

## **Improving Student Engagement in the First-Year Transition Seminar Class with Open Educational Resources**

**Dr. Gang Liu, University of Pittsburgh at Bradford**

Dr. Gang Liu is an Assistant Professor of Mechanical Engineering Technology in the Division of Physical and Computational Sciences, at the University of Pittsburgh at Bradford. He received his Ph.D. degree in mechanical engineering in 2006 and another Ph.D. degree in engineering education in 2018. He teaches mechanical engineering undergraduate courses, including statics, dynamics, mechanics of materials, etc. His research interests include in-class intervention, misconceptions, First-Year Experience, novices and experts, and metacognition. Address: 242 Duke Engineering Building Division of Physical and Computational Sciences University of Pittsburgh at Bradford Bradford, PA 16701 Office Phone: 814-362-7571 Email: gliu@pitt.edu

## **Improving Student Engagement in the First-Year Transition Seminar Class with Open Educational Resources**

**Gang Liu**

*Division of Physical and Computational Sciences,  
University of Pittsburgh at Bradford, Bradford, Pennsylvania, 16701*

### **Abstract**

First-year experience in college is critical and challenging to students from all socioeconomic backgrounds. It laid the foundation for the coming four years and significantly influenced the quality of students' academic and social lives. But the fact is that the gaps between high school and college are so huge that some students struggle in the first year and even the years to come. First-Year Transition Seminar (FYTS) is a one-credit-hour course designed to transition students to the university academic setting, introduce students to the general education program, and educate students about the array of campus activities and professional services available. This first-year experience course aims to help new college students prepare for college life and make some adjustments in many ways, including academic, emotional, and intellectual.

According to the unpublished enrollment data, there are many students in the university the author served who have financial situations, including 45.3% Pell Grant eligible and 44.8% first-generation college students. College life could be difficult for students by challenging their abilities of self-regulation, time management, emotion control, financial management, etc. Among them, the cost of textbooks and other educational materials is a heavy burden on all students.

Introducing open educational resources could relieve them from the burden of buying hard-copy textbooks and using them for only one semester. Besides the free textbook, we introduced many seminars on various topics dealing with different "subjects". By assigning free-of-charge events, online reading, classroom exercises, and outside activities to assist students in transitioning to university-level work and campus culture, the course provides a dynamic atmosphere to build a first-year class community easy to engage. The overall goal of the First-Year Transition Seminar is to encourage the students to be involved in all available college events and provide students with a solid and rewarding foundation for academic and personal success.

### **Keywords**

First-year experience, open educational resources, student engagement

### **Background**

Modern universities are designed to foster the students to become competent professionals and serve the community better. Students need to complete the whole undergraduate education to be ready for their next steps. However, the nationwide high attrition rates that exist in most undergraduate majors, including every engineering major, are detrimental to the development of future professionals. The reason behind this phenomenon is complicated, but the low academic performance in critical courses and unpleasant first-year college experiences play a big role. In

most four-year institutes, there are more than 20% of enrolled students didn't return, and about 40% didn't return for the second year in those two-year colleges [1]. Those who never finished their college life suffered a lifetime of economic disadvantages [2], [3]. Low-income and first-generation college students have been found as the main proportion of dropout students after their first year in college. Financial situation or socioeconomic condition is one of the biggest factors.

With tons of financial aid available to college students, it makes college affordable to certain families. However, financial aid could not keep the same pace with the inflation of tuition fees in the past three decades and many students were out of financial reach, which made college not affordable, primarily for low-income students. For many low-income students, the inability to pay tuition fees and other college costs is one of the obstacles preventing them from pursuing their dreams.

First-year experience (FYE) in college is critical and challenging to students from all socioeconomic backgrounds. It laid the foundation for the coming four years and significantly influenced the quality of students' academic and social lives. Research shows that the first-year college experience plays a very important role in a successful college life [1]. It is one of the reasons that most of the modern higher educational institutes started first-year experience courses or seminars to help the new college students transiting to new academic and personal lives by learning different skills including but not limited to time management, financial management, setting up goals, making adjustments in several ways, and cultivating a good communication capability, etc.

