INTERVENTION BRIEF
Supporting Postsecondary Success

INSTITUTE OF EDUCATION SCIENCES

Open Learning Initiative (OLI)

Online instruction, including online instruction that is blended with traditional in-person instruction, offers students more flexibility in the timing of their coursework and may deepen students' understanding of the material. By leveraging online courseware, colleges have the potential to expand college access, reduce costs, recruit a more diverse student population, and accelerate instruction under some conditions.[1]

Carnegie Mellon University's (CMU's) *Open Learning Initiative (OLI)* provides online courses and learning materials to instructors and learners at low or no cost that can be presented in blended or purely online formats. *OLI* courses feature learning activities with immediate feedback for students and a dashboard for instructors to monitor student progress.

This What Works Clearinghouse (WWC) report, part of the WWC's Supporting Postsecondary Success topic area, explores the effects of *OLI* on course completion rates and academic achievement. The WWC identified 12 studies of *OLI*, three of which meet WWC standards.[2] The evidence presented in this report includes studies of the impacts of *OLI* on community college students, including students who were White, Black, Hispanic, and Asian or Pacific Islander.

What Happens When Students Participate in *OLI*?[3]

The evidence indicates that implementing *OLI*:

- **may increase credit accumulation and persistence**
- **has inconsistent effects on academic achievement**

Findings on *OLI* from three studies that meet WWC standards are shown in Table 1. For each student outcome reviewed by the WWC, an effectiveness rating, the improvement index, and the number of studies and students that contributed to the findings are presented. The improvement index is a measure of the intervention's effect on an outcome. It can be interpreted as the expected change in percentile rank for an average comparison group student if that student had received the intervention. Findings on credit accumulation are based on one study with 605 students. Findings on academic achievement are based on three studies with 795 students. See Box 1 for a description of WWC effectiveness ratings.

Table 1. Summary of findings on *OLI* from studies that meet WWC standards

	Study findings		Evidence meeting WWC standards (version 3.0)	
Outcome	Effectiveness rating	Improvement index *(percentile points)*	Number of studies	Number of students
Credit accumulation and persistence	Potentially positive effects	+7	1	605
Academic achievement	Mixed effects	+8	3	795

Table Note: The improvement index is a measure of the effect of the intervention. The improvement index can be interpreted as the expected change in percentile rank for an average comparison group student if that student had received the intervention. For example, an improvement index of +7 means that the expected percentile rank of the average comparison group student would increase by 7 points if they received *OLI*. The improvement index values are generated by averaging findings from the outcome analyses that meet WWC standards, as reported by Bowen et al. (2014); Lovett, Meyer, & Thille (2008); and Schunn & Patchan (2009). Outcomes include completing and passing a course (credit accumulation and persistence) and final exam and standardized test scores (academic achievement). The effects of *OLI* are not known for other outcomes within the Supporting Postsecondary Success topic area, including college access and enrollment; college attendance; college degree attainment; and labor market outcomes.

BOX 1. HOW THE WWC REVIEWS AND DESCRIBES EVIDENCE

The WWC evaluates evidence based on the quality and results of reviewed studies. The criteria that the WWC uses for evaluating evidence are defined in the **Procedures and Standards Handbooks** and the **Review Protocols**. The studies summarized in this report were reviewed under WWC Standards (version 3.0) and the Supporting Postsecondary Success topic area protocol (version 3.0).

To determine the effectiveness rating, the WWC considers what methods each study used, the direction of the effects, and how many studies tested the intervention. The higher the effectiveness rating, the more certain the WWC is about the reported results and about what will happen if the same intervention is implemented again. The following key provides a link between effectiveness ratings and the statements used in this report:

Effectiveness Rating	*Rating Interpretation*	Description of the Evidence
Positive (or Negative) Effects	The intervention is ***likely to change*** an outcome	Strong evidence of a positive effect, with no overriding contrary evidence
Potentially Positive (or Negative) Effects	The intervention ***may change*** an outcome	Evidence of a positive effect with no overriding contrary evidence
No Discernible Effects	The intervention ***may result in little to no change*** in an outcome	No affirmative evidence of effects
Mixed Effects	The intervention ***has inconsistent effects*** on an outcome	Evidence includes studies in at least two of these categories: studies with positive effects, studies with negative effects, or more studies with indeterminate effects than with positive or negative effects

How is *OLI* Implemented?

