The International Journal of
OPEN EDUCATIONAL RESOURCES

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OPEN EDUCATIONAL RESOURCES

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(cont'd.)

Letter from the Editor

Melissa Layne
American Public University System, USA

Dear Readers of *IJOER*,

Well, fall is here, and what better time than now to introduce our IJOER Fall/Winter 2020 issue. This issue contains some impressive studies that advance the Open Educational Resources (OER) literature in new directions. Additionally, our regular special section, *3 Questions for an OER Leader,* features *IRRODL*'s Editor-in-Chief, Dr. Rory McGreal. We were thrilled and delighted that Rory joined me for an interview. Interestingly and coincidently, much of our discussion is reflected in this issue's articles.

In our first article, *The Development and Implementation of Missing Tools and Procedures at the Interface of a University's Learning Management System, its OER Repository, and the Austrian OER Referatory,* authors Christoph Ladurner, Christian Ortner, Karin Lach, Martin Ebner, Maria Haas, Markus Ebner, Raman Ganguly, and Sandra Schön lead a pioneering and innovative effort to encourage and enable instructors to use their own learning management systems for publishing OER. They further explain how marking educational resources with metadata has enabled them to develop an OER repository accessible via the Austrian OER portal. The authors share their recommendations for projects in OER infrastructure implementations.

In our second article, *Evaluation of the UNESCO Recommendation Concerning Open Educational Resources,* author Stephen Downes revisits the UNESCO Recommendations on OER—highlighting both benefits and shortcomings. Downes states that although the recommendations certainly further the goals of OER, there are areas in which ambiguity remains.

In our third article, *Toward a Working Definition of Open Pedagogy,* author Alan Witt analyzed the term "open pedagogy" to come closer to a working definition via the exploration of the current literature. Pedagogy is informed by the practitioners' conscious identification with the open movement, open access, and OER. By developing a taxonomy from related articles, Witt uses this taxonomy to construct a working definition of open pedagogy.

In our fourth article, *A Qualitative Analysis of Open Textbook Reviews,* authors Merinda McLure and Olga Belikov undertook a unique study using a qualitative

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approach to analyze open textbook reviews. Many instructors rely upon user reviews of already-developed OER, resting their decisions on quality and various other criteria. Feedback given to open textbooks is extremely valuable as it supports an instructor's consideration, author and publisher creation, and revision.

In our fifth article, *Evaluation of Open Educational Resources Among Students in Blended Research Methods and Statistics Coursework,* whereby authors Lindsay Phillips, Laura Gelety, and Lisa Hain replaced the traditional textbook used in their blended course, Research Methods and Statistics, to examine student perceptions, challenges, and effectiveness of OER. By administering a student satisfaction survey and using a mixed-methods approach, their results indicate ... well, I'm not going to spoil the surprise by revealing the results!

In our sixth article, *Exploring Faculty Perceptions of OER and Impediments to their Use: A Multi-Institutional Study,* authors Abbey Elder, Amanda Larson, Elaine Thornton, and Will Cross examine faculty perceptions of OER across four universities. The importance that OER initiatives have on its advancement and growth is not stressed enough, without addressing and understanding faculty perceptions of OER. This grassroots approach reveals important perspectives, barriers, and beliefs—which pave the way for OER development and adoption.

For our seventh article, *"Open"-ing Up Courses for Diversity and Deeper Learning,* authors Marcos Rivera, Kaity Prieto, Shanna Smith Jaggars, e alexander, and Amanda Folk tackle the challenge that both faculty and students have when navigating diversity courses. They assert that in order to be effective on university and college campuses, pedagogical and curricular development of courses are key. In combination with a commercial textbook, the authors used OER and open educational practices (OEP) to advance social justice, inclusiveness, and equity awareness.

In our eighth article, *Comparative Analysis of an Open Educational Resource Textbook and Commercial Textbook on Student Outcomes in an Online Nursing Course,* authors Jamie Murphy and Nancy Winters address the paucity of research on nursing courses that utilize OER by using a comparative, retrospective grade review study design, to understand student outcome differences between the use of a commercial textbook and the use of an instructor-developed textbook using OER. The discussion forum, assignments, and final grades for all students enrolled in an online nursing course were analyzed.

In our ninth article, *Overcoming Textbook Access Barriers in an Introductory Psychology Course: An OER Study at a Hispanic-Serving Institution*, author Adam John Privitera breaks new ground by conducting a small-scale investigation of the need for low-cost textbook alternatives in an introductory psychology course. OER textbooks can minimize the financial burden on low-income students and help realize their academic goals. In this study, psychology OER were adapted from

existing resources and piloted in three sections of the psychology course. The second aim of the study was to examine how the use of OER in this context impacted students in the course.

In our tenth article, *Moving Toward an Open Educational Resources (OER) Pedagogy: Presenting Three Ways of Using OER in the Professional Writing Classroom,* author Sarbani Sen Vengadasalam develops a checklist/rubric to assist instructors in determining the usefulness of OER in writing, business, and technical writing courses. He also provides ways to interface writing classes with OER.

In our final article, *Meta-syntheses of OER Transition in Online Higher Education,* authors Michele Wells, Robert Jesiolowski, Jeanelle Verwayne, and Jessie Pablo present a well-scoped research analysis on the more highly-focused-upon OER topics with which researchers continue to contribute: lowering textbook costs for students; student and faculty response to the use of OERs; institutional and faculty support; training and professional development; and the use of OERs in educational communities. Meta-synthesis studies are extremely valuable to the OER community and not to be confused with a narrative literature review. As with the aforementioned topics, it's important that we continue to critically evaluate and statistically combine results of comparable studies, thus increasing the number of observations as well as statistical power. This is a study we would like to see on a regular basis!

The articles in this issue are sure to impress. The articles not only represent conversations on current work within the OER community, they are also an indicator that authors are exploring different trajectories for OER research, thus sparking growth and evolution. For continuing to advance knowledge and awareness through your passion to share, I thank you for your generous contributions in OER academic scholarship.

I would also like to thank the peer reviewers, copyeditors, web developers, and printers whose labor went into producing *IJOER* that should not go unrecognized.

As always, stay with us and expect more.

Melissa Layne, EdD

Editor-in-Chief, *International Journal of Open Educational Resources*

***Call for Proposals:** *IJOER* Special Issue Spring/Summer 2021

Queridos lectores de *IJOER*,

El otoño está aquí, y qué mejor momento que ahora para presentar nuestro número IJOER Otoño / Invierno 2020. Este número contiene algunos estudios impresionantes que hacen avanzar la literatura REA en nuevas direcciones. Además, nuestra sección especial habitual, 3 preguntas para un líder REA, presenta al editor en jefe de IRRODL, el Dr. Rory McGreal. Estábamos encantados y encantados de que Rory se uniera a mí para una entrevista. Curiosa y coincidentemente, gran parte de nuestra discusión se refleja en los artículos de este número.

Bueno, el otoño está aquí, y qué mejor momento que ahora para presentar nuestro número IJOER Otoño / Invierno 2020. Este número contiene algunos estudios impresionantes que hacen avanzar la literatura REA en nuevas direcciones. Además, nuestra sección especial habitual, 3 preguntas para un líder REA, presenta al editor en jefe de IRRODL, el Dr. Rory McGreal. Estábamos encantados y encantados de que Rory se uniera a mí para una entrevista. Curiosa y coincidentemente, gran parte de nuestra discusión se refleja en los artículos de este número.

Nuestro segundo artículo, Un análisis cualitativo de revisiones de libros de texto abiertos, los autores Merinda McLure y Olga Belikov llevaron a cabo un estudio único utilizando un enfoque cualitativo para analizar las revisiones de libros de texto abiertos. Muchos instructores confían en las revisiones de los usuarios de los REA ya desarrollados, y basan sus decisiones en la calidad y otros criterios. Los comentarios que se brindan a los libros de texto abiertos son extremadamente valiosos, ya que respaldan la consideración del instructor, la creación y revisión del autor y editor.

En nuestro tercer artículo, *Evaluación de la recomendación de la UNESCO sobre recursos educativos abiertos*, el autor Stephen Downes revisa las Recomendaciones de la UNESCO sobre recursos educativos abiertos, destacando tanto los beneficios como las deficiencias. Downes afirma que aunque las recomendaciones ciertamente promueven los objetivos de los REA, hay áreas en las que persiste la ambigüedad.

En nuestro cuarto artículo, *Evaluación de recursos educativos abiertos entre estudiantes en cursos combinados de métodos de investigación y estadística*, en el que las autoras Lindsay Phillips, Laura Gelety y Lisa Hain reemplazaron el libro de texto tradicional utilizado en su curso combinado, Métodos de investigación y estadísticas para examinar las percepciones de los estudiantes, desafíos y eficacia de los REA. Al administrar una encuesta de satisfacción de los estudiantes y utilizar un enfoque de métodos mixtos, los resultados indican ... bueno, ¡no voy a estropear la sorpresa al revelar los resultados!

En nuestro quinto artículo, *Explorando las percepciones de los profesores sobre los REA e impedimentos para su uso: un estudio multiinstitucional*, los autores Abbey

Elder, Amanda Larson, Elaine Thornton y Will Cross examinan las percepciones de los profesores sobre los REA en cuatro universidades. No se enfatiza lo suficiente la importancia que tienen las iniciativas de REA en su avance y crecimiento, sin abordar y comprender las percepciones de los profesores sobre los REA. Este enfoque de base revela importantes perspectivas, barreras y creencias, que allanan el camino para el desarrollo y la adopción de REA.

Para nuestro sexto artículo, *"Cursos abiertos" para la diversidad y el aprendizaje más profundo*, los autores Marcos Rivera, Kaity Prieto, Shanna Smith Jaggars, e alexander y Amanda Folk abordan el desafío que tienen tanto los profesores como los estudiantes al navegar por los cursos de diversidad. Afirman que para ser eficaces en los campus universitarios y universitarios, el desarrollo pedagógico y curricular de los cursos es clave. En combinación con un libro de texto comercial, los autores utilizaron recursos educativos abiertos (REA) y prácticas educativas abiertas (OEP) para promover la justicia social, la inclusión y la conciencia de la equidad.

En nuestro séptimo artículo, *Análisis comparativo de un libro de texto de recursos educativos abiertos y un libro de texto comercial sobre los resultados de los estudiantes en un curso de enfermería en línea*, los autores Jamie Murphy y Nancy Winters abordan la escasez de investigaciones sobre cursos de enfermería que utilizan REA mediante una revisión de calificaciones comparativa y retrospectiva diseño del estudio, para comprender las diferencias de resultados de los estudiantes entre el uso de un libro de texto comercial y uno que fue desarrollado por un instructor usando REA. Se analizaron foros de discusión, trabajos y calificaciones finales de todos los estudiantes inscritos en un curso de enfermería en línea.

Nuestro octavo artículo, *Superando las barreras de acceso a los libros de texto en un curso introductorio de psicología: un estudio REA en una institución que sirve a hispanos*, el autor Adam John Privitera abre nuevos caminos al realizar una investigación a pequeña escala de la necesidad de alternativas de libros de texto de bajo costo en una introducción curso de psicología. Los libros de texto REA pueden minimizar la carga financiera de los estudiantes de bajos ingresos y ayudar a alcanzar sus metas académicas. En este estudio, los REA de psicología se adaptaron de los recursos existentes y se pusieron a prueba en tres secciones del curso de psicología. El segundo objetivo del estudio fue examinar cómo el uso de REA en este contexto afectó a los estudiantes en el curso.

En nuestro noveno artículo, *Hacia una pedagogía de recursos educativos abiertos (REA): presentación de tres formas de usar los REA en el aula de redacción profesional*, Sarbani Sen Vengadasalam desarrolla una lista de verificación / rúbrica para ayudar a los instructores a determinar la utilidad de los REA en la escritura, los negocios y cursos de redacción técnica. También proporciona formas de interconectar las clases de escritura con los recursos educativos abiertos.

En nuestro artículo final, *Hacia una definición práctica de la pedagogía abierta*, el autor Alan Witt analizó el término "Pedagogía abierta" para acercarse a una definición de trabajo a través de la exploración de la literatura actual. La pedagogía se basa en la identificación consciente de los practicantes con el movimiento abierto, el acceso abierto y los recursos educativos abiertos. Al desarrollar una taxonomía a partir de artículos relacionados, Witt utilizó esta taxonomía para construir una definición de trabajo de la pedagogía abierta.

Los artículos de este número seguramente impresionarán. Los artículos no solo representan conversaciones sobre el trabajo actual dentro de la comunidad REA, sino que son un indicador de que los autores están explorando diferentes trayectorias para la investigación de REA, lo que genera crecimiento y evolución. Por continuar avanzando en el conocimiento y la conciencia a través de su pasión por compartir, les agradezco sus generosas contribuciones en la beca académica REA.

También me gustaría agradecer a los revisores, correctores de estilo, desarrolladores web e impresores cuyo trabajo que se dedicó a producir IJOER no debería pasar desapercibido.

Como siempre, quédese con nosotros y espere más.

Melissa Layne, Ed.D.

Editora Principal, *International Journal of Open Educational Resources*

***Se requieren propuestas para:** *IJOER* número especial primavera/verano 2021

秋天已至，此时正是介绍2020年IJOER秋冬季期刊的最佳时刻。本期内容涵盖一些为开放教育资源（OER）文献提供新方向的研究。此外，期刊特殊板块—“为OER领导者准备的三个问题”—邀请了*IRRODL*主编Rory McGreal博士。我们对Rory同意接受采访感到兴奋。碰巧的是，我们的讨论在很大程度上都在本期收录的文章中有所体现。

第一篇文章《大学学习管理系统、OER存储库及奥地利OER门户网站界面所需工具和步骤的开发和执行》中，作者Christoph Ladurner、Christian Ortner、 Karin Lach、Martin Ebner、Maria Haas、Markus Ebner、Raman Ganguly 和Sandra Schön引领了一项创新实践，鼓励并让教师能够使用个人学习管理系统发表OER。作者进一步解释了用元数据标记教育资源如何能帮助开发OER存储库，后者能通过奥地利OER门户网站获取。作者就OER基础设施执行的相关项目分享了建议。

第二篇文章《开放课本评论定性分析》中，作者Merinda McLure 与Olga Belikov进行了一项独特研究，用定性方法分析开放课本评论。许多教师依赖用户对已开发的OER的评论，并基于质量和其他标准做决定。开放课本收到的反馈具有宝贵价值，因为其能支持教师对OER的考量、以及作者和发行者对OER的创建和修订。

第三篇文章《关于教科文组织〈开放教育资源建议书〉的评价》中，作者Stephen Downes重审了联合国教科文组织的《开放教育资源建议书》，强调了建议书的优缺点。Downes认为，尽管建议书推动了OER目标，但仍存在模糊区域。

第四篇文章《混合研究方法与统计学课程学生对开放教育资源的评价》中，作者Lindsay Phillips、Laura Gelety和Lisa Hain在研究方法与统计学这门混合课程中使用OER代替传统课本，以分析学生对OER的感知、OER带来的挑战以及OER的有效性。通过执行一项学生满意度调查，同时使用混合方法，研究结果显示…, 请读者阅读文章找到研究结果！

第五篇文章《探究教师对开放教育资源（OER）的感知以及OER使用障碍：一项多机构研究》中，作者Abbey Elder、Amanda Larson、Elaine Thornton和Will Cross分析了四所大学的教师对OER的感知。必须应对并理解教师对OER的感知，才能真正强调OER倡议计划对其进步与发展产生的重要作用。这项草根方法揭示了关于OER的重要视角、障碍、信念，进而为OER的开发和采纳奠定基础。

第六篇文章《为多样性和深度学习“开放”课程》中，作者Marcos River-a、Kaity Prieto、Shanna Smith Jaggars、e alexander和Amanda Folk应对了教师和学生在完成多样化课程时面临的挑战。作者主张，为有效实现大学校园的多样性，教学法开发和课程开发尤为关键。通过结合商业课本，作者使用开放教育资源和开放教育实践（OEP）增进社会正义、包容性、公平意识。

第七篇文章《比较分析网络护理课程中开放教育资源课本与商业课本对学生结果产生的影响》中，作者Jamie Murphy 和Nancy Winters通过一项比较性、回溯性成绩评定研究设计，填补了与护理课程OER使用相关的研究空白，以期理解使用商业课本和使用由教师开发的OER对学生结果产生的差异。分析了一门网络护理课程中所有学生的论坛、作业和最终成绩。

第八篇文章《克服心理学入门课程中的课本获取障碍：一所拉美裔服务机构的开放教育资源研究》中，作者Adam John Privitera通过在一门心理学入门课中就低成本课本替代方案之需进行一项小范围调查，得出了新的研究结果。OER课本能让低收入学生的经济压力最小化，并帮助实现其学业目标。在这项研究中，心理学OER改编自现有资源，并试用于心理课的三个

部分。该研究的第二个目标旨在分析此背景下OER的使用如何对这门课的学生产生影响。

第九篇文章《迈向开放教育资源（OER）教学法：专业写作课堂中使用OER的三种方法》中，作者Sarbani Sen Vengadasalam提出一项清单/说明，协助教师决定OER在写作、商业写作、技术写作课中的有用性。作者还提供了用OER连接写作课的方法。

第十篇文章《对开放教学法进行初步定义》中，作者Alan Witt分析了“开放教学法”这一术语，以期通过探究现有文献对该术语进行初步定义。从业人员对开放运动、开放获取、开放教育资源的认同启发了教学法。通过对相关文章进行分类，作者用该分类法对开放教学法建构了一个初步定义。

本期收录的文章值得一读。文章不仅代表了有关OER社区当前研究进展的交流，还代表了作者目前为OER研究所探索的不同轨迹，以期激发相关进展。我感谢各位作者对OER学术文献所作的贡献，以及不断为增进知识和相关意识所作的努力。

我还要感谢同行评审员、出版编辑、网络开发商和出版人员，他们为IJOER所付出的努力应得到认可。

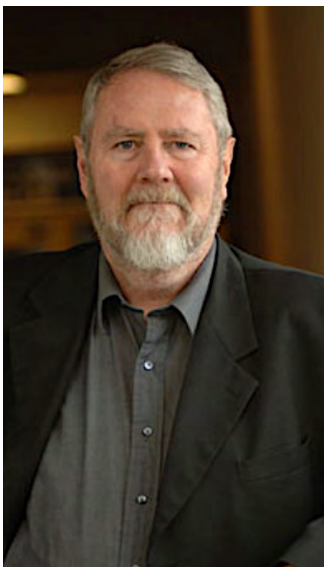
一如既往，和我们一起展望更多。

Melissa Layne，教育学博士
《国际开放教育资源期刊》主编

*研究课题征集：2021年*IJOER*春夏季特刊

3 Questions for an OER Leader | Featuring Rory McGreal

Melissa Layne



Dr. Rory McGreal is a professor at the Athabasca University and Chairholder of the UNESCO/International Council for Open and Distance Education in Open Educational Resources. He is a professor in the Faculty of Humanities and Social Sciences at Athabasca University—Canada's Open University, based in Alberta, Canada. He is also the Director of the Technology Enhanced Knowledge Research Institute (TEKRI); Editor of the International Review of Research in Open and Distributed Learning (IRRODL); and founder of the OER Knowledge Cloud, which received an award of excellence from the Open Education Consortium. Formerly, he served as the Associate Vice President Research. He has received lifetime recognition awards from the Open Education Consortium, the European Distance Education Network, and the Canadian Network for Innovation in Education.

Melissa: Hello Dr. McGreal, thank you very much for taking the time out of your schedule to join me for this interview in our regular section, *3 Questions for an OER Leader*. Welcome.

Rory: Thank you. And thank you very much for this kind invitation to speak to your readers.

Melissa: So, before I start asking you the serious questions (this one doesn't count as one of the three), I wanted to point out an interesting factoid that I'm sure many people in the OER community may or may not know, and that is the title of *IRRODL* journal wasn't initially named *International Review of Research in Open and Distributed Learning*. Previously, it was called the *International Review of Research in Open and Distance Learning*. When and why was the change made?

Rory: Very good question. It was about four years ago—it could be five, but years blend into each other as you get older. We made the change because we saw that everybody was getting into distance education and that blended education and hybrid education and other forms were mixing with distance education. We found that in distance education, there were times when people would meet together and do things. It was becoming mixed. So, we were looking for another term—and at the same time, we received a grant from UNESCO to focus more on open educational resources. We wanted to make sure that

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this wasn't just about distance learning, but it was also about open learning, specifically open educational resources, and also open education in general. So, we didn't want to lose the initials and we found the word *distributed.* That's the truth and I'm sticking to it.

Melissa: In terms of the UNESCO recommendations, what are your perceptions of the latest UNESCO recommendations? What do you think of the overall initiative?

Rory: Well, I'm a big supporter of the initiative. I attended the meeting in Paris, and consulted with several people around the world on some of the changes that were made. But in terms of evolving the recommendations, I think that's a non-starter. It took so long to put the recommendations together, that I don't really see much room for any evolution. Further, to get an agreement with so many countries is just impossible at that point to make changes. I think it is an issue. Publishers could drive a truck through open now and still call themselves who we are. So, I think there's a real problem there. But at this point, it's really impossible to change that definition. I mean, we see the same problem with open access publishing where they claim to be open, when really, they're not open. It's up to us to continue and support the original idea of open educational resources. Despite the problems, I still think it was a great accomplishment.

Melissa: Do you see UNESCO doing anything different than going forward in their initiatives?

Rory: I think there's been a huge bounce in growth of all (initiatives). Due to COVID-19, all kinds of institutions are beginning to understand how to use distance education, distributed education, online education, and blended e-learning. They're open now to all kinds of new modes that they weren't before. They were sort of stuck in the 19th century with the classroom-based model, and now they're realizing that there are many other models that can be applied. Also, as part of that, they're finding that online can be very difficult when using commercial content—especially if you're looking at students who are living in different countries with different copyright laws, different copyright agreements among publishers, digital locks, and all kinds of other problems. In Canada, of course, and many other countries, privacy is also an issue. When companies collect and own student data, there are some real problems with commercial content. So, this is an impetus for educators to start using more and more open educational resources because they're unencumbered. I mean, it's not just they're cheap, but they're unencumbered with all of these other effects. One of the problems that we face is that we have students in 60 countries where there are digital locks on content. Much of the video material that we use is multimedia material and they can open the material in different countries. It's illegal to break the locks because of the Digital Millennium Copyright Act that America has pushed around the world. People are realizing this is unworkable. We can't really use content with these locks on them. Then, of course, there's the legal

entanglement where you're not legally allowed to break the lock. Even if you have a reasonable, non-criminal purpose in accessing the material, it's illegal to break the lock. They're basically putting themselves out of business by trying to protect it too much. They'll eventually have to come up with other ways of open-washing to stay in the game, because we are, of course, free and we don't have any of those encumbrances.

2 **Melissa:** Turning to academic scholarship in OER, what research priorities should we be exploring? Do you see OER research studies advancing toward different trajectories? If so, how will your role at UNESCO progress these other directions?

Rory: In my role as UNESCO Chair, since January of 2019, we have had a policy about the articles that delve into students' perception, satisfaction, their ideas about interaction, etc., and we suggest that if you're going to submit an article about these phenomena—which are important, you must also show that the students learned something—or that they didn't.

At *IRRODL*, what we're finding is that some articles concluded that (paraphrasing), "yes, the students just loved the course, the teachers loved it. It was highly interactive," but they don't even mention what particular subject students were learning, or even whether or not the students learned anything. I've had five or six articles this year where authors were asked by the peer reviewers to rewrite their papers to include student learning data. Some of the authors actually *had* student learning data, but didn't think it was important to include. If you're a teacher in the classroom, I don't care what you do. If students don't learn anything, you're not doing your job right. I mean that. This means an online classroom or face-to-face, or anything else. Students can really love you as a teacher. They can love the interactions they've had with you ... and by the way, if they've learned something, they think that's important – that maybe those actions you made with the students had a positive effect on their learning achievement. I also feel we don't get many articles on cost-effectiveness. It's a no-brainer that OER costs less than the commercial products, but we don't seem to get really good analysis on the cost-effectiveness of open educational resources. What's key, of course, is awareness, which is still a problem. I think there's been a big boost due to COVID-19 that a lot more people know about it. However, there is still a problem with lack of awareness. What we found is that as we explained to teachers what they are to students, and that they have experience with the way they are, they get it and they're very supportive. However, so many still don't really understand what they are, or what they're all about. I don't think we've done a very good job in propagating what we are and how there are benefits—not just financial, but also a benefit to teachers in allowing flexibility, etc.

3 **Melissa:** This is a nice transition to our third question: What message would you like to communicate

from this interview to our OER Community? How can we play a role, as editors, to boost awareness?

Well, what I'm seeing is the sort of a move toward closing of what open is—which sounds strange, but people have their opinion about what openness *is,* and other opinions are not accepted. To me, openness is not a left- or right-wing phenomenon; it's egalitarian. It's inclusive of diverse groups, and a wide range of views can be accommodated with open educational resources. However, what I'm finding is that there are strong authoritarian tendencies. From the right and the left within our movement they want to say, "oh, this is all we are, and this is inclusive and this is what we believe." And others say, "well, no, *this* is inclusive and that's our belief." This is not what being "open" is all about. As an open community, like we're *supposed* to be, we need to be, open to a wide range of different philosophies. In terms of methodologies, if you're constructivists, put it out as constructivist. If you're connected, just put it out as connectivists. I don't see why these things are so onerous and people make a big deal about them. We cannot afford to become captive to one educational or political orthodoxy. It doesn't matter how zealously they put it forward. We need to be open. I'm on the working group at UNESCO for equality, diversity, and inclusiveness. What some do not realize is that we need to be inclusive of not only of groups, but also of individual views and opinions. As a UNESCO Chair—as all the UNESCO chairs do, we support human rights and the Universal Declaration of Human Rights. Free expression is the cornerstone of those rights. We need to harness open educational resources to support a big, inclusive, and diverse tent.

Melissa: Anything else you'd like to add?

Rory: As a journalist, I think that we need to find ways of supporting the sustainability of open access, things like the Directory of Open Access Journals, and even consider joining the council of Elsevier movements, which are happening around the world. California seems to be leading in it, but I don't know. I think recently they made an agreement with Elsevier that substantially reduced their costs. When publishers have open-washing and pretend to be open access journals, we have to be aware of them and make people aware of them, because they could ruin us by their bad reputation. Those are issues that we as journalists need to be aware of.

Melissa: Rory, thank you. I really appreciate you joining me for this interview, and I think that our readers are going to be excited to learn your perspectives on these topics and issues. **Ω**

The Development and Implementation of Missing Tools and Procedures at the Interface of a University's Learning Management System, its OER Repository, and the Austrian OER Referatory

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Abstract

To enable broad access to education and generous use of educational resources, Graz University of Technology (TU Graz) also relies on Open Educational Resources (OER). This article describes the technological developments and processes that enable teachers at TU Graz to use their own learning management system (LMS)

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for the publication of OER. The article describes how interfaces and processes have marked educational resources of TU Graz with metadata to offer them to a broad public via the university's own OER repository and via the Austrian OER portal of the University of Vienna. Only appropriately qualified lecturers at TU Graz are authorized to use the new OER plug-in. The article concludes with recommendations for projects in OER infrastructure implementations.

Keywords: Open Educational Resources (OER), metadata, learning objects metadata (LOM), library, repository, learning management system (LMS), training, certification, higher education, university

El desarrollo e implementación de herramientas y procedimientos que faltan en la interfaz del sistema de gestión del aprendizaje de una universidad, su repositorio de REA y el referatorio de REA de Austria

Resumen

Para permitir un acceso amplio a la educación y un uso generoso de los recursos educativos, la Universidad Tecnológica de Graz también se basa en Recursos Educativos Abiertos (en resumen, REA). Este artículo describe los desarrollos y procesos tecnológicos que permiten a los profesores de la Universidad Tecnológica de Graz utilizar su propio sistema de gestión del aprendizaje para la publicación de REA. El artículo describe cómo las interfaces y los procesos han marcado los recursos educativos de la Universidad de Tecnología de Graz con metadatos para ofrecerlos a un público amplio a través del repositorio de REA de la propia universidad y a través del portal de REA de Austria de la Universidad de Tecnología de Graz. Solo los profesores debidamente cualificados de la Universidad Tecnológica de Graz están autorizados a utilizar el nuevo complemento OER. El artículo concluye con recomendaciones para proyectos en implementaciones de infraestructura REA.

Palabras clave: Recursos educativos abiertos (REA), metadatos, LOM, biblioteca, repositorio, sistema de gestión del aprendizaje, formación, certificación, educación superior, universidad

大学学习管理系统、OER存储库及奥地利OER门户网站界面所需工具和步骤的开发和执行

摘要

为让教育的广泛获取、教育资源的免费使用成为可能，格拉茨科技大学也依靠开放教育资源（简称OERs）。本文描述了让格拉茨科技大学教师能使用个人学习管理系统来发表OER的相关技术开发和过程。本文描述了界面和过程如何用元数据标记格拉茨科技大学的教育资源，并通过该大学的OER存储库及奥地利OER门户网站将资源提供给广泛大众。只有合格的格拉茨科技大学教师才被授权使用新OER插件。本文结论对OER基础设施执行的相关项目提出了建议。

关键词：开放教育资源（OER），元数据，学习对象元数据（LOM），图书馆，存储库，学习管理系统，培训，认证，高等教育，大学

Introduction

Open Educational Resources (OER) at German-speaking European universities

To provide broad access to education and allow for a more widespread use and re-use of educational resources, many global organizations and agencies rely on open educational resources. UNESCO (2002) defined open educational resources (OER) as "teaching, learning and research resources in any medium, digital or otherwise, that are in the public domain or published under an open licence allowing free access, use, editing and redistribution by others without or with minor restrictions. The principle of open licensing is within the existing framework of copyright law, as established by relevant international agreements and respects the authorship of a work." The European Commission (2013) also promotes OERs, with the aim of "opening up education" and improving the teaching of digital skills in schools and universities. There are also many theoretical debates on OER, for example, on the relationship between sharing and openness (Missomelius et al., 2014).

For educational resources to become modifiable and reusable for third parties in a legally compliant manner, they have to be published under a free/open license. Even though there are other licensing models, the so-called Creative Commons (CC) licensing model is best known in German-speaking Europe (http://de.creativecommons.org/). Examples for "open licenses" are "CC

BY" or "CC BY-SA." Resources for which no copyright exists anymore and resources that have been published in the public domain with a CC0 license are "open" as well. There are, however, CC licenses that do not meet the definition of "open" licenses: for example, when commercial use is prevented (CC BY-NC, CC BY-NC-SA; see also Klimpel, 2012). Using open licenses is more important in German-speaking Europe than, for example, in the USA, as there are no fair-use rules, and the re-use of schoolbooks and textbooks, for example, is only allowed to a very limited extent (Ebner, Schön, & Kumar, 2016).

Regarding OER in the context of universities in German-speaking Europe, there are specific issues compared to other countries (see Ebner, Schön, & Kumar, 2016, Mruck et al., 2013). First, attending public universities does not involve expensive fees, which means that OER are not suitable as a potential marketing tool to attract future students. Furthermore, academic freedom is considered a significant aspect of the university sector so that faculty cannot, e.g., be forced to publish teaching materials as OER. However, OER are perceived as a potential means to boost the public image and the impact of a university and to help spread its materials.

It may be obvious from the above that it is difficult to introduce and implement OER strategies at European universities and to implement processes that actively support the creation and publication of OER. In Austria, the most important initiative on OER in higher education was the project "Open Education Austria," which was co-financed by the Federal Ministry of Education, Science, and Research. The project, the first phase of which lasted from June 2016 to December 2018, was renewed in March 2020 as "Open Education Austria Advanced" with additional partners. Its aims include expanding the OER infrastructure for Austrian universities until 2024 and the further development of a system for the OER certification of teachers and universities (Ebner 2018; Ebner, Freisleben-Teutscher, Gröblinger, et al., 2016; Ebner, Kopp, Freisleben-Teutscher, et al., 2016). One sub-project concerns the expansion of the service and technology infrastructure for publishing OER within the partner universities and for sharing experiences and solutions with others (see Figure 1). A prototype for an application enabling the automatic transfer of OER from a learning management system (LMS) into a library system has been developed.

This paper describes the development of an OER plug-in that can be selected by appropriately qualified lecturers of the Graz University of Technology (TU Graz). It will allow them to label learning resources in the LMS (Moodle) with the corresponding OER metadata, to transfer them into the university's repository and to make them available via other (planned) services, in particular those for doing research on the Austrian OER portal, which is being developed and is hosted by the University of Vienna. Teachers and students worldwide will then be able to search for OERs via the OER portal to access materials of the library of TU Graz.

Before we present the more detailed methods and results of our development, we would like to discuss the background and current state of the debate on educational resources and metadata.

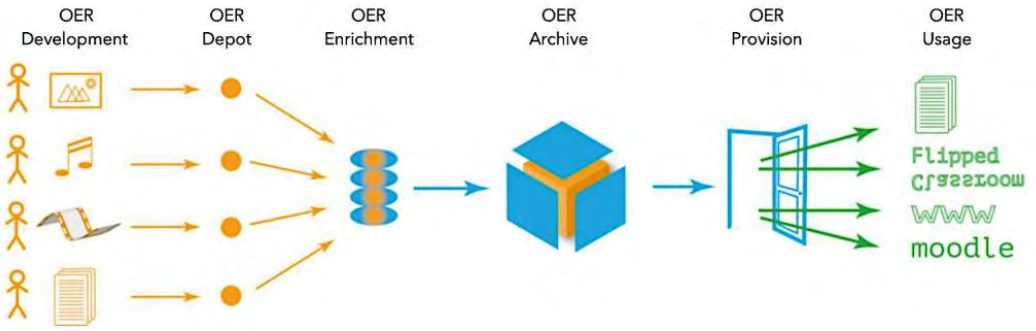

Figure 1. Schematic Representation of the Technical Infrastructure for Making OER Available within the Open Educational Austria Advanced Project

Source: Open Education Austria Advanced (2020-05-19).

Review of the Literature

Metadata Standards for OER

To make OERs available to others, they must also be findable and researchable. The use and embedding of open licensing in the source code is only a first step. To enable teachers to conduct granular research, for example, on specific target groups or teaching topics, more precise descriptions—so-called metadata—are necessary. As freely available educational resources emerged on the Internet, research projects that specifically addressed this challenge were undertaken. For example, the 2005–2008 EC-funded project CALIBRATE attempted to develop a common search and exchange facility via various national education servers of participating ministries of education.

The basis for such an exchange of resources is uniform descriptions of the materials, i.e., standards for the metadata of the resources. There are different approaches and proposals for classifications of metadata of (free) educational materials or learning objects (see e.g., Pohl, 2014). OERs are very diverse, which is a challenge (Ebner et al., 2015): OERs are of varying granularity, from individual images to complete courses; they can be static or dynamic; and they can be individual, rigid documents or dynamic developments, such as wiki systems. In addition, there are a variety of technical formats (from courses to apps to video), different curricula, different target groups, and also different producers within the entire educational sector.

Barker and Campbell (2010) provided an overview of standards for metadata of educational resources.

Ziedorn et al. (2013) compiled a corresponding overview of usable metadata standards for OER. As a long-term goal, one should "achieve a standardisation of the metadata schema (whether an existing one or a newly developed one by the International Organization for Standardization (ISO))" (Derr & Neumann, 2013, p. 10). In particular Edusharing e. V. and the German OER Metadata Group are working in this field, the latter with the aim of "achieving harmonisation of OER metadata in the German-speaking world and to develop a recommendation on this" (OER Metadata Group, 2015). With digital OERs, many projects use and extend the standards of learning objects, e.g., the standard "Learning Objects Metadata" (LOM) (Rensing, 2013). LOM is an open standard developed and published by the Institute of Electrical and Electronics Engineers (IEEE) organization (Wikipedia, 2019). LOM is divided into different categories that cover partial aspects of metadata. Other publications on metadata and OER favor the approach of the Learning Registry Metadata Initiative (LRMI): "The LRMI standard enables the mapping of the dynamic process of user interaction (rating, indexing, versioning, etc.) as an integral part of OER" (Steiner, 2017, p. 53). In 2020, "LOM for Higher Education OER Repositories," i.e., a "Description of the XML Schema Definition of the Metadata Profile for Open Educational Resources in Higher Education" was published by the OER Metadata Group, a working group of German-speaking universities (KIM-AG, 2020; Menzel & Pohl, 2020).