Open Educational Resources (OERs) are freely accessible, openly licensed teaching, learning, and research materials that provide everyone free of charge and with perpetual access from anywhere with an internet connection [4]-[10]. These resources include free textbooks, publicly accessible videos, course modules, and other learning materials. OERs were designed to increase the affordability of education by lowering costs, to improve the accessibility by promoting equitable access to educational resources, and to boost the adaptability of education by encouraging students and faculty to adjust their learning and teaching strategies.

## **Settings**

College life could be exciting in many ways but also challenging to their abilities of self-regulation, time management, emotion control, financial management, etc. Among them, the cost of educational resources, including textbooks, is a heavy burden on all students. Research shows that low-income students tend to go to the college that offers the lowest cost of attendance (COA) [2], [11]. The affordability of higher education plays a big role in their choices. There are many students who have financial situations in the public university the author served at, including 45.3% Pell Grant eligible and 44.8% first-generation college students [12]. Affordability is one of the critical factors in keeping these students in their program and OERs help to achieve that goal to a certain extent.

The gaps between high school and college are so huge that some students struggle in the first year and even the years to come. First-Year Transition Seminar (FYTS) is a one-credit-hour course designed to help all students transition into the university academic setting, introduce students to

the general education program, and educate students as to the array of campus activities and professional services available. This course provides a dynamic atmosphere to build a first-year class community with assignments, classroom exercises, and outside-classroom activities to assist students in transitioning to university-level work and campus culture. The purpose of this first-year experience course is to help new college students prepare for their college life and make some adjustments in many ways, including academic, emotional, and intellectual.

Introducing open educational resources could relieve them from buying expensive hardcopy textbooks and using them for only one semester. Adopting the OpenStax OER textbook was the first step. Students can access the content of their textbooks on the internet from anywhere through their personal computers, phones, or public computers. They can also download it onto their own electronic devices so they can read it even without an internet connection. By assigning free-of-charge events, online reading, classroom exercises, and outside activities to assist students in transitioning to university-level work and campus culture, the course provides a dynamic atmosphere to build a first-year class community easy to engage. Besides the free textbook, we introduced many seminars on various topics dealing with different subjects free of charge.

Free is not the only advantage of OER materials. Instructors have the flexibility to add different events, activities, and seminars with various subjects, including but not limited to the resources listed below.

- OpenStax textbook available online.
- modules integrated with a learning management system (Canvas).
- recorded video lectures.
- online homework assignments.
- games to be involved.
- free computer lending program from the library.
- Club-day and Club-night sign-in.
- free out-of-classroom events.
- guest speakers with diverse topics.
- Falling Leaves Festival.
- free musical events.
- annual environmental science retreat.
- Library tour led by experts.
- Writing center services.
- Mathematics center services.
- TRIO student support services.
- disability resources and services.
- Academic coaching and tutoring services.
- Academic Success and Advising counseling services.

Generally, OER materials are fully customizable so that the instructors can adapt course materials to align with their teaching objectives, teaching strategy, and the needs of their First-Year college students. For example, the author of the present paper provided his students with the most recent research results in engineering education fields, including the discussion about topics of how to

adjust to the new environment, prioritization and procrastination, effective learning, productive failure, metacognitive learning, creative thinking, effective communication, health (physical, emotional, and mental) management, decision-making, etc.

## Research Questions

In the present paper, there are three fundamental research questions to investigate,

- Will OER materials increase the engagement of First-Year College Students?
- What are the barriers to adopting OERs in the current curriculum?
- What can we do to improve the situation as educators?

The present paper also explores the reasons behind these phenomena and constructive suggestions to improve the adoption of OER materials in First-Year college teaching.

## Research Method

The present paper uses the attendance records of the First-Year Transition Seminars (FS 104), the activity time on LMS (Canvas), and the survey results of the Entrance Survey and Exit Survey to investigate the engagement of the first-year college students.

## Findings and Discussions

- *Will OER materials increase the engagement of First-Year College Students?*

OERs are accessible to all students, regardless of their financial circumstances which promotes equity in education and ensures that all first-year students have equal access to high-quality learning materials. OERs offer dynamic and interactive learning materials that can enhance student engagement. Deploying multimedia resources, interactive quizzes, and real-world examples can make learning more interesting and relatable for first-year students.