The following section provides details of how *OLI* was implemented. This information can help educators identify the requirements for implementing *OLI* and determine whether those implementation requirements would be feasible at their institutions. Information on *OLI* presented in this section comes from the three studies that meet WWC evidence standards (Bowen et al., 2014; Lovett, Meyer, & Thille, 2008; Schunn & Patchan, 2009), from *OLI*'s website, and from correspondence with the developer.

- **Goal:** *OLI* is designed to support learning and instruction via the high-quality online courses and learning materials available at low or no cost available on the *OLI* website.
- **Target Population:** Most *OLI* courses are open to both students who take credit-bearing, instructor-led classes and independent learners who do not receive credit or instructor monitoring. Over the past decade, more than four million students have enrolled in 40 *OLI* courses offered in both high schools and colleges.[4]
- **Method of Delivery:** Courses and learning materials are available on the *OLI* website. While *OLI* content is delivered online, instructors may choose to supplement the online material with face-to-face reinforcement (hybrid delivery). Two studies featured in this report (Bowen et al., 2014; Lovett, Meyer, & Thille, 2008) investigated the effects of *OLI* that used a blended approach, which supplemented online instruction provided through *OLI* with in-person instruction. One study (Schunn & Patchan, 2009) investigated the effects of *OLI* using online instruction only.
- **Frequency and Duration of Service:** *OLI* provides content that ranges in length from several-hour modules to full-semester courses. Independent learners may complete the material at their own pace, while students in instructor-led courses may be assigned to complete the material in a specified timeframe.
- **Intervention Components:** The *OLI* model includes several components, which are noted in Table 2.

Comparison Group: In the three studies that contribute to this Intervention Report, students in the comparison group completed coursework in traditional face-to-face settings.

Table 2. Components of *OLI*

Key component	*OLI*
Learning objectives	Every *OLI* course, section, and page lists learning objectives, allowing students to assess whether they have understood key concepts.
Expository materials	Materials include readings, examples, and multi-media components that support learning objectives. These expository materials can be downloaded from *OLI* to create a textbook.
Learning activities with immediate feedback	Two types of embedded learning activities provide opportunities for students to practice what they have learned and test their understanding: • *Learn by Doing* activities include multiple choice questions, simulations, matching, and other options to help students practice a new skill or understand a new concept. • *Did I Get This?* activities are self-assessments that pose questions to students to see if they understood a specific concept. These activities are presented after *Learn by Doing* activities. Students receive immediate feedback after each response addressing the misconception behind an incorrect answer or reinforcing the reasoning behind a correct answer. Checkpoint quizzes are also available within *OLI*, which provide detailed scores and information for instructors, and can be used to calculate course grades.
Learning Dashboard	The Learning Dashboard provides instructors with real-time student-level information about progress through *OLI* course activities, interaction patterns with course materials, and class-level accuracy in answering questions related to each learning objective.
Gradebook	Student performance on quizzes is reported in the learning dashboard as well as the gradebook. In the gradebook, instructors can view grades, adjust grades, change grading options, and grant exceptions to individual students.
Face-to-face reinforcement (optional)	Some instructors supplement the online *OLI* material with one to two hours of face-to-face instruction every week.

What Does *OLI* Cost?

The WWC identified a number of cost components from the *OLI* website. The cost breakdown below is not designed to be exhaustive; rather, it is designed to provide educators an overview of the kinds of resources needed to implement *OLI*.