Methodology

This article documents the development and implementation of the technical infrastructure and process that enable lecturers at TU Graz to (1) provide self-created learning and teaching resources with an open license and (2) transfer these OERs from the LMS to the repository at TU Graz. The aim is to make these resources searchable and findable on the (planned) Austria-wide referatory for OERs, an OER subject portal of the University of Vienna. Besides technical solutions, lecturer qualifications and authorizations are necessary steps in the process.

Two key developments were necessary for this. First, the existing technical systems had to be identified and then converted so that OERs could be created, which then could be searched by others. This required technical analyses and developments. Second, a process had to be created and implemented that qualifies teachers to develop and publish OERs.

In this paper, we describe the technical analyses and developments of the awarding of the learning and teaching resources of TU Graz as OER, i.e., the selection of the corresponding metadata standard and the awards used, as well as the technical implementations in the form of a plug-in for the university's own LMS and developments of application programming interfaces (API). Methodically, procedures of technical analysis and prototype development are used in software development. We also describe the development and imple-

mentation of the qualification and certification process. In this way, we document the procedures and experiences in a socio-scientific-descriptive way. We also used internal working papers, documentation, and a project presentation as a basis for this contribution (Ebner et al., 2017; Haas, 2018; Ladurner, 2019). A short version of this contribution was already presented and will be published in conference proceedings in German (Ladurner et al., 2020).

Findings

In the following, we describe the individual development steps and their results in the development of the technical and social implementation of the plug-in and the APIs into the technical infrastructure and processes of the OER publication at TU Graz.

Analysis of the initial situation at TU Graz

The following technologies and processes were established at TU Graz at the end of 2017, at the beginning of the implementation concerning educational resources.

"TeachCenter" is the name of the LMS at TU Graz. At the end of 2017, it was based on the open source software Moodle, version 3.1. At TU Graz, Moodle was extended by a web service for user synchronization and synchronization, course registrations, and de-registrations. In addition, a user interface was developed that corresponds to the corporate identity of TU Graz. Courses are created and maintained at the request of the lecturers. The TU Graz TeachCenter contained about 1,200 courses in 2017; currently (May 2020), there are more than 2,000 courses (Ebner et al., 2020). Courses in the LMS are linked to one or more courses at TUGRAZonline, the campus management system and corresponding user administration. TUGRAZonline is the central administration system for TU Graz staff and students. Students can register for their courses, and lecturers can carry out administrative tasks (e.g., input exam results) to manage courses.

There are two ways to upload a file into a course. The first possibility is to upload the file by using "drag & drop" on the "main page" of the course. Files uploaded that way will be stored with the system-wide standard license "All rights reserved" and the instructor will be entered as author. The second possibility is to select and upload files via "Add file." Here teachers have the option of specifying the author and the license used. The licenses and authorship of materials can be adjusted later (by clicking on "Edit" and "Settings").

The repository of TU Graz is a proprietary development, written in PHP. In order for the resources in the repository to be ordered and searched, additional information about the materials is required, so-called "metadata," which describe the materials. The repository of TU Graz has implemented the Machine Exchange Format for Libraries (MAB) (German National Library, 2019) for this purpose. It is used in the library program Aleph as a database format for storing bibliographic

data. The development of the format has been discontinued and is being replaced by MARC21 (Deutsche Nationalbibliothek, 2019). MAB is a data format that divides the information into fields. A field comprises a three-digit number, an indicator, and 1-n subfields (which in turn comprise a subfield identifier and subfield values). Some fields can be repeated and some cannot. This means that TU Graz's repository is not designed for teaching and learning resources.

A special feature that should be noted is the TUbe video portal of TU Graz, where course recordings and videos of lecturers can be filed, stored, and embedded in the LMS.

Schematically, as shown in Figure 2, the initial situation 2017 lacks interfaces that, on the one hand, transfer the materials from the LMS of TU Graz to the repository of the University Library of TU Graz. On the other hand, it enables the transfer of metadata to the Austrian OER portal.

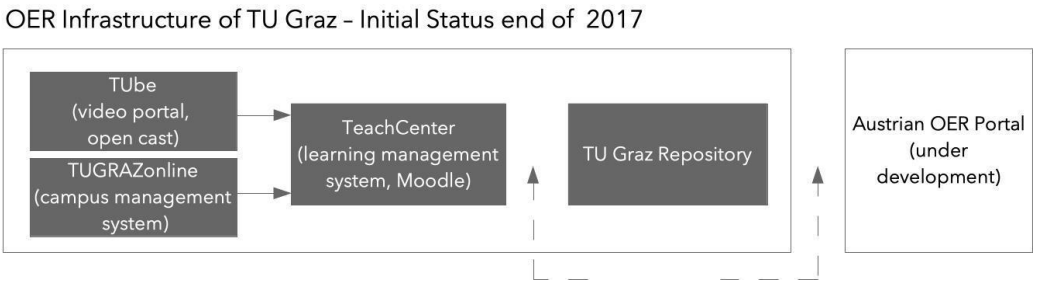

Figure 2. Schematic Representation of the Initial Technical Infrastructure for Making OER Available at TU Graz

Note: Status End 2017.

For the sake of completeness, it should be pointed out that there is another platform for openly licensed materials at TU Graz, the MOOC platform imoox.at, where lecturers create OERs. As with the LMS TeachCenter and the TUbe video portal, there is currently no way of making the materials available to others for research purposes via the university's own repository or the Austrian OER portal developed by the TU Graz.

Sketch of the technical solution and development procedure

In order to transfer the data from the TeachCenter to the TU Graz repository or the Austrian OER portal, it is necessary to give lecturers the opportunity to supplement the corresponding metadata and develop interfaces (API). Figure 3 shows the necessary LMS plug-in and location of the API.

The procedure for the development was as follows. First, we determined how the OER should be described in the repository, i.e., which metadata should be used. To do this, we needed to choose a standard and discover which data already existed, which data was necessary, and which data had to be added by the teachers.

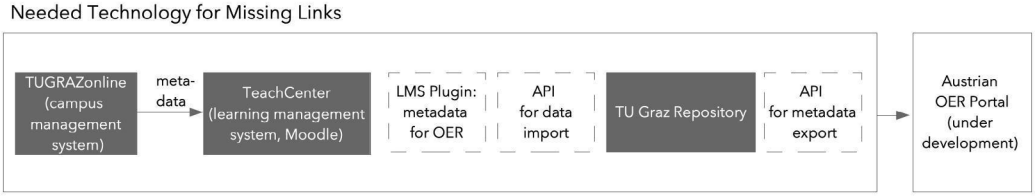

Figure 3. Missing Technologies—Rough Concept of the Technical Solution

Choice of metadata standard and analysis and of available metadata

Since MAB is not designed for OERs, a standard had to be sought that could describe learning and teaching resources. The metadata standard LOM was already in use in several projects at the time of the analysis, and the LOM metadata can also be translated (Educa.ch, 2017). LOM was therefore selected, and the repository data model was adapted to LOM. This means that additional fields—corresponding to LOM semantics—were implemented.

Since we assumed that teachers are not very keen on entering additional metadata on their learning objects and units into a system, the question now arose which LOM metadata is already in the Campus Management System. To enable a coherent procedure, this equivalence check of metadata and LOM analysis and selection of relevant metadata was carried out in cooperation with the University of Vienna, which is interested in a joint procedure and selection for the Austrian OER portal and its own repository. Therefore, the metadata from the systems of TU Graz and the metadata of the Austrian OER portal of the University of Vienna were compared with LOM.

An equivalence list (see Table 1) was elaborated. It shows which of the LOM data are available in the information systems of the two universities.

The comparison of LOM of the metadata of the information systems of TU Graz and the University of Vienna shows that there are large overlaps. However, there are also fields in the systems of TU Graz that are not available at the University of Vienna (e.g., *resourceType*). Since the universities are striving for a compatible solution, this field is not considered further. Some LOM fields that are also present in the equivalence list in the information systems of both universities were not selected (for example, cost, reference program) because they do not appear to be relevant.

Schematically, therefore, there are different metadata identified as necessary based on a selection of metadata based on the LOM schema. They can be taken from different existing sources, namely the information systems of TU Graz and the file itself. However, a part must still be supplemented by the authors themselves or must be editable by them. Figure 4 gives an overview of the different sources.

Table 1. Equivalence List of the Fields of the Campus Management System of TU Graz, the Austrian OER Portal of the University of Vienna and the LOM Standard.

Documentation		*Repository: OER API*			
teachcenter		openlib	description[static]	vienna	lom
		1000	unique id		
		1050	children ids		
		1051	all child ids		
	C	1102	child type [course]		
	O	1600	creation date node		
	U	1601	modification date node		
title course	R	331	title	title course	
science field	S	1800	science field	science field	
location	E	1507	location [graz]	location	coverage [1.6]
intended end user role		1801	intended end user role [learner]	intended end user role	intended end user role [5.5]
context		1802	context [university]	context	context [5.6]
course language		1301	language	course language	
		1000	unique id		
		1050	children ids		
		1051	all child ids		
		1052	root ids		
		1053	parent ids		
		1102	child type [unit]		
		1600	creation date node		
		1602	modification date node		
institute		1803	institute	institute	
year		1401	year	year	
semester	U	1409	semester	semester	
description	N	1500	abstract	description	
university lecturer	I	100	author 1	university lecturer	contribute [2.3]
	T	103	corporate body 1	corporate body lecturer	role [2.3.1]
contributor		104	author 2	contributor	

categories		710	subject	categories	
course type		1804	course type	course type	structure [1.7]
		1000	unique id	unique identifier	identifier [1.1] [3.1]
		1052	root ids		
		1053	parent ids		
		1102	child type [file]		
		1600	creation date node		contribution to metadata [3.2]
		1601	modification date node		contribution to metadata [3.2]
author		100	author	author	author [2.3]
		103	corporate body	corporate body	role [2.3.1]
filename		331	title	filename	title [1.2]
filesize		1200pb	filesize	filesize	size [4.2]
		1200pa	filename[hash value of file]		
abstract	F	1500	abstract	abstract	
file language	I	1301	language	file language	language [1.3]
cost	L	1709	cost [none]	cost	cost [6.1]
	E		copyright a. other restrictions [yes]	copyright other restrictions	copyright and other restrictions [6.2]
licence		1701	licence [cc-*]	licence	description of rights [6.3]
reference program		1214	reference program	reference program	name of required technology [4.4.1.2]
categories		710	subject	categories	
subjects		710	subject	subjects	
file creation date		1604	file creation date	date	version [2.1] [2.3.3]
		1602	file modification date		
oefos		1508	oefos	oefos	
resourceType		1109	resource type		
	L			metadaten link	
	I			download link	location [4.3]
	N			id	
	K				

Source: Ladurner (2018, Table 1).

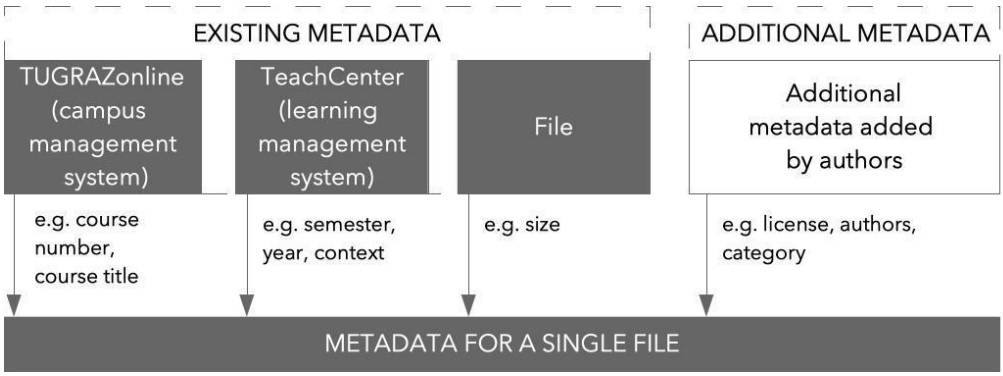

Figure 4. Overview of Sources of Existing and Necessary Metadata

Data model of the metadata

The metadata in the repository is managed in nodes, which are arranged in a tree structure. The nodes are stored in XML files. A node consists of several fields. A field is divided into field number, field indicator, and subfields. Subfields are divided into subfield *identifier* and subfield *value*. Subfields can occur several times in a field. Field number and field indicator are unique in the field. However, fields with the same number and field indicator can be used more than once. The tree structure depends on which object is catalogued. The type *journal* or *book* is presented here as an example: journals are divided into *journal* → *volume* → *issue* → *article*. Books are divided into *book* → *chapter* → *subChapter* etc. The OER metadata is also structured in a tree structure. There is information concerning a course (top level), information concerning a year or semester (unit, middle level), and information concerning the file directly (lowest level, see Figure 5).

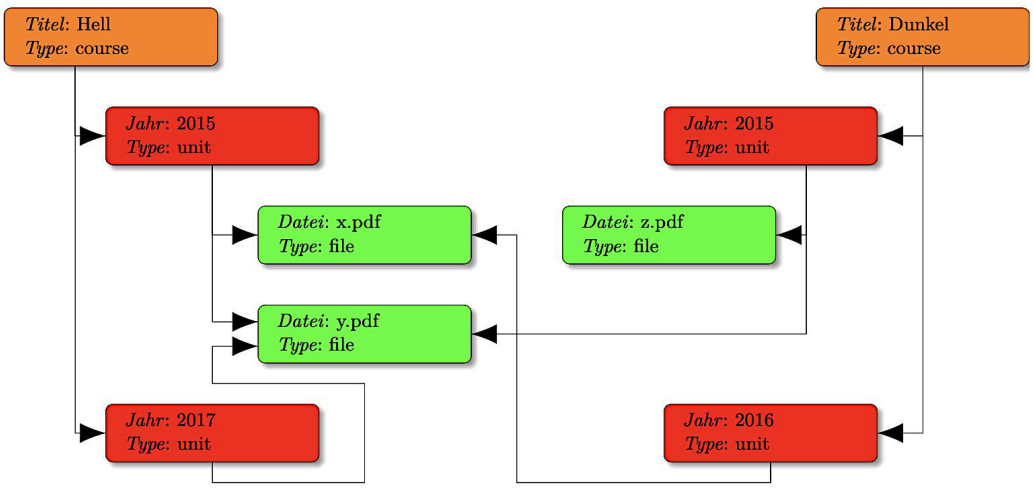

Figure 5. Tree Structure of OER Metadata Using the Example of Two Courses (Hell [Light]) and Dunkel [Dark])

Source: Ladurner (2018, Figure 1).

Automatic provision of metadata for OER

The analysis and selection showed for TU Graz that the following metadata can be provided by the LMS, the file itself, or the campus management system: *author* (if not explicitly entered, the person who uploaded the file is used here), *license* (if not explicitly set, the default license is entered here "all rights reserved," but all CC licenses are also available), *name* of the file, *file size* and *file type* (Mime Type), upload date and change date, course (*language, course type, teachers*), *faculty/institute* (*studies, semester*), *name of the person* who uploaded the file, and *keywords* (*tags*, if used). For some fields and metadata, however, an input mask had to be created in the LMS to allow users to specify or adjust the metadata.

Interface development of the plug-in in the learning management system (LMS)

A plug-in for the LMS has therefore been developed for teachers, in which they can specify which files may be placed under a CC license and exported to the repository. Since the LMS does not require metadata for individual files, some of them have to be added by the course instructor. All instructors will see the menu item "OER plug-in." Only authorized persons can upload files. Persons without authorization will receive information on what OERs are and how to get permission to publish OERs (see Figure 6).

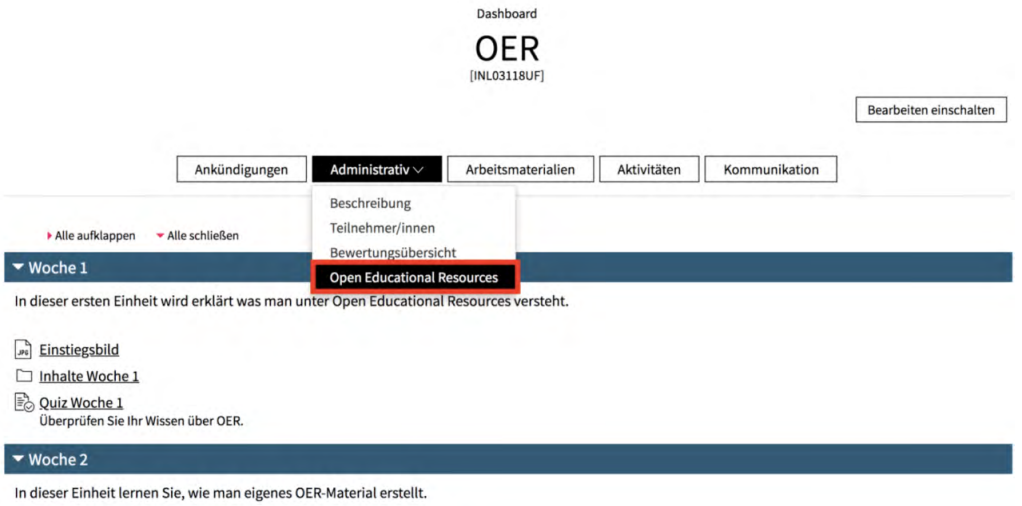

Figure 6. Screenshot of the Plug-In (Access to the Plug-In)

Figure 7 shows part of the plug-in, and provides an example to illustrate that the metadata in the plug-in comes from different sources. The semester and context are from the LMS (Teach-Center) and the complete course description comes from the campus management system (TUGRAZonline). The information about the file size is taken from the file itself. This means that

teachers need and can only edit relatively few metadata: file name, language, resource type, role, author (originator), CC-license, keywords, and the OEFOS classification.

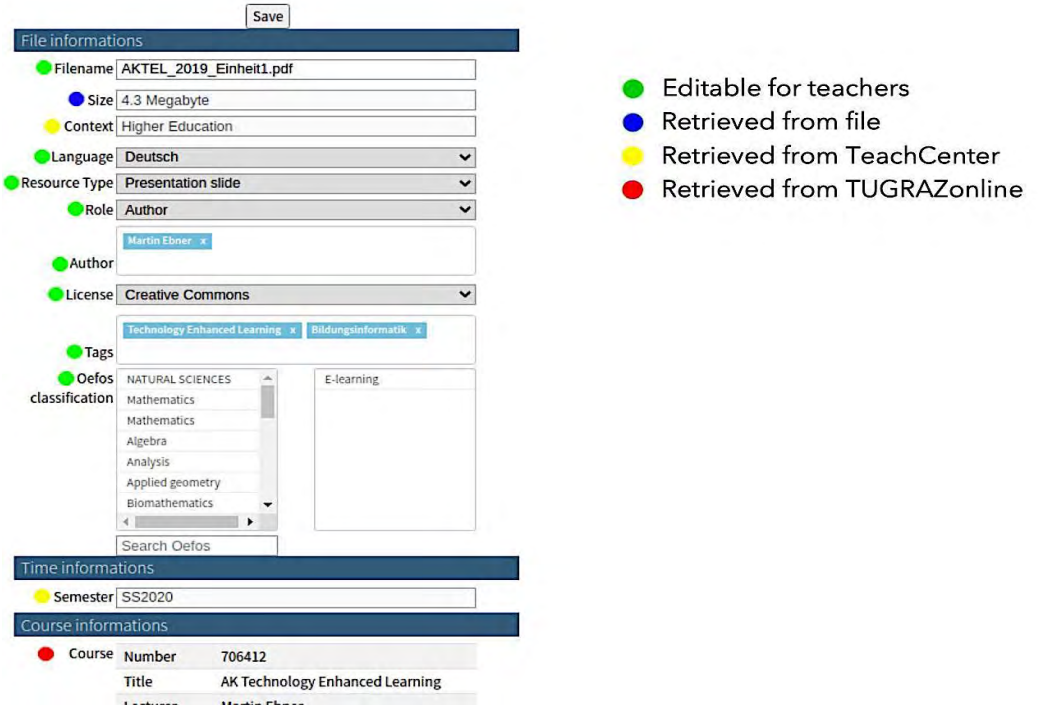

Figure 7. Screenshot of the Plug-In and Legend of the Origin of the Data and Possibilities for Data Input by the Teachers (Selection)

Development of Application Programming Interface (API)

The API is divided into an import and an export direction. The LMS is offered a Representational State Transfer (REST)-API, which allows users to import the entire course as a ZIP file into the repository of TU Graz. The API is kept very simple for this purpose. A token is responsible for authentication and the file pairs are packed in a ZIP file. A file pair comprises a file for metadata and a downloadable file. Like the repository of TU Graz, the API was programmed in PHP.

We defined the following for the API import:

- The *Uniform Resource Locator* (URL) is https://openlib.tugraz.at/upload.php.
- The *token* identifies the importing institution and thus gives it the right to upload files.
- A ZIP file is defined as a *package* that contains file pairs (JavaScript Object Notation [JSON] file for the metadata and a file without a file extension, which represents the

described file). A course can be divided into several packages.

- We base the error messages on Simple Web-service Offering Repository Deposit (SWORD) (*AllGood, AuthenticationFailed, BadRequest ContentMalformed, DigestMismatch, ServerError,ValidationFailed*, etc.).

The metadata are displayed as shown in Table 1 for the *course*, the *unit,* and the individual *file*.

The interface for the export of metadata, especially for the Austrian OER portal, has also been deliberately kept simple. The metadata is packed into a JSON file and exported via REST. The metadata has the same structure as the files that are imported. However, the attribute on the left is added. This contains *id*, *course,* and *file*. In addition, it adds the attribute location with TU Graz to *course*. The files themselves remain in the repository and are accessible via a persistent identifier. The upload is then carried out again via REST to the test instance (https://portal.openeducation.at/upload/json/v1/openlib.tugraz.at).

Unfortunately, it was overlooked that the API should also be implemented via a standard. The error codes were thus still adapted to SWORD (Sword, 2019). However, the changeover to SWORD has been put on hold for the time being.

Process modeling: OER certification of instructors

Besides the technical solutions, it is also necessary to create processes for the teaching staff so they can produce OERs and avoid legal pitfalls. As shown in Figure 8, they offered OER training at TU Graz for this purpose. Lecturers who successfully complete this further training in the scope of one ECTS (equivalent to 25 hours) and create OERs are given the opportunity to activate the plug-in. The training includes classroom training and successful participation in the MOOC on OER, which is available on the platform iMooX.at. For successful participation in the MOOC, it is necessary to take several tests per unit. Certification for OERs is not understood in the sense of quality control relating to the resources but in terms of quality control relating to their creators. Teachers are trained to ensure that they know the legal requirements for dealing with and creating OERs.

We base the OER further education and OER certification on the proposals on OER of the *Forum Neue Medien in der Lehre Austria* (Ebner, Kopp, Freisleben-Teutscher, et al., 2016) and their white paper on OER certification in Austria (Ebner, 2018; Ebner, Freisleben-Teutscher, Gröblinger, et al., 2016).

Implementation and usage

So far, we have implemented the processes and tools at the TU Graz and they are all already in use. After an OER training and OER certification, seven lecturers at TU Graz have activated the plug-in. Some of them had already used it during the previous semester, so that the corresponding files and metadata can be found in the repository of TU Graz and are also already searchable

in the Austrian OER portal. In the first semester, data from four courses were transferred from the LMS to the OER repository of TU Graz. Figure 9 shows a screenshot of course documents that are now available with an open license.

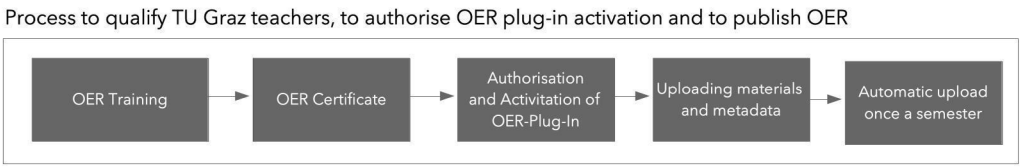

Figure 8. Process Modeling of Qualification and Rights Allocation for the Publication of OER at TU Graz

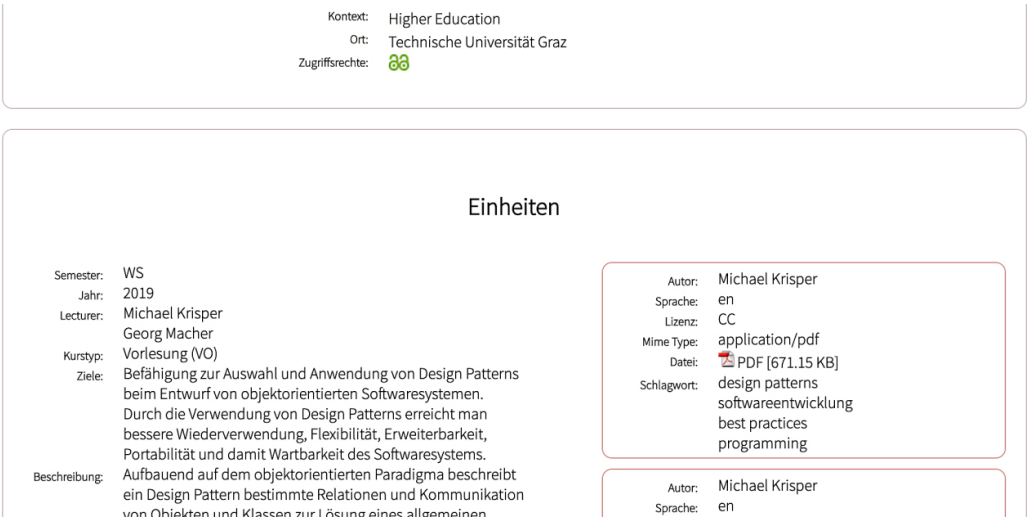

Figure 9. Screenshot of an Entry for Openly Licensed Course Materials in the OER Repository ("TU GRAZ OPEN Library")
Source: https://openlib.tugraz.at/design-patterns.

The transfer of the metadata of the OER materials from the TU GRAZ OPEN Library is also implemented and executable (see Figure 10).

Next Steps and Recommendations

We have described and presented the steps in our development here in detail to give others the opportunity to develop similar interfaces and to implement similar processes at their institutions. Implementing the plug-in and interfaces has already gone through further adjustments. The OER plugin has been adapted for the version of Moodle in use (3.5). An adaptation to Moodle 3.9 is planned for 2021.

The developed technologies and processes are in productive use; we have implemented the corresponding processes and technologies at TU Graz.

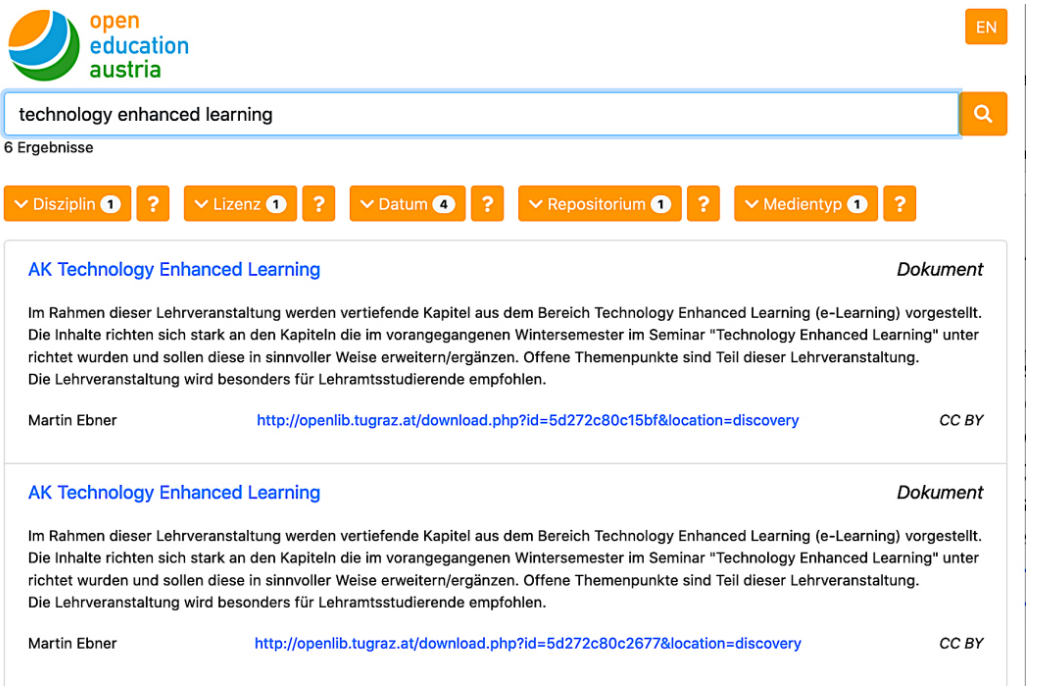

Figure 10. Screenshot of the Metadata of OER Materials of TU Graz in the Austrian OER Portal of the University of Vienna

Source: https://portal.openeducation.at/?q=technology%20enhanced%20learning

The plug-in is in use and, as shown, the export of the materials has already been carried out successfully. A far-reaching internal rollout of the OER certification and use of the OER plug-in at TU Graz has not yet started, however. The same applies to the Austrian OER portal of the University of Vienna, whose extensions and the public launch are still pending while it is already in productive mode.

As shown, videos are uploaded and made available on a separate platform (TUbe) at TU Graz. A plug-in for the collection of metadata and interface to the TU GRAZ OPEN Library is one of the next steps. These further developments, including the implementation of an Austria-wide OER certification, will be continued until 2024 as part of the "Open Education Austria Advanced" project.

Finally, we would like to make the following recommendations to similar OER infrastructure projects:

- Look closely: it surprised us to find that there is an impressive amount of metadata that is more or less implicitly available for educational resources, e.g., for which degree program or in which semester they are used.

- Avoid additional effort: you should keep the additional workload for the creators of OERs as low as possible in the system. You should therefore

concentrate on the most necessary data.

- Think big and develop together: if possible, use and exploit metadata that can be made available by many others.
- Use standards: under no circumstances should we reinvent the world of metadata. Using standards facilitates compatibility. This applies not only to metadata but also to the development of APIs.

Acknowledgement

The development work presented here was co-funded by the Federal Ministry of Education, Science and Research, Austria, as part of the 2019 call for proposals for digital and social transformation in higher education for the project "Open Education Austria Advanced" (2021–2024, partner organizations: University of Vienna, Graz University of Technology, University of Graz, University of Innsbruck, fnma, and ÖIBF)

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Evaluation of the UNESCO Recommendation Concerning Open Educational Resources

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Abstract

Open Educational Resources (OER) "are learning, teaching and research materials in any format and medium that reside in the public domain or are under copyright that have been released under an open license, that permit no-cost access, re-use, re-purpose, adaptation and redistribution by others" (UNESCO).

In November 2019, UNESCO adopted a resolution on OER that had five objectives:

1. Building capacity of stakeholders to create access, use, adapt and redistribute OER;
2. Developing supportive policy;
3. Encouraging inclusive and equitable quality OER;
4. Nurturing the creation of sustainability models for OER; and
5. Facilitating international cooperation.

 doi: 10.18278/ijoer.3.2.4

Overall this policy represents well the state of the art in OER and would serve to further the aims and objectives of open online education. Having said that, the document suffers from numerous cases of ambiguous terminology, some of it in places where serious misunderstandings could arise. The purpose of this article is to review this resolution, highlighting areas of ambiguity or where further discussion is needed in the OER community.

Keywords: UNESCO, recommendations, Open Educational Resources (OER), evaluation

Evaluación de la Recomendación de la UNESCO sobre los recursos educativos abiertos

Resumen

Los Recursos Educativos Abiertos (REA) "son materiales de aprendizaje, enseñanza e investigación en cualquier formato y medio que residen en el dominio público o están sujetos a derechos de autor que han sido publicados bajo una licencia abierta, que permiten el acceso, la reutilización y la reutilización sin costo. -Propósito, adaptación y redistribución por otros".

En noviembre de 2019, la UNESCO adoptó una resolución sobre REA que tenía cinco objetivos:

1. Fortalecimiento de la capacidad de las partes interesadas para crear acceso, utilizar, adaptar y redistribuir REA;
2. Desarrollar una política de apoyo;
3. Fomentar los REA de calidad inclusivos y equitativos;
4. Fomentar la creación de modelos de sostenibilidad para REA; y
5. Fomentar la creación de modelos de sostenibilidad para REA

En general, esta política representa bien el estado del arte en recursos educativos abiertos (REA) y serviría para promover los propósitos y objetivos de la educación abierta en línea. Dicho esto, el documento adolece de numerosos casos de terminología ambigua, algunos de ellos en lugares donde podrían surgir graves malentendidos. El propósito de este artículo es revisar esta resolución, destacando áreas de ambigüedad o donde se necesita más discusión en la comunidad REA.

Palabras clave: UNESCO, Recomendaciones, Recursos educativos abiertos, evaluación

关于教科文组织《开放教育资源建议书》的评价

摘要

开放教育资源（OER）是“以各种媒介为载体的任何形式的学习、教学和研究资料，这些资料在公有领域提供，或以开放许可授权的形式提供，允许他人免费获取、再利用、转用、改编和重新发布。”

2019年11月，联合国教科文组织（UNESCO）采纳了一项关于OER的建议书，建议书有5个目标：

1. 增强利益攸关方创建、获取、再利用、改编和重新发布开放式教育资源的能力

2. 制定支持政策；

3. 鼓励包容、公平的优质开放式教育资源；

4. 促进创建可持续的开放教育资源模式；

5. 促进国际合作。

整体而言，这项政策很好地代表了开放教育资源（OER）的现状，并且将促进实现开放网络教育的目标。尽管如此，这份建议书存在许多模糊术语，其中一些可能引起严重误解。本文旨在审视该建议书，对模糊概念或OER社区需进一步探讨的部分进行强调。

关键词：联合国教科文组织（UNESCO），建议书，开放教育资源，评价

Introduction

Open Educational Resources (OER) "are learning, teaching and research materials in any format and medium that reside in the public domain or are under copyright that have been released under an open license, that permit no-cost access, re-use, re-purpose, adaptation and redistribution by others."

In November 2019, UNESCO adopted a resolution on OER that had five objectives:

1. Building capacity of stakeholders to create access, use, adapt and redistribute OER;
2. Developing supportive policy;
3. Encouraging inclusive and equitable quality OER;
4. Nurturing the creation of sustainability models for OER; and
5. Facilitating international cooperation.

Overall this policy represents well the state of the art in OER and would serve to further the aims and objectives of open online education. Having said that, the document suffers from numerous cases of ambiguous terminology, some of it in places where serious misunderstandings could arise. The purpose of this article is to review this resolution, highlighting areas of ambiguity or where further discussion is needed in the OER community.

The document also suffers in places from a lack of clarity about the role of OER, equivocating between a perspective where OER are materials used exclusively in formal education, such as schools and institutions, and a perspective where OERs are used more widely to support informal and non-formal learning. I have noted instances where this occurs and argue in general for the latter, wider, perspective.

Related to this is the discussion of quality that occurs throughout the document. While nobody is arguing against quality, much of the language at least implies that a regulatory framework ought to be put in place, one that might be appropriate, if it is appropriate at all, for resources being developed for lower level schools and classrooms.

There are numerous cases where such a framework would be inappropriate, especially with respect to community-based OER development, and for OER intended for informal, adult and corporate learning. There is also a danger that such a framework would inhibit, rather than enhance, OER development.