Buying the required textbooks is part of student engagement, especially among First-Year college students. The research found significant correlations between OERs and credit accumulation, but no significance with cumulative GPA, in other words, students will take more courses with OERs, while their academic performance does not change much [13]. Students tend to enroll in courses with no cost in textbooks and required learning materials, compared to those courses that need to buy expensive textbooks that might be used for only one semester [14]. One research of post-secondary students in Florida found that 64% of about 22,000 students reported having not purchased the required textbook because of its high price [15].

The purpose of adopting the OER textbook is to give more flexibility and space to the students so that they can access the textbook which was recognized as an important learning resource. It was supposed to increase the portion of students who read the textbook when it is free, but the reality is that it does not work as we expected. In fact, many college students do not read the assigned reading before the class. According to the research, less than 18% of the students reported that they frequently read the textbook before coming to the class even with a hardcopy textbook, while more than 53% of them never or rarely read it before the class [15], [16]. Free access to the required

textbook can remove some factors that deter students from enrollment, unfortunately, it does not necessarily increase student engagement by itself.

Compared to the free textbook, some other OER materials stimulated the students to be involved in the class discussion and out-of-class activities, including the free seminars by guest speakers, club nights, and video materials. Students are willing to share their ideas with each other as soon as the barriers are broken. From the attendance records, there are more than half students in the author's first-year class participated in various activities in the outdoor events organized by the faculties. And the seminars with guest speakers are crowded with students. Curiosity and fun are the driving forces behind the engagement, not the costs.

- ***What are the barriers to adopting OERs in the current curriculum?***

More and more educators believe that OER presents benefits unmatched by traditional commercial copyrighted resources, while most faculties still don't use them and have no plan to adopt OERs in the near future. There are many barriers preventing the adoption of OER materials in our daily teaching. Here we focused only on three of them, awareness, difficulties, and the availability of high-quality OER materials.

#### *Awareness of OER materials*

OERs were widely adopted in K-5 education for decades, but not in the college level. According to the research result of Allen and Seaman [5], only 34% of faculties among 2,144 respondents acknowledged OERs and lack of training to transition to OERs. This number increased slowly in the past several years, but it's still far below expectations [17]. Students' awareness of the OER is on the other side, especially for First-Year college students. Some of them are not used to using online free learning materials as alternates of their traditional paperback textbooks or do even not know the existence of the free OER learning resources.

Our FYTS program provides Technology Training in the first academic week with the most frequently used fundamental skills, including learning management system (Canvas, Blackboard, etc.), syllabus, printing service, access to learning materials via computer and smartphone, etiquette in daily communication including emails and homework, etc.

#### *Difficulties in adopting OER materials*

Many faculties are reluctant to adopt OERs into their classes because of several reasons. One of them is the systemic and institutional barriers. The lack of the necessary training and access to high-quality OER materials, not only the free textbooks, prevents them from switching to new teaching strategies to match the OERs.

The second reason is that some of the faculties are used to applying the existing textbooks and lectures they are using and are reluctant to change to another system. Resistance to change in traditional teaching methods and materials can be a barrier to the widespread adoption of OERs among faculty. In addition, the learning curve and time-consuming of OER teaching are among the barriers [17].

The complexity of switching to OERs is another reason. There are too many types of OER materials the faculties need to learn, and master compared to traditional teaching. Plus, the quality and efficacy of the OER materials are also questionable to them.

Not only the faculties but also the students have trouble adapting to the OERs. Some first-year college students may have difficulty managing their time, which leads to a lack of time to prepare for the lectures and review the content after the class. It is not necessarily caused by the OER materials, but instead by students' learning habits [18].

#### *Concern about the quality of OER materials*

Since OERs are created and published by educators rather than commercial publishing companies with many experts in this field, the quality and depth of content vary vastly. Finding high-quality OERs is a challenging job for most faculties even though they have the intention to switch to OERs from traditional teaching ways. It's a reality that most of the existing OER materials do not have the same quality in compared to that of commercial companies such as Pearson and Wiley. Without professionals in multiple fields, the OER materials have issues with the quality of text and images, font sizes, tables and figures, lack of transcripts available for videos, etc. Research indicated that adopting OERs does not necessarily improve the academic performance of the students, or the differences are not statistically significant [5], [19]-[25]. One research shows that the overall academic performance in one of the OERs-adopted business courses is worse than the contrast group using traditional textbooks [25].

