendance, assignment completion, and unit exam grades (Drab-Hudson et al., 2012).

The redesigned course demonstrated higher course completion rates, increased student learning, and more positive student course perception when directly compared to previous

traditional sections (Hudson et al., 2015). The DFW rate dropped from a 24.6% average to 19.3% after several semesters of redesign implementation. There is a degree of nuance to this finding, however. The redesign committee expected that in the first semester immediately after the redesign implementation, DFW rates would temporarily inflate due to student intimidation and uncertainty about the new course format. This brief inflation did occur, with the Spring 2012 semester showing a slight, non-significant increase in DFW rates compared to the previous Fall 2011 semester with the traditional course design. This change was the only increase in DFW rates, however, and the following four semesters all showed DFW rate decreases. The difference between the traditional course format and the redesigned course became significant after the Fall 2013 semester, which is the fifth semester of redesign implementation (Drab-Hudson et al., 2012; Hudson et al., 2015).

Lastly, course perceptions improved. All introductory psychology sections answered a ten-item departmental course evaluation measure concerning the quality of the course at the end of each semester, with question topics including course content, professors, and class environment. The same pattern of an initial decrease was expected and found with course evaluations, as was previously discussed with DFW rates and letter grades. Support for the prediction of an initial decline was found, in that mean ratings of the course dropped initially from the Fall 2011 traditional course to the Spring 2012 redesigned course. Six out of the ten items on the measure demonstrated this initial decrease. After this initial decrease, five out of the ten items demonstrated mean increase in the next three semesters (Hudson et al., 2015). After assessment for a few semesters, new questions were added to the departmental course evaluation measure including effectiveness of ULAs, clickers, and online assignments. The measure was a 7-point Likert-type scale, that ranged from *highly ineffective* to *highly effective*. Of particular

interest to this paper was the questions about the implementation of ULAs, and the students rated both the ULAs themselves ( $M = 5.26$ ,  $SD = 1.23$ ) and the ULA-led study session ( $M = 5.16$ ,  $SD = 1.52$ ) as effective (Hudson et al., 2015). These results parallel the model incorporated by (Arbes & Kitchener, 1974), where course assistants conducted workshops that the students preferred over the traditional lecture style.

### **Concluding Remarks**

The revamped course offers a unique interpersonal experience for all involved individuals. ULAs and course faculty have the opportunity to work with each other and create mutually beneficial relationships, ULAs are able to help enrolled students through the course, and students are able to have an involved upperclassman Psychology major to connect with. In addition to these interpersonal experiences, the course in itself was completely transformed with positive impacts on course grades, DWF rates, and evaluations of the course. Students rated the ULA-led study sessions and ULAs themselves as effective, and these results show promise for implementation at other universities. Institutions interested in the positive academic and student benefits seen in this example can consider implementing a program similar to the redesigned course at Missouri State University.

## References

- Arbes, W., & Kitchener, K. (1974). Faculty consultation: A study in support of education through student interaction. *Journal of Counseling Psychology, 21*(2), 121-126. <http://dx.doi.org/10.1037/h0036285>
- Benjamin, L. T. (1991). Personalization and active learning in the large introductory psychology class. *Teaching of Psychology, 18*(2), 68-74  
[http://dx.doi.org/10.1207/s15328023top1802\\_1](http://dx.doi.org/10.1207/s15328023top1802_1)
- Boeding, C. H., & Vattano, F. J. (1976). Undergraduates as teaching assistants: A comparison of two discussion methods. *Teaching of Psychology, 3*(2), 55-59.  
[https://doi.org/10.1207/s15328023top0302\\_2](https://doi.org/10.1207/s15328023top0302_2)
- Cuseo, J. (2007). The empirical case against large class size: Adverse effects on the teaching, learning, and retention of first-year students. *Journal of Faculty Development, 21*(1), 5- 21. Retrieved from <http://hdl.handle.net/1951/58765>.
- Drab-Hudson, D. L., Whisenhunt, B.L., Shoptaugh, C. F., Newman, M. C., Rost, A. & Fondren- Happel, R. N. (2012). Transforming introductory psychology: A systematic approach to course redesign. *Psychology Learning and Teaching, 11*(2), 146-157. <http://dx.doi.org/10.2304/plat.2012.11.2.146>
- Egerton, J. (1976). Teaching while learning to teach. *Change, 8*(2), 58-61. <http://dx.doi.org/10.1080/00091383.1976.10568841>
- Elliot, S., Combs, S., Huelskamp, A., & Hritz, N. (2017). Engaging students in large health classes with active learning strategies. *Journal of Physical Education, Recreation & Dance, 88*(6), 38-43.
- Fenollar, P., Román, S., & Cuestas, P. J. (2007). University students' academic performance: An