This also relates to the question of who creates OER. While the document quite rightly points to the need to support disadvantaged communities, it often offers the perspective of requiring the provision of service to those communities, rather than that of supporting and empowering such communities. This raises the wider issue of digital colonialism, and the need for communities and cultures to have a voice and ownership over their own learning resources and development.

What Are OER?

Content, Tools, and Infrastructure

The UNESCO definition includes "learning, teaching and research materials in any format and medium." Usually these are taken to be instructional materials, for example, textbooks, exercises, and class notes. The UNESCO definition reads more widely, however, explicitly including tools, platforms, metadata, standards, libraries and other repositories, search engines, preservation systems, and frontier technologies. [III.i.11.d]

Limitations of Copyright

The definition describes two ways content, tools and infrastructure can be "open": they can reside in the public domain or can have been released under an open license. The presumption under most legislation is that all resources not in the public domain are copyrighted, trademarked, or otherwise protected. The UNESCO declaration suggests that governments raise awareness "concerning exceptions and limitations for the use of copyrighted works for educational and research purposes." [III.i.11.c]

This recommendation recognizes the mixes and complex nature of rights governing educational materials. It is unlikely that educators will be able to rely on OER exclusively, and it may not be desirable to do so, for a variety of reasons. However, it should be taken that the gist of the UNESCO recommendation the use of non-open copyright works should be the exception, rather than the rule.

It would have been helpful at this point for UNESCO to make clear what is implicit in this recommendation, and that is the fact that copyright is not an absolute. It is a right *granted* by governments, and is subject to limitations, such as those concerning fair use and expiry into the public domain. And it is important that governments and institutions understand that they do not need to comply with every and all request or stipulation made by commercial publishers, and that terms of service may be subject to being overturned by relevant law, as just recently occurred with LinkedIn's terms of service (Woollacott, 2019).

No-Cost

The UNESCO definition is somewhat unique in that it required "no-cost" access. Various less stringent definitions have been attempted over the years in efforts to allow the commercial sale of OERs, for example, by stipulating that it "does not limit use or form" or "does not include NonCommercial limitations." Examples of these other definitions are available on the Creative Commons Wiki (Creative Commons, n.d.).

It is arguable that the "no-cost" provision is important and an essential component of the definition of OER. Creating a cost for access to OER creates a barrier to access and limits access to some people. However, there are numerous declarations and statements asserting that the purpose of OER is access *for all* (Downes, n.d.), and that access for all is the primary and original motivating factor in the creation of OER.

Open Licenses

OER distributed under open licenses are, according to the definition, resources "that permit no-cost access, re-use, re-purpose, adaptation and redistribution by others." These conditions represent a variation of the "five freedoms" of open resources generally, and have been reiterated in numerous statements and declarations recognized by the UNESCO recommendation, for example, the 2007 Cape Town Open Education Declaration and the 2012 Paris OER Declaration.

The application of open licenses "introduces significant opportunities for more cost-effective creation, access, re-use, re-purpose, adaptation, redistribution, curation, and quality assurance of those materials." These attributes serve broad educational needs, "including, but not limited to translation, adaptation to different learning and cultural contexts, development of gender-sensitive materials, and the creation of alternative and accessible formats of materials for learners with special educational needs." [II.6]

Historically, a great deal of emphasis has been placed on the definition and interpretation of open licenses. For example, proponents have argued that content of different types cannot be mixed. But most of these limitations only hold if the user is a commercial entity making a specifically commercial use of the resource. This limitation does not impact more educational users, whose focus remains on content and pedagogy. We should resist the idea that a person must become expert in copyright in order to use and benefit from OER.

Indeed, the introduction of the idea of copyright and licensing to the idea of sharing educational resources is arguably an unwelcome distraction from the main purpose. It leads to the feeling that the free and open use of learning resources is the *exception*, rather than the rule, and that *special permissions* are required in order to do it. But it is preferable to assert and make clear that copyright itself is the special permission you need to have in order to benefit commercially from the distribution of a resource. This should be especially the case in the domain of education, where in many nations, education is seen as a public good, provided non-commercially by governments, with fees (especially at the lower levels) being the exception rather than the rule.

Education Licenses

The UNESCO document recommends "exploring the development of an international framework for copyright exceptions and limitations for education and research purposes" [III.iv.15.e]. This is a recommendation that resurfaces on a regular basis (Nobre, 2018), but one that should be resisted where possible. The issue arising with such a provision concerns the definition of "education" (and in wider contexts, "research"). In particular, education is typically thought to be only the activities conducted by and in the context of educational institutions such as schools.

However, a significant proportion of the benefit (arguably, *most* of

the benefit) of OER and of access to learning resources generally occurs in the context of *informal and non-formal* learning (Weller et al., n.d.). But "exceptions and limitations for educational purposes" do not typically apply to these contexts, and so (for example) people learning on their own, or learning in the workplace, are not able to take advantage of these exceptions and limitations.

Further, limiting these exceptions and limitations to educational and research purposes privileges educational and research institutions, and enables people who attend them (usually paying tuition or other costs) to enjoy privileged access to learning resources. It also creates a need for and demand for commercial resources that may persist after leaving the institution, creating an ongoing demand for these commercial resources (e.g., this note from Maha Nadarasa on the SolidWorks website, https://forum.solidworks.com/thread/230942). It may be the case that these results are desirable; that is a policy question. But these results are arguably inconsistent with the aims and objectives of a policy supporting OER.

The Role of OER

Sustainable Development Goal 4

Much of the role of OER is for UNESCO viewed in the light of Sustainable Development Goal 4 (SDG4), adopted as part of the 2030 Agenda for Sustainable Development at the United Nations (UN) Sustainable Development Summit in 2015 (https://sustainabledevelopment.un.org/post2015/transformingourworld). The goal of SDG4 is to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all." OER are not specifically mentioned in SDG4 but are seen as a means of promoting these objectives.

The UNESCO recommendation states explicitly that a key prerequisite to achieve SDG4 is "sustained investment and educational actions by governments and other key education stakeholders, as appropriate, in the creation, curation, regular updating, ensuring inclusive and equitable access, and effective use of high quality educational and research materials and programmes of study" [II.5]. It follows that one reason these actions are undertaken, then, is to achieve the objectives of SDG4.

It's an open and empirical question of whether any or all of these actions are in fact required to meet SDG 4. The phrase "effective use of high quality educational and research materials and programmes of study" is limiting rather than enabling. What constitutes "high quality?" Would lower quality resources (such as, say, the early Khan Academy videos or student-produced resources) be sufficient? Similarly, what constitutes "effective use"? Arguably, *any* use might serve to satisfy SDG 4. We will consider the question of quality more fully below.

Innovative Pedagogies

In addition to the role of OER in supporting SDG4, the UNESCO recommendation also includes an ambitious

and forward-looking objective, suggesting that "the judicious application of OER, in combination with appropriate pedagogical methodologies, well-designed learning objects and the diversity of learning activities, can provide a broader range of innovative pedagogical options to engage both educators and learners to become more active participants in educational processes and creators of content as members of diverse and inclusive Knowledge Societies" [II.7].

This statement revisits the idea of the Knowledge Society, that is, a society that can "can successfully cope with this tension by setting up institutions and organizations that enable people and information to develop without limits, and that open opportunities for all kinds of knowledge to be mass-produced and mass-utilized throughout the society as a whole" (UN, 2005), an idea frequently revisited by the UN over the years. And it speaks to the idea that, by participating in the creation and use of OERs, students and educations become able to participate as members of the Knowledge Society.

The question is, what is needed *in addition* to OER in order to achieve desired educational outcomes (whatever those may be). Is it *all and only* "appropriate pedagogical methodologies, well-designed learning objects and the diversity of learning activities"? The terms "appropriate" and "well-designed" are significantly ambiguous. Additionally, the term "learning object" is a technical term and has a precise meaning in this context (http://edutechwiki.unige.ch/en/Learning_object). Additionally, the use of the term "application" suggests OER as a "treatment" as understood in the context of literature describing instructivist pedagogies.

It would be preferable to think of this section as saying simply that "OER can help provide a broader range of innovative pedagogical options," while reading the antecedent as suggestions for application rather than a specific prescription. This makes it clear that OER do not enable this in and of themselves, but leave open a wider range of options as to how this potential may be realized.

Open Pedagogy

Increasingly over the last few years the use of OER has been associated with "open pedagogy," that is, a style of pedagogy that supports participatory technologies, encourages spontaneous innovation and creativity, and promotes the free sharing of ideas and resources to disseminate knowledge. As Hegarty (2015) wrote, "Immersion in using and creating OER requires a significant change in practice and the development of specific attributes, such as openness, connectedness, trust, and innovation."

The UNESCO recommendation includes an endorsement of many of the practices of open pedagogy, including "equitable and inclusive access to OER and their use, adaptation and redistribution." The use of OER "can help meet the needs of individual learners and effectively promote gender equality and incentivize innovative pedagogi-

cal, didactical and methodological approaches" [I.3].

There is, however, tension between the expression in the UNESCO declaration and in the practice of open pedagogy. It is important to note that recognize here, and something that is embodied in open pedagogy and elsewhere, that OER enable greater *agency* on the part of the learner. The section 3 just quoted can be viewed as representing learners as passive and as individuals who are being helped, provided, supported, or incentivized. OER as envisioned in open pedagogy enable individuals to define their own learning path and outcomes, as they are able to access and adapt materials based on their own needs.

Who Creates OER?

Stakeholders

A stakeholder is a person who holds an interest in the objectives and outcomes of a program. The definition and assessment of program, including those that address OER, is based on the needs and opinions of stakeholders. Therefore, a definition of OER policy requires a description of the stakeholders.

The UNESCO recommendation provides that description:

> Stakeholders in the formal, non-formal and informal sectors (where appropriate) in this Recommendation include: teachers, educators, learners, governmental bodies, parents, educational providers and institutions, education support personnel, teacher trainers, educational policy makers, cultural institutions (such as libraries, archives and museums) and their users, ICT infrastructure providers, researchers, research institutions, civil society organizations (including professional and student associations), publishers, the public and private sectors, intergovernmental organizations, copyright holders and authors, media and broadcasting groups and funding bodies. [I.4]

This is a very broad listing of stakeholders, and it is recognized by most that the interests of these stakeholders do not always align. The UNESCO recommendations also provide a secondary list of stakeholders:

> Member States are encouraged to support the creation, access, re-use, re-purpose, adaptation and redistribution of inclusive and equitable quality OER for all stakeholders. These would include those learners in formal and non-formal education contexts irrespective of, inter alia, age, gender, physical ability, socio-economic status, as well as those in vulnerable situations, indigenous peoples, those in remote rural areas (including nomadic populations), people residing in areas affected by conflicts and natural disasters, ethnic minorities, migrants, refugees, and displaced persons. In all instances, gender equality

> should be ensured, and particular attention paid to equity and inclusion for learners who are especially disadvantaged due to multiple and intersecting forms of discrimination. [III.iii.13]

While the first list is composed of institutional stakeholders, and in particular, those concerned with the production and deployment of OER, the second list is composed of groups of learners, taking care to explicitly name traditionally disadvantaged and overlooked groups.

A major stakeholder generally omitted in the document may be broadly classified under the heading of "employers." This especially applies to employers in SMEs who do not have access to learning resources, but who have no less a need to provide training and development to employees, and who have an interest in the broader outcomes of education policy, even if they are not directly involved in the production, deployment or use of educational resources.

The Consumer-Producer Model

The division of stakeholder groups into three broad categories, as described in the previous section, requires a consideration of the model of OER development, deployment and use that is generally assumed in the UNESCO recommendation:

- First, a category of OER *producers* such as publishers, copyright holders and authors, media, and broadcasting groups
- Second, a category of institutions that *deploy* OER and, as such, are responsible for *quality control* over these resources
- And third, a category of resource *consumers*, which would include all students, and especially traditionally disadvantaged and overlooked groups

One of the thrusts of open pedagogy, and a fact widely understood in the educational community to be important, is that the people listed here as *consumers* have a voice in the development of and use of OER, and not merely access to those created and produced by others. In other words, despite how the recommendations sometimes appear, there should not be a sharp distinction drawn between producers and consumers and those in between.

This is sometimes recognized by the UNESCO declaration. It encourages "building awareness among relevant stakeholder communities on how OER can ... empower educators and learners to become co-creators of knowledge" [III.i.11.a]. This is contrary not only to a consumer-producer model, but also to instructivist models where pedagogies and resources are thought of as "treatments" or "applications" rather than co-creations.

This is especially the case with respect to the traditionally disadvantaged and overlooked groups listed above. While the document quite rightly points to the need to support disadvantaged communities, it often offers the perspective of requiring the provi-

sion of service to those communities, rather than that of supporting and empowering such communities. Numerous voices have expressed the concern that OER, and similar initiatives, are just another example of the privileged nations imposing their values on others (e.g., Crissinger, 2015).

It is important to view the recommendations in such a way as to ensure that OER support and promote not only the education of, but the identity and *voice* of, those from vulnerable groups and persons with disabilities.

How Benefits are Created

The UNESCO recommendations point of this section is to point out the benefits of "regional and global collaboration and advocacy in the creation, access, re-use, re-purpose, adaptation, redistribution and evaluation of OER" [II.8, III.v.15.a]. This allows governments to evaluate resources for quality and to optimize their own investments. The benefit is that they can "meet their defined national educational policy priorities more cost-effectively and sustainably."

This depiction presumes the consumer-producer model sketched above, depicting students as passive recipients. However, as noted above, OER serve: the interests of learners, education providers, national government, and more. While this section clearly identifies national governments, it remains true that the actual benefits of cooperation are realized by all stakeholders, and that this actually makes a stronger case for cooperation.

Similarly, notwithstanding the need for governments to make their own assessments and meet national priorities, a better reading of the recommendations would allow for the possibility that all stakeholders participate in the evaluation of resources. Additionally, collaboration should allow for more dimensions of assessment than "quality" and to allow for multiple types of assessment of the same resource, from varying perspectives.

There is also ambiguity in the type of benefit produced. There is a lot of debate in the OER community around the following point: "in ways that will enable them to meet their defined national educational policy priorities more cost-effectively and sustainably." The argument here is that the benefit produced by OER is not merely efficiency or cost-effectiveness, but rather, improved educational outcomes, broader participation, support for marginalized populations, and promotion of equality (e.g., Wiley, 2017).

Teacher Education

Teachers are at once creators of educational resources and directly implicated in their deployment. The key role they play makes them a natural focus of the UNESCO recommendations, especially with respect to their own education and development.

UNESCO specifically recommends teacher education "on how to create, access, make available, re-use, adapt, and redistribute OER as an integral part of training programmes at all levels of education" [III.i.11.b]. It also

recommends "improving capacity of public authorities, policy makers, quality development and assurance professionals."

Because of the need for wider education in open resources and related subjects, teachers should not only learn these things, but should also be able to teach these things, because not only teachers are implicated in the production and use of OER. The educator's role should be *supportive* here. That is, if teachers are to be trained in the use of OER (as they should be) then they should be trained in how to *support the use* of OER by other people.

We might think of the use of OER as a kind of literacy. We want all people to be literate in OER. And to be literate means being able to access, use, create, and employ OER for a wide range of learning objectives. So, while we want our teachers to be literate, we also want them to be able help learners be literate.

Research on OER

An important part of the creation, deployment, and use of OER is the research supporting and reporting on these activities. The UNESCO document recommends members supplement OER initiatives by "encouraging and supporting research on OER, through relevant research programmes on OER development, sharing and evaluating, including the support of digital technologies (such as AI)" [III.ii.12.g]. This should be more precisely understood as meaning that the 'support' of digital technologies would be with respect to their use in the development and use of OER, and not just generic support for digital technologies.

There is a danger here of repeating work that has already been done, and also of conducting research on OER prior to implementing OER. At this point (17 years after the 2002 UNESCO declaration on OER), the research to be done ought to be research on actual implementations of OER, and not merely on (say) how to develop, share, and evaluate OER, much of which already exists (e.g., at the OER Knowledge Cloud, https://www.oerknowledgecloud.org/; the OER World Map, https://oerworldmap.org/). So it would be better to focus on research programs that assess the development, evaluation, and sharing of OER.

It is also prudent, as OER are created, deployed, and used, to evaluate their impact with respect to the role they are expected to play and the benefit they are expected to produce. This should include research not only on the direct application of OER, but also the policies and infrastructure that surround them, "deploying appropriate research mechanisms to measure the effectiveness and efficiency of OER policies and incentives against defined objectives" [III,v.16.a].

At the same time, there is vagueness to the UNESCO recommendations. The document recommends "developing strategies to monitor the educational effectiveness and long-term financial efficiency of OER" [III.iv.16.c]; however, the definitions of "educational effectiveness" and "long-term financial

efficiency" would be difficult to obtain. It may be more prudent simply to monitor the long-term social and economic impacts, if any, of OER. The outcomes of such research would determine how it can be best applied.

Quality of OER

Quality Assurance

The UNESCO recommendation frequently references the quality of OER and suggests explicitly that governments should "develop and integrate quality assurance mechanism for OER into the existing quality assurance strategies for teaching and learning materials" [III.ii.12.b]. They advocate "developing and adapting existing evidence-based standards, benchmarks and related criteria for the quality assurance of OER, as appropriate, which emphasize reviewing educational resources (both openly licensed and not openly licensed) under regular quality assurance mechanisms" [III.iii.13.f].

Nobody would argue against quality in educational resources. Resources used in the educational system, and especially the primary educational system, are reviewed and assessed for suitability. In this context, "quality" means "appropriate for use in schools." This is true for resources used in public (i.e., government) schools, at private schools, and for home schooling. However, I think there is a concern here and the potential for greater policy implications.

The use of OER therefore raises two questions: first, how do we ensure that OER meet the same criteria for use in schools, and second, should these criteria apply more broadly to encompass OER *not* intended for use in schools? As we discuss elsewhere in this document, proponents often assume the stance that OER *only* refers to resources used by teachers in educational settings, and so we have proposals that address the quality of OER to ensure inappropriate resources are not used in schools.

In a world with millions of OER, it would not be feasible to assess all possible resources that could be used in a school. So, the quality assurance recommendation creates a built-in limitation on the quantity of OER that can be produced, and by implication, a limitation on who can produce OER. Is this desirable? Are "regular quality-assurance mechanisms" the appropriate response here? Arguably, they are not.

The question becomes even larger when we consider the larger application of OER *outside* the domain of formal educational curricula. Many people—millions!—produce OER. Arguably, it would not be acceptable to require that all these people satisfy an OER quality framework before they are allowed to distribute their OER. At the very best, any quality enforcement mechanism would have to be *a posteriori*—that is, it would apply only after the resource is distributed and as a corrective. Even so, the expense required could be considerable.

What is Quality?

There is a significant question: *what counts as quality?* There have been some

suggestions for quality frameworks (for example, TIPS, http://oasis.col.org/handle/11599/562; CARE, https://careframework.org/; ECEC, https://nesetweb.eu/en/resources/library/the-current-state-of-national-ecec-quality-frameworks-or-equivalent-strategic-policy-documents-governing-ecec-quality-in-eu-member-states/). These have their differences, but in all cases, what counts as quality depends on purpose, and in the world of educational resources, there is no single purpose, but multiple purposes, as evidenced by the list of stakeholders above.

There are also different methods for the evaluation of quality for OER. Some have suggested peer review, as practiced by MERLOT (https://www.merlot.org/merlot/). Some recommend a quality certification process, perhaps along the lines of ISO (https://www.iso.org/iso-9001-quality-management.html). Arguably a definition of quality based on student *outcomes* could be proposed, such that quality OERs lead to improved learning performance. Alternatively, quality could be measured in a utilitarian fashion, by whether a resource is actually used, or as determined by a recommendation system.

Arguably, the issue of quality in OER is a straw man. It can deflect (and be used to deflect) from the objective of OER, which is to provide access to learning resources. While nobody can reasonably argue *against* quality, the case *for* quality is notoriously slippery and difficult to make, especially with regards to pedagogy, outcomes, and minimum acceptable standards.

The danger here is that the wording of the recommendation in relation to quality supports a view where *only* materials *known* to be high quality and effective (however defined) are considered in this context to support learning, to support open pedagogy, to support SDG4, and to support the other purposes of OER, that these assurances can be made only by large enterprises, and that this condition would therefore work against grassroots and learner-led OER initiatives.

Of course, we prefer quality, but its use in the UNESCO document also suggests that there is a class of OER that is designated "non-quality." What should be the consequences of this? Should designated non-quality resources be omitted from this recommendation? Should they be ineligible for funding? Should they be prohibited from use in schools? These questions remain unanswered in the UNESCO document.

Supporting Quality

It should also be noted that although the UNESCO document addresses OER in "the formal, non-formal and informal sectors" [I.4], there is in general a tendency to treat OER from the context of traditional (formal) education. We see this reflected in assessment of quality and outcomes of OER, for example, evaluation of the value of OER according to whether it is reused by teachers (as opposed to accessed and used independently by learners). This tendency should be resisted. It is arguable the most significant impact of OER will be (and is being) felt outside traditional and formal education.

That is why it is important that the assessment and evaluation of quality not become a burden that prohibits some entities (especially small and non-commercial entities) from creating and distributing OER. In order to support the objectives of OER—that is, to increase access to learning resources and to reduce educational expenses—*especially* in non-formal and informal learning, then measures taken to support quality should be well considered.

There are good lessons to be drawn from the implementation of the Americans With Disabilities Act (ADA) (https://www.ada.gov/) in the United States. The ADA is a well intentioned and much needed piece of legislation and was important in ensuring that people with disabilities are able to properly access resources and facilities. An undesirable side effect, however, was that in some cases, ADA complaints prompted resources to be withdrawn entirely. For example, the University of California, Berkeley, "announced that it may eliminate free online content rather than comply with a U.S. Justice Department order that it make the content accessible to those with disabilities" (Jaschik, 2016).

What could be more important than evaluation and assessment for quality is the provision of mechanisms that are more likely to promote quality outcomes. So instead of becoming a barrier, quality becomes something an OER policy can help people achieve. For example, rather than develop a policy requiring that (say) all videos be closed captioned, a better approach may be to support the development of an application that can automatically (and reliably) generate closed captions for any video. For example, the University of Washington provides a page with advice and links to free online tools (University of Washington, 2020) that help OER creators encourage viewers to help caption videos, an example of "crowdsourcing" being used to support quality.

Privacy

The UNESCO document recommends "developing and implementing policies that apply the highest standards to privacy and data protection during the production and use of OER, OER infrastructure and related services" [III. ii.12.h]. This recommendation speaks to the increasing importance of personal privacy and security in online technology; however, it is not clear what the "highest standard" would be in this case.

Many nations would support something like the European General Data Protection Regulation (GDPR) (European Union, 2016), while others may argue that such a standard is too stringent. In education, especially, there are instances where the bar is often set lower, to facilitate the deployment of (say) learning analytics and adaptive learning (Prinsloo & Slade, 2015). So there is not unanimity on the issue of privacy as related to OER. This is currently an area more suited to investigation rather than declaration of policy. Certainly, there is a good deal of discussion taking place in the field now about

data privacy and ethics in open and online learning (Altman et al., 2018).

Inclusiveness

The language of the UNESCO document speaks of "formats and standards to maximize equitable access, co-creation, curation, and searchability, including for those from vulnerable groups and persons with disabilities" [II.9.iii]. This addresses a large issue in OER, that of colonialism. Above we spoke of the need to ensure OER support and promote the voice of those from vulnerable groups and persons with disabilities. The issue of colonialism begins with voice, but extends further.

For example, in another section, the UNESCO document recommends that members support "supporting OER stakeholders to develop gender-sensitive, culturally and linguistically relevant OER, and to create local language OER, particularly in indigenous languages which are less used, under-resourced and endangered" [III.iii.13.b]. But rather than, for example, paying some southern university to develop and distribute Inuktitut resources for the people of northern Canada, it would be less colonial to fund Inuit communities to develop and distribute Inuktitut resources themselves.

This reflects an important policy point here. A lot of advocacy comes in the form of one person or organization recommending that another person or organization be required to perform a specific service. But as a policy, it may be more effective to deploy resources to *enable* the person needing the service to obtain or produce this service for themselves.

For the most part, people do not oppose gender equality, non-discrimination, accessibility, or inclusiveness. But rather than taking a stance that leans toward management and regulation, it is probably more effective to adopt a stance that is supportive and inclusive, in other words, to *enable rather than require*, and employ regulation only where the provision of support is insufficient to move individuals or the community as a whole.

Supporting OER

Distribution and Access

Distribution and access are key requirements not only for OER but also for learning resources in general, which is why they have so often been the focus of standards initiatives such as the IEEE Learning Object Metadata (LOM) standard (IEEE, 2002) and the ISO Metadata for Learning Resources (MLR) standard (ISO-IEC, 2011). Learning resources are typically contained in a common store, called a "repository," where they are searched for and retrieved by means of metadata. This is the approach the UNESCO document takes. It recommends members "develop a global pool of culturally diverse, locally relevant, gender-sensitive, accessible, educational materials in multiple languages and formats" [II.9.v].

Rather than "develop a global pool," which suggests a single common supply, it would be preferable to "devel-

op an abundance," which suggests the same result, but does not make an *a priori* stipulation on how that result would be distributed. This allows member states to consider, for example, developing a *decentralized network* of OER, an approach that would be more sustainable in both senses than a centralized "pool."

The UNESCO document is unfortunately vague about precisely this point. For example, it suggests "supporting the creation and maintenance of effective peer networks that share OER, based on areas such as subject matter, language, institutions, regions and level of education at local, regional and global levels" [III.v.15.c]. The term "peer networks" in this context can be a technical term, and it is not clear whether the document intends it to be used that way.

A peer network, sometimes called a "distributed network," is one in which there is no central service, but rather, numerous member-to-member (aka peer-to-peer) connections, so that functionality (such as work, data storage, data transfer, computing, or other activities) are distributed across the network (Microsoft, 2018). This is the sort of network we recommend instead of a centralized pool. On the other hand, it is possible that the authors intended the term peer network to mean a social network composed of people who are peers with each other (aka a "community of practice"; Wenger-Trayner & Wenger-Trayner, 2015) to organize based on subject areas, language, etc. If this is the case (as seems likely), then the term community of practice should be used instead of peer network.

In the end, it is arguable that both types of peer networks are well worth pursuing, and probably represent in one way or another the future of OER (Downes, 2019).

Capacity Building

Capacity building [II.9.i] (as opposed to, say, resource production) is the key enabler to any OER strategy. This is especially the case with respect to non-traditional authors of OER, such as employers, research agencies, and learners themselves. The UNESCO document generally recommends an *educational* approach to capacity-building, suggesting "awareness" campaigns, in-service and pre-service courses, and information and assistance.

Perhaps even more important is the recommendation toward "leveraging open licensed tools, platforms with interoperation of metadata, and standards" [III.i.11.d]. This should be applied in all government functions, where possible, and not only in the production of OER. One of the major benefits of OER is that it can be one of the major *byproducts* of other activities. Hence we hear proponents of OER also promoting the practices of "working out loud" or "open working," or in my domain, "open science" or "open research" (Crump, 2019).

Policies and Open Mandates

It is not surprising to read the UNESCO document support "embedding OER

policies into national policy frameworks and strategies and aligning them with other open policies and guiding principles such as those for Open Access, Open Data, Open Source Software and Open Science" [III.ii.12.e]. OER are but one element of a broader approach to open government and open science and are typically employed in conjunction with such initiatives.

The document recommends adopting a number of supporting policy initiatives, including frameworks that support open licensing of publicly funded research and educational materials [II.9.ii]. In the context of other open science and open access publications, however, the policy framework has in itself been insufficient. Numerous advocates, and no small number of governments, actually support *mandated* open access for publicly funded materials. The reason for this (as advocates such as Peter Suber and Stevan Harnad have long argued) is that without mandates, compliance rates are very low (Poynder, 2011).

It should be noted that these are designated as "open access" mandates rather than "openly licensed or dedicated to the public domain." This is because it ties to the wider issue of open government, open science, and open data, using a similar terminology. And also, because open access entails more than just open licensing. Open access requires actually making the resource available to people where they can access it, rather than simply attaching a license to what may otherwise be a private and unshared resource.

Sustainability

The UNESCO document recommends nurturing the creation of sustainability models for OER [II.9.iv]. However, the term "sustainable" has two senses, and it is not clear whether UNESCO intends either (i) sustainable as in "sustainable development" (and therefore SDG 4), suggesting a sense of stewardship, especially of the environment, but also of cultures and values, or (ii) sustainable in the sense of fiscally possible, that is, with a business model or revenue model.

The difficulty specific to OER is that "sustainability models" of the second sort imply the development of some sort of *commercial* model, so that the initiative or programme does not rely on ongoing public or government support. It is not clear, however, that OER can succeed within a commercial model. What we have seen in practice, for example, with the development of Massive Open Online Courses, is that providers, after initially receiving significant funder support, *pivot* from the provision of free learning resources to the deployment of a commercial for-pay model. In the current case, the sustainability requirement may require just such a model of commercialization and pivot (Reich & Ruipérez-Valiente, 2019).

The UNESCO document sometimes reads as supportive of the second model. For example, the document recommends "catalysing sustainability models, not only through traditional funding sources, but also through non-traditional reciprocity-based resource mobilisation, through partner-

ships and networking, revenue generation such as donations, memberships, pay what you want, and crowdfunding that may provide revenues and sustainability to OER provision while ensuring that costs for accessing essential materials for teaching and learning are not shifted to individual educators or students" [III.iv.14.b].

These models have been known to the OER community for more than a decade (Downes, 2005). Since then, many (if not most) of the models discussed above have been found to be deficient. In particular, there has been no widespread success of donations, memberships, pay what you want, and crowdfunding. Such models (Donors Choose, https://www.donorschoose.org/, is a good example) tend to disproportionately reward a small number of contributors (an example of the Power Law phenomenon; Sokolova & Perez, 2018) and shift the cost of materials onto teachers, to the point where they have been disallowed in numerous jurisdictions (Schwartz, 2019).

Therefore, it could be argued that sustainability, as defined here, is an undesirable outcome, and that the purpose and objectives of OER would be better served as a public benefit rather than as a self-sustaining enterprise. And it could be argued, in relation to this, and congruently with other points about the informal uses of OER and the need for various communities to have a voice in the creation and use of OER, that community-based OER initiatives are mostly likely to provide the best outcomes from a national government and funder perspective.

Conclusion

From the perspective of enabling access to learning and education for all persons, the UNESCO document is a significant step forward, arguing persuasively for the need for OER not only in support of SDG4, but also to open the way to accessible and inclusive learning resources for all.

That said, UNESCO should reconsider whether it intends to explicitly endorse a consumer-producer model of OER or whether it would countenance a more community-based model. It should reconsider whether it thinks of OER in terms of something that is done for learners and supported through some sort of sustainable (or commercial) program, or whether the production and use of OER is something that learners do for themselves. And in a similar vein, it should consider whether the quality of OER is mandated and monitored, or whether it is enabled and supported.

In particular, UNESCO should reconsider whether the role of "value-added" models in OER [III.iv.14.c]. The idea of a "value added models using OER" is that the OER is used as free content around which other goods and services are wrapped, effectively enclosing the OER in a commercial container. In addition to concerns about this creating cost to what would otherwise be free resources (thereby running counter to the premise that OER support no-cost access) there is a wider concern about the commodification and commercialization of individual labor and community culture.

We see this concern raised in other areas as well. In the realm of social media, there is the argument that sites such as Facebook and YouTube commercialize and monetize public discourse, using member contributions as free labor. Additionally, in the realm of big data and machine learning, there is the concern that companies such as Google and Facebook commercialize and monetize activity and social graph data, again using member contributions as free labor.

The communities that create, deploy, and use OERs have contributed to our society a wealth of resources, pedagogies, and practices. It is heartening to see this contribution recognized, welcomed, and supported by UNESCO. It is now time for the community to work with UNESCO and governments to ensure this wealth serves the benefit of all society and is not regarded as a commercial asset that benefits only a few.

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Toward a Working Definition of Open Pedagogy

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Abstract

This paper analyzes recent literature on or using the term "open pedagogy" in order to distill a working definition. The term is currently contested, and is discarded completely by some influencers due to a lack of definition and thus usefulness as a rigorous academic term. This study analyzes how researchers currently use the term in the literature, searching for commonalities, with the goal of proposing a synthesis that encompasses the majority of the field and can provide potential common ground for further research on the subject.

The result was a pool of 98 peer-reviewed articles and book chapters, which were then scanned and classified to develop a taxonomy. The taxonomy was used to construct a working definition of open pedagogy as any pedagogy informed by the practitioners' conscious identification with the open movement, open access, and open educational resources (OER). In effect, open pedagogy describes the interaction between the open movement and pedagogy, whereas open educational practices (OEP) and OER-enabled pedagogy describe the actual practices arising from that pedagogical approach.

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Keywords: definition of open pedagogy, open educational practices (OEP), Open Educational Resources (OEP), open pedagogy, open movement

Hacia una definición práctica de la pedagogía abierta

Resumen

Este artículo analiza la literatura reciente sobre el uso del término "Pedagogía Abierta" con el fin de destilar una definición de trabajo. El término está actualmente en disputa, y algunos influencers lo descartan por completo por falta de definición y, por tanto, por su utilidad como término académico riguroso. Este estudio analizó cómo los investigadores utilizan actualmente el término en la literatura y buscó puntos en común con el objetivo de proponer una síntesis que abarque la mayor parte del campo y pueda proporcionar un terreno común potencial para futuras investigaciones sobre el tema.

El resultado fue un conjunto de 98 artículos revisados por pares y capítulos de libros, que luego fueron escaneados y clasificados para desarrollar una taxonomía. La taxonomía se utilizó para construir una definición de trabajo de pedagogía abierta como cualquier pedagogía informada por la identificación consciente de los profesionales con el movimiento abierto, el acceso abierto y los recursos educativos abiertos. En efecto, la pedagogía abierta describe la interacción entre el movimiento abierto y la pedagogía, mientras que las prácticas educativas abiertas y la pedagogía habilitada por REA describen las prácticas reales que surgen de ese enfoque pedagógico.

Palabras clave: Definición de Pedagogía Abierta, Prácticas Educativas Abiertas, REA, Pedagogía Abierta, Movimiento Abierto

对开放教学法进行初步定义

摘要

本文分析了关于“开放教学法”或使用该术语的近期文献，以期提炼一个初步定义。该术语如今受到质疑，并且被一些影响者完全弃用，因为其缺乏定义，因此没有一个严谨的学术术语应具备的有用性。本研究分析了当前文献中该术语的

使用情况，并从中寻找共性以提出一个综合概念，后者涵盖该领域的绝大部分并且能为未来研究提供一个潜在的共同基础。
结果由98篇同行评审文章和书籍章节组成，随后通过审阅并进行分类。分类结果被用于建构一个关于开放教学法的初步定义，即受从业人员认同的开放运动、开放存取、开放教育资源而启发的任何教学法。实际上，开放教学法描述的是开放运动与教学法之间的相互影响，而开放教育实践与受OER驱动的教学法描述的是教学法的实际操作。

关键词：开放教学法定义，开放教育实践，开放教育资源（OER），开放教学法，开放运动

Open pedagogy is an inspirational concept that has led many librarians and teachers to adopt new approaches to education. As a facet of the growing open movement, it has taken on a life of its own in the literature, sparking an ongoing debate as to how open educational resources (OER) and the concept of open impacts or should impact pedagogy and how teachers can relate to students. This in turn led to attempts to codify the concept, which ran into a common roadblock to many academic adventures into classification: disagreement on the specifics. As the conversation continued in the literature, author after author added their own spin to the concept, to the point where several researchers have thrown up their hands and abandoned it entirely to the miasma of uncertainty and slippery meaning, moving on to other terms such as OER-Enabled Pedagogy (Wiley & Hilton, 2018). Others have embraced the nebulousness, defining open pedagogy as a "site of praxis" (DeRosa & Jhangiani, 2017) to be explored and arguing that the concept naturally resists an exact definition. Some also posit that what is termed open pedagogy is actually "rediscovering the specificity of their disciplinary pedagogy through a new lens" (Beetham et al., 2012, para. 3), in effect arguing that the term is a re-conception of preexisting educational theories and is thus partially redundant.