Meanwhile, OERs have kept improving in the past decades with the contribution of OER-supporting organizations, faculties and students [27]. Some of the OERs are designed to deploy the most effective ways by integrating the feedback and implementing the research results in cognitive science, through which to help the students to get better understanding of critical concepts [28]. They usually keep updating within a shorter period compared to the traditional textbooks. The existing curricula and course materials are defined and designed by higher education institutions and faculties without input from students while OERs are more student-centered, focusing more on how to help learners process.

The author of the present paper is collecting the students' input with survey results to adjust the additional OER materials to match their interests. In fact, there are many faculties that have attempted to have students involved to develop their own OERs as primary course learning activities. With direct input and feedback from students, the OER and coursework could be more effective.

- ***What can we do to improve the situation as educators?***

While new approaches to OERs seem to gain ground with free open digital educational resources, it does not leave traditional teaching in a subsidiary role. OERs and traditional teaching should be compensated to each other right now. However, the advantages of OERs are incomparable and will be the trend of next-generation education.

Educators have to embrace the trend and adjust themselves to the coming era, including refreshing their knowledge frame system, preparing themselves by taking training, and developing more

high-quality OERs to match the needs of future education. Achieving a balance between the current curricula and the fast-shifting industrial needs might have a long way to go. It's such a tedious job that needs more and continuous efforts from educators, researchers, and policymakers to push the integration of OERs into the college curriculum.

Recommendations for successful OER Integration in the First-Year Experience include providing training and support to faculty members to increase their awareness of OERs and help them integrate these valuable high-quality resources effectively into their courses; establishing clear criteria for evaluating the quality of OERs and create a repository of recommended OERs for first-year courses; offering resources and support for students, including technology access, to ensure that all students can benefit from OERs; fostering partnerships with other institutions and organizations to share best practices and resources related to OER integration.

## Conclusion

Even though the OER materials can increase student engagement and thus improve student academic performance and retention rate, a free textbook does not change the student engagement of first-year college students much from the published research results and from our observations. The first-year experience is a crucial period in a student's academic journey and the integration of OERs can play a significant role in enhancing their experiences in their freshmen year, especially for low-income and first-generation students. OERs can provide cost savings, improve student engagement, and promote equity in education. However, free or low cost is not enough [27]. Challenges such as faculty awareness, readiness to switch to OERs, and availability of high-quality OERs must be addressed to ensure successful OER integration. By following recommended strategies, institutions can leverage OERs to support their first-year students, ultimately leading to improved retention rates and academic success.

## References

- [1] R. Feldman, *The First Year of College. Research, Theory, and Practice on Improving the Student Experience and Increasing Retention*. Cambridge University Press, 2018.
- [2] A. Baldwin, *College Success*. OpenStax. 2020 <https://openstax.org/details/books/college-success>
- [3] M. Daly, and L. Bengali, "Is It Still Worth Going to College?" *FRBSF Economic Letter*. San Francisco, CA: Federal Reserve Bank of San Francisco, 2014.
- [4] William & Flora Hewlett Foundation, "Open Educational Resources." Accessed June 15, 2019. <https://hewlett.org/strategy/open-educational-resources/>
- [5] E. Allen, and J. Seaman, *Opening the curriculum: Open educational resources in U.S.*, 2014.
- [6] A. Bissell, "Permission granted: Open licensing for educational resources." *Open Learning, The Journal of Open and Distance Learning*, 2009, 24, 97–106.
- [7] T. Bliss, and M. Smith, "A Brief History of Open Educational Resources." In *Open: The Philosophy and Practices that are Revolutionizing Education and Science*, edited by Rajiv