- **Personnel Costs:** *OLI* can be delivered as part of an academic course at a college. *OLI* does not incur any personnel costs beyond those normally associated with teaching a course.
- **Facilities Costs:** *OLI* courses delivered in a hybrid format require physical space to accommodate periodic face-to-face instruction.
- **Equipment and Materials Costs:** All *OLI* courses require internet access and an up-to-date web browser. Some content cannot be accessed on mobile devices.
- **Costs Paid by Students or Parents:** *OLI* courses may be completed by independent learners or by students in credit-bearing, instructor-led classes. Most of the *OLI* courses are free to independent learners, but a few charge a $10 maintenance fee. Most *OLI* courses delivered for credit will charge students a maintenance fee of $25, with fees ranging from $10 to $80 per student. Course fees may be paid by individual students or by colleges. Students are also subject to any tuition fees assessed by their college.
- **In-Kind Supports:** *OLI* does not include any in-kind supports.
- **Sources of Funding:** The William and Flora Hewlett Foundation funded the development of the first four *OLI* courses at Carnegie Mellon University in 2002. Further development of *OLI* courses was supported by the Bill & Melinda Gates Foundation, the Kresge Foundation, the Lumina Foundation, the National Science Foundation, the Spencer Foundation, and the Walter S. Johnson Foundation. Ongoing funding and operational support are provided by Carnegie Mellon University.

For More Information:

About *OLI*

The Simon Initiative, Carnegie Mellon University
5000 Forbes Avenue, Pittsburgh, PA 15213
Web: **http://oli.cmu.edu/**. Phone: (412) 268-3294

For detailed cost information, please see: **http://oli.cmu.edu/olis-payment-options-and-cost/**.

About the studies reviewed

Bowen, W. G., Chingos, M. M., Lack, K. A., & Nygren, T. I. (2014). Interactive learning online at public universities: Evidence from a six-campus randomized trial. *Journal of Policy Analysis and Management, 33*(1), 94-111. Retrieved from **https://eric.ed.gov/?id=EJ1027704**

Lovett, M., Meyer, O., & Thille, C. (2008). The Open Learning Initiative: Measuring the effectiveness of the OLI statistics course in accelerating student learning. *Journal of Interactive Media in Education, 1*. Retrieved from **https://eric.ed.gov/?id=EJ840810**

Schunn, C. D., & Patchan, M. (2009). An evaluation of accelerated learning in the CMU Open Learning Initiative course "Logic & Proofs". Pittsburgh, PA: University of Pittsburgh, Learning Research and Development Center.

In What Context Was *OLI* Studied?

The following section provides information on the setting and participants involved in the three studies of *OLI* that meet WWC evidence standards. This information can help educators understand the context in which the studies of *OLI* were conducted so that they can better determine whether the program might be suitable for their setting.

WHERE THE STUDY WAS CONDUCTED

3 studies, **942** students in **8** colleges and universities in **Maryland**, **New York**, and **Pennsylvania**

1 private 4-year college, **7** public 4-year colleges

GRADES

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Postsecondary (PS)

LEARN MORE

Read more about the *OLI* intervention and the studies that are summarized here on the **Intervention Report webpage**.

ENDNOTES

[1] For more information, please see Recommendation 2 in the WWC Practice Guide, **Using Technology to Support Postsecondary Student Learning**.

[2] The descriptive information for this intervention comes from *OLI*'s website (**https://oli.cmu.edu/**) and from Bowen et al. (2014), Lovett, Meyer, & Thille (2008), and Schunn & Patchan (2009). The What Works Clearinghouse (WWC) requests developers review the intervention description sections for accuracy from their perspective. The WWC provided the developer with the intervention description in March 2019 and the WWC incorporated feedback from the developer. Further verification of the accuracy of the descriptive information for this intervention is beyond the scope of this review.

[3] The literature search reflects documents publicly available by March 2019. Reviews of the studies in this report used the standards from the WWC Procedures and Standards Handbook (version 3.0) and the Supporting Postsecondary Success review protocol (version 3.0). The evidence presented in this report is based on available research. Findings and conclusions could change as new research becomes available.

[4] Bier, N., Moore, S., & Van Velsen, M. (2019). Instrumenting courseware and leveraging data with the Open Learning Initiative (OLI). Companion Proceedings 9th International Learning Analytics & Knowledge Conference, Tempe, AZ.