Despite these obstacles, the fact that the concept is inspirational and still can lead to a transformation of practice means that it cannot be abandoned just yet. This analysis examined the use of the term in the current literature to search for potential commonalities and to develop a working definition of open pedagogy that could encapsulate the current field while providing utility and rigor for researchers.

Literature Review

The idea of an open pedagogy is not a new one, as noted by DeRosa and Jhangiani (2017, p. 8),

who rounded up scholarship from several authors who traced the term back to as early as 1979. The current usage of the term, however, has a much more recent lineage, popularized by David Wiley (2013) in a blog post in which he issued a call for open pedagogy. He defined the concept as "that set of teaching and learning practices only possible in the context of the free access and 4R permissions characteristic of open educational resources" (Wiley, 2013, final paragraph). The 4Rs turned into the 5Rs as the conversation changed over time, but that initial definition continues to be cited in articles published up to 2019. His conception of the term emerged somewhat in parallel with the idea of open educational practices (OEP), coming out of the work of Conole (2010), who defines them as "a set of activities and support around the creation, use and repurposing of Open Educational Resources (OERs)" (para. 6). The two terms have continued to be used, sometimes interchangeably, throughout the literature up to the present day. Wiley's work continues to be influential, and is cited either directly or as an inspiration used by authors to refine their own definition.

Hegarty (2015), who built on both Wiley (2013) and Conole (2013), constructed one such redefinition. He posited eight attributes associated with open pedagogy: participatory technologies; people, openness, and trust; innovation and creativity; sharing ideas and resources, connected community; learner-generated; reflective practice; and peer review (p. 5). He also noted that it was difficult to disassociate individual elements from each other, and thus an open pedagogy would likely have most, if not all, as an integral part of its practice (p. 10). Hegarty's work showed up repeatedly in the articles that followed, likely because it melded both of the existing concepts into a coherent whole and gave specific definitions of associated practices.

Another influential approach to the topic has emerged from the work of DeRosa and Jhangiani (2017), both of whom are highly prolific scholars and collaborators in this field. They conceptualize open pedagogy as a "site of praxis, a place where theories about learning, teaching, technology, and social justice enter into a conversation with each other… This site is dynamic, contested, constantly under revision, and resists static definitional claims" (p. 7). They engage with the concept of OEP as elements that accompany or emerge out of the adoption of open pedagogy. They also specifically tie the concept to other pedagogical schools, specifically "constructivist pedagogy, connected learning, and critical digital pedagogy" (p. 10). Given the intentional amorphousness of their conceptualization, their work has been popular among scholars who recognize the contested nature of the term and want to be precise in their imprecision.

More recently, Wiley and Hilton (2018) chimed in again to argue that open pedagogy had grown increasingly amorphous to the point of losing its utility, proposing a shift in terminology instead to OER-enabled pedagogy, which allowed for more specificity. This has presented some confusion given that

the acronym is identical to OEP, and all three terms have been used interchangeably in the current literature. Wiley and Hilton's (2018) shift in terminology did not change the essence of the definition, but instead strove for clarity of usage as Wiley's (2013) original conception was predicated on the use of 4R permissions that were enabled by OER.

The term "open pedagogy" has been stubbornly resilient, and deserves continued examination as a result. This analysis, in the process of codifying a taxonomy of the term's usage, focused on looking for common threads and a potential path out of the interchangeable terminology toward more clarity of usage.

Methodology

The first step was to conduct a search of the literature. Because the goal of this analysis was specifically to explore scholars' use of the term "open pedagogy," the search process used that exact phrase in quotes in both Google Scholar and an institutional discovery tool that included access to Education Source, ERIC, and LISTA (along with another 400 databases). The articles and book chapters were then scanned using the following criteria:

- Recent: Articles within the last five years (defined as January 2014 to the present). The goal of this paper was to look at the current conversation, and a five-year window captured a good cross-section of that conversation, while still being achievable within the allotted period.
- Peer-reviewed/scholarly: This was achieved by using the available filters in the discovery layer and reading the author requirements and "about us" sections on the journals in Google Scholar. Over the course of the analysis, it became apparent that much of the conversation was taking place outside of the bounds of scholarly publishing, but the focus of this analysis was on the scholarly publications. The scope of the paper was shifted accordingly to look specifically at how the conversation within the context of scholarly publishing used the term.
- Academic journals: Again, as part of the (relatively arbitrary) selection for peer-reviewed journals, this weeded out conference presentations, dissertations and theses, and other articles that had not gone through either the editing process for scholarly publication or the formal peer-reviewed process.

This weeding process yielded 37 results in the discovery layer and approximately 560 results in Google Scholar (due to the limited filtering options). These were read to discern whether they actually used the term, to weed out the articles that were duplicates, did not meet the scope criteria above, or that only used the term in a citation. This filtering process led to a list of $n = 98$ articles and book chapters after excluding those that were not obtainable within a reasonable period.

Once the resources were obtained, the online, searchable pdfs were

scanned using Ctrl. F for the term "open ped" to find the full usage of the term, and read through in the case of those that were not machine searchable. Physical books were searched using the index, starting with the term "open pedagogy" and, where that was not available, searching for open or pedagogy instead. Once the term was found, the article was read for context. As the scanning continued, a lexicon was developed through an iterative process: each read-through of the assembled articles led to new terms and concepts and old concepts were collapsed into categories as it became clear they were synonymous or intrinsically connected. After several read-throughs, the categories were codified with formal definitions and a final read-through was conducted to make sure every entry fit the revision. In cases where the author of a piece explicitly used another author's definition, the cited author's coding was added to any other meanings the author of the piece imputed onto the term.

Once the spreadsheet was completed, the values were compared to look for high percentages of co-incidence, as measured by dividing the total number of times two classifications showed up in the same article by the total number of articles that fit a particular classification. For example, *Reflection/Vulnerability* occurred six times in conjunction with *Explicit*, yielding two fractions: 6/41 and 6/10, denoting respectively how often the combination occurred in the pool of *Explicit* articles and how often it occurred in the pool of *Reflection/Vulnerability* articles. The level of significance was set at 70% or higher, chosen after the chart was completed because 10-15% of the articles used the term open more colloquially and a 70% threshold thus represented a solid increase above 65%. This is, of course, somewhat arbitrary, but it does establish a decently firm ground for discussion. Individual co-incidence of terms at or above 70% was analyzed to discern potential reasons for the high rating, and then the entire dataset was analyzed to look for potential commonalities that could be used to establish a definition.

The taxonomy (the full version of which is available in Appendix A) was divided into several meta-categories, each of which serves a different purpose for analysis.

- **Type of definition:** *Implicit* vs. *Explicit* definitions divided the articles by whether the author intended to actively define the concept or used the concept without defining it. *Implicit* definitions are more amorphous and context-driven. *Primary* and *Secondary* referred to whether the author put forward their own definition or used the definition from another source. This was useful in determining whether to copy the categorization from one entry to another in the data chart: specifically, any entry that used a single author's definition (e.g. *Explicit* & *Secondary).*

- **Concept of open:** The four categories here looked at different ways in which they discussed the idea of open. *Spectrum* views the concept of openness as a sliding scale, where

you can become more or less open depending on how you approach an endeavor. *Collection* views open as a checklist, where you would check off elements in order to define an endeavor as open. The two of these were mutually exclusive. *Adjective* described articles that used the word open more as an adjective to describe pedagogy and other pursuits rather than looking at "open pedagogy" as a discrete concept. Finally, *Context of the Open Movement* describes articles that talked about open pedagogy in the same context as open access, OER, or the open education movement. All of these concepts are useful in determining how each author viewed the concept of open on a more philosophical level.

- **Relation to OEP or OER-enabled pedagogy:** These two looked at how the term was used in relation to the concepts of OEP or OER-enabled pedagogy, whether open pedagogy was viewed as a subcategory or whether the term was synonymous with either concept. This is important in measuring the overall trend of the field toward using the terms OER-enabled pedagogy and OEP.

- **Student focus:** These categories looked at how open pedagogy was defined in relation to student autonomy, student- or learner-centered pedagogy, or connectivism and networked learning. This is important in situating open pedagogy within the scope of educational theory.

- **Practices:** These categories looked at elements such as the 5R permissions, co-creation of content, reflexive practices, and use of open access materials or courses. This is important for looking at the ways in which specific practices were mapped onto the concept of open pedagogy.

Discussion

After reading and classifying the articles, the following tables were developed:

Analysis was iterative with the development of the charts and taxonomy until the terms were fully codified. At that junction, the focus moved toward looking at co-incidence of terms and how they interacted.

Co-incidence of terms

The comparison of categories within the data to look for co-incidence of terms yielded 31 combinations that hit the 70% or higher mark for significance. Out of that pool, 13 involved the *Context of the Open Movement*, which was unsurprising given the general subject matter under discussion and the fact that many of the categories, by definition, were part of the open movement. Therefore, those 13 combinations did not yield any major insights. Another 12 were in the type of article category. A likely reason for this lies in the fact that a pre-created definition is extremely useful to any researcher looking to have a rigorous foundation for their arguments, or for researchers looking for potential tools for instruction. For in-

Table 1: Taxonomy Count

TABLE 1: TAXONOMY COUNT

Article	Pub. Date	Exp.	Imp.	Prim.	Sec.	Secondary Source(s)	Spectrum	Collection	Context of the Open Movement	Adjective	Subset of OEP	Synonymous with OEP	Autonomy/ Agency	Student-Centered Pedagogy	Connectivism	Creation of Content	Open Access	5R Permissions	Reflection/ Vulnerability
Al Abri, M. H., & Dabbagh, N. (2019).	2019	1			1	Wiley (2017)		1	1			1		1		1	1	1	
Badea, M., et al. (2018).	2018	1		1			1			1			1						1
Baker, A., & Ippoliti, C. (2018).	2018	1			1	Hegarty (2015)		1	1			1			1	1	1	1	1
Bandi-Rao, S., & Sepp, M. (2014).	2014		1		1	Lockridge (2014)							1		1	1			
Barker, J., et al. (2018).	2018		1	1			1		1	1	1								
Blomgren, C. (2018) OER Awareness	2018		1		1	Multiple Sources		1	1								1		
Blomgren, C., & McPherson, I. (2018) Scoping	2018		1		1	Multiple Sources		1	1					1	1	1	1		
Bonica, M. J., et al. (2018)	2018	1		1		Wiley (2017)		1	1				1			1	1	1	
Borthwick, K., & Gallagher-Brett, A. (2014)	2014		1		1	Beetham (2012)			1	1	1								
Bozkurt, A., Koseoglu, S., & Singh, L. (2019)	2019		1		1	Multiple Sources			1	1	1				1	1			
Brier, S. (2017)	2017		1	1						1									
Collier, A., & Ross, J. (2017)	2017		1		1	Multiple Sources			1	1					1		1		
Cooney, C. (2017)	2017		1	1					1					1		1	1		
Coughlan, T., & Perryman, L. A. (2015	2015	1		1			1		1		1		1						
Cronin, C. (2017)	2017		1		1	Multiple Sources			1		1								
Czerniewicz, L., et al. (2017a) MOOC	2017	1			1	Multiple Sources			1			1		1					
Czerniewicz, L., et al. (2017b) OER	2017	1			1	Multiple Sources	1		1			1		1		1	1		
Dalton, E. M., Pérez, L., & Grant, K. (2016)	2016	1			1	Stacey (2013)		1	1						1		1		
De la Fuente, L., & Comas-Quinn, A. (2016)	2016		1		1	Wiley (2013)			1	1						1	1		
DeRosa, R., & Robison, S. (2017) From OER	2017	1		1				1	1				1			1				
Derosa, R., & Jhangiani, R. (2017)	2017	1		1					1				1		1	1	1	1	
Edwards, C. et al. (2014)	2014		1	1					1						1	1			
Ford, K. (2017)	2017		1	1						1									
Garner, N., Siol, A., & Eilks, I. (2015)	2015		1	1						1			1						
Gil-Jaurena, I., & Domínguez, D. (2018)	2018		1	1					1	1			1						
Goodlad, K., & Leonard, A. E. (2018)	2018		1	1															
Graham, L., & Roberts, V. (2018)	2018		1		1	Hegarty (2015)		1	1			1		1	1	1	1		
Harrison, R. K. (2015)	2015	1		1						1				1	1	1			1
Hartnett, J. (2017)	2017		1	1					1								1		
Hegarty, B. (2015)	2015	1		1		Multiple Sources		1	1			1			1	1	1	1	1
Henderson, S., & Ostashewski, N. (2018)	2018		1		1	Hegarty (2015)			1										
Hickey, A., Pauli-Myler, T., & Smith, C. (2018)	2018		1	1									1		1				
Hilton, M. (2014)	2014		1	1			1			1									
Hodgkinson-Williams, C., et al. (2017)	2017		1		1	Cronin (2017)			1		1			1					
James, R., & Bossu, C. (2014)	2014		1		1	Conole (2013)			1	1	1								
Jhangiani, R. S. (2018) Athenaeum	2016	1			1	Wiley (2017)		1	1							1	1	1	
Jhangiani, R. S. (2017a) Open	2017		1	1		Derosa (2017)			1							1			
Jhangiani, R. S. (2017b) Pragmatism	2017		1	1					1										
Jhangiani, R. S. (2016) Ditching	2018	1		1		Wiley (2013)			1							1			
John, B., et al. (2016)	2016	1		1					1					1	1				
Kalir, J. H. (2019)	2019	1			1	Derosa (2017)			1				1		1	1	1	1	
Karunanayaka, S. P., & Naidu, S. (2017a)	2017	1			1	Multiple Sources		1	1							1			
Karunanayaka, S. P., & Naidu, S. (2017b)	2017	1			1	Multiple Sources		1	1							1			
Klobas, J. E., et al. (2015)	2015	1		1					1				1		1				
Knipping C.,et al . (2015)	2015		1		1					1				1					
Koseoglu, S., & Bozkurt, A. (2018)	2018		1		1				1			1							
Laudonia, I., & Eilks, I. (2018)	2018		1	1									1						

Table 2: Raw Data of Co-Incidence

TABLE 2: RAW DATA OF CO-INCIDENCE

Terms	N	Exp.	Imp.	Prim.	Sec.	Spectrum	Collection	Context of the Open Movement	Adjective	Subset of OEP	Synonymous with OEP	Autonomy/Agency	Student-Centered Pedagogy	Connectivism	Creation of Content	Open Access	5R Permissions	Reflection/ Vulnerability
Explicit	41		0	21	20	5	13	32	4	2	11	11	10	14	27	21	16	6
Implicit	57	0		35	22	6	3	45	24	6	3	10	13	12	19	13	4	4
Primary	56	21	35		0	8	3	50	18	2	4	17	12	13	26	16	6	7
Secondary	42	20	22	0		3	13	27	10	6	10	4	11	13	20	18	14	3
Spectrum	11	5	6	8	3		0	9	8	2	1	4	3	1	2	1	0	2
Collection	16	13	3	3	13	0		12	0	1	6	3	4	7	14	12	7	4
Context of the Open Movement	77	32	45	50	27	9	12		21	5	10	16	18	18	37	26	14	7
Adjective	28	4	24	18	10	8	0	21		4	0	5	7	4	4	3	0	6
Subset of OEP	8	2	6	2	6	2	1	5	4		0	2	1	1	2	0	0	1
Synonymous with OEP	14	11	3	4	10	1	6	10	0	0		1	6	5	9	11	9	3
Autonomy/Agency	21	11	10	17	4	4	3	16	5	2	1		0	10	10	6	6	2
Student-Centered Pedagogy	23	10	13	12	11	3	4	18	7	1	6	0		5	11	7	2	1
Connectivism	26	14	12	13	13	1	7	18	4	1	5	10	5		19	15	8	5
Creation of Content	46	27	19	26	20	2	14	37	4	2	9	10	11	19		24	14	6
Open Access	34	21	13	16	18	1	12	26	3	0	11	6	7	15	24		13	3
5R Permissions	20	16	4	6	14	0	7	14	0	0	9	6	2	8	14	13		3
Reflection/Vulnerability	10	6	4	7	3	2	4	7	6	1	3	2	1	5	6	3	3	
Total N of Articles	98																	

Table 3: % of Co-Incidence

TABLE 3: % OF CO-INCIDENCE

Terms	N	Exp.	Imp.	Prim.	Sec.	Spectrum	Collection	Context of the Open Movement	Adjective	Subset of OEP	Synonymous with OEP	Autonomy/Agency	Student-Centered Pedagogy	Connectivism	Creation of Content	Open Access	5R Permissions	Reflection/ Vulnerability
Explicit	41		0.0%	51.2%	48.8%	12.2%	31.7%	78.0%	9.8%	4.9%	26.8%	26.8%	24.4%	34.1%	65.9%	51.2%	39.0%	14.6%
Implicit	57	0.0%		61.4%	38.6%	10.5%	5.3%	78.9%	42.1%	10.5%	5.3%	17.5%	22.8%	21.1%	33.3%	22.8%	7.0%	7.0%
Primary	56	37.5%	62.5%		0.0%	14.3%	5.4%	89.3%	32.1%	3.6%	7.1%	30.4%	21.4%	23.2%	46.4%	28.6%	10.7%	12.5%
Secondary	42	47.6%	52.4%	0.0%		7.1%	31.0%	64.3%	23.8%	14.3%	23.8%	9.5%	26.2%	31.0%	47.6%	42.9%	33.3%	7.1%
Spectrum	11	45.5%	54.5%	72.7%	27.3%		0.0%	81.8%	72.7%	18.2%	9.1%	36.4%	27.3%	9.1%	18.2%	9.1%	0.0%	18.2%
Collection	16	81.3%	18.8%	18.8%	81.3%	0.0%		75.0%	0.0%	6.3%	37.5%	18.8%	25.0%	43.8%	87.5%	75.0%	43.8%	25.0%
Context of the Open Movement	77	41.6%	58.4%	64.9%	35.1%	11.7%	15.6%		27.3%	6.5%	13.0%	20.8%	23.4%	23.4%	48.1%	33.8%	18.2%	9.1%
Adjective	28	14.3%	85.7%	64.3%	35.7%	28.6%	0.0%	75.0%		14.3%	0.0%	17.9%	25.0%	14.3%	14.3%	10.7%	0.0%	21.4%
Subset of OEP	8	25.0%	75.0%	25.0%	75.0%	25.0%	12.5%	62.5%	50.0%		0.0%	25.0%	12.5%	12.5%	25.0%	0.0%	0.0%	12.5%
Synonymous with OEP	14	78.6%	21.4%	28.6%	71.4%	7.1%	42.9%	71.4%	0.0%	0.0%		7.1%	42.9%	35.7%	64.3%	78.6%	64.3%	21.4%
Autonomy/Agency	21	52.4%	47.6%	81.0%	19.0%	19.0%	14.3%	76.2%	23.8%	9.5%	4.8%		0.0%	47.6%	47.6%	28.6%	28.6%	9.5%
Student-Centered Pedagogy	23	43.5%	56.5%	52.2%	47.8%	13.0%	17.4%	78.3%	30.4%	4.3%	26.1%	0.0%		21.7%	47.8%	30.4%	8.7%	4.3%
Connectivism	26	53.8%	46.2%	50.0%	50.0%	3.8%	26.9%	69.2%	15.4%	3.8%	19.2%	38.5%	19.2%		73.1%	57.7%	30.8%	19.2%
Creation of Content	46	58.7%	41.3%	56.5%	43.5%	4.3%	30.4%	80.4%	8.7%	4.3%	19.6%	21.7%	23.9%	41.3%		52.2%	30.4%	13.0%
Open Access	34	61.8%	38.2%	47.1%	52.9%	2.9%	35.3%	76.5%	8.8%	0.0%	32.4%	17.6%	20.6%	44.1%	70.6%		38.2%	8.8%
5R Permissions	20	80.0%	20.0%	30.0%	70.0%	0.0%	35.0%	70.0%	0.0%	0.0%	45.0%	30.0%	10.0%	40.0%	70.0%	65.0%		15.0%
Reflection/Vulnerability	10	60.0%	40.0%	70.0%	30.0%	20.0%	40.0%	70.0%	60.0%	10.0%	30.0%	20.0%	10.0%	50.0%	60.0%	30.0%	30.0%	

stance, *Secondary* articles were at a 70% co-incidence rate with *5R Permission*s, likely because the category comes from a single specific source (Wiley, 2013). Similarly, *Secondary* sources appeared in consort with both of the OEP related categories in high rates, likely because the terms had active authorial definitions from Conole (2010) and Wiley and Hilton (2018).

Other combinations were more axiomatic. For instance, *Implicit* definitions had a high degree of co-incidence with *Adjective* and *Subset of OEP*. The former makes sense as using open as a descriptor makes it far less likely that you would actively define open pedagogy as a concept, a conclusion borne out by the 9.8% co-incidence rate of *Explicit* definitions to *Adjective*. *Implicit* also naturally leads to *Subset of OEP*, because many of those articles listed open pedagogy as part of a list of practices within OEP. Similarly, *Explicit* co-occurred with *Collection* and with the *5R permissions* categorization of open pedagogy because both categories involve an explicit list of attributes or conditions necessary to qualify for the definition. Finally, *Adjective* combined with *Spectrum*, because one of the criteria for both was looking for phrases such as "more or less open."

The more interesting co-incident terms were those five within the category of practices. *Creation of Content* was combined with *Attributes*, *5R Permissions*, and *Open Access*, all of which makes sense given that *Creation of Content* is either listed as a trait or heavily implied in several conceptions of open pedagogy (Hegarty, 2015; Wiley, 2013). Of all the practices, *Creation of Content* was present in the most articles, with 46.9% including it in their conception of open pedagogy. Surprisingly, *5R Permissions* had a very low correlation with *Open Access*, though this is likely because open access is implicit in the concept of 5R permissions and thus did not need an active mention. This is borne out by the fact that *Open Access* as compared to *5R permissions* hit 65%; many of the articles discussing open access and open pedagogy also explained or referenced the 5R permissions. The last combination was *5R permissions* and *Synonymous with OEP*, likely because the use of 5R permissions is implicit in Wiley and Hilton's (2018) construction of OER-enabled pedagogy and because OEP are defined by their use of OER, which is intimately tied with the 5Rs.

Analysis of the data set as a whole

Despite some relatively high levels of co-incidence between terms, it is striking that the highest level of practice failed to break the 50% mark of the articles when defining open pedagogy. The only concept that managed that was C*ontext of the Open Movement*, which came in at 78.6% of all the articles. This indicates that the terminology is ill defined at best, as there is a morass of conflicting definitions at play. Several of the articles in this study also noted that the concept of open pedagogy had become contested, vague, or otherwise hard to utilize for research (DeRosa & Jhangiani, 2017; Reed, 2018; Weller, 2014; Wiley & Hilton, 2018). Apart from a preponderance of *Creation of Content*, there are

limited pools of similarity around those who used secondary definitions of the terms, and even those authors often added on additional categories to their definitions. Additionally, individual authors shifted their definitions over time, rarely maintaining complete consistency with how they used the term, although many acknowledged that fact in their works (Jhangiani, 2016; Wiley & Hilton, 2018). DeRosa and Jhangiani (2017) in particular view the concept of open pedagogy as more of an amorphous site of praxis, one that resists active definition, a conception fully corroborated by the data pool.

This creates several problems for creating any kind of working definition of the term. There are several major competing schematics (Hegarty, 2015; Wiley, 2013) and many papers that select elements from each of them when crafting their own definitions (DeRosa & Jhangiani, 2017; Karunanayaka & Naidu, 2017a). Conceptions such as that of Derosa and Jhangiani (2017), while accurate in describing the nebulousness of the concept, do not lend themselves to reproducibility of results or rigorous examination of outcomes arising from the use of open pedagogy because by definition they cannot be fully defined. To encapsulate the concept, one would need to step backward or outward to create an inclusive concept that fits most of the data. The only common thread weaving through the vast majority of these articles is the *Context of the Open Movement*, with 77 of the 98 articles directly making that connection. These examine the concept as situated within the open movement or stemming from issues addressed by the open movement such as access, creation of content, and 5R issues. This presents a potential path forward that encapsulates many of the offered definitions and distinguishes the concept from both OER-enabled pedagogy and OEP: if the former two concepts look specifically at practices and their outcomes, then open pedagogy addresses the reasons for adoption or theoretical background of those practices. In other words, if OER-enabled pedagogy and OEP address the how, open pedagogy addresses the why.

Conclusions and a Working Definition of Open Pedagogy

Given the overall chaos in the use of the term open pedagogy within the scholarly literature, Wiley and Hilton's (2018) approach of abandoning the term entirely and switching over to OER-enabled pedagogy appears to be a workable course. This does carry the risk of a similar muddling happening to that concept, but practices have the virtue of being more readily definable than pedagogy. Yet the term open pedagogy still occurs with a decent frequency in recent literature, despite the prevalence of OEP and OER-enabled pedagogy. This suggests that it has staying power, either as an inspirational concept or as a convincing definition in the preceding literature. Because the term has continued popularity, sometimes in conjunction with the concepts of OEP and OER-enabled pedagogy, it seems worthwhile to attempt rehabilitation. Drawing from the

discussion above, this paper proposes a working definition of open pedagogy as follows: open pedagogy is any pedagogy informed by the practitioners' conscious identification with the open movement, open access, and OER. In effect, open pedagogy describes the interaction between the open movement and pedagogy, where OEP and OER-enabled pedagogy describe the actual practices arising from that pedagogical approach.

This defines the scope of research into open pedagogy to the micro level when talking about effects on practitioners' pedagogy, and to the macro level when talking about student outcomes. It mirrors the definitions of several authors that note the path from open pedagogy to OER-enabled pedagogy or OEP, as well as those who view the terms as similar or synonymous. It also allows for some intriguing explorations into the adoption of educational practices that fit pre-existing educational schools of theory such as Connectivism and Student-Centered Learning. Again, this puts the unit of research at the level of the individual educator, the department, or an entire school. Adopting this conception of open pedagogy has the potential to lead to more rigorous research than the current usage allows, as the mélange of definitions currently in use makes generalizability impossible. This new definition also allows the establishment of a clear line between open pedagogy and OER-enabled pedagogy/OEP: the latter two are concerned with the outcomes of students, while the former is concerned with the activities and behaviors of teachers and collectives of the same.

Further Research

This working definition of open pedagogy as any pedagogy informed by a conscious adherence to the open movement has several potential uses. At the macro level, it has utility in studies analyzing changes to the pedagogical practices of teachers in reaction to their institutions adopting statements of support for the open movement or open access. In particular, it would be interesting to uncover whether the adoption of such policies leads to educators themselves using more strategies associated with connectivism and student-centered learning. This working definition can also be used to study causal linkages between the ideology of open and student outcomes by tracing the adoption of existing educational practices back to their source in an ideological shift. This avoids the trap that Beetham et al. (2012) alluded to of creating entirely new educational theories when existing ones may have greater explanatory power.

OEP have great potential to transform the way librarians, professors, and other educators connect with and empower students. If allegiance to the concept of open inspires that shift, then that connection is worthy of study, and the conception of open pedagogy outlined here provides a coherent basis for that enterprise.

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APPENDICES

Appendix A: Taxonomy

- **Implicit** denotes articles where the concept of open pedagogy is assumed to be understood by the reader and thus no attempts are made to define it. Implicit definitions include listing open pedagogy alongside open access and OER, or as a subset of OEP or OER-enabled pedagogy without a specific definition.
- **Explicit** denotes articles where the authors actively put forward a definition of the term, either by saying "Open pedagogy is defined as…" or using variations such as "Open pedagogy, where the learning is…" It includes articles where the authors explicitly refused to pin the concept down but still actively discussed the definition.
- **Primary** denotes articles where the authors put forward their own definition or spin on a pre-existing definition. It also includes articles where the definition was implicit but the author did not specifically cite another author's construction of the term.
- **Secondary** denotes articles where the authors implicitly or explicitly used another author's definition of the term.
- **Spectrum** denotes articles that view openness as a sliding scale.
- **Collection** denotes articles that specify a list of criteria, practices, or attributes, some or all of which must be met in order to be open.
- **Context of the Open Movement** denotes articles that discuss open pedagogy in the context of OER, open access, and the Open Movement. This includes articles that contrast open pedagogy with the use of open access materials, but still discuss them in the same breath as part of a larger movement.
- **Adjective** denotes articles that use open as a descriptive add-on to the term pedagogy rather than as a formal category. This can include talking about "opening up the pedagogy," "more open," "open to," and other descriptions, and typically implies that the author does not view "open pedagogy" as a discrete concept.
- **Subset of OEP** denotes articles that describe open pedagogy as a practice within the umbrella of OEP (which refers in this case to both OEP and OER-enabled pedagogy).
- **Synonymous with OEP** denotes articles that explicitly or implicitly state the equivalence of open pedagogy with either OEP or OER-enabled pedagogy.

- **Autonomy/Agency** denotes articles that define an element of open pedagogy to include students acting without active guidance from teachers, use the terms agency or autonomy in their definition, or talk about the students planning their own curriculum.

- **Student-Centered Pedagogy** denotes articles that define an element of open pedagogy to include adherence to the educational approach of student-centered pedagogy, learner-centered pedagogy, or student-centered learning using those exact terms.

- **Connectivism** denotes articles that define an element of open pedagogy to include either adherence to the educational approach of connectivism or the general idea of networked instruction where students teach each other while not necessarily excluding professors from the equation.

- **Creation of Content** denotes articles that define an element of open pedagogy to include the creation of content intended for publication or for the open commons.

- **Open Access** denotes articles that define an element of open pedagogy to include the use of OER or OAR, or that define open as openness to access to the instruction itself. Essentially, where open pedagogy revolves around access.

- **5R Permissions** denotes articles that define open pedagogy using Wiley's (2013) construction that open pedagogy is that which is only possible when the 4R permissions are fully enabled. 5Rs is used because the field of discussion (including Wiley himself in later works) added an R.

- **Reflection/Vulnerability** denotes articles that define an element of open pedagogy to include self-reflection on the part of the students and/or instructors or instructors opening up to their students and showing vulnerability. In other words, psychological openness.

A Qualitative Analysis of Open Textbook Reviews

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Abstract

Open textbooks are a type of Open Educational Resource (OER). They present educators with an alternative to commercial textbooks, afford students and educators permissions granted by open licenses, and reduce student costs. The purpose of this qualitative study is to examine how educators evaluate the quality of open textbooks. We analyzed 954 educator reviews of 235 unique open textbooks. American postsecondary educators authored the reviews between April 2014 and March 2017 and the Open Education Network (OEN; formerly the Open Textbook Network, https://open.umn.edu/otn/collected) and openly published the reviews in the

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Open Textbook Library (OTL, https://open.umn.edu/opentextbooks/), unedited and with Creative Commons Attribution 4.0 International licenses (CC BY 4.0). Overall, reviewers found the open textbooks to be of sufficient quality for use. The reviews provide insight into educator concerns and interests regarding the quality and characteristics of open textbooks and may support peer educators' consideration, and authors' and publishers' creation and revision, of open textbooks.

Keywords: Open Educational Resources (OER), open textbooks, qualitative research, template analysis, higher education, textbook reviews

Un análisis cualitativo de revisiones de libros de texto abiertos

Resumen

Los libros de texto abiertos son un tipo de recurso educativo abierto. Presentan a los educadores una alternativa a los libros de texto comerciales, les brindan a los estudiantes y educadores permisos otorgados por licencias abiertas y les permiten a los educadores reducir los costos de los estudiantes. El propósito de este estudio cualitativo es examinar cómo los educadores evalúan la calidad de los libros de texto abiertos. Analizamos 954 reseñas de educadores de 235 libros de texto abiertos únicos. Los educadores postsecundarios estadounidenses fueron autores de las revisiones entre abril de 2014 y marzo de 2017 y la Red de Educación Abierta (anteriormente Red de Libros de Texto Abierta) <https://open.umn.edu/otn/> recopilaron y publicaron abiertamente las revisiones en la Biblioteca de Libros de Texto Abiertos <https://open.umn.edu/opentextbooks/>, sin editar y con licencias Creative Commons Attribution 4.0 International (CC BY 4.0) https://creativecommons.org/licenses/by/4.0/. En general, los revisores encontraron que los libros de texto abiertos tenían la calidad suficiente para su uso. Las revisiones brindan información sobre las inquietudes e intereses de los educadores con respecto a la calidad y las características de los libros de texto abiertos y pueden apoyar la consideración de los educadores pares y la creación y revisión de los libros de texto abiertos por parte de los autores y editores.

Palabras clave: recursos educativos abiertos (REA), libros de texto abiertos, investigación cualitativa, análisis de plantillas, educación superior, revisiones de libros de texto

开放课本评论定性分析

摘要

开放课本是开放教育资源的一种类型。它们为教育者提供商业课本替代方案、为学生和教育者提供开放许可、允许教育者减少学生费用。本篇定性研究旨在分析教育者如何评价开放课本质量。我们分析了关于235部独特开放课本的954条教育者评论。这些评论于2014年4月至2017年3月间由美国高等教育教师撰写，开放教育网络（前身为开放课本网络，https://open.umn.edu/otn/）对此进行了收集并在开放课本图书馆（https://open.umn.edu/opentextbooks/）中进行公开发表，评论未经编辑，遵循知识共享署名4.0国际许可协议（CC BY 4.0，https://creativecommons.org/licenses/by/4.0/）。整体而言，评论者认为开放课本质量优，适合使用。评论展示了教育者在开放课本的质量及特征方面的顾虑和兴趣，并可能支持同行教育者对开放课本的考虑，以及作者和出版者对开放课本的创作和修改。

关键词:开放教育资源（OER），开放课本，定性研究，模板分析，高等教育，课本评论

Introduction

While for many students pursuing postsecondary education is a priority, the cost of higher education is often a barrier. The 2015–16 National Postsecondary Student Aid Study (2018) found that in the 2015–2016 school year, 72% of all undergraduates received some form of financial aid. The costs of textbooks and course materials increase students' higher education expenses and U.S. institutions suggested that students budget $1,002-$1,504 for books and supplies in 2017–2018 (The Institute for College Access & Success, 2019). While course material costs are only part of the significant expense students face pursuing higher education, these costs may negatively influence student behaviors and choices related to academic success. The 2018 Student Textbook and Course Materials Survey (Office of Distance Learning & Student Services, 2019) found by surveying postsecondary students across Florida that "[t]he top 5 highest percentage answers reported by students when asked about the impact of textbook costs" were "not purchasing the required textbook; taking fewer courses; not registering for a specific course; earning a poor grade; and dropping a course" (p. 13). Postsecondary administrators and faculty appreciate that course materials costs are

problematic and concerning (Seaman & Seaman, 2020), and in response to the Ithaka S+R US Faculty Survey 2018 (2019), seven in 10 faculty "indicated that reducing the cost that students pay for textbooks and other course materials is highly important" (p. 47).

Faculty members appear to be increasingly aware of Open Educational Resources (OER) as alternatives to commercial materials. The William and Flora Hewlett Foundation (2020) defines OER as:

> teaching, learning and research materials in any medium—digital or otherwise—that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions.

Seaman and Seaman (2020) found that 53% of faculty surveyed reported awareness of OER and observed increasing awareness over five surveys from 2014–2019. Ithaka S+R US Faculty Survey 2018 respondents reported using open textbooks (32%), open course modules (24%), and open video lectures (32%). Open textbooks are increasingly available across a wide variety of discipline areas. The Open Textbook Library (OTL, https://open.umn.edu/opentextbooks/) is one comprehensive catalog of open textbooks that currently includes records for more than 700 open textbooks, and a growing selection of repositories and search engines now exists to help educators identify and access OER. The body of research literature concerning OER is likewise growing rapidly. Hilton (2019) identified 25 refereed studies examining OER efficacy, finding that "[a] consistent trend across this OER efficacy research (spanning 2008 to 2018) is that OER does not harm student learning" (p. 17).

The purpose of this qualitative study is to examine how educators evaluate the quality of open textbooks. We analyzed 954 educator reviews of 235 unique open textbooks that American postsecondary educators authored between April 2014 and March 2017. While there are user reviews of textbooks, this study is unique in that the reviews are comprehensive evaluations of specifically open textbooks, completed by experts in the respective fields. The Open Education Network (OEN, https://open.umn.edu/otn/) collected and openly published the reviews in the OTL. In this report, we present the encouraging results from this analysis.

Review of Relevant Literature

Research studies that examine or include postsecondary educator perceptions of OER are increasing in number. Hilton (2019) counted 29 studies concerning faculty or student perceptions of OER, published between 2002 and 2018 that met a set of criteria for inclusion. He commented that "[e]very study that has asked those who have used both OER and CT [commercial textbooks] as primary learning resources to directly compare the two has shown that a strong majority of participants report that OER are as good or better" (p. 17), with the important note

that educators' positive perceptions of OER may be influenced by their sensitivity to student appreciation for no-cost OER as course materials. We set aside perceptions reports of educators who may or may not have used OER (Blankstein & Wolff-Eisenberg, 2019; Cardoso et al., 2019; Jaschik & Lederman, 2018; Seaman & Seaman, 2020) and review studies reporting postsecondary educators' perceptions after using OER or open textbooks were excluded from this study. The studies we review here reveal educators' motivations for exploring and adopting OER, their experiences using OER, and how educators perceive OER quality and efficacy. While there is a body of literature concerning textbook evaluation, it is expansive and addresses too wide a variety of values to examine in the current article. However, Bliss (2013) reviewed textbook evaluation research in his in-depth literature analysis and found that primary evaluation criteria included cost, sensitivity to diversity, content comprehensiveness and accuracy, readability, educational impact, inclusion of effective pedagogical aids, interaction, human interest, learnability, and usability.

A number of studies have examined the perceptions of educators after they have used OER in their teaching. Bliss, Hilton et al. (2013) and Hilton, Robinson et al. (2013) each surveyed small numbers of faculty members (20 or less) who used OER in community college courses. In each study, a majority of faculty evaluated OER quality as equivalent to, or better than, the quality of commercial materials they had used. Delimont et al. (2016) interviewed 13 university instructors who received a grant to transition to open and alternative resources in their courses. All but one instructor preferred these resources to a commercial textbook. Jhangiani et al. (2016) surveyed 78 postsecondary educators, 77% of whom reported having used OER. Of those, 59% rated OER as comparable to or better than commercial materials. Abramovich and McBride (2018) surveyed 35 educators who used OER and 97% found the OER to be equally useful, or more useful, than commercial materials. Overall, these perception studies evidence positive perceptions of OER by educators, particularly those who have used OER in their teaching (Venegas Muggli & Westermann 2019).

Researchers have also investigated the perceptions of educators after educators have taught with open textbooks and found that the majority had positive perceptions of these resources. Petrides et al. (2011) reported the perspectives of educators who used open textbooks found that adoption of open textbooks were influenced by "cost, content quality, and ease of use" (p. 43), but that reducing student costs was most influential; multiple sources contributed to the educators' perception of content quality; and perceived ease of use related to the digital format of the open textbooks and related possibilities for educators to edit and integrate the content with other resources. Bliss, Robinson et al. (2013) surveyed 58 community college educators who taught with

open textbooks. The majority found the quality to be comparable to or better than that of commercial textbooks. Pitt (2015) reported findings from two surveys of 127 total educators who had used OpenStax textbooks and 70-80% reported that they would also use other OER. The California OER Council (2016) surveyed 16 postsecondary educators who had adopted open textbooks for their courses. Most rated the open textbooks as comparable to, or better than, the commercial textbooks used for the courses. Ozdemir and Hendricks (2017) reviewed 51 educator e-portfolios in which the educators described their use of open textbooks in postsecondary courses. The majority reported that "the quality of the textbooks was as good or better, than that of traditional textbooks" (p. 98) and that they had "overwhelmingly positive experiences with using open textbooks" (p. 110). Jung et al. (2017) surveyed 136 postsecondary educators who had used open textbooks and 80% "believed that using open textbooks was at least as good as or better than using traditional textbooks" (p. 132), 62% thought the open textbook quality was comparable to that of commercial textbooks, and 19% thought the quality was better. Watson et al. (2017) used a focus group interview to explore the experiences of three biology educators who adopted the OpenStax Biology open textbook. These educators viewed the content as comparable to commercial textbook equivalents and "used the new text as an opportunity to rethink how they organized the content for their students" (p. 294). Vander Waal Mills et al. (2019) surveyed 44 biology faculty members across 40 community and technical colleges in Minnesota. Of the 20 faculty who had self-selected to use an open textbook in their biology course, 90% appeared to prioritize cost effectiveness as the reason for choosing to use the open textbook and 70% found it to be comparable in quality to relevant commercial biology textbooks. Rodes et al. (2019) conducted multiple interviews with 12 faculty members who had created, used, and shared OER. These educators related the potential of OER to the mission of public universities in Latin America and "mainly intrinsic factors, such as the pleasure of contributing and sharing" (p. 176) motivated the educators' OER creation and use.

To our knowledge, only one published study has analyzed educator reviews included in the OTL. Whereas our study concerns the free responses included in these reviews, Fischer et al. (2017) examined the five-point Likert scale ratings that 416 educators assigned in their OTL reviews of 121 open textbooks, and relationships between these ratings and reviewer characteristics (such as country of residence and tenure-track status). Reviewers had generally positive evaluations of the textbooks across the 10 measures of quality. Our present study analyzed a larger set of open textbook reviews are analyzed by exploring nuanced patterns across reviewers' free responses in 10 areas of concern, and consider reviewers' additional, unprompted assessments of quality included in their free responses, such as comparisons made between the open textbooks and traditional textbooks.

It is encouraging that postsecondary educators who have used OER in their teaching have generally positive perceptions of OER quality. Continued research investigating educator perceptions of and experiences using OER, along with a growing body of studies investigating OER efficacy, may encourage more faculty to explore OER.

Method

Our initial data set consisted of 963 reviews of open textbooks that the OEN collected from educators at American universities and colleges between April 2014 and March 2017. When we compiled the set of reviews, it comprised all of the reviews that the OEN collected during that time period and 69% of the 1,375 reviews were collected from OEN and then also included in the OTL. The OTL has since grown to include just over 2,000 reviews. We eliminated nine of the 963 reviews because they were open textbooks that do not meet the OTL criteria (see OEN, n.d.b), reducing our final data set to 954 reviews of 235 unique open textbooks.

The reviews follow a standard format that the OEN provided to reviewers in the form of an online questionnaire. Reviewers wrote free responses to prompt questions for 10 areas of concern (see Table 1) and were invited to provide additional comments. While reviewers were also asked to provide a 5-point Likert scale rating for each area of concern, and the open textbook overall, our analysis considered only reviewers' free responses.

Data Analysis

We used template analysis to code the reviewers' open responses in the qualitative data analysis software programs Dedoose (www.dedoose.com) and NVivo (www.qsrinternational.com/nvivo/home). Template analysis is a style and technique (King, 2014) where researchers extract themes, main ideas, and contextual information as latent content (Cassell & Symon, 2004). Researchers develop a "coding template, usually on the basis of a subset of the data, which is then applied to further data, revised and reapplied" (King, 2014, p. 2).

We developed and refined a thematic coding template by coding a subset of 400 of the 954 reviews in several, progressive stages. First, we independently coded a common subset of 20 reviews in order to independently generate draft templates. We then discussed our coding and draft templates and collapsed them into one revised template. Second, the revised template was used to independently code a common subset of 200 reviews that included the initial 20 reviews. We discussed our coding and revised the template for use in all subsequent work. Third, we used the revised template to revise our coding of the 200 reviews and to independently code a new, common subset of 200 reviews. Fourth, we randomly selected 40 of the 400 reviews we had coded and assessed the consistency of our coding for these 40 reviews. We then identified and resolved coding disagreements across the larger subset of 400 reviews and divided between us,

Table 1. Reviews Questionnaire: Areas of Concern with Prompt Questions for Free Responses

Area of concern	Prompt question
Comprehensiveness	Please comment on the book's comprehensiveness. The text covers all areas and ideas of the subject appropriately and provides an effective index and/or glossary.
Accuracy	Please comment on the book's accuracy. Content is accurate, error-free and unbiased.
Relevance and longevity	Please comment on the book's relevance/longevity. Content is up-to-date, but not in a way that will quickly make the text obsolete within a short period of time. The text is written and/or arranged in such a way that necessary updates will be relatively easy and straightforward to implement.
Clarity	Please comment on the book's clarity. The text is written in lucid, accessible prose, and provides adequate context for any jargon/technical terminology used.
Consistency	Please comment on the book's consistency. The text is internally consistent in terms of terminology and framework.
Modularity	Please comment on the book's modularity. The text is easily and readily divisible into smaller reading sections that can be assigned at different points within the course (i.e., enormous blocks of text without subheadings should be avoided). The text should not be overly self-referential, and should be easily reorganized and realigned with various subunits of a course without presenting much disruption to the reader.
Organization, structure, and flow	Please comment on the book's organization/structure/flow. The topics in the text are presented in a logical, clear fashion.
Interface	Please comment on the book's interface. The text is free of significant interface issues, including navigation problems, distortion of images/charts, and any other display features that may distract or confuse the reader.
Grammatical errors	Please comment on the book's grammar. The text contains no grammatical errors.
Cultural relevance	Please comment on the book's cultural relevance. The text is not culturally insensitive or offensive in any way. It should make use of examples that are inclusive of a variety of races, ethnicities, and backgrounds.
Additional comments	Are there any other comments you would like to make about this book?

Note. The OEN review questionnaire is an adaptation of the BC Open Textbooks Review Criteria (https://open.bccampus.ca/bc-open-textbooks-review-criteria/).

and independently coded, the remaining 554 reviews.

Our coding template included primary codes such as *(+) Comprehensive* and *(-) Not Comprehensive* that were specific to each of the 10 areas of concern and the additional comments section in the reviews. We coded every reviewer response, in each area of concern, with one primary code for that area of concern to reflect reviewers' evaluation of the open textbook in that area of concern. In this paper, we address findings from our application of primary codes. Our template also included secondary codes we used to code comments addressing ideas and perspectives. Our application of secondary codes supports a separate analysis that is beyond the scope of this paper.

Rigor

We each analyzed the reviews. Through several successive stages, we independently coded a common set of 400 of the 954 open textbook reviews (a significant ratio) in order to attempt to account for individual researcher interpretation (Larsson, 1993; Scandura & Williams, 2000) of the reviewer comments. We came to consensus on independently coded subsets by comparing inconsistencies and resolving disagreements through discussion. This consensus coding (Larsson, 1993) informed our coding of the remaining reviews, which we divided between us and coded independently.

Results

We organize the results of our coding by the reviews' 10 areas of concern. We summarize our results in tables. Where counts do not total 100%, it is because we excluded comments that did not respond to the area of concern.

Comprehensiveness

In Table 2, we summarize our primary coding of reviewer evaluations of content comprehensiveness. The overwhelming majority of reviews described the open textbook content as comprehensive (73%) or somewhat comprehensive (22.1%). Only 2.1% of reviewers described the content as not comprehensive and thus insufficiently comprehensive for use.

Reviewers who found the textbook's comprehensiveness to be commendable often noted alignment with both course curricula and their own teaching, detailed topic coverage, and noted for example, "[t]his is a very comprehensive textbook that provides an appropriate balance between the different fields of biology" (Allen, 2015). Some reviewers commented that the textbook was exceptionally comprehensive as compared to commercial textbooks. "All the standard topics are there as well as additional material not found in most introductory physics books" (Papavasiliou, 2015). At times, reviewers related comprehensiveness to other content elements, including glossaries, exercises, assessments, assignments, discussion questions, and appended

Table 2. Coded Reviewer Comments on the Topic of Comprehensiveness

Code	n	%	Example
(+) Comprehensive	703	73.0	"This textbook is amazingly comprehensive" (Sylwester, 2016)
(-) Somewhat comprehensive	213	22.1	"The book is quite comprehensive, and covers similar materials to other public speaking texts" (Crawford Barniskis, 2016)
(-) Not comprehensive	21	2.1	"The textbook does not cover all the material one would need to address in college algebra" (Frankl, 2013)

**Note.* Counts do not total 100% because we excluded comments that did not respond to this area of concern.

content: "The amount of material that is reviewed is awesome and useful. The index and other main components a textbook covers was [*sic*] accurate and meaningful" (Danielson, 2014).

In comments we coded as *(-) Somewhat Comprehensive*, reviewers' comparisons to commercial textbooks were still largely positive and the reviewers commented on minor flaws. "It covers all the appropriate areas, but the coverage is a bit thin when it comes to examples" (Perry, 2016). Others noted content omissions and room for improvement. "This provides an excellent level of detail for a non-majors biology course. Only a couple of areas were lacking" (Ansley, 2016). Some reviewers noted content portions they found too basic or superficial. "The text is fairly comprehensive for an introductory level course, but it often lacks detail--even for an Intro text" (Addae, 2015). Reviewers often noted if a table of contents, index, or glossary was missing and that this detracted from overall comprehensiveness

Reviewers often acknowledged that a single textbook—commercial or open—can rarely present an entirely comprehensive treatment of a topic and still be an effective learning resource. Overall, reviewers overwhelmingly found the open textbooks they reviewed to be sufficiently comprehensive for use. Many made comparisons to specific commercial texts.

Reviewers who described a textbook as not comprehensive indicated that it could not stand alone as the primary course text, topic coverage was insufficient for their teaching or too superficial, coverage compared poorly to commercial textbooks, or missing topics were too significant an omission.

Accuracy

Overall, reviewers found the content of the open textbooks to be accurate. Table 3 summarizes our findings that 80.8% of reviews described the content as accurate, with only 15.2% describing

Table 3. Coded Reviewer Comments on the Topic of Content Accuracy

Code	n	%	Example
(+) Accurate	778	80.8	"As far as the science and economics are presented in an elementary fashion, there is little to be disputed in its accuracy" (Fithian, 2015)
(-) Somewhat accurate	146	15.2	"The text is mostly accurate, especially the sections on probability and statistical distributions, but there are some puzzling gaffes" (Murtaugh, 2014)
(-) Not accurate	10	1.0	"There are many overstated generalities, inaccuracies and incomplete descriptions of function through the text" (Wilson, 2017)

**Note*. Counts do not total 100% because we excluded comments that did not respond to this area of concern.

the accuracy as somewhat flawed and 1.0% indicating that the content was not accurate.

Reviewer comments evidenced careful scrutiny, as reviewers commented on the presence or absence of current, referenced sources, and noted errors while assessing the content as accurate overall. "The book is accurate and unbiased. The book is up to date and very well researched. There are virtually no errors" (Johnson, 2015). When commending content accuracy, reviewers still offered suggestions for additions or improvements. "The [book] provides a reliable guide to the musical periods and movements, personalities and forms it covers. It may be served with a chapter that details the beginning of western music and it's [*sic*] history prior to the Middle Ages" (Mulcahy, 2017). Comments specific to bias tended to be limited, with reviewers indicating that they did not detect bias, or identifying bias but without describing it as detrimental to the text.

Comments coded as *(-) Somewhat Accurate* generally described the content as accurate but were often more nuanced. "The content of the text is generally accurate but not uniformly. There are many errors and the use of terminology that has since been changed due to new findings" (Sam-Yellowe, 2015). When highlighting minor errors, reviewers usually also noted the overall accuracy of the text's content, using qualifiers such as "mostly," "reasonably," "largely," "generally," and "average."

Reviewers who found the textbook content inaccurate were frank: "The book contains serious errors and oversimplifications. For example, the assertion about jazz eighth notes on p. 54 is false" (Feustle, 2017).

Relevance & Longevity

The prompt for this section was complex compared to others, as it asked about both relevance and longevity (see Table 1). As Table 4 documents, the majority of reviews (81.2%) described the content as relevant, while a minority of reviews described the content as somewhat (sufficiently) relevant (14 %) or not relevant (2.5%).

Table 4. Coded Reviewer Comments on the Topic of Relevance

Code	n	%	Example
(+) Relevant	782	81.2	"The content is up-to-date, including discussion of social media and references to recent works of media criticism" (Trouten, 2014)
(-) Somewhat relevant	135	14.0	"For the book to be relevant, examples must be up-to-date and meaningful to students. I find the many examples in this book interesting but from students' point of view, the examples may not be as appealing" (Lee, 2014)
(-) Not relevant	24	2.5	"The text used an old version of the Project Management Body of Knowledge which limits its usefulness. The essential project management concepts are still valid but the latest research and trends aren't evident here" (Griep, 2016)

**Note*. Counts do not total 100% because we excluded comments that did not respond to this area of concern.

In line with the multifaceted prompt question, reviewers often commented on the currency of the content, the relevance of the content for a contemporary student audience, whether or why the content might grow dated in time, and how difficult it might be to update the content over time to ensure the textbook's continuing relevance and use. Reviewers indicated appreciation that many textbooks must strike a balance between enduring but also current content reflecting changes in the field of study, society, and culture:

> The climate section is so well written that I believe that this has at least 5 years of life in it, before it might become painfully obvious that it needs updating. The policy sections are written in a general enough way that I also think they will stay current. (Lajtha, 2014)

Reviewers were generally optimistic that open textbooks would have reasonable longevity, updates would be feasible, and instructors could supplement dated content with current materials.

Comments we coded as *(-) Somewhat Relevant* often addressed issues such as the lack or currency of graphics,

photographs, or references to current culture or information sources (e.g., blogs/videos); dated sources, statistics, cases, or examples; and the need to address new developments in a rapidly changing area of study. "The content mostly references experts and other texts from the 1990s and 2000s with most major references ending by 2007. It seems the text could use some updating on recent developments" (Carroll, 2016). Comments also indicated reviewer appreciation for the desirability but challenge of encompassing enduring content and current content vulnerable to rapid obsolescence:

> It deals relatively well with controversial topics such as deforestation and climate change. Its treatment of such issues is current and up-to-date, but broad enough that the book will remain relevant in the short term to medium. It is less successful at presenting new themes, currents, and debates within cultural geography. The book's depiction of this subfield is somewhat outdated already (Williams, 2016)

When describing the content as not relevant, reviewers related relevance to the coverage of important content but also to engaging students, sometimes speaking from their experience teaching with the open textbook. "There were not many current or recent developments included. This made it particularly hard to engage the students" (K. Miller, 2017). Some reviewers indicated that a lack of relevance rendered the textbook unusable. At the same time, reviewers often commented on how easy or difficult it would be to make the content relevant: "In short, this textbook is due for a major revision .... This revision would be a major undertaking and a challenge for the authors" (Mitra, 2017).

Overall, in the Relevance section, educators provided rich insights and observations that could inform the work of open textbook authors and publishers.

Clarity

The prompt for this segment asked educators to consider if the textbook content is "written in lucid, accessible prose, and provides adequate context for any jargon/technical terminology used" (see Table 1). Reviewers addressed the presence or absence of these characteristics, but also numerous qualities they perceived to be related, including the flow of ideas, level of language, and consistency of author voice. Table 5 summarizes our finding that 80.4% of reviews that described the text as clear. A minority (15.6%) of reviews found clarity somewhat lacking and only 3.6% of reviews indicated that the text was not clear.

Positive evaluations illustrated reviewer attention to elements perceived as contributing to clarity, including the level of language; humor and tone; the inclusion of context and definitions for terminology and clear explanations of key concepts; concision; supplementary media; text formatting; and the ability of the text to engage learners and communicate the content to specific or varied audiences:

Table 5. Coded Reviewer Comments on the Topic of Clarity

Code	n	%	Example
(+) Clear	774	80.4	"This text is extremely and unusually well-written and clear. This is one of the text's greatest selling points" (Goren, 2014)
(-) Somewhat clear	150	15.6	"For the majority of the content, the clarity is excellent. However, at times, I needed to read through the entire section, then revisit [*sic*] early paragraphs [*sic*] to get the entire message" (Colvin, 2014)
(-) Not clear	25	3.6	"The organization of the text is laborious—both for student and instructor" (Richars, 2017)

**Note*. Counts do not total 100% because we excluded comments that did not respond to this area of concern.

> The book is written in a clear and easy-to-understand style that is adequate for those who are novice to educational psychology .... Although the book is written by two authors, it's hard to detect the difference between the authors' writing. (Koç, 2015)

Even positive reviews often included suggestions for further improving the clarity of the text, elements such as formatting or the accessibility or tone of the writing.

When reviewers evaluated clarity as sufficient but flawed, they often indicated how clarity was lacking in specific instances or varied across the text, and how clarity could be improved:

> I like the way the text is written to be approachable for a wide variety of students. I think balancing chemical reactions could be done in a clearer way, as it is hard to tell which numbers are the co-efficients [*sic*]. (Smith, 2017)

Reviewers also commented on relationships between the clarity of the text and a wide variety of elements such as long quotations, jargon, definitions, detail, inadequate chapter transitions, and non-ideal examples, which might detract from students' comprehension of what evaluators perceived to be generally clear content:

> This textbook is easy to follow and the inherent technical jargon of GIS is explained well. Repetitive sentences and unnecessary phrasing, however, abound, and a few of the context examples the authors provide are too in-depth for an introductory textbook. (Widener, 2015)

In comments we coded as *(-) Not Clear*, reviewers described similar issues detracting from clarity, but as so significant or prolific that these would negatively affect readers' comprehension. "Text was heavy, with lengthy meandering discussions on different approaches

to a topic that were too in depth before even discussing the actual topic" (Matoush, 2017). These reviewers indicated frustration reading the text and concern that their students would experience even greater difficulty. Overall, however, reviewers found the text to be clear enough for classroom use.

Consistency

The prompt for this section pointed to the internal consistency of the text in terms of terminology and framework. Table 6 describes our finding that a large majority (83.2%) of reviewers described the open textbooks as consistent, while 12.7% described some weaknesses, and just 3.0% described the content as not consistent.

Table 6. Coded Reviewer Comments on the Topic of Consistency

Code	n	%	Example
(+) Consistent	801	83.2	"Consistent terminology is used throughout. Even better, the terminology the author uses is consistent with the language of the cases and the rules. This will help to limit unnecessary student confusion" (Sherowski, 2015)
(-) Somewhat consistent	122	12.7	"The framework of the book is internally consistent, though I think it takes on too much to have true consistency. Compared to similar books on the market for introductory textbooks I think it may cover a bit too much to provide real consistency" (Bell, 2017)
(-) Not consistent	29	3.0	"Each chapter in this book was written by nine individual writers in what seems like an environment where collaboration was not emphasized. This means that each chapter is tonally very different from the others" (Weedman, 2017)

**Note*. Counts do not total 100% because we excluded comments that did not respond to this area of concern.

Reviewers who described the content as consistent highlighted organizational frameworks, consistent terminology, and relationships between these characteristics and reader comprehension. "The framework of the book is perhaps its greatest strength. The author has framed research concepts within the proper epistemological and ontological frameworks, which allows her even-handed treatment of qualitative and quantitative methods to cohere well within each section" (DeCarlo, 2017). They described consistency in terms of theoretical and pedagogical approach; language, writing style,

and author voice; and formatting and layout.

When consistency was acceptable but lacking, reviewers related this to potential use or comprehension issues for educators or students: "The content in each chapter does match the content in other chapters, but the poor placement of the chapters only makes that consistency accessible if one were to really dig" (Harker, 2016).

Comments we coded as *(-) Not Consistent* indicated that effective use of the text could be significantly impeded by the absence of consistency. "The book felt like it was almost two separate books put together - which is part of why it can be considered so comprehensive" (Brown, 2015). These comments also suggested that the intellectual framework of a book may be communicated through structural and formatting elements, such as section divisions. "The text needs some work in terms of the consistency of its structure/framework. A less minimal approach to section/subsection headings would help" (Shapiro, 2017).

Modularity

Reviewer comments suggested high educator interest in modularity. Table 7 documents our findings that 62.5% reviews described the open textbooks as modular, 26.4% deemed modularity sufficient but flawed, and 2.2% found it lacking.

Table 7. Coded Reviewer Comments on the Topic of Modularity

Code	n	%	Example
(+) Modular	806	62.5	"The book was clearly developed with an eye for modularity" (MacTavish, 2014)
(-) Somewhat modular	104	26.4	"The text does have some self-referencing. Presenting only certain sub-units might require some work" (Aspelund, 2015)
(-) Not modular	21	2.2	"Modularity is not the best in the book. It takes time to explore and navigate through chapters. Once you are in a chapter then it's pretty well organised" (Bhargava, 2016)

**Note*. Counts do not total 100% because we excluded comments that did not respond to this area of concern.

Reviewers who found the open textbooks to be modular described this modularity. They indicated how chapters, sections, sidebars, exercises, and "key takeaways" sections organized and divided the content and made it possible to use the content in part or whole, or in a different order than presented by the text. They commented on how commendable modularity could be improved further; whether or not the text self-referenced; how the sequencing of

the content compared to commercial textbooks with the same focus; and how the text's modularity related to the varied or consistent structure of associated courses: "This text is designed with modularity in mind .... In the instructor's information, the authors are even kind enough to include several sample syllabi with a variety of lengths and subject emphasis" (Rittenbach, 2017). Evaluators highlighted modularity as directly related to instructor integration. "The text materials can easily be divided into subunits suited to the instructor's purposes, who may easily pick and choose which materials to use or not to use" (Eubanks, 2017).

When reviewers indicated that a textbook was modular but not to the extent that it could be, they often indicated how and where modularity was lacking, and provided constructive suggestions for improving modularity:

> Modularity is important to me because I often like to cover topics in a little different order than is traditional. For example, I prefer to discuss conservation of momentum before Newton's laws. As with most texts, this text makes it difficult to do that as the chapter on conservation of momentum makes extensive reference to force. I feel that the modularity of this text is typical for the genre. (Rees, 2016)

Reviewers noted it might not be possible to make modular use of a text that was not structured to be divided or reordered. "The sections and exercises have some modularity for utilization as stand-alone elements. However, as a whole the text builds from a foundation in theory and proceeds through increasingly complex methodological approaches making a reorganization challenging" (Raley, 2017).

When evaluating open textbooks as not modular, reviewers described teaching considerations, such as dividing the text into reasonable reading assignments for students and to align the text with lessons or class sessions. "Since the modularity is based on relatively topic-centered arrangement, reorganization and realignment of subunits does not seem easy to do" (Zuganelli, 2015).

Organization, Structure and Flow

Reviewers commented on organization in several sections of the reviews (e.g., Clarity and Modularity) but the prompt for this section was simple. "Please comment on the book's organization/structure/flow. The topics in the text are presented in a logical, clear fashion." Table 8 documents our findings that 78% of reviews described the open textbook as organized, 15% indicated the organization was flawed, and 3% described the content as not organized.

Reviewers who complemented the textbook's organization often described it as being a key attribute. "The organization of this book is one of its greatest strengths" (Pihlaja, 2017). They compared the textbook's organization to that of related, commercial textbooks, made recommendations for further improving strong organization, and specified how the organization was

Table 8. Coded Reviewer Comments on the Topic of Organization

Code	n	%	Example
(+) Organized	751	78.0	"The organization is fine. The book presents all the topics in an appropriate sequence" (Gorecki, 2016)
(-) Somewhat organized	174	15.0	"I struggled with the flow of the content. I would like to see definitions and Cultural Intelligence model presented early in the text. I would also encourage chapters to be logically and clearly connected to your model" (Friedman, 2016)
(-) Not organized	29	3.0	"The main weakness of the textbook is in the ordering of topics within chapters. It tends to jump from one topic to the next without a proper transition, e.g. Middle America chapter discusses the colonial era and then, afterwards, addresses Native American cultures as they existed before the colonial era" (Timms, 2014)

**Note*. Counts do not total 100% because we excluded comments that did not respond to this area of concern.

logical and would likely serve learners, even if the content sequencing did not align with the reviewer's course curriculum. "I noted no issues with organization or structure, and the ordering of topics appears reasonable. The author's sequence is not identical to what I am used to teaching, but it appears logical, workable and perhaps superior" (Moore, 2016).

When reviewers found the organization to be sufficient but flawed or atypical, they indicated how it might be improved:

> Content in chapters 1 and 2 are thorough, but uneven in their treatment of topics and would benefit from reorganization .... The whole book would have benefited from having resources listed at the end of each chapter, in addition to being individual links on which the reader must click to examine. (White, 2017)

Criticisms often related to the inconsistent quality of the logic, content organization, sequencing, and flow, and suggested that inconsistency affected the unity of the text overall.

Reviewers who described the organization as poor or lacking indicated how this could impede learning. "The organization of the text is very unusual. Air resistance is discussed in the chapter on forces .... This organization is detrimental to student learning" (Zurcher, 2015). They expressed considerable care and concern for student learning, and suggested ways the text could be improved or educators could mitigate these issues.

Interface

Reviewer comments included attention to navigation, images, charts, and display features. The majority of reviews (83.7%) positively described the open textbook as free of interface issues, while 10.8% described some issues and 1.5% indicated that the interface was insufficient (Table 9).

Table 9. Coded Reviewer Comments on the Interface

Code	n	%	Example
(+) No interface issues	602	83.7	"The text is a plain pdf, and the images within it all look fine. No problems with the interface at all" (Fountain, 2015)
(-) Some interface issues	254	10.8	"As I mentioned above, there is no index, glossary or table of contents .... As with many pdfs, the product on the screen is not as crisp as what a student might view in a physical book with nicer graphics" (Krutz, 2015)
(-) Insufficient interface	14	1.5	"Very poor. There was very little use of color, pictures, and other graphics" (Trombley, 2016)

**Note*. Counts do not total 100% because we excluded comments that did not respond to this area of concern.

Positive evaluations of interface were generally straightforward, sometimes indicated that reviewers had tested multiple electronic formats of the text, such as PDF and EPUB, and often evidenced that reviewers had checked navigation and hyperlinks. "The book has a solid interface .... All of the links within the table of contents and hyperlinks [*sic*] within the text function" (Wilcox, 2016). Reviewers also commented on how interface facilitates and enhances a reader's interaction with textbook content. "Colors for text, fonts, [*sic*] headings are all appropriate and help to focus the reader's attention to what is truly important" (Gort, 2017).

When reviewers evaluated the interface as flawed, they commented on how this negatively affected their reading experience and offered suggestions for improvement. "The book had a great deal of white space and frequent blank pages .... A bit of work to improve the design and make the book more visually interesting (colors, less wasted space, etc.), certainly wouldn't hurt" (Maurer, 2017). Their comments reflect the extent to which they value and expect typical interface elements and affordances of electronic publication including text searchability and hyperlinked navigation. "At 700+ pages, there's no table of contents and little in the PDF that allows for quick and easy browsing without intense scrolling. I'd recommend a hyperlinked TOC" (Marx, 2016). Reviewers often described very specific

interface flaws, such as the absence of page numbers, that authors and publishers could resolve in future editions.

When reviewers described the interface as insufficient, they drew connections to the ways in which visual elements, and text formatting such as bolding or italicizing, can engage readers and support comprehension and learning. "The textbook contains only words .... The lack of color, images, and charts may make it difficult for students to remain engaged" (Sanders, 2017). They also mentioned formatting errors and approaches that might distract or deter readers and negatively impact learning. "Simply put; there are just to [*sic*] many errors in equation (both chemical and mathematical) formatting to make this text useable [*sic*]" (Philbin, 2014).

Grammatical Errors

Table 10 documents our finding that the majority (81.6%) of reviews described the grammar as sound. Just 13.4% of reviews indicated limited or minor grammar issues, and only 1.5% described significant issues.

Table 10. Coded Reviewer Comments on the Topic of Grammatical Errors

Code	n	%	Example
(+) No grammar issues	786	81.6	"The grammar is sound" (Bess, 2016)
(-) Limited or minor grammar issues	129	13.4	"Written in a conversational, informal style the book is by and large free of grammatical errors. There are about a dozen minor mistakes, such as concatenated words or repeated words" (Anghel, 2017)
(-) Significant grammar issues	14	1.5	"The book still needs some work in this regard. Pronouns don't always agree with the antecedents, and I noted several shifts in voice in the text" (Jenkins, 2017)

**Note*. Counts do not total 100% because we excluded comments that did not respond to this area of concern.

Comments describing sound grammar indicated the absence of issues or even commended the grammar. "The grammar is excellent. It is written in a scholarly format but does not confuse readers with undefined jargon or superfluous words" (Tusing, 2017). Reviewers were often inclined to make related comments concerning the extent to which the textbook's language was formal or conversational. "I have not noticed any grammatical errors. In terms of style, I would say that it is colloquial, friendly English. The material is certainly technical but there is a consultative, inviting [*sic*] tone behind the technical discussion" (Fowler, 2015).

When reviewers found the grammar to be flawed, they cited specific issues. "At times, sentences run

on, with the sentence looking more like a paragraph and having multiple commas. Otherwise, the writing looks clean, although at quite a high level" (Weimerskirch, 2014). They often qualified the scope and extent of grammar issues. "There are occasional text and grammatical errors found in the book. However, these have been quickly corrected in the online version when a report was submitted" (Tiffany, 2017). Reviewers who described significant grammar issues frequently expressed concern with finding these issues in a published textbook. "The book is written as one might spontaneously talk. Grammar is not a top priority of this friendly style of writing. Words are used improperly and punctuation is sometimes used improperly" (Tullis, 2017). They expressed concern about using substandard text with students. "As an instructor in an English department, I do not want to put a textbook in front of my students that does not model consistent and clean sentences at a level they should aim for" (Parker, 2016).

Cultural Relevance

Responses to this prompt were more diverse than in other review sections, which seems unsurprising given that reviewers may have diverse cultural perspectives and that cultural relevance may be more subjective than other measures of quality. Many comments seemed to reflect the influence of the prompt: reviewers often described the text as neutral, not insensitive, or not offensive. Table 11 documents the results of our primary coding, which found that 66.6% of reviews described the content as culturally relevant.

Table 11. Coded Reviewer Comments on the Topic of Cultural Relevance

Code	n	%	Example
(+) Relevant	641	66.6	"This textbook is inclusive and comprehensive and is written in a respectful tone" (Kompelien, 2016)
(-) Somewhat relevant	236	24.5	"There was not a strong emphasis on cultural relevance. On a positive note there were no issues with cultural insensitivity either. General psychology textbooks tend to be a bit culturally neutral, however there could be added cultural implications to the topics" (Shelton, 2017)
(-) Not relevant	31	3.2	"Not offensive, but could have included examples/exercises that were multicultural" (O'Halloran, 2016)

**Note*. Counts do not total 100% because we excluded comments that did not respond to this area of concern.

While many of the comments we coded as *(+) Relevant* described the textbook as neutral or not culturally insensitive, some applauded clear attention to diversity. "Barkan does an excellent job of addressing social problems, which by nature can be controversial, in a manner that is neither culturally insensitive nor offensive. Barkan uses examples that are diverse, multicultural, and inclusive" (Jones, 2015). Reviewers also noted examples of attention to issues of diversity and inclusion:

> Dr. Collins really opens the opportunity to have lengthy discussions about social inclusiveness—how even in a single country, social issues affect how businesses relate to their marketplace. It was among the first examples of this level of dialogue I've seen in a textbook targeted at introductory business. (Gore, 2015)

Additionally, reviewers commented on a perceived absence of problematic bias. "The book is free of race, class, gender or other bias and provides broad and varied examples of strategies appropriate for a [*sic*] teaching students with diverse generational backgrounds as well as emotional and learning diversities" (C. Miller, 2017).

Some reviewers described the absence of explicit attention to diversity as flawed but not egregious, and found attention to diversity an improvement over commercial textbooks:

> While the content does not appear to be biased or insensitive/offensive, only about 1/3 of the photos of people in the text represented racial diversity (which likely isn't the author's intention; there may have been limited options for open-source images to use in the text). However, this representation of diversity was actually higher than some of the other texts I have been sent by publishers recently. (Krzmarzick, 2017)

Other reviewers suggested that while a text might not be culturally offensive, a lack of explicit attention to diversity is flawed in failing to reflect diverse learner identities. "There is no cultural offensiveness but not much diversity in examples and students [*sic*] names either. Marginalized students (of color, with disabilities, of different sexuality or gender) would not see themselves reflected much" (Swing, 2017).

Reviews that described the open textbook as not culturally relevant indicated the absence of clear attention to diversity. "The book is not inclusive of diversity. The majority, if not all, of the pictures within the text are of Caucasians" (Blyer, 2017). One reviewer commented that while a textbook's content may not have specific cultural relevance, it may still address perspectives that have been excluded or underrepresented:

> All other examples relate to non-human species and represent scientific or natural resources questions embedded within a profession that has historically been predominantly white and

> male. It would have been forward-thinking, and more directly relevant to a greater proportion of the students I currently teach, if the author had included examples relevant beyond this perspective. (Tuominen, 2016)

Discussion

The primary finding of this study is that a large number of educators found the open textbooks they reviewed to be of sufficient quality for use in teaching and of comparable or better quality than commercial textbooks. This substantiates previous studies of faculty perceptions that open textbooks can compare favorably to commercial textbooks (Jhangiani et al., 2016; Woodward et al., 2017). Our study adds to the research literature by analyzing comprehensive open textbook reviews authored by a large number of educators who possess disciplinary expertise and familiarity with comparable commercial textbooks. Our findings increase the evidence base supporting educator adoption of open textbooks and that is available for consideration by educators who are skeptical of OER quality (Allen & Seaman, 2014; Belikov & Bodily, 2016).

As we analyzed specifically the free responses included in these open textbook reviews, our study provides a more nuanced perspective on open textbook quality assessment. In prior studies where educators have used Likert-scale items to evaluate open textbooks (Kimmons, 2015), the educators have not also provided free responses that may illuminate their quantitative ratings. The free responses we analyzed help us understand what educators value in discrete areas of concern such as grammar and cultural relevance, and how educators perceived the quality of these open textbooks in each area of concern and overall.

Although the reviewers often found flaws with the textbooks, these were most often minor, the majority of evaluators' comments indicated that these flaws did not render the textbook unacceptable for adoption in teaching, and reviewers often asserted that these flaws could be corrected. Additionally, many reviewers stated that similar flaws are frequently present in commercial textbooks, and that educators need to account for flaws and imperfect curricular alignment when adopting any textbook. This corroborates results from other studies that perceived textbook quality is influenced by the context for use (Woodward et al., 2017).

Reviewers found the open textbooks to be more flawed in terms of organization, flow, and writing consistency. In comparison, commercial textbooks may more typically have a single author voice resulting from substantial professional editing. Nonetheless, reviewers found the modularity of the open textbooks to be strong (making it straightforward for educators to extract, or reorder students' use of, specific sections). The overall quality of a textbook may represent a balancing act between quality characteristics with negative relationships, where increased modularity results in decreased consistency, for example.

One unexpected observation was the variation in reviewer comments concerning the consumption of open textbooks in a digital format. Some reviewers expressed concern that a digital textbook may not support student learning as effectively as print. The digital format of a textbook has been shown to have little impact on learning (Rockinson-Szapkiw et al., 2013) and whereas students may wait to or never purchase commercial textbooks due to cost, students may freely access electronic open textbooks during and beyond their courses (Office of Distance Learning & Student Services, 2019). Reviewers often recognized cost savings, portability, adaptability, and searchability as affordances of the digital format of open textbooks, and that the digital format makes it easier to distribute the open textbook and integrate it with other course materials.

Study Limitations

While the results of this study are promising, some limitations and delimitations are noteworthy. First, the reviewers may have had more positive bias toward open textbooks than the general educator population. These reviewers self-selected to complete an OEN workshop about OER that may have positively influenced their perceptions and evaluations of open textbooks. In many cases, the educators received a small stipend from their institution to recognize the time and effort they invested in attending a workshop and authoring a review. The presence of this stipend may have led some educators to be kind in their reviews. However, reviewers were explicitly encouraged to be honest in their reviews; they were advised that their reviews would be published as-is to the OTL, without editing; and the reviewer responses include clear criticisms. Second, as this study is delimited to the American context, these evaluations may have limited international applicability. Third, as we are actively engaged and immersed in research and the community discourse concerning OER, we likely make assumptions, and have specific biases, about OER. We attempted to separate our personal assumptions and ensure reliability by conducting a significant extent of double coding, and by comparing our coding. Nonetheless, our biases and perceptions concerning OER may have influenced our interpretation of the reviews as we coded. Our limited application of the *(-) Cons of open textbooks* code, for example, may reflect our bias toward open textbooks. Finally, the self-reported reviews are subjective and other educators' evaluations of these open textbooks might be different. Thus, our interpretation of the reviewers' free responses is open to human interpretation, even given our efforts to adhere to best practices of qualitative research and accommodations to human error. To counteract this possibility, and to ensure trustworthiness and transparency of our work and results, we have described our work in detail and included direct quotations from reviewers.

Implications for Future Research

Although we often use peer review as a proxy for quality, other measures, such

as student performance after using a textbook, are often considered to be valid. Studies that evaluate other measures of open textbook quality would support a more holistic view of the quality of these open textbooks. Additionally, the educators reviewing these textbooks had not necessarily used them in teaching. Studies exploring educators' perceptions of these open textbooks during and following use would further our understanding of how educators evaluate these textbooks in practice. Further analysis of this or similar data could be conducted to compare trends across evaluation criteria and any patterns across evaluations to highlight strengths and weaknesses of open textbooks.

Conclusion

In this study, we analyzed educator reviews of open textbooks across 10 areas of concern. The results of this study were encouraging: overall, reviewers found the open textbooks to be of sufficient quality for use. While open textbooks present advantages and disadvantages as learning resources, educators generally evaluated the quality of these open textbooks as comparable to or better than that of commercial textbooks. Reviewers indicated that the open textbooks have value as resources for teaching and learning in higher education that can also reduce students' course materials costs and afford both educators and students the benefits of open licensing.

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APPENDIX A

Reviews Quoted

This appendix provides references for the open textbook reviews we quote in this paper. Reviews are listed alphabetically by reviewer name.

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Evaluation of Open Educational Resources Among Students in Blended Research Methods and Statistics Coursework

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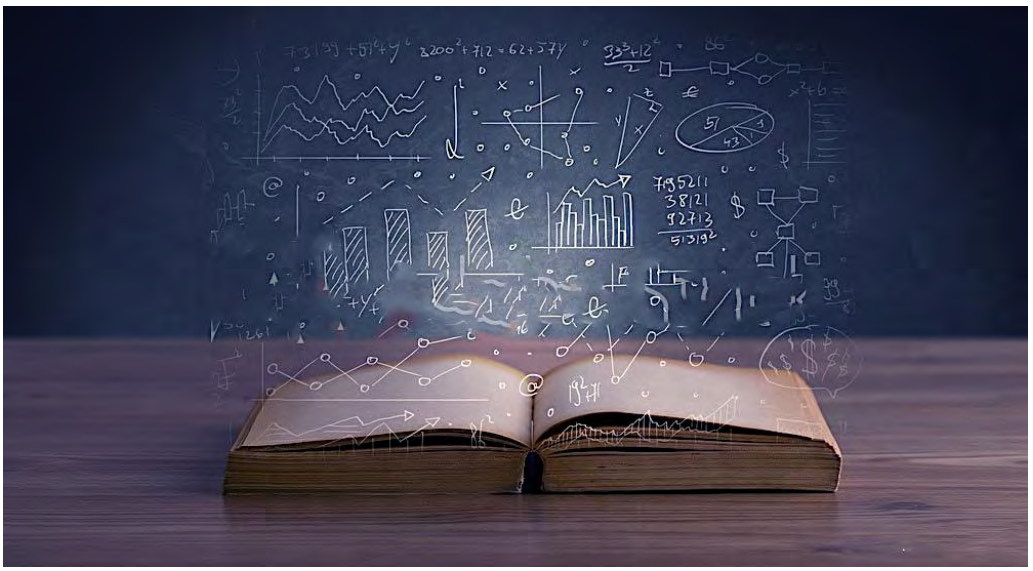

Abstract

This article presents relevant research and a preliminary investigation of Open Educational Resources (OER). The authors of this study utilized OER to replace a traditional textbook in a two-course blended research methods and statistics sequence for working adult undergraduate psychology students. The authors aimed to consider student satisfaction with OER, and more importantly, to see if OER produced different grades when compared to prior course sections taught with a traditional textbook. Twenty students consented to participate in an online satisfaction survey. Qualitatively, participants reported that OER were concise, relevant to coursework, applicable, and had strong visual presentations. Quantitatively, grades significantly improved following implementation of OER. Although grades improved when OER replaced a textbook, this finding should be interpreted with caution. Limitations of this evaluation include a small sample size and self-reporting biases. These results provide preliminary evidence that students may ben-

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efit from implementation of OER. However, ongoing research into the perceptions, challenges, and effectiveness of OER is necessary.

Keywords: open educational resources (OER), research and statistics, applied psychology

Author note: This research was conducted at Albright College

Evaluación de recursos educativos abiertos entre estudiantes de métodos de investigación combinados y cursos de estadística

Resumen

Este artículo presenta una investigación relevante y una investigación preliminar de los Recursos Educativos Abiertos (REA). Los autores de este estudio utilizaron REA para reemplazar el libro de texto tradicional en una secuencia combinada de métodos de investigación y estadísticas de dos cursos para estudiantes adultos de psicología que trabajan. Los autores tenían como objetivo considerar la satisfacción de los estudiantes con los REA y, lo que es más importante, ver si los REA producían calificaciones diferentes en comparación con las secciones de cursos anteriores que se enseñaban con un libro de texto tradicional. Veinte estudiantes dieron su consentimiento para participar en una encuesta de satisfacción en línea. Cualitativamente, los participantes informaron que los REA eran concisos, relevantes para el trabajo del curso, aplicables y tenían presentaciones visuales sólidas. Cuantitativamente, las calificaciones mejoraron significativamente después de la implementación de REA. Aunque las calificaciones mejoraron cuando REA reemplazó a un libro de texto, este hallazgo debe interpretarse con cautela. Las limitaciones de esta evaluación incluyen el pequeño tamaño de la muestra y los sesgos de autoinforme. Estos resultados proporcionan evidencia preliminar de que los estudiantes pueden beneficiarse de la implementación de REA. Sin embargo, es necesaria una investigación continua sobre las percepciones, los desafíos y la eficacia de los REA.

Palabras clave: recursos educativos abiertos, investigación y estadística, psicología aplicada

混合研究方法与统计学课程学生对开放教育资源的评价

摘要

本文展示了开放教育资源（OER）相关研究并提出一项初步探究。作者在混合研究方法与统计学课程中使用OER代替传统课本，对象为在职成人本科心理学学生。作者旨在考量学生对OER的满意度，更重要的是，与使用传统课本的课程部分相比，OER是否会让学生取得不同的学习成绩。20名学生同意参与网络满意度调查。定性来看，参与者汇报认为OER内容简洁、与课程相关、可应用、并具备强烈的视觉效果。定量来看，在执行OER之后学生成绩显著提高。尽管用OER取代课本后成绩有所提升，但这一研究发现应进行慎重诠释。该评价的限制包括样本量小和自我汇报偏差。结果就学生可能从OER学习中获益提供了初步证明。然而，有关OER的感知、挑战及有效性的持续研究是必要的。

关键词：开放教育资源，研究与统计，应用心理学

Introduction

This article presents the process and preliminary investigation of Open Educational Resources (OER) replacing a textbook in a two-course blended research methods and statistics sequence for working adult undergraduate psychology students. We taught students in four sections replacing a textbook with OER, which are "high quality educational materials" that are "freely licensed, remixable learning resources" (https://hewlett.org/strategy/open-education/#overview, para. 1).

OER are very versatile and can be changed to fit an instructor's lesson plan or classroom needs (Ikahihifo et al., 2017). Creative Commons Licensing allows instructors to modify materials to fit their courses (Kinskey et al., 2018). The acceptance of open textbooks is rapidly gaining appreciation, most notably in the field of psychology, which has been a forerunner in the OER movement (Robinson-Keilig, 2017). With the growing number of OER available, it is difficult to determine the quality and credibility of the material. The perception and willingness to use OER may be affected by the perceived quality of the material (Ikahihifo et al., 2017). Gerung (2017) conducted an extensive comparison of psychology students using OER versus traditional textbooks (with over 2200 students recruited from six different schools). This research indicated that while OER may be viewed favorably by students, and viewed as more applicable

to life than traditional textbooks, in two studies, students using OER did worse on a quiz than those using the traditional textbook. In fact, although students did not do as well on quizzes, their self-perception of learning was higher than those using traditional textbooks. Following Gerung's (2017) conclusion that student perception does not always equate to measured learning, the study described in this article focused on one OER implementation in a blended research methods and statistics sequence. This evaluation aimed to consider student satisfaction with OER, and more importantly, to see if OER produced different outcomes when compared to prior course sections taught with a traditional textbook.

Research on OER

Past research has focused on cost, student satisfaction, and quality of materials. Ikahihifo et al. (2017) hypothesized that costs for institutions and students who adopt OER for an online or hybrid class would be significantly reduced. Researchers recruited 11 faculty members in different fields of study at Reynolds Community College to adopt and regularly use OER in their classes. Most classes used open digital textbooks via OpenStax, which gave the students the option to pay for a printed version. At the end of the semester, students were asked via email to complete a survey based on their experiences. Students rated their perception of the quality level of the OER used during the course and their level of engagement with the OER compared to traditional course materials. The majority of responses (n = 206) were positive, with 54.9% (113 students) rating their experience as a 5 (excellent), and about 39% (81 students) rating their perception of the OER's quality as good to favorable. Only 12 students (less than 6%) considered the OER's quality to be less than traditional course materials.

Students regarded OER as favorable for several reasons. The first was the ease of use of OER (Ikahihifo et al., 2017). Students found it was easier to adapt their resources to different subjects and classes and that the materials were tailored to their courses. When asked to rate their level of engagement with OER, 74% found OER to be more engaging than traditional textbooks. Ikahihifo et al. (2017) suggested, based on the cost of comparable course materials, that students and the institution saved $34,000 in that trial semester.

Kinskey et al. (2018) surveyed 209 students in the Minnesota state system to assess attitudes towards various resources. They found that 58.6% of respondents had avoided purchasing textbooks due to cost in the past, and that 85% of participants had taken courses in which a text was required but was not needed (for a variety of reasons, including instructor not assigning readings and students not needing the textbook to complete assignments). Students responded to different types of resources and indicated having similar attitudes (mostly neutral) to traditional textbooks, online textbooks, and OER. When asked to identify what they liked about OER, they mentioned cost, ease

of having materials within their learning management system, and ability to interact with the materials. The negatives of OER for these participants included needing to access them online, not enjoying reading online, and not being able to highlight or underline. Quality of materials was also viewed as a potential concern.

Comprehensively investigating both satisfaction and learning outcomes, Hilton (2016) compiled 16 studies that examined the perceptions of OER by college students and professors and how well OER affected students' learning outcomes. Studies analyzed included those published in peer-review journals where OER were the primary learning materials and those that included perceptions of students and instructors of OER quality and their educational outcomes (Hilton, 2016). Over 46,000 students participated in the 16 studies analyzed by Hilton (2016). In the nine studies pertaining to OER efficacy, only one yielded results of a lower learning outcome. Three of the nine significantly favored OER, three showed no difference, and two did not report statistics. The analysis of these studies has limitations that should be noted. For example, the studies' utilization of OER in the courses varied in each study; some printed out digital textbooks to use in a more traditional manner, while others used completely digital resources.

While Hilton (2016) looked at OER research in a variety of courses, Lovett et al. (2008) specifically investigated OER implementation in statistics education through the Open Learning Initiative (OLI) of Carnegie Mellon University. OLI involved designing web-based courses that facilitate learning without an instructor (or to complement traditional face-to-face instruction). Although over a decade ago, this research might be relevant to implementation of OER in statistics. Lovett et al. (2008) conducted three studies in Fall 2005, Spring 2006, and Spring 2007 to assess the effectiveness of an OLI statistics course offered completely online or in hybrid format. All studies involved comparison with student performance in a traditional statistics course. The third study also involved the assessment of an accelerated learning hypothesis that argued that in a hybrid OLI statistics course, students would learn just as much in a significantly shorter amount of time compared to students taking the same statistics course in a traditional format during a full semester. For all three studies, no significant differences were found in test scores for the OLI course students and traditional course students. However, in the third study, students who took the accelerated hybrid OLI statistics course learned as much or more in eight weeks than the students who took the traditional course that spanned fifteen weeks. The students in the accelerated hybrid OLI course also retained as much information as those who took the traditional course. The authors argue that hybrid OLI courses facilitate more effective and efficient learning in accelerated courses. They posit that this is because the students who took the accelerated hybrid OLI statistics course

were better prepared for the face-to-face class meetings than is typically the case. This higher level of preparedness was facilitated by active student engagement in the multiple practice and comprehension checking opportunities that were offered prior to the class meetings. The students also received immediate and tailored feedback on their work, which allowed for self-reflection of understanding of the material. As a result, this preparedness allowed for a more efficient and effective use of the students' time with the instructor during class meetings (Lovett et al., 2008).

Most recently, Magro and Tabaei (2020) surveyed 66 students enrolled in eight different sections of psychology courses at Touro University that were using OER textbooks. Although this was part of a larger pilot program that also investigated the role of the library in OER implementation, the findings regarding the student outcomes were most meaningful. A majority of students (68%) preferred the quality of the OER textbook over the commercial textbook. Further, when the students' grades in courses using OER were compared to students' grades previous to OER implementation, the students enrolled in the courses using OER had higher grades. This study also provided corroboration of previous findings by Hilton et. al (2016) in which students in courses using OER may achieve higher grades than those students who took the same course using a commercial textbook.

In a similar study, though in chemistry and not psychology coursework, Springer (2019) investigated several factors related to OER adoption. Most relevant to this literature review, Springer (2019) investigated student perception and student performance, comparing final grades (homework, examinations) from those taught with OER (n = 22) and those taught with a textbook (n =16) in a chemistry course at a small, rural community college. Although this grade comparison revealed significant differences between grades with slightly higher grades for the OER group, the small sample size does not allow for a significant effect size or the ability to make a firm conclusion about the comparison. Springer (2019) suggested that these data at least indicate that learning outcomes were not adversely affected by OER implementation. Regarding perception of OER, students felt that OER seemed as high quality as a textbook (but did not see the textbook used in the comparison group). Students varied on perception of usability of OER, with some expressing concerns about the time it took to "load" the customized OER materials used in this study.

Blended Research Design and Statistics Course

There is evidence that, in spite of potential challenges, students often have neutral or even positive responses to OER (Farrow et al., 2015; Islim & Cagiltay, 2016; Kinskey et al., 2018; Springer, 2019), and that most preliminary studies of OER have not found lower learning outcomes (Hilton, 2016; Lovett et al., 2008; Springer, 2019). Due to the risks (in quality and student satisfaction) of moving forward in OER imple-

mentation without formal evaluation of materials, this study investigated student response to implementation of OER in a two-part, blended research methods and statistics sequence in an accelerated program for working adult undergraduate students en-route to earning their Bachelor of Science in Applied Psychology.

In this program, research methods and statistics coursework is taught in two sequenced courses (with a grade after each course). The learning objectives encompass concepts from research methods and statistics for behavioral sciences (Table 1). Integrating these two content areas has resulted in higher learning outcomes and improved exit assessments of research skills when compared to non-integrated coursework (Barron & Apple, 2014) and higher psychology concentration achievement test scores (ACAT) compared to the national norm (Pliske et al., 2015). Our OER included two open textbooks, one for research methods (see Price et al., 2017) and one focused more heavily on quantitative analysis (see VassarStats Concepts and Implications of Inferential Statistics at http://vassarstats.net/textbook/). In addition, a research methods chapter from the NOBA collection was utilized (see http://nobaproject.com). Readings from these open textbooks were required for each of the 10 weeks of the course. Readings were embedded in the learning management system that linked directly to the required readings. The Price et al. textbook and the NOBA chapter could also be downloaded or printed as PDFs. This provided the students with multiple ways to interact with the materials that best suited their preferences.

Table 1. Course Objectives in Sequence

Course Objectives Related to Research Methods:

Students will be able to

- **CO1:** Identify and define different research methods, including their advantages and disadvantages, so that you can discriminate between good science and opinion (i.e., fact or fiction) (APA Goals 2 and 3).
- **CO2:** Execute critical thinking skills in relation to experimental methodology (APA Goals 2 and 3).
- **CO3:** Employ APA writing style for all sections of a research paper, in preparation for the Applied Research Project (APA Goals 2 and 7).
- **CO4:** Construct a soundly designed research question to investigate a topic of interest (APA Goal 2).

Course Objectives Related to Quantitative Methods:

Students will be able to

- **CO5:** Distinguish between the two broad types of statistics: inferential and descriptive (APA Goal 2).

- **CO6:** Calculate descriptive statistics: tables, graphs and measures of central tendency and variability (APA Goal 2).
- **CO7:** Recognize the probabilistic basis of inferential statistics (APA Goal 2).
- **CO8:** Compute various inferential procedures (APA Goal 2).
- **CO9:** Distinguish which statistical procedure is appropriate for particular research designs.
- **CO10:** Execute the steps in hypothesis testing and be able to interpret the results (APA Goal 2).
- **CO11:** Demonstrate proficiency in SPSS (APA Goals 2 and 6).

Methods

Participants

The four sections of our blended Research Methods and Statistics course, taught by three different faculty members, followed an identical structure of incorporating OER in a learning management system. All students received an email invitation asking them to take a survey on their experience with OER following completion of their course. Twenty students consented to participate in an online quantitative and qualitative satisfaction survey evaluating OER. As this survey was similar to a course evaluation, the students were not asked to provide demographic information to assure anonymity.

Materials and Procedure

First, students received an email invitation to complete the evaluation after their final meeting of their course. Interested students clicked on the web link and were directed to an online survey. They read and indicated their consent on an informed consent page. Then, participants completed the survey, which involved rating their satisfaction on several closed- and open-ended questions that allowed them to describe their experiences (survey questions and responses are in Table 2). Finally, participants read a debriefing statement. This entire process occurred online.

Results

Student Satisfaction

Regarding quantitative questions, responses were predominantly positive (Table 2). For open-ended questions, responses were also generally positive (selected participant quotes are in Table 3). Prominent themes in student responses were identified through phenomenological analysis, utilizing the process outlined by Creswell and Poth (2018). This method involves compiling a list of statements that participants used to describe their experience and organizing the important statements into commonly experienced themes. Themes identified as "strengths" were that the OER used were *concise, relevant to coursework,* and *applicable* and had *strong visual presentations*. Conversely the themes expressed as "weaknesses" included the students' desire to hold an actual textbook.

Table 2. Responses to close-ended survey questions

The research methods readings for this course were:				
	Strongly agree	Agree	Disagree	Strongly disagree
Helpful.	30% (6)	55% (11)	5% (1)	10% (2)
Adequate to help me understand materials.	40% (8)	40% (8)	20% (4)	0% (0)
Confusing.	10.53% (2)	21.05% (4)	57.89% (11)	10.53% (2)
Too long.	5% (1)	10% (2)	65% (13)	20% (4)
Detailed enough to understand course content.	25% (5)	50% (10)	25% (5)	0% (0)
Appropriately matched with course content	35% (7)	60% (12)	5% (1)	0% (0)
The statistics readings for this course were:				
	Strongly agree	Agree	Disagree	Strongly disagree
Helpful.	25% (5)	50% (10)	15% (3)	10% (2)
Adequate to help me understand materials.	20% (4)	45% (9)	20% (4)	15% (3)
Confusing.	5.26% (1)	42.11% (8)	42.11% (8)	10.53% (2)
Too long.	0% (0)	10% (2)	65% (13)	25% (5)
Detailed enough to understand course content.	15% (3)	40% (8)	30% (6)	15% (3)
Appropriately matched with course content.	25% (5)	60% (12)	5% (1)	10% (2)

*Percentages represent percent of those participants who answered each question. Number of participants who indicated each response appears in parentheses following the percentage.

Table 3. Selected Student Quotes about OER

The readings were brief and relevant to the topics covered in class.
The readings did help me when I was confused or didn't understand a concept.
It was very helpful and easy to read for a subject that I thought was going to be impossible to figure out!
The readings were relevant to the topics discussed in classes and provided additional information to gain a greater understanding of the material.
I appreciated that the readings were not "unnecessarily" excessive.

Grade Assessment

To assess whether final learning outcomes are affected by the implementation of OER, the authors also compared final grades of students who utilized OER to the most recent groups of students who utilized the traditional textbook (prior to OER implementation). As noted, this coursework is split into two blended courses, so grades were analyzed for the first and second halves (Table 4). Grades for both halves included points for participation, homework assignments, and examinations. Regarding the first half of the course sequence, an independent-samples *t*-test found that grades improved following implementation of OER, $t(54) = 2.081$, $p = .04$. The average percentage grade for students taught with OER ($M = 95.56$, $SD = 5.21$) was slightly higher than the average of those taught just prior to OER implementation, using a traditional textbook ($M = 92.03$, $SD = 7.46$). Regarding the second half of the course sequence (which includes a cumulative final examination), an independent-samples *t*-test found that grades improved following implementation of OER ($t(54) = 2.239$, $p = .029$). The average grade for students taught with OER ($M = 93.02$, $SD = 6.05$) was slightly higher than the average of those taught just prior to OER implementation, using a traditional textbook ($M = 87.76$, $SD = 11.23$).

Table 4. Results of Independent Sample t-Tests

Dependent Variable	M	SD	t	p
First Half of Course Sequence				
Grades before OER	92.03	7.46	2.081	.04
Grades after OER	95.56	5.21		
Second Half of Course Sequence				
Grades before OER	87.76	11.23	2.239	.02
Grades after OER	93.02	6.05		

Discussion

These results provide preliminary evidence that students may experience satisfaction and possible academic benefits from implementation of OER and free online resources. Students were generally positive in their responses to questions about OER in this course, although most questions indicated that a small group of students did not like the chosen materials (Table 2). Other studies have found that students have neutral or positive responses to OER in terms of satisfaction and perceived effectiveness (Farrow et al., 2015; Islim & Cagiltay, 2016; Kinskey et al., 2018; Magro & Tabaei, 2020; Springer, 2019).

Although grades improved when OER replaced a textbook for assigned readings (similar to most studies included by Hilton, 2016 and the third of Lovett et al.'s, 2008 three studies), we interpret this finding with caution because many other factors could explain this difference (e.g., possible instructional changes, differences in class size, improvements in utilization of the learning management system), and these comparison groups were not the result of random assignment. Further study in the area of impact of OER on final grades is necessary to ensure that a transition to OER does not adversely affect grades or learning of course competencies. These authors echo Springer's (2019) concern of small sample size, preventing firm statements about the grade comparison. This study and the Springer (2019) study both demonstrate methods for evaluation during OER implementation that can be used to evaluate transitions to OER, making sure that the transition does not have a negative effect on learning. Both studies also provide ongoing support of OER consistent with findings of studies with larger sample sizes (e.g., Hilton, 2016).

Some faculty members might face difficulties with OER. For example, depending on the source, links might need to be checked and updated. There might be difficulty finding sources in more specific or obscure content area. Finally, some students may simply prefer a traditional textbook, which occurred for a small number of students in this research (although readers should note that the current study included adult learners and students of different age groups who might have different experiences). Kinskey et al. (2018) had similar findings that highlight concerns with OER with regard to the challenges of changing/disappearing resources and difficulty with accessibility,

Limitations of this evaluation include a small sample size and self-reporting biases. In addition, student perception (the primary focus of this research) does not indicate the quality of materials. It might also be the case that the chosen OER materials allowed for more effective teaching, thus improving student performance. For the grade comparison, groups were not randomly assigned. Additionally, although grades were used for a comparison and assignments were designed to assess learning of course objectives, grades are not the only measure of true learned knowledge. Finally, demographic information

was not requested to protect participant anonymity and student comfort in giving honest responses, so we have limited information about the sample, other than indicating that this was a sample of working adult students.

Relevant to the limitations of this study (and Springer, 2019), Grimaldi et al. (2019) suggested that studies that find positive effects of OER should be interpreted with caution (especially those with small sample sizes). They further argued that researchers examining effectiveness of OER should take into account textbook access rate prior to implementing OER. According to the results of their studies testing the access hypothesis, the higher the access rate for traditional textbooks prior to the implementation of OER, the more difficult it is to find significant effects of OER.

This study provides some support that OER and free online resources might not affect learning or grades (also found by Hilton, 2016), and provides some student response data that indicate that, other than some limitations, some students prefer OER and free online materials that are matched to course objectives. Specific to the focus of this study, implementing OER in research methods and statistics, this study and that of Lovett et al. (2008) provide preliminary evidence to support OER in these courses, although implementation should be evaluated. Research should continue to delve into student (and faculty) perception of OER, identifying and managing challenges, and ongoing assessment of student learning.

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Exploring Faculty Perceptions of OER and Impediments to Their Use: A Multi-Institutional Study

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Abstract

Understanding faculty perceptions about Open Educational Resources (OER) is a vital step for those hoping to support the growth of OER initiatives at higher education institutions. Faculty members' perceptions of OER often influence their interest in adopting open educational practices and their willingness to seek out support from campus staff. To explore how faculty members across their four institutions feel about open education, the authors developed a survey to discover faculty members' (1) perspectives on, (2) barriers to, and (3) beliefs about OER use. The survey corroborated past research findings that faculty often have difficulty finding time to locate and evaluate OER, and that there is a need among the ac-

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ademic community to better compensate educators for their work developing open content. More notably, the authors discovered that faculty who are aware of library support services and other institutional OER initiatives are more engaged in open educational practices and willing to explore OER, regardless of their prior experience with open education.

Keywords: open education, Open Educational Resources (OER), barriers, incentives, OER initiatives, academic libraries

Explorando las percepciones de los profesores sobre los REA y los impedimentos para su uso: un estudio multiinstitucional

Resumen

Comprender las percepciones de los profesores sobre los REA es un paso vital para quienes esperan apoyar el crecimiento de las iniciativas de REA en las instituciones de educación superior. Las percepciones de los miembros de la facultad sobre los REA a menudo influyen en su interés en adoptar prácticas educativas abiertas y su voluntad de buscar el apoyo del personal del campus. Para explorar cómo los miembros de la facultad en sus cuatro instituciones se sienten sobre la educación abierta, los autores desarrollaron una encuesta para descubrir las perspectivas de los miembros de la facultad (1), (2) las barreras y (3) las creencias sobre el uso de REA. La encuesta corroboró los resultados de investigaciones anteriores de que los profesores a menudo tienen dificultades para encontrar tiempo para localizar y evaluar REA, y que existe una necesidad entre la comunidad académica de compensar mejor a los educadores por su trabajo en el desarrollo de contenido abierto. Más notablemente, los autores descubrieron que los profesores que conocen los servicios de apoyo bibliotecario y otras iniciativas institucionales de REA están más comprometidos con las prácticas educativas abiertas y están más dispuestos a explorar los REA, independientemente de su experiencia previa con la educación abierta.

Palabras clave: educación abierta, REA, barreras, incentivos, iniciativas REA, bibliotecas académicas

探究教师对开放教育资源（OER）的感知以及OER使用障碍：一项多机构研究

摘要

理解教师对开放教育资源（OER）的感知对那些希望支持OER倡议在高等教育机构中发展的人士而言尤为关键。教师对OER的感知经常会影响其在采纳开放教育实践方面的兴趣，以及其在寻求学校员工支持方面的意愿。为探究4个机构的教师对开放教育的感知，作者设计了一项调查以了解教师在OER使用方面的感知、障碍和信念。调查证实了以往的研究发现，即教师经常难以有时间对OER进行定位和评价，并且学术界需要更好地补偿教育者在开发开放内容方面付出的劳动。更重要的是，作者发现，那些了解图书馆支持服务及其他机构OER倡议计划的教师会更多地参与开放教育实践，并更愿意探究OER，不管他们是否此前接触过开放教育。

关键词：开放教育，OER，障碍，激励，OER倡议，学术图书馆

Introduction

Open Education has become an impactful tool for ensuring equity, affordability, and student success in higher education. This is thanks to the freedoms permitted by open educational resources (OER), "teaching, learning, and research resources that are free of cost and access barriers, and which also carry legal permission for open use" (SPARC, n.d.). As more instructors adopt, adapt, and author these resources, it is important for support staff to understand the support that instructors on their campuses might need.

The authors aimed to examine disciplinary differences in the use of OER among faculty in four North American universities—Iowa State University (Iowa State), North Carolina State University (NC State), Pennsylvania State University (Penn State), and the University of Arkansas (Arkansas)—and identify any specific support those faculty need in relation to their discipline. Although the survey could not get a statistically significant sample of any single discipline, some noteworthy findings were identified.

These include:

- Institutional support is a major factor in faculty awareness of, interest in, and creation of OER.
- Barriers to OER adoption are less related to personal concerns and

more related to a lack of support and time needed to adopt and adapt resources.

- Faculty still have misconceptions about what open resources are and how to get support for integrating them in their courses.

Background

The academic library has housed services like Course Reserves and institutional repositories for decades, serving as a space for sharing learning materials and research alike. Consequently, the library has become a natural home for Open Education initiatives (Kleymeer et al., 2010), and libraries have quickly become an integral part of the work being done in the Open Education space over the past six years (Jensen & West, 2015). As more OER services are becoming embedded in the academic librarian positions, it is vital that librarians examine how our services are being used and whether they are truly meeting the needs of our users.

To learn more about the perceptions of faculty toward OER on college campuses, many libraries turn to institutional surveys. In a meta-analysis of some OER perception studies, Hilton (2019) identified two major trends: first, although the use of OER does not have a strong, direct impact on student learning, OER do not harm student learning either (Croteau, 2017; Lawrence & Lester, 2018; Winitzky-Stephens & Pickavance, 2017); and second, a majority of faculty and student surveys have positive opinions on the use of OER in their courses, even when compared to commercial textbooks (Gurung, 2017; Ikahihifo et al., 2017; Jhangiani et al., 2018).

Faculty perceptions are particularly impactful because instructors are usually the decision-makers about the materials they use in class. It is vital that faculty understand the pros and cons of different types of course materials and the support available to faculty through their institutions, so they can take advantage of the support available to them. Regardless of whether the use of OER could be positive in their classrooms, faculty will not make this change if they lack the time, money, or ability to find and integrate OER into their courses, three major barriers to adopting open content (Belikov & Bodily, 2016; Martin, 2018). As Zhadko and Ko (2019) stressed,

> OER initiatives must include opportunities for faculty to share their successes and have established structures to ensure that faculty are supported and rewarded from the very start of the course planning processes.

To respond to the possibility that faculty needs are still going unmet on our own campuses, this survey was developed to explore faculty interests and needs related to OER. In addition, the survey hoped to determine if there were any disciplinary differences in faculty members' interest in and needs for adopting OER. Specifically, the survey was conducted to determine instructors' current knowledge and awareness

of open educational resources (OER), instructors' awareness of and interest in open pedagogy, what material formats and types of educational resources instructors in specific disciplines are most likely to utilize, and incentives and deterrents to instructors' use of OER.

Methods

We administered a mixed methods survey through Qualtrics. The survey questions were adapted from the *Identifying OER Needs by Discipline* survey guide (Elder, 2018).

The final survey instrument included 22 to 35 questions depending on each participants' answers. These questions were divided into five discrete sections: experience with OER, awareness of institutional support, interest in OER, open educational practices, and open licensing. These sections included a mix of multiple choice, open-ended, and Likert scale questions. The entire survey took approximately 22 minutes for participants to complete. To get an understanding of the disciplinary breakdown of faculty participating in the survey, a pre-populated list of disciplines was used and adapted from the International Standard Classification of Education (ISCEd) to attempt to limit any bias toward a particular institutional breakdown of subject areas.

Data Collection

Once the survey questions were refined, we loaded them into the Qualtrics platform, which was used for distribution and data collection. Participants were recruited through an anonymous survey link sent out via email to the faculty at each researchers' institutions after IRB approval was acquired. For Iowa State University and the University of Arkansas, the link was sent to a list of all faculty. At Penn State, the link was distributed through the Open Liaison Program listserv and the Affordable Course Transformation grant initiative listserv. The Open Liaison Program has one volunteer at each campus library who is responsible for disseminating open related content to their location or subject area, which ensured the survey would be sent out at each campus location. The Affordable Course Transformation listserv ensured that it would reach individuals who had formally worked on OER. Due to institutional requirements, North Carolina State's survey was sent to a sample of 25% of all faculty (roughly 500 individuals) meeting eligibility requirements.

Email recipients self-selected themselves for participation. Reminders were sent two weeks after the original email to the same sample to encourage completion of the survey.

Data Analysis

Once the survey was closed in Qualtrics, the data was exported to Excel for basic quantitative analysis, with more complex analyses—such as cross-tabulations—handled within the Qualtrics interface.

For open-ended survey questions, thematic analysis was used to qualitatively analyze participants' re-

sponses and sort them into themes (Braun & Clarke, 2006). As Braun and Clarke (2006) emphasized, "a theme represents some level of patterned response or meaning within the data set" (p. 82). Since the data was gleaned from open-ended responses alone, there was not an extensive amount of data to categorize; however, some themes were identified in the results below.

Results

Respondents represented a diverse set of disciplines, demographics, and years of teaching experience. Overall, 177 people responded to the survey, with 136 answering more than 60% of the questions.

Of those 136 people, a plurality were associate professors (30%), with another 19% full professors and 18% assistant professors. Combined, 67% of respondents were on the tenure track. Significantly, almost a quarter (24%) were full-time non-tenure-track faculty, with an additional 6% in part-time non-tenure-track roles. A handful (1%) of clinical professors and professional staff with teaching responsibilities also completed the survey.

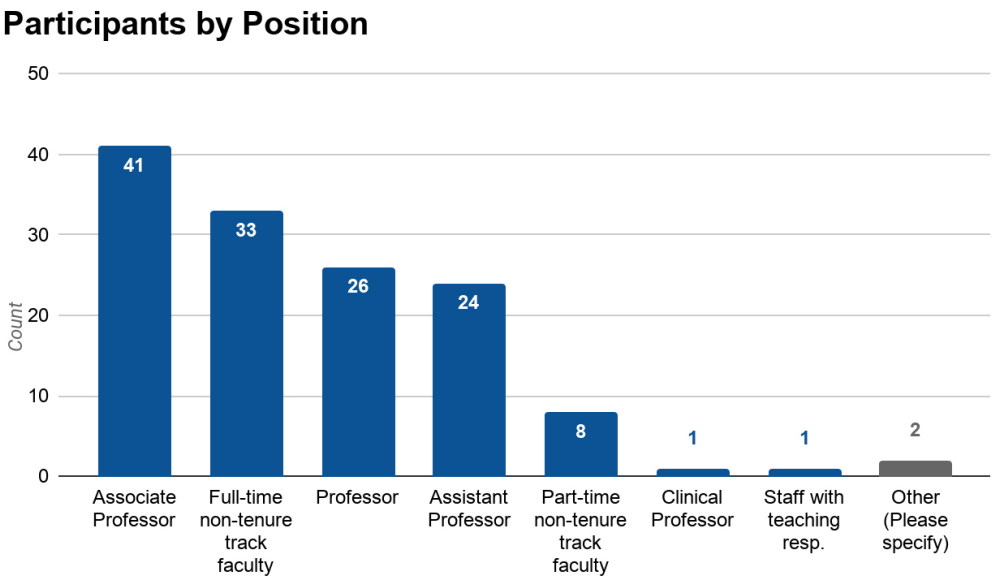

Figure 1. Participants by position

Respondents reflected a wide range of teaching experience. Again, there was no simple majority but a plurality (30%) had more than 20 years of teaching experience. Twenty-four percent reported experience between six and 10 years, while another 15% had experience between three and five years. A similar percentage reported experience between 11 and 15 years (13%) and between 16 and 20 years (13%).

Table 1. Participants by year(s) teaching

Years Teaching	Participants (Count)	Participants (Percent)
More than 20 years	41	30%
16-20 years	17	13%
11-15 years	17	13%
6-10 years	33	24%
3-5 years	21	15%
1-2 years	2	1%
Less than 1 year	5	4%

Respondents came from an equally diverse set of disciplines. The Arts and Humanities (23%) and Natural Sciences, Mathematics, and Statistics (21%) were most highly represented, with Social Sciences (18%) and Engineering (14%) close behind. While several other disciplines were represented, none were reported by more than 7% of respondents.

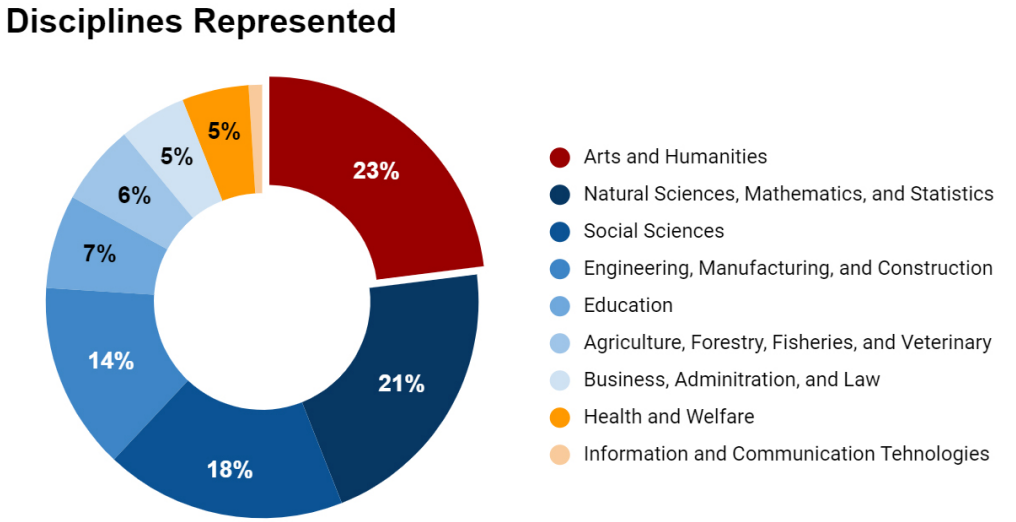

Figure 2. Participants by discipline

Within the broad umbrella of Arts and Humanities, literature and languages (10%) and history and archeology (9%) were best represented, with music, fine, and performing arts (7%) and fashion and design (2%) also reflected.

Within the Natural Sciences, Mathematics, and Statistics, biology (8%) and math and statistics (8%) were the best-represented, while physics (6%), chemistry (5%), and earth and environmental sciences (4%) were also listed.

Within the Social Sciences, psychology (7%), political science (6%), and journalism (5%) were the most common, with economics (4%), sociology (3%), and library science (1%) also represented.

OER Use and Interest

The majority of respondents had not used OER, but pockets of use appeared among instructors with more than 20 years of experience (13 of 41) and six to 10 years (12 of 33). Significantly, while OER use seems to become more common for instructors with more years of teaching experience, instructors with between three to five years of experience represented an outlier, with the majority of instructors in that group (13 of 21) reporting that they had used OER.

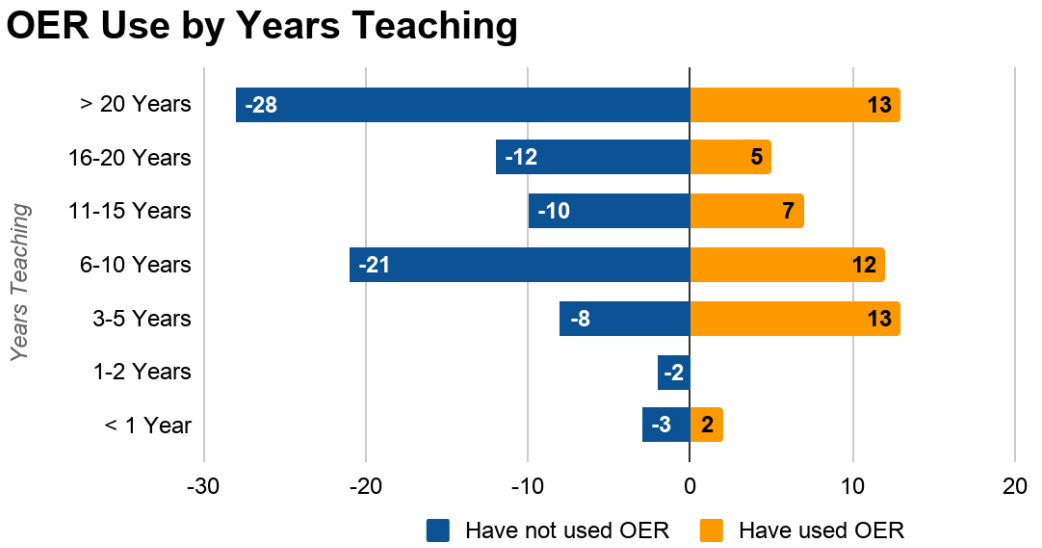

Figure 3. Experience with OER: Year(s) teaching

Within the set of instructors that reported having used OER (n = 52), adapting was the most reported approach, with creation and a combination of creating and adapting also reported.

Associate professors were the group that reported greatest engagement with OER, leading the field in creating, adapting, and using a hybrid of adapting and creating. Full-time non-tenure-track instructors also reported both adapting and hybrid engagement, as did professors, although neither group reported simply creating OER without some adapting. At the other end of the spectrum, part-time non-tenure-track faculty reported creating OER but not adapting or using a hybrid approach.

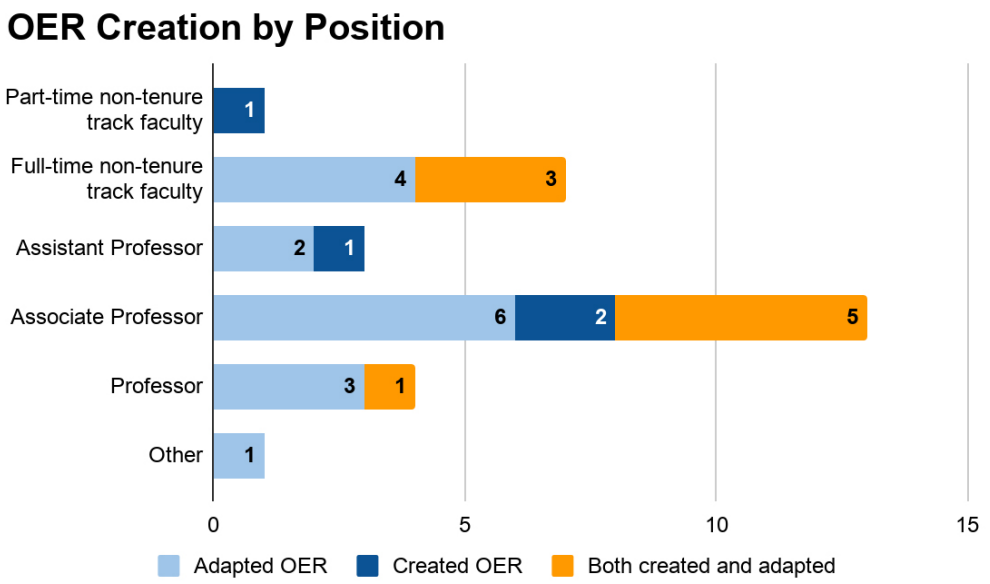

Figure 4. OER creation by position

Respondents also included a large number of instructors (75%) who were interested in OER but have not yet used them, while a much smaller set (nine) indicated that they were not interested in OER and thus had not used them. While these numbers are encouraging and align with national surveys suggesting that instructors are interested but may need more support (Seaman & Seaman, 2018), it is also possible that these results reflect some self-selection bias, since those who chose to complete, or at least participate in more than half of the survey, are more likely to be interested in OER than those who did not participate.

Qualitative responses suggest that instructors' interest in OER is largely due to its ability to increase cost savings for students, but faculty also noted interest in OER to fill gaps so that they could find or develop materials for their niche subjects. Respondents also expressed interest in the ability to update materials in a timely manner and to contribute unique content to their discipline that might not otherwise be published.

The Impact of Institutional Support for OER

One finding revealed by the survey is that faculty want more institutional support, whether they are aware of the support currently available to them or not. Question 13, "*Do you feel that your institution provides sufficient support for instructors in your discipline who are interested in adopting OER? Why or why not?*" received 94 responses out of 136 total responses. When the answers for this question were coded by theme (see Table 2), the most populous category

was "unsure of the support available." Fifty-four percent of the participants from Iowa State (n = 20) and 71% of the participants from NC State (n = 5) fell into this category, as did 43% of the participants from Arkansas (n = 9). This is a significant finding for us at the institution level because as coordinators of OER initiatives, we want faculty to know that our services exist so they can utilize those services accordingly.

Table 2. Awareness of initiative by institution

Institution	Positive	Could be better	Unsure of support	Negative*	Total (Count)
Iowa State	9	6	20	2	37
Pennsylvania State	12	10	4	3	29
Arkansas	10	1	9	1	21
North Carolina State	0	1	5	1	7

*Negative comments largely skewed toward a lack of top-down institutional or departmental support rather than against the OER initiative or coordinator specifically. (See Appendix 1 for the complete list of responses to Question 13).

As shown in Table 2, Penn State had a significantly higher number of respondents who knew there was an initiative available to them, with 12 reporting "positive" awareness and 10 reporting "could be better," for a total of 76% of respondents being aware and approving of the initiative (n = 22). This suggests that Penn State's communication strategy is effective at making some faculty aware of the programs offered to them. Their communication strategy includes having news stories shared in Penn State News and emails sent out by the Deans of Academic Affairs, the Open Liaisons, and instructional designers. In addition, previous OER grantees are asked to share their experience in the program directly with their peers and new applicants are required to complete a mandatory consultation about their proposed project where they are briefed on the support offered by the program at Penn State. It is worth noting that at Penn State the survey was delivered to instructors who had participated in creating OER directly in addition to others, and that this targeted survey dissemination may account for the higher awareness of services offered among their respondents.

Although this finding is useful for understanding whether faculty are aware of OER support services, it also belies a gap in what faculty think of as institutional support and what those of us in the role of OER coordinator think it means. As personnel dedicated specifically to support faculty in the adoption, adaptation, and authoring of OER, we see ourselves and our services as institutional support. However, faculty do not necessarily make that connection when they think of institutional support for OER.

For example, even where there are support staff and services available, participants frequently answered that they expect their institution to offer time, course releases, and honorariums as forms of support for adopting, adapting, or authoring OER for their classes. In addition, even though Question 13 asked about support at the institutional level, 10% of respondents expressed concern about a lack of personal time to devote to OER adoption and development.

Finally, when faculty respondents did recognize that OER is supported at the institutional level, they further noted that it is not supported intentionally at the college/department level. They also indicated that contingent faculty (fixed term, adjunct vs. tenure track) are not respected within their departments and have little opportunity to develop course materials or make programmatic change. So, while a President or Provost may support OER as part of their strategic initiative for affordability, open education work does not trickle down as something important at the department level. In addition, faculty indicated that using OER in their courses is often "primarily framed as a money-saving measure rather than a pedagogical choice." This framing is not necessarily bad, but it is notable that participants pointed it out. Saving students money is an important and worthwhile goal for an OER initiative; however, marketing OER as *only* a money-saving measure disregards the fact that these are "educational resources" that ought to support the learning needs of students.

The Impact of Institutional Support on OER Use

Often, institutional support takes the form of a grant initiative to provide a small stipend, dedicated personnel, or a combination of both, to help faculty adopt, adapt, or author OER for the classes they instruct. The authors of this study were interested in how aware faculty were about the grant initiatives at our institutions, and whether they have created or adapted OER. As shown in Table 3, faculty were largely unaware about whether their institution offered grants for adapting or authoring OER. In total, 73 of 136 faculty respondents were unaware that their institution provides funding opportunities for OER adoption or creation.

Table 3. OER creation: Awareness of grant program

	Have you created or adapted OER?				
Does your institution provide grants?	*Neither created nor adapted*	*Adapted*	*Created*	*Both created and adapted*	*Total (Count)*
No	0	0	0	1	1
Unsure	12	8	0	0	20
Yes	11	8	4	8	31

Why is this significant? First, we each offer this support and we want our community to utilize it. Such a low level of awareness among respondents suggests that each of our institutional OER initiatives could do more to generate awareness of our work. Secondly, when asked what types of support they want from their institution, 37 of the 76 faculty who were unaware of grant programs available indicated interest in receiving "financial incentives to adopt or create OER (grants, stipends)." This group of respondents would likely benefit greatly from learning about the existing initiatives on their campus, and as OER coordinators, we need to know that these faculty exist to market our services to them.

Finally, the faculty who were aware of our grant programs were also much more likely to have adopted, adapted, and created OER. This may be because these respondents were able to take advantage of the support available to them, or perhaps because faculty who are most interested in OER were willing to keep up with their institutional initiatives. More research is needed to determine the exact cause for this correlation.

Barriers to OER Use

In addition to exploring participants' interest in and awareness of local support, our survey also explored barriers to faculty members' use of OER. For Question 15, "*Which of the following do you see as barriers to your use of OER?*" participants were asked to choose options from a list of potential barriers. The full breakdown of responses is shown in Figure 5 below.

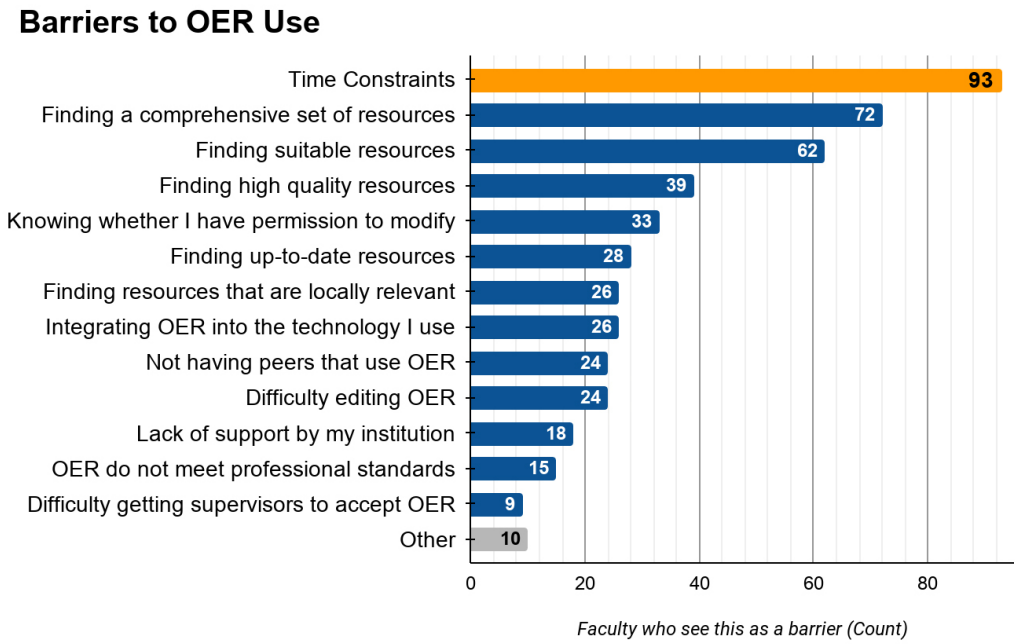

Figure 5. Barriers to OER Use

Participants could choose multiple options from the lists of variables, but the clear frontrunner from the results was "time constraints," with 94 faculty members (69%) selecting this option as a barrier to their use of OER (one participant commented this in the "Other" category). Despite this clear lead, after analyzing the results the survey runners identified a more prominent concern among faculty was the ability to locate appropriate open content for their course. One hundred and seventeen participants (86%) selected at least one of the barriers related to finding OER from the survey's options (finding comprehensive materials, finding suitable materials, finding high-quality materials, finding up-to-date materials, and finding locally relevant materials). It should be noted that the terms "suitable" and "high quality" used on the survey should have been rephrased for clarity before dissemination because they are both subjective and closely related. Because of this, the use of both terms may have confused the participants and limited their ability to respond accurately.

Open-ended responses in the "Other" category of Question 15 noted that a few respondents (n = 3) were uninformed about OER, and that this lack of experience led to an inability to choose barriers from the options listed. Other responses noted that the participant did not have any interest in OER.

It is thought-provoking to compare these responses with those drawn from an earlier study of faculty perceptions. Belikov and Bodily (2016) analyzed 218 open responses regarding barriers to OER adoption provided by a portion of over 2,000 faculty. They coded the responses, creating 10 primary categories: need more information, lack of discoverability, confusing OER with digital, general positive perception, not applicable to faculty, lack of time to evaluate, cost benefits, equal to traditional materials, pedagogical benefits, and lack of quality (Belikov & Bodily, 2016). Many of their findings were echoed by our survey respondents. Time constraints still pose a barrier to faculty members' adoption and exploration of OER, for example. However, unlike the Belikov and Bodily survey, fewer of the responses to our survey indicated a lack of participant understanding of OER. This may be due to an increased awareness of OER among faculty, but it is more likely because we did not provide an explicit option for this barrier, since three of the responses in the "Other" category indicated a lack of understanding about OER.

Incentives Requested by Faculty

As we noted in the "institutional support" section, many respondents were unaware of the resources available to them on a campus level. To explore the types of institutional support that participants need to complete their work in more depth, participants were asked "What sort of OER support would you like to receive from your institution?" The results to this question were not wholly surprising, with most faculty (n = 49) asking for help locating and evaluating content or receiving targeted disciplinary support (Figure 6 below).

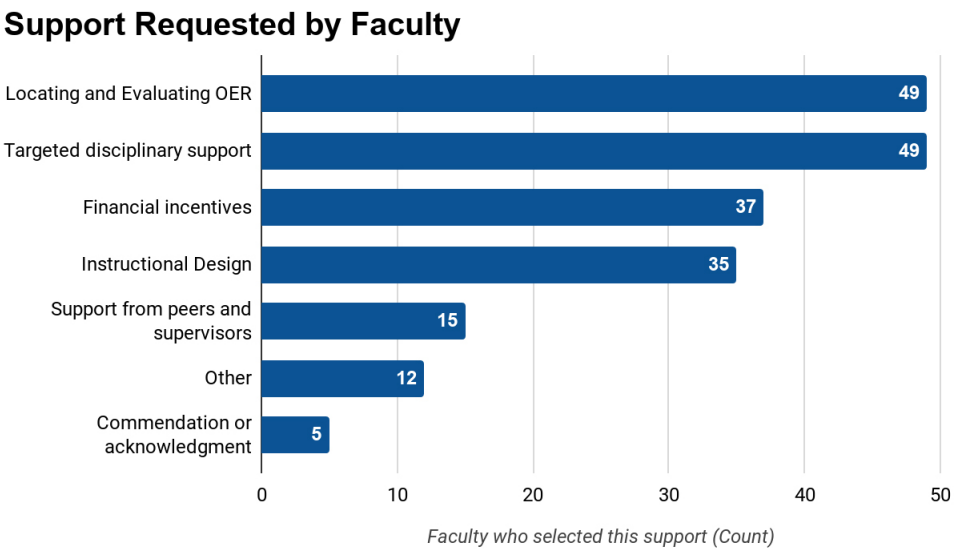

Figure 6. Support requested by faculty

The third and fourth most popular options were for financial incentives (n = 37) and instructional design support (n = 35). In addition to these, 15 participants asked for support from their peers and supervisors and five noted that commendations for their work would improve their use of OER.

Among the open-ended answers to the "other" category (n = 12), the most commons responses (n = 5) belied confusion about what an OER actually is, and asked for "explanations of what OER is," a "fundamental [sic] understanding of what OER is and how it can be applied," and similar support through education. In addition to these, two responses asked specifically for compensation for developing courses that use OER, either monetarily or through course release time. These responses show that we were correct in our analysis of the previous question, and that we should have provided an option of "lack of understanding about OER" for respondents to select in Question 15.

Discussion

Two points which require more discussion are findings that may be skewed by perceptions of specific terms, "locating and evaluating OER" and "institutional support," respectively. These phrases were used within the survey guide because they seemed clear to the survey runners, but in both cases, they were misconstrued or perhaps not clear enough to the participants. This is explored in more depth below.

The first phrase that we believe may have skewed our results was "locating and evaluating OER." The survey paired these two types of assistance, locating and evaluating, as a single option in multiple survey questions. However, responses from faculty that they "had

no idea" what OER are led us to question this pairing's use and what faculty really meant when selecting this option. Assistance selecting resources might involve curating lists of resources from many search tools and repositories, and this assistance might be more easily provided than assistance evaluating resources. In addition, instructors are considered subject experts and it is up to them to determine the viability of educational resources for each course they teach. While OER evaluation rubrics can be used to help faculty evaluate open resources, some respondents might find it patronizing to be offered support evaluating content for their own course. Alternatively, because many of our respondents were either unaware of OER or unaware of the support available to them, they might have had difficulty both locating content and locating rubrics for evaluating OER. Therefore, separating out these two potential barriers could have helped the survey yield more specific and actionable results.

In another response that was affected by the respondent's perception, faculty answering Question 13 equated "institutional support" with institutional support from administrators specifically. This led many to state that their institution did not offer OER support, despite the existence of an OER initiative on their campus. This is echoed in case studies from other institutions, where faculty have stated that they were prompted not to participate in OER initiatives based on the feedback of their department chairs (Soper et al. 2018). While the survey runners expected to see more comments about the support already available through their initiatives, it is important to consider how faculty members' conceptions of the phrase "institutional support" differ from our own. If faculty want institutional support as they define the term, it may be worthwhile for OER coordinators to consider ways we can approach institutionalizing support by investing in more top-down incentives for OER use. This work has become more common across OER initiatives in North America over the past two years, and is exemplified in the *Open Education Strategic Plan* at Kwantlen Polytechnic University (Jhangiani, 2018).

Limitations

The biggest limitation to this study stems from the amount and quality of data it was able to gather. Although the survey returned 178 responses in total, this sample makes up only 1.4% percent of the populations being studied (approximately 12,300 faculty total), and 42 of the responses returned were incomplete. This low return rate was likely due to the length of the survey and the complicated nature of the topic. With 19 participants stating that they are "not at all confident" about their knowledge of OER, it is remarkable that the 22-minute survey received as many responses as it did.

Besides the general response rate to the survey, there were also some missed opportunities with questions that the team could have included. For example, we did not ask faculty to share

their contact information for follow-up. This meant that, as we encountered responses that were confused about OER and wanted to get access to more basic information, we did not have the means to follow up with these participants with guidance. In addition, following up the survey with interviews could have given us a more in-depth look at some of the interesting responses to the survey's open-ended questions, and we could have further explored topics that we had not anticipated being so prominent, such as the need for course release time and a lack of awareness of institutional support available.

Because of the survey's low participation numbers, the team could not get a statistically significant sample of any single discipline, so the original concept of this survey, to figure out if there are disciplinary differences in OER use, could not be studied in any meaningful way. If this survey were to be run again, the research team would choose to provide incentives to participants and to follow up with interviews to receive better participation numbers and a greater depth of responses.

Next Steps

Because the survey's results came in during the Spring 2019 semester, the institutions' OER initiatives have been able to utilize these results in various ways over the past calendar year.

At Iowa State, the findings were used to communicate initiative needs to administrators. The data collected through this survey was incredibly useful at articulating what faculty think about our OER initiative—or in our case, what faculty don't think. The most integral finding for ISU was that faculty members had no idea what OER were or that support was available on campus. This gave us the opportunity to create a new web presence for our initiative, alter our marketing tactics, and secure funding for an upcoming Affordability Summit on campus, slated for Fall 2021.

At Penn State, these findings were used to rethink the marketing of the Affordable Course Transformation grant initiative. We still used Penn State News to disseminate a general call and distributed emails through listservs, for example, the Open Liaisons, Instructional Design Community, Deans of Academic Affairs, and campus Chancellors. In addition, we added departmental meetings within colleges and with instructional design units for our in-person outreach efforts. Based on the results of the survey, we were able switch up our marketing from being explicitly affordability-driven to putting more emphasis on pedagogy. For example, messaging shifted to the following: yes, affordability is important, but let's talk about how we can engage your students through open materials and pedagogical practices that support OER and transform your teaching.

At NC State, these results were illuminating, but less impactful, given the relatively low participation rate. They were discussed with the Alt-Textbook team and communicated to the Libraries' administration to be incorpo-

rated into our larger advocacy and programming efforts.

At Arkansas, survey results indicated the need to continue broad advocacy efforts. Only half of the respondents were aware of on campus OER workshops. More than half were aware of campus support initiatives. Communication and marketing strategies have been expanded to reach more targets. Most respondents expressed the desire for more support locating and evaluating OER. To address these desires, targeted outreach to specific departments and schools has increased. This has led to increases in individual consultation bookings which are necessary for assisting faculty identify subject-specific resources. Finally, the results were also used to encourage university administrators to increase public support for OER and tie OER initiatives to campus priorities such as student success.

Conclusion

The results of this study have been incredibly useful in the growth of the OER initiatives at Arkansas, Iowa State, NC State, and Penn State. The survey provides a guide for other institutions interested in learning about the needs of their own populations as well. In one sense, it serves as an excellent "what not to do" scenario, highlighting why surveys should be short enough for a faculty member to easily complete over their lunch break. On the other hand, this survey shows how an in-depth survey with room for open-ended responses can allow for unexpected and interesting results to emerge.

Regardless of the process' successes and failures, the data presented here contains three findings that could be explored and implemented at other institutions: 1) OER initiatives need to target faculty directly to promote basic services such as consultations, workshops, and seminars on "what is an OER?" even if the initiative offers more in-depth services; 2) in order to fully engage with faculty on campus, an OER initiative must have champions among the administrators and department chairs on campus, those who can speak up and show that there is explicit support for faculty who want to put time into "doing the work" of OER; and 3) even for established OER initiatives, initiative coordinators should employ regular marketing strategies to keep faculty invested in and aware of the grant initiatives and support available to them.

In short, nothing about an OER initiative should be assumed or taken for granted. Even if you think you know your audience, there are likely faculty falling through the cracks who need basic support, whether that support is acknowledgement of OER work from a supervisor or a better understanding of what an OER *is*.

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Appendix 1: Survey Instrument

An exported pdf of the survey instrument used in this study, adapted from Identifying OER Needs by Discipline can be found online here: https://drive.google.com/file/d/17Z7VjFHDyrTs5E93ZmutQWWK84bSLLIj/view

Appendix 2: Responses to Q13

Question 13: "Do you feel that your institution provides sufficient support for instructors in your discipline who are interested in adopting OER? Why or why not?"

1. yes; it is cost effective
2. Yes. We're encouraged to do so, and the library staff are able to point us towards available resources.
3. Yes. We have a dedicated staff person, Abbey Elder, who is always willing to discuss OER with us.
4. Yes. They are certainly encouraging and willing to provide guidance in finding resources.
5. Yes.
6. Yes, they've answered questions.
7. Yes, they encourage it. Most of them in my area are terrible, which is why I haven't used them.
8. Yes, there are resources and support for those who wish to build or pull together OER. It's still a very time consuming endeavor in my subject area, but there is money available and people willing to at least serve in a consultative capacity.
9. Yes, there are grant opportunities for faculty to develop and/or adapt OER to their courses.
10. Yes, the support staff were willing to meet with me one-on-one to discuss adoption options.
11. Yes, the people in charge of OER resources were very helpful to me in my text creation process.
12. Yes, the OER site is specific and rich in content
13. Yes, the library does provide support in finding and adopting OER.
14. yes, IF we have the time and make the effort. I have asked for help and the staff was very helpful. I was a faculty member of an ad hoc committee to develop the OER grants program.
15. Yes, given the grant program and the OER support through the library.
16. Yes, but you have to want it badly enough to wade through the issues
17. yes, but could be better. larger "small" grants can be more effective.
18. "Yes There is opportunity to grow the support as more faculty adopt OERs or as they decide to develop their own"

19. Yes although the support is not necessarily discipline-specific, and seems primarily framed as a money-saving measure rather than a pedagogical choice.
20. Yes - I recently applied for a small grant to search for and adopt OER in one of my 100 level behavior and health courses. In addition to that, I feel that our librarians have been clear that they can be a resource in this area, whether or not I receive the grant.
21. Yes
22. Yes
23. yes
24. We have a librarian who is well-versed and very helpful with this. I would like to learn more about the legalities of it all and ideas on how to best utilize OER.
25. We could do a better job in informing the faculty of OER options.
26. Unsure: I lack the direct knowledge necessary to answer in an informed way.
27. Unsure.
28. unsure of what exists
29. Unsure
30. This is time consuming… I am a certified instruction/integration specialist. I have created and/or redesigned several (that I teach) courses with no compensation. I have attended OER workshops to be told there are little resources for content that I am seeking. Again, time consuming and frustrating. It seems as though Penn State does not value experience and expertise that non-tenured track education faculty bring to the table…
31. They do, but developing OER material is simply too time consuming.
32. They are trying to, by offering assistance and grants
33. There could be more support for adopting OER. Partly this is a matter of acknowledging this in faculty evaluations as adopting materials and techniques that are OER often requires some degree of effort.
34. The information that I obtained from my own searches and from the University support person's searches for content-specific information that is up-to-date, research-based and evidence-based was very sparse for my field of study/use.
35. The college does not put an emphasis on OER but the university does.

36. Support? If you define creative license as support, then yes. I like the freedom to tailor my course within the confines of the discipline--rhetoric and composition.
37. Support is sufficient. Time for discovery and course integration are lacking at the department level.
38. Support is adequate, but usually consists of making us aware of open access texts.
39. So far it is not my experience. As far as I know this is not even within the metrics used to evaluate or assess professional performance.
40. Our institution provides a wealth of knowledge and resources, but there is a need to spread the word so to speak, as traditional teaching and learning needs to adapt to such opportunities.
41. Our department provides a lot of autonomy to instructors. This is good, but it makes it hard to disseminate pedagogical support because instructors need to take initiative to find and pursue resources and face few consequences if they do not.
42. Not sure. OER can be helpful, but most of what I've had access to is lesson slides. Software, simulations, games and interactive tools would be extremely helpful for the kind of teaching I do.
43. Not sure. Not very familiar with OER in my field.
44. not sure
45. Not aware of any resources
46. No. Course releases and honorarium to develop/write Open Educational Materials. I won't do it without offset of other responsibilities because I would rather just use books that exist, even though they require students to purchase them.
47. No. Very little support. This may be partially because we are on a satellite campus.
48. No. The office was super disorganized
49. No. Faculty are too distributed
50. No. We got a letter from the bookstore telling us that we should adopt OER, but I have no idea how.
51. No, The problem seems to be the scheduling of help sessions. There is little consideration for teaching obligations. In other words any time there is some sort of instructional meeting scheduled it during class schedules.
52. No, I have never seen any support for instructors from my institution

53. No earthly idea.
54. Never enough support, but I working with a great team!
55. My institution is not averse to my discipline, but overall its emphasis is STEM
56. More workshops on how to use material would be great. Especially information on how to edit existing material.
57. It was hard to figure out whom to contact and what the rules are.
58. Institutional support is there. Content for my courses isn't available in the current repositories I've seen.
59. If they do, it's not well marketed.
60. I think that once more individuals become more familiar with OER that there will be additional support and resources.
61. I routinely use free materials from a variety of sources but have never used formal OER. I cannot answer the question because I don't know if OER has content that is related to my classes.
62. I realize that OER sources exist. But, I have not been updated about the credibility, usefulness, and applicability of these sources for my class. I have very little time to determine what to use or how to use any source. So, I typically use the textbooks that others recommend or books that are provided quickly and easily. (e.g., provided by Norton)
63. I honestly do not know at this point.
64. I haven't honestly been looking into this as I have little time left in this job.
65. I haven't discussed this with my institution.
66. I have not looked into this enough to know. There may be many resources available that I am unaware of. I would like to learn more about this.
67. I have no idea.
68. I have no idea, which is a problem in itself
69. I have no idea
70. I had never heard of OER until I read the email asking me to participate in this survey.
71. I guess the UA does but I'm so busy, I haven't paused to take notice.
72. I feel as though my institution would prefer to generate revenue at its own bookstore through requiring textbook purchases. Though OER would significantly help students financially, it unfortunately seems as though

the institution is more invested in maintaining this revenue stream, especially as it encourages the adoption of the Infinite Access online textbook system.

73. I don't think it does for my discipline, but I am new to OER so I am not entirely sure what is out there.
74. I don't know of anyone in this department using OER. If they are, it has not been communicated to the faculty as a whole.
75. I don't know
76. I constantly receive up-to-date information about OER from TLT at Penn State Univ. They provide tremendous help to me, and my students, to take advantage of technology involved in OER.
77. I cannot assess accurately.
78. I believe they do. However, I have not pursued this option so I don't know the full extent of the support available.
79. I believe that there is sufficient support for adopting OER. I have had good experience with the OER working group in searching and finding existing OER materials. There are several initiatives for developing OERs as well, but I have not had the opportunity to participate.
80. I am very uncertain about all aspects of OER. I am not certain if this is because I am not paying attention to available resources of if the resources are missing.
81. I am unaware of what support is provided in OER
82. I am on a 9 month renewable contract, am not allowed to attend faculty meetings, and am treated as inferior because I only have a masters. Thus, it feels damn near impossible to introduce significant changes to the program. I have faced strong backlash in the past and find that it will be more worth while to wait until I have a more permanent position.
83. I am not sure
84. I am not aware of any support for adopting OER.
85. I am neutral on this as I have not had time to investigate. I find that NCSU usually has the resources and support necessary.
86. good initiative; I will definitely think about this the next time I'm scheduled to teach the introductory course where this would best fit, but OERs don't seem appropriate for the more specialized 300 and 400-level courses that I'm teaching this coming year
87. For those that receive support, the support is excellent. Unfortunately the support can be spread around relatively few individuals - so more support from higher administration would be helpful.

88. Don't know.
89. don't know about OER
90. As I am unsure of my institution's approach and acceptance of OER, it would seem to indicate that there is insufficient support in my discipline for OER use.
91. as far as I know they do not provide any but I am not in a field were there would be a lot, if any, OER material available.
92. Again, never heard of OER before today. And my PhD is in Education … and I graduated in this decade. Have never heard of this.
93. Adopting, yes. Creating, no. The time commitment would be so much for creating OERs. Without a course buy-out, I don't think it would be possible for faculty in my department.
94. Adopting these sorts of materials usually requires some extra effort on the part of faculty which is not recognized or compensated.

"Open"-ing Up Courses for Diversity and Deeper Learning

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Abstract

Universities increasingly require students to enroll in diversity coursework, which is positively associated with a range of academic and social outcomes and psychological wellbeing. However, these courses can be challenging for both students and faculty to navigate. For institutions to effectively engage diversity on campus, attention must be paid to pedagogical and curricular transformation—not only in stand-alone diversity classes, but in major-specific coursework as well. This conceptual paper explores the benefits of using open educational resources (OER) and open educational practices (OEP), in combination with the Hewlett Foundation's Deeper Learning framework and empathic scaffolding, in promot-

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ing social justice and equity in courses by diversifying curricular content and enhancing students' learning and skill development. Pedagogical and curricular examples from instructors' diversity initiatives in two academic fields, drawing from a larger study on OER creation and adoption, are shared as a potential reference point for faculty interested in implementing similar practices.

Keywords: open educational resources (OER), open educational practices (OEP), curricular diversity, deeper learning

Cursos "abiertos" para la diversidad y el aprendizaje más profundo

Resumen

Las universidades exigen cada vez más que los estudiantes se inscriban en cursos de diversidad, lo que se asocia positivamente con una variedad de resultados académicos y sociales, así como con el bienestar psicológico. Sin embargo, estos cursos pueden ser difíciles de navegar tanto para los estudiantes como para los profesores. Para que las instituciones involucren efectivamente la diversidad en el campus, se debe prestar atención a la transformación pedagógica y curricular, no solo en los cursos de diversidad independientes, sino también en los campos principales. Este documento conceptual explora los beneficios de usar recursos educativos abiertos (REA) y prácticas educativas abiertas (OEP), en combinación con el marco de aprendizaje más profundo de la Fundación Hewlett y el andamiaje empático, para promover la justicia social y la equidad en los cursos mediante la diversificación del contenido curricular y la mejora de los estudiantes. 'aprendizaje y desarrollo de habilidades. Los ejemplos pedagógicos y curriculares de las iniciativas de diversidad de los instructores en dos campos académicos, extraídos de un estudio más amplio sobre la creación y adopción de REA, se comparten como un punto de referencia potencial para los profesores interesados en implementar prácticas similares.

Palabras clave: recursos educativos abiertos, prácticas educativas abiertas, diversidad curricular, aprendizaje más profundo

为多样性和深度学习“开放”课程

摘要

大学越来越多地要求学生注册多样化课程，这与一系列学术结果、社会结果、以及心理福祉呈正相关。然而对学生和教师而言，如何完成这些课程可能是一场挑战。为了让机构能有效参与校园多样性，则必须关注教学法和课程转型—不仅针对独立的多样性课程，对主要学科领域而言也是如此。本篇概念性文章探究了使用开放教育资源（OER）和开放教育实践（OEP）的益处，结合休利特基金会的深度学习框架和共情框架，通过对课程内容进行多样化并提升学生的学习发展和技能发展，进而推动社会正义和课程公平。分享了两个学术领域的教师多样性倡议计划所提供的教学实例与课程实例（取自一项关于OER创造与采纳的大型研究），以供对执行相似实践感兴趣的教师参考。

关键词：开放教育资源，开放教育实践，课程多样性，深度学习

Introduction

Universities increasingly require students to enroll in diversity coursework (Ravitch, 2015), which is positively associated with a range of academic and social outcomes and psychological wellbeing (Bowman, 2010; Bowman et al., 2011). These courses, however, can be emotionally and cognitively challenging for both students and faculty to navigate (Peters-Davis & Shultz, 2016). When poorly executed, diversity experiences can negatively impact student development (Bowman, 2010; Milem et al., 2005). For institutions to effectively engage diversity on campus, attention must be paid to pedagogical and curricular transformation—not only by diversity, equity, and inclusion facilitators in stand-alone diversity classes, but by instructors in all major-specific coursework (Milem et al., 2005; Ukpokodu, 2010). Customizable learning materials, such as open educational resources (OER), and a focus on open pedagogical opportunities offer a way to effectively develop diversity coursework and support the introduction of curricular and pedagogical diversity in the classroom.

Black feminist scholars have long been calling for pedagogical approaches that center personal experience, promote empathy, and uplift the voices of marginalized communities (Henry, 2005). Diversity efforts in education are not new. Yet as campus communities grapple with widening equity

gaps as a result of a global pandemic and seek to support students of color in the wake of racist violence, there is a national call-to-action for diversity work. Instructors who may have never considered the importance of diversifying their curriculum or infusing empathy into their practice are now compelled to do so. As diversity work moves towards the mainstream and #KeepTeaching efforts prioritize equity and inclusion, the need to provide faculty with resources becomes more important than ever.

This conceptual paper explores the benefits of using OER and open educational practices (OEP), in combination with the Hewlett Foundation's (2012) Deeper Learning framework and empathic scaffolding (Bauer & Clancy, 2018), to promote social justice and equity in higher education by diversifying curricular content and enhancing students' learning and skill development. Assignments designed using OEP, coupled with the Deeper Learning competencies of collaboration and communication, can prepare students to interact with specific communities and the world more broadly—essentially moving learning from an individual to a societal benefit. Through OEP, educators and students can develop relationships with local communities and design collaborative projects for students to learn more about the population, document its history, and share their work with the community and beyond. Yet while OEP provides a promising opportunity for more inclusive and effective pedagogy, instructors may be hesitant to explore these new modes of instruction because they may not know how to engage with them (Harley, 2008).

In the absence of models for effective pedagogical implementation, instructors often default to teaching in the same way they successfully learned as students, creating a barrier to innovation (Mehta & Fine, 2015). With this in mind, this paper offers pedagogical and curricular examples from diversity initiatives in two academic fields, drawing from a larger study on OER creation and adoption, as a potential reference point for faculty interested in implementing similar practices.

Framing the Conversation

Open education refers to educational materials and practices that improve access, efficacy, and equity (Open Education Consortium, n.d.). It describes a range of policies, practices, materials, and pedagogies, as well as the values inherent in the free exchange of information (Cronin & MacLaren, 2018). The current conversation around open education has privileged OER, or those teaching, learning, and research materials that can be freely used, modified, and redistributed (Hewlett Foundation, n.d.). The focus on materials that can reduce cost is unsurprising given the variety of textbook affordability initiatives saving students millions of dollars per year (Jaggars et al., 2019). The cost conversation alone, however, does not communicate the full benefits of OER as a pedagogical resource (Rivera et al., 2019). Research has shown students and faculty are generally pleased with the quality

and experience of using OER (Jaggars et al., 2018) and that courses utilizing OER tend to exhibit positive or neutral difference in academic outcomes compared to courses using traditional texts (Croteau, 2017; Hilton et al., 2013; Shaw et al., 2020). This suggests OER do not harm, and potentially may benefit, student learning. Positive outcomes in courses that use OER include increases to final grades and lower "D," "F," or withdrawal (DFW) rates (Colvard et al., 2018) The positive influences of OER may be particularly significant for traditionally high-risk groups including Pell grant recipients, part-time students, and those who have been historically underserved by higher education (Colvard et al., 2018).

Further, faculty members perceive higher student interest and engagement with OER materials, allowing them to increase the depth and breadth of content in courses or to include additional educational activities (Bliss et al., 2013). Because of their customizability, OERs also allow educators to tailor materials to meet the needs of diverse learners and implement culturally responsive teaching practices (Hockings et al., 2012; Prescott et al., 2018), which research has demonstrated is indispensable for teaching social justice (Bauer & Clancy, 2018). OER are particularly adaptable because they are premised on what Willey (2014) calls the "Five Rs" of open education. This includes the rights to retain, reuse, revise, remix, and redistribute content. The flexibility and ethos of sharing offered by OER makes them an effective tool for teaching and learning (Rech & Mortimore, 2020; Scronce et al., 2020).

While the definition of OER is generally well accepted, definitions of OEP have ranged from the basic use of open materials to an intentional focus on both the cultural and pedagogical dimensions of openness disconnected from OER (Cronin & MacLaren, 2018; Hodgkinson-Williams, 2014). In this paper, we use the term OEP when referencing the "practices which support the (re)use and production of OER through institutional policies, promote innovative pedagogical models, and respect and empower learners as co-producers on their lifelong learning path" (Andrade et al., 2011, p. 12). Examples of OEPs include students completing assignments that contribute to websites and e-portfolios, or even developing their own OER to be used in future classes (Paskevicius, 2017). OEPs have the potential to provide instructors with curricular opportunities to enhance teaching and learning (Conole, 2018; Ehlers & Conole, 2010). Built on the foundation provided by customizable OER, OEPs further allow for what Bauer and Clancy (2018) call empathic scaffolding, whereby instructors structure content and pedagogy—through the "strategic selection and arrangement of course content"—to expand students' comfort discussing race and social justice (p. 74). OEP and the customizable materials associated with them offer educators opportunities to (re)design courses in an intentional way. Yet the varying definitions of OEP, along with related terms such as connected learning and open pedagogy, create a barrier

to successful implementation. There is a need for scholarship that clarifies terminology and offers practical guidance to educators. We begin to address this gap by demonstrating varying dimensions of diversity in education before discussing how OER and OEP can support teaching and learning.

Dimensions of Diversity (in) Education

Diversity education and diversity of educational materials are necessary for student development and skill attainment, including the development of different perspectives, challenging biases and stereotypes, and learning to interact with diverse peers (Bowman, 2010; Bowman et al., 2011). OEP and OER can contribute to various dimensions of diversity—content, cognitive, and pedagogical—that support the development of these skills, enhance diverse representation, and improve engagement with the curriculum. Although discussed here as distinct concepts, these three dimensions are often interconnected and overlap in educational contexts.

Diversity Coursework

Diverse content included in diversity courses supports cultural competency through a reduction in students' prejudices and encourages students to challenge social injustices (Denson & Chang 2009; Engberg, 2004; Nelson Laird, 2005; Zúñiga et al., 2005). Further, diversity courses promote multicultural competency, or the ability to engage with diverse peers and understand different cultural perspectives (Chang, 2002; Hurtado et al., 2008). The American Association of Colleges and Universities (2002) referred to this skill set as social responsibility; it includes considering multiple perspectives, negotiating conflict, and being open to having one's views challenged (Hurtado et al., 2012). Pedagogy must include recognition of difference for students to become civic equals (Gutmann, 2004). However, diversity courses tend to be relegated to the humanities and social sciences instead of housed widely in all disciplines (Acosta et al., 2015). Students are returning to campuses amidst heightened racial tensions and campus protests (Douglas et al., 2020) and faculty must be ready to navigate and contribute to the difficult conversations that result. Further, students and community leaders across the country are demanding their high schools and colleges diversify the curriculum and provide anti-racist texts (Jurado, 2020; Natanson, 2020; Nguyen, 2020). The customizability of OER/OEP offers the opportunity to expand this dimension of diversity to ensure students are engaging with multiple perspectives and developing cultural competencies and skills.

Cognitive Diversity

The 2012 President's Council of Advisors on Science and Technology observed that the topic of demographic diversification across disciplines also supports increasing cognitive diversity, or the ability to approach learning with a variety of cognitive strategies and to

synthesize a range of divergent perspectives (National Academies of Sciences, Engineering, & Medicine, 2018). Cognitive diversity can also describe the diversity of a group's composition across different beliefs, perspectives, ideas, and preferences (Miller et al., 1998). Students benefit when they collaborate with individuals across differences and grapple with conflicting perspectives. For example, groups are more adept at the creation of new knowledge when diverse perspectives are represented (Mitchell & Nicholas, 2006). Additionally, academic opportunities that integrate various disciplines, including arts, humanities, social sciences, and science, technology, engineering, and math (STEM) fields expand learners' cognitive repertoire (National Academies of Sciences, Engineering, and Medicine, 2018); OER/OEP create opportunity for structuring course materials and activities with interdisciplinarity in mind. Apart from considering the diversity of course content and the student perspectives represented in the classroom, faculty can diversify their pedagogical approaches to engage students more effectively with the material.

Pedagogical Diversity

In addition to limiting cognitive diversity, traditional pedagogies create barriers in diversifying fields of study by historically disregarding and discouraging certain populations—including women and students of color—from more technical majors and careers (Byars-Winston et al., 2010; President's Council of Advisors on Science and Technology, 2012). Without practical guidance on effective instruction, faculty members often replicate how they successfully learned as students, limiting pedagogical innovation (Mehta & Fine, 2015). Many postsecondary instructors use traditional "knowledge transmission" styles of teaching (Bailey et al., 2015), mirroring the teacher-directed instruction that results in the rote learning common in under-resourced high schools (Knoester & Au, 2017). The creation and adoption of OER materials provides an opportunity for instructors to reflect on how they plan to integrate the materials in their courses and the pedagogical approaches used in their classroom; changing materials can, but does not necessarily, encourage instructors to break away from the knowledge transition model in favor of learning facilitation (e.g., Hendricks et al., 2017; Pawlyshyn et al., 2013). Although OEP builds on the foundation provided by OER to offer instructors opportunities to enhance and innovate pedagogically (Ehlers & Conole, 2010), instructors seek additional support and resources for implementation (Harley, 2008). Frameworks for learning, such as Deeper Learning and empathic scaffolding, are such supports that can serve as guides for the creation and implementation of OER and OEP.

Deeper Learning

The Hewlett Foundation's (2012) Deeper Learning framework offers a practical guide for the creation and implementation of open education while also encouraging student

development. The introduction of new materials and practices, which are often necessary to successfully implement Deeper Learning, can also enhance the development of the dimensions of diversity discussed above. The National Research Council (2012) defined Deeper Learning as "the process through which an individual becomes capable of taking what was learned in one situation and applying it to new situations" (p. 5). Deeper Learning emphasizes interpersonal, intrapersonal, and cognitive skills development. The cognitive domain refers to how a student thinks critically about complex problems and how they understand and apply content knowledge. The intrapersonal domain pertains to students' ability to self-regulate their learning and includes skills such as learning to learn and developing an academic mindset. Finally, the interpersonal domain focuses on interactions with others. Skills associated with this include effective communication and collaboration.

In practice, Deeper Learning-aligned pedagogy emphasizes a focus on symbiotic relationships between real-world conditions and classroom concepts, ongoing assessment of understanding, and active participation in developing knowledge through (re)source curation (see Petrides et al., 2017; Rivera et al., 2019). When thoughtfully implemented, these types of project- and inquiry-based approaches, along with service-learning and community-based research, have been shown to benefit student learning and development (Coker et al., 2017; Hébert & Hauf, 2015; Kuh, 2008). Research has demonstrated that community and peer engagement positively influence students' cultural awareness, self-efficacy, and communication skills and that these benefits persist long-term (George et al., 2017; Vaz & Quinn, 2014).

Empathic Scaffolding

The introduction of new materials and new perspectives in a course opens an opportunity to strategically present challenging topics to students. Diversity is one such topic with which students may be uncomfortable engaging and they may react in ways not conducive to classroom dialogue (Bauer & Clancy, 2018; Cole et al., 2011). In the case of race, in particular, students of color are often burdened with the task of educating their white classmates (Harris et al., 2015) and white students are hesitant—and often opposed—to discuss their privilege (Peters-Davis & Shultz, 2016). The customizability of OER/OEP allows instructors to mitigate harm or foster engagement by structuring content and pedagogy to expand students' comfort in discussing race and social justice (i.e., empathic scaffolding; Bauer & Clancy, 2018). For example, students in an engineering class might be asked to reflect on a time they felt frustrated navigating campus, perhaps due to a physical barrier they encountered. This empathy-building activity then becomes the starting point for a conversation around ableism and assistive technologies. Further, the open nature of OER and OEP allow educators to integrate opportunities for reflection necessary for taking stock of students' comprehension. For

instance, journaling activities provide students with privileged identities an opportunity to process their thinking in such a way that does not further harm their peers while simultaneously allowing marginalized students space to privately reflect—without the obligation to perform for others. As Bauer and Clancy (2018) stressed, "building in a framework for capturing that (lack of) understanding through frequent checks of understanding and feedback is vital to effectively scaffolding content" (p. 76). For example, using anonymous polls with software students can access on their mobile devices can be a useful tool for quick assessments during lectures. Instructors can also purposefully implement reflection activities and practices, such as small group discussion, to encourage students to grapple with content and conversations that make them uncomfortable (Bauer & Clancy, 2018). As previously described, these conversations are taking place on campuses whether or not instructors feel prepared to guide them. Well-trained and thoughtful educators have the responsibility to ensure that difficult conversations around race and other aspects of identity do not perpetuate harm.

Below, we detail how these learning frameworks may be applied to coursework while simultaneously enhancing curricular diversity and skill development. We do this by providing examples from Midwestern University's[1] Affordable Learning Program to demonstrate how this might look in practice.

Open Education in Context: Midwestern's Affordable Learning Program

In 2015, Midwestern University introduced an OER initiative to address rising textbook costs at the institution. The initiative provided grants to instructors across a range of disciplines who wanted to replace traditional course texts with high-quality open and affordable alternatives. Instructors were encouraged to select educational resources that best met their needs by adopting an existing open textbook, authoring a textbook, or curating a suite of library materials or other freely available digital readings. Although the initiative was largely framed as an affordability project, it also sought to improve student learning and encourage faculty innovation.

The examples for practice highlighted throughout this paper were drawn from a larger study of Midwestern's affordable learning initiative and serve as illustrative examples of potential implementation. Interviews explored the production of OER, instructor satisfaction with OER materials, and changes in teaching and learning. Interviews with nine instructors from two academic fields—six from Social Work and three from STEM Education—are discussed below, demonstrating OER/OEP's utility across divergent academic disciplines. The social work materials were used to renovate a diversity sequence for their major and minor programs and the STEM education ma-

1 We use a pseudonym for the institution and the learning program to protect confidentiality.

terials were developed for an intermediate writing course.

Drawing on the extant literature and practical insights gained at Midwestern, we present two ideas for how OER/OEP, coupled with Deeper Learning and empathic scaffolding, can help introduce different dimensions of diversity in teaching and learning across fields of study, and create opportunities for longer-term social justice outcomes:

1. The customizability and flexibility of OER can assist instructors in creating curricular diversity and introduce empathic scaffolding to meet desired alignment and learning outcomes.

2. Deeper Learning offers a practical guide for creating and implementing open education while encouraging students' skill development. The learning goals and competencies can also potentially support social justice education.

Within the ideas presented, we share insights gleaned conversations with instructors about their motivations and experiences engaging with OER/OEP. The value of OEP/OER to present content, cognitive, and pedagogical diversity in the classroom for the betterment of learning is illustrated through these ideas and insights.

Leveraging the Customizability of OER to Develop Curricular Diversity

The customizable nature of OER allows educators to tailor materials to better address students' respective needs. A blanket approach to textbook and material adoption may not be appropriate for all learners, particularly when some learning materials can be exclusionary to diverse populations by centering whiteness (Alemán, 2014; Burrows, 2017) and Americentric ideals (Bartolini et al., 2009). In studying collaborations between Rice University and the Creative Commons Consortium, Baker et al. (2009) found that "publishers' textbooks are inappropriate for use in community college courses because ... they contain generic information that lacks regional, local, or cultural relevance to diverse community college student populations" (p. 3). Further, a survey of British Columbia college educators found that, on average, faculty felt OER better accommodated diverse learners and increased learner satisfaction, experimentation, engagement, discussion participation, and interest in the subject (Jhangiani et al., 2016). This was in part because open materials allowed for "teaching to the content and the learner's needs rather than teaching to the book" (Jhangiani et al., 2016, p. 29). Although not a universal solution to meet the needs of learners, the customizable option of OER presents educators with multiple opportunities to enhance their course materials with diverse perspectives and content.

Several instructors we spoke with saw the ability to customize the learning material and include diverse and relevant sources as a benefit to using OER. They discussed intentionally interweaving various educational resources as part of their curricular development—either to present students with multiple perspectives on one topic or to ensure that students reached desired learning outcomes when no single resource achieved this goal on its own. Instructors discussed developing weekly modules and writing content to "knit" together disparate source materials or assigning exemplary videos in combination with articles, which helped with perceived student engagement in the course. The materials used were selected for their relevance *and* the intention to get students more involved and motivated about learning. Another instructor, whose course focused on perspectives of marginalized groups, discussed how the ability to adapt the course's design and content enables them to appeal to, engage, and pique the interests of students who are older, veterans, and of color. Bringing attention to experiences and curricular needs of students who may be marginalized in ways that are not class-related highlights the importance of conceptualizing access more inclusively.

These perspectives and content can also be intentionally introduced to mitigate the unease that comes from discussing challenging topics. Instructors discussed using OER in curriculum design to facilitate empathic scaffolding so that students were willing to engage in uncomfortable conversations that support cultural responsiveness and empathic scaffolding. Course materials can give attention to underserved groups that are also underrepresented among this field's students, faculty, and professionals, as well as in college textbooks and curricular applications (Burk, 2007). For example, an instructor used the U.S. Department of Health and Human Services and the U.S. Department of Housing and Urban Development websites, but also included local data from the Coalition for the Homeless and the National Alliance to End Homelessness. They further personalized the material by discussing the nearby drop-in center for LGBT homeless youth. The movement from national to local (re)sources transferred the content and discussion from an abstract national level to a localized example within the community. Scaffolding such as this can encourage students to connect the material to real-life challenges and consider underrepresented populations in their communities. Along with the opportunity to gain a deeper understanding of local communities and an appreciation for diversity, students can gain skills associated with academic success more broadly.

Skill Development through Diversity Coursework

Teaching race and social justice in a contextually specific and developmentally appropriate way allows for personal growth and benefits the campus and surrounding community. However, some students—particularly White and mid- to low-in-

come—may benefit more than others from diversity coursework and related initiatives (Bowman, 2009; Harris et al., 2015). Research on engaging K-12 students in courses designed with Deeper Learning in mind, however, suggests a wider array of students may develop skills and competencies associated with academic success (Bitter et al., 2014; Noguera et al., 2015). For instance, students with lower levels of prior academic achievement and those who were low-income experienced the same benefits from Deeper Learning as their higher-resourced peers, suggesting schools offering Deeper Learning-aligned instruction can provide more equitable opportunities for students at all ability and income levels (Bitter et al., 2014). Thus, by pairing OEP with Deeper Learning, educators can respond to the needs for cultural competence, while also promoting academic, problem solving, communication, and collaborative skill development among all learners.

Cultural Responsiveness

In addition to scaffolding course content in developmentally and pedagogically appropriate ways, instructors can adopt materials and adapt courses to respond to social environments, including current events and specific groups' socio-historical needs. Textbooks and other materials not regularly updated are quickly outdated and may have limited cultural relevance on recent topics like Black Lives Matter and the disproportionate impact of COVID-19 on Indigenous, Black, and Latinx communities. Including timely and culturally relevant resources encourage students to consider the environment in which they live and will work in. Instructors can further include materials from the communities being studied, including blogs and popular sources, to center the voices of marginalized populations typically absent from textbooks (Alemán, 2014; Burrows, 2017).

Developing assignments that ask students to think critically about general practices can also be an effective strategy to encourage the application of content knowledge. For example, a social work instructor adjusted their curriculum to include an assignment specific to addressing the needs of an underserved ethnic population in the neighboring community. They realized students will need to work with populations that receive little concentration in the extant literature. Students were asked to read culturally relevant material on the population, identify general substance abuse interventions, and consider culturally responsive adaptations to better serve the population.

By having students work through the gap in resources for the specific population, the instructor's approach served as a pedagogical intervention that not only addressed the topical information, but also encouraged students to develop their critical thinking and problem-solving skills. Another instructor adjusted lesson materials in response to current events and created an assignment that prompted students to explore how different news sources discussed the same incident. The instructor saw value in having students read materials that are "here and

now" and that encourage them to think more critically and reflect on how information from different sources affects them daily.

Not only was learning about different cultures and communities important to instructors, but students' engagement with each other and with the community was also discussed as a critical component in their overall learning and development. Community-based projects can enhance students' level of peer engagement and collaboration. Two instructors designed major class projects that required students to assess social services available to an assigned population. Similarly, a third instructor provided an opportunity for students to engage with the local community and identify what social service agencies were doing to specifically serve diverse populations. Students moved beyond the classroom to develop a deeper awareness of the gaps in services, what providers are doing well, and where improvements could be made. Designing an assignment with practical outcomes allowed students to apply in-class concepts to external scenarios. Instructors emphasized skills development to help students become better practitioners and citizens, but also better and continued learners after college.

Cognitive Development

OER materials can encourage cognitive development—a domain integral to Deeper Learning—and introduce cognitive diversity to a course when assignments come from an array of sources with varying formats. Whereas a traditional textbook is highly structured, the disparate formatting of OER materials was itself a developmental tool, compelling students to pay attention to and think more critically about information. One instructor felt the "messiness" of OER was advantageous in supporting student growth. The sources used placed more responsibility on students to make connections across texts in the absence of an intentionally sequenced textbook—while simultaneously connecting social justice concepts and modern discourses to their discipline's more traditional ones. These insights from faculty illustrate how OER can simultaneously support cognitive development and empathic scaffolding.

Another marker of students' cognitive development has been their critique of course materials; students provided feedback to instructors about a lack of representation of some marginalized populations and a need to edit or reorganize course content. Purposely including students in revising course materials engages them in a co-creation process, which is itself an OEP (Lane & McAndrew, 2010); encouraging students to critically examine provided resources helps them to further develop cognitive skills and competencies as well.

Considerations for Implementation

Instructors should feel empowered to design educational materials, assignments, and assessments with their localized context and student body in mind. Although our research

team is a proponent of using OEP toward a more socially conscious end for learners, we recognize the majority of faculty may not be thinking about using open education in this way, further emphasizing the need for professional development and practical support. There is also a need for faculty to strengthen their pedagogical skillsets so that they are better equipped to implement open materials that they adopt for their classes with a more critical lens toward topics of study.

Moreover, instructors must be willing to take on the additional labor that is necessary for curating and cultivating a pedagogically strong course based on open education. Of the instructor examples presented, only one underscored the fact that using OER materials calls on instructors to frequently update both their knowledge and materials for the issues discussed in classes. This professor also suggested that their coworkers saw the need to constantly self-educate and update their courses as a burden—rather than as a best practice. Although this requires more work, updating materials allows faculty to be responsive to students' daily realities and stay well informed of relevant content. This speaks to the importance of faculty being as proactive about teaching as they expect students to be about learning. Instructors must take on constant self-education in contemporary social issues if they are to effectively support students in their development (Acosta et al., 2015; Nicotera & Kang, 2009). This is perhaps truer for fields that have historically been homogenous, or unwelcoming or inaccessible to marginalized students. Littlejohn and Hood (2017) identified the need for educators to continually develop their practice, including through their ongoing learning, as critical in keeping up with pedagogical advancement. Fortunately, both racial justice movements and the shift to virtual learning necessitated by COVID-19 have prompted colleges and universities to ramp up diversity efforts. Many have begun offering training on implicit bias, curricular diversity, and pedagogical inclusivity in which instructors should participate.

Regarding Deeper Learning, it is difficult to ascertain the specific degree to which students learn cognitively, interpersonally, or intrapersonally. One possibility is that OERs, when enacted in a meaningful way, support the learning of students in these domains simultaneously. By asking students to engage with peers and collaborate with community partners (interpersonal development), faculty members place them in positions that challenge their ideas about course concepts (cognitive development). Consequently, students reflect on their reactions to the new material, informed by previously held ideas about the topics, which may foster intrapersonal development.

Lessons Learned

An overarching lesson we gleaned working with faculty who were using affordable materials is that OER and OEP have great potential for supporting more inclusive and tailored learning for students—but this potential requires proactivity, com-

mitment, and imagination on the part of educators to be realized. "Too often, new technologies are themselves presented as transformational agents," and the role of the educator in educational transformation is lost (Fisher, 2006, p. 301). OER alone cannot drive social change; rather, "it is through educators' engagement with OER within the contexts of their practice that they develop the necessary knowledge (theoretical, socio-cultural, and practical–experiential) to develop their practice" (Littlejohn & Hood, 2017, pp. 506-507). Admittedly, this demands a commitment on the part of the educator.

Interviews with instructors consistently revealed the degree to which they put time and energy into course design and developing of learning objectives and goals; researching, collecting, curating, and organizing course materials; matching course materials with course assignments and desired learning outcomes; and assessing student learning to adjust or restructure assignments—which then may prompt more researching, collecting, curating, and organizing of course materials. Although these steps of course design theoretically exist for most educators, they are even more necessary for those who design courses completely with OER—especially courses that incorporate social justice education.

Conversations with instructors also suggest they rely on and promote collaboration, using the 5Rs of OER, as part of their curricular design. Interviewees continuously discussed *reusing* OER in lessons, particularly for engaging current events or rapidly-shifting social movements; *revising* colleagues' shared content for their courses, to later *redistribute* to colleagues who did their own *revising*; and *remixing* content to tailor lessons to their specific desired learning outcomes, when no one resource was sufficient in doing so. Their constant discussion of four of the five Rs suggests that OER fosters a community of learning for educators who use it. In turn, instructors require their students to collaborate—with both each other and community members—to expand perspectives and enhance learning. Collaboration among instructors on OER (re)creation strengthens the ability to produce curricula that is diverse in both structure and perspective—which supports the development of skills, cultural competence, and empathy for students with an array of identities.

Watters (2014) cautioned that we cannot "presume that, because something is 'open' that it necessarily contains all the conditions for equality or freedom or justice" (n.p.). Openness, of materials or practice, does not eliminate the "inequalities, institutions, biases, [or] history" in institutions of higher education (Watters, 2014, n.p.). Educators must proactively work towards improving materials and practices with a social justice agenda. With Watters' caution in mind, we argue OEP, when paired with the Deeper Learning framework and the principals of empathic scaffolding, can enhance curricular diversity and develop students' cultural competence and other necessary skills for success.

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Comparative Analysis of an Open Educational Resource Textbook and Commercial Textbook on Student Outcomes in an Online Nursing Course

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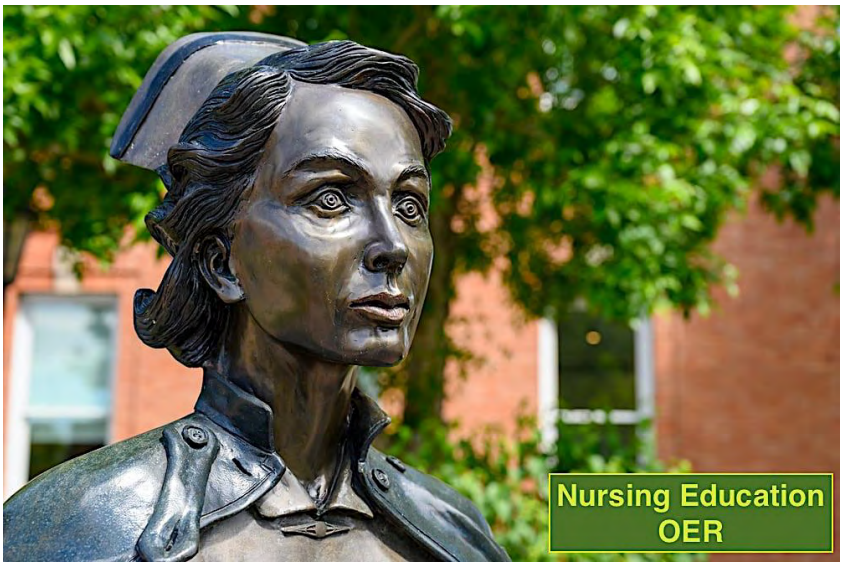

Abstract

There is a growing body of research on the benefits of using open educational resources (OER) in higher education, and their impact on student outcomes. However, there is only one study on outcomes data related to the use of OER in undergraduate online nursing education.

This study aimed to determine if there was a difference in undergraduate nursing student outcomes for courses utilizing a teacher-developed OER textbook compared to courses utilizing a commercial textbook (CT). A retrospective grade review study design was used to identify discussion forum, assignment, and final grades for all students enrolled in an online nursing course. The sample included 160 students; 84 from seven sections that utilized the teacher-developed OER, and 78 from six sections that utilized a traditional CT. Descriptive and bivariate analysis found statistically significant differences in mean scores for one of three assignments

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in the course (p = .04, d = .33), with the OER scores (M = 89.46) being higher than the traditional textbook group (M = 85.70). For the remaining assignments, there was no statistically significant difference in assignment (p < .05), discussion forum (p < .05), or final grades (p < .05).

This study addressed the current gap in knowledge related to outcomes when using OER in online undergraduate nursing education courses. Based on the results of this study, the use of OER offered similar outcomes compared to the CT.

Keywords: Open Educational Resources (OER); learning outcomes; nursing; online education

Análisis comparativo