- integrative conceptual framework and empirical analysis. *British Journal of Educational Psychology*, 77(4), 873-891. <http://dx.doi.org/10.1348/000709907X189118>
- Garcia-Sanpedro, M. J. (2012). Feedback and feedforward: Focal points for improving academic performance. *Journal of Technology and Science Education*, 2, 77-85.  
<http://dx.doi.org/10.3926/jotse>
- Groccia, J., & Miller, J. (1998). *Enhancing Productivity: Administrative, Instructional, and Technological Strategies: New Directions for Higher Education*, No. 103. San Francisco, CA: Jossey-Bass.
- Higher Education Research Institute. (2014). *Findings from the 2014 College Senior Survey*. Retrieved from <http://www.heri.ucla.edu/briefs/CSS-2014-Brief.pdf>. Los Angeles: Higher Education Research Institute.
- Hornsby D.J. & Osman, R. (2014). Massification in higher education: Large classes and student learning. *Higher Education*. 67(6), 711-719.  
<http://dx.doi.org/10.1007/s10734-014-9733-1>
- 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(4), 255-268. <http://dx.doi.org/10.1037/stl0000043>
- Hudson, D. L., Whisenhunt, B. L., Shoptaugh, C. F., Rost, A., & Fondren-Happel, R. N. (2014). Redesigning a large enrollment course: The impact on academic performance, course completion and student perceptions in introductory psychology. *Psychology Learning and Teaching*, 13(2), 107-119. <http://dx.doi.org/10.1037/stl0000043>
- Kim, Y. K. & Sax, L. J. (2009). Student-faculty interaction in research universities:

- Differences by student gender, race, social class, and first-generation status. *Research in Higher Education*, 50(5), 437-459. <http://dx.doi.org/10.2304/plat.2013.13.2.107>
- Kuh, G. D., Schuh, J. H., Whitt, E. J., Andreas, R., Lyons, J., Strange, C. C., Krehbiel, L. E., & MacKay, K. A. (1991). *Involving Colleges: Successful Approaches to Fostering Student Learning and Development Outside the Classroom*. San Francisco: Jossey-Bass Publishers.
- Lau, L. K. (2003). Institutional factors affecting student retention. *Education*, 124(1), 126-136.
- Mendenhall, M., & Burr, W. R. (1983). Enlarging the role of the undergraduate teaching assistant. *Teaching of Psychology*, 10(3), 184-185  
[http://dx.doi.org/10.1207/s15328023top1003\\_27](http://dx.doi.org/10.1207/s15328023top1003_27)
- Pascarella, E. T. (1980). Student–faculty informal contact and college outcomes. *Review of Educational Research*, 50(4), 545–595.
- Pascarella, E.T., & Terenzini, P. T. (1977). Patterns of student-faculty informal interaction beyond the classroom and voluntary freshman attrition. *Journal of Higher Education*, 48(5), 540-552. <http://dx.doi.org/10.2307/1981596>
- Scott, P. (1995). *The meanings of mass higher education*. Buckingham: SHRE and Open University Press.
- Stanley, C.A. & Porter, M.E. (Eds.) (2002). *Engaging Large Classes. Strategies and Techniques for College Faculty*. Bolton, MA: Anker Publishing.
- Tucker, B. (2012). The flipped classroom: Online instruction at home frees class time for learning. *Education Next*, 12, 82-83.
- Twigg, C. A. (2013). Improving learning and reducing costs: Outcomes from changing the

equation. *Change: The Magazine of Higher Learning*, 45(4), 6-

14. <http://dx.doi.org/10.1080/00091383.2013.806169>