- Jhangiani and Robert Biswas-Diener, 9-27. London: Ubiquity Press, 2017. DOI: <https://doi.org/10.5334/bbc.b>
- [8] S. D’Antoni, “Open educational resources: Reviewing initiatives and issues. Open Learning,” *The Journal of Open and Distance Learning*, 2009, 24, 3–10
- [9] Hewlett, *Open educational resources*. 2013. <http://www.hewlett.org/programs/education-program/open-educational-resources>
- [10] S.M. Johnstone, “Open educational resources serve the world.” *Educause Quarterly*, 2005, 28(3), 15.
- [11] G. Winston, "Subsidies, Hierarchy and Peers: The Awkward Economics of Higher Education." *Journal of Economic Perspectives*, 1999, 13(1): 13-36. DOI: 10.1257/jep.13.1.13
- [12] J.L. Baldwin, “*Enrolled student demographic data for fall 2023*”, Fall 2023 Unpublished raw data, University of Pittsburgh at Bradford.
- [13] R. Griffiths, J. Mislavy, and S. Wang, “Encouraging impacts of an Open Education Resource Degree Initiative on college students’ progress to degree.” *High Educ*, 2022, 84: 1089–1106. <https://doi.org/10.1007/s10734-022-00817-9>
- [14] National Center for Education Statistics, *The Condition of Education 2016*. (NCES 2016-144), Undergraduate Retention and Graduation Rates.
- [15] Florida Virtual Campus, *2012 Florida student textbook survey*. Tallahassee. [http://www.openacesstextbooks.org/pdf/2012\\_Florida\\_Student\\_Textbook\\_Survey.pdf](http://www.openacesstextbooks.org/pdf/2012_Florida_Student_Textbook_Survey.pdf).
- [16] T. Berry, L. Cook, N. Hill, and K. Stevens, “An exploratory analysis of textbook usage and study habits: Misperceptions and barriers to success.” *College Teaching*, 2010, 59(1), 31–39.
- [17] T. Bliss, T. Robinson, J. Hilton, and D. Wiley, “An OER COUP: College teacher and student perceptions of open educational resources.” *Journal of Interactive Media in Education*, 2013, 17(1), 1–25.
- [18] D. Darwin, “How much do study habits, skills, and attitudes affect student performance in introductory college accounting courses?” *New Horizons in Education*, 2011 59(3).
- [19] G. Allen, A. Guzman-Alvarez, M. Molinaro, and D. Larsen, “Assessing the impact and efficacy of the open-access ChemWiki textbook project.” *Educause Learning Initiative Brief*. January 2015. <https://net.educause.edu/ir/library/pdf/elib1501.pdf>
- [20] W. Bowen, M. Chingos, K. Lack, T. Nygren, “Interactive learning online at public universities: Evidence from randomized trials.” Ithaka S + R. Retrieved from <http://mitcet.mit.edu/wp-content/uploads/2012/05/BowenReport-2012.pdf>
- [21] A. Feldstein, M. Martin, A. Hudson, et al., “Open textbooks and increased student access and outcomes.” *European Journal of Open, Distance and E-Learning*, 2012.
- [22] L. Fischer, J. Hilton, T. Robinson, and D. Wiley, “A multi-institutional study of the impact of open textbook adoption on the learning outcomes of post-secondary students.” *Journal of Computing in Higher Education*, 2015, 27(3), 159–172.

- [23] J. Hilton, and C. Laman, “One college’s use of an open psychology textbook. Open Learning.” *The Journal of Open and Distance Learning*, 2012, 27(3), 201–217.
- [24] J. Hilton, “Open educational resources and college textbook choices: a review of research on efficacy and perceptions.” *Education Tech Research and Development*, 2016, 64(4), 573 – 590.
- [25] M. Lovett, O. Meyer, and C. Thille, “The open learning initiative: Measuring the effectiveness of the OLI statistics course in accelerating student learning.” *Journal of Interactive Media in Education*, 2008 (1), 1-16.
- [26] T. Robinson, “Open textbooks: The effects of open educational resource adoption on measures of post-secondary student success.” Doctoral dissertation, Brigham Young University, 2015.
- [27] R. Gurung, “Are OE Resources High Quality?” In *Open: The Philosophy and Practices that are Revolutionizing Education and Science*. R. Jhangiani, and R. Biswas-Diener, (eds.) 2017, pp. 79–86. London: Ubiquity Press. DOI: <https://doi.org/10.5334/bbc.f>. License: CC-BY 4.0
- [28] R. Jhangiani, and R. Biswas-Diener, *Open: The Philosophy and Practices that are Revolutionizing Education and Science*. London: Ubiquity Press, 2017. DOI: <https://doi.org/10.5334/bbc>
- [29] R. Baraniuk, N. Finkbeiner, D. Harris, et al., “Free is Not Enough.” In *Open: The Philosophy and Practices that are Revolutionizing Education and Science*. R. Jhangiani, and R. Biswas-Diener, (eds.) 2017, pp. 219–226. London: Ubiquity Press. DOI: <https://doi.org/10.5334/bbc.q>. License: CC-BY 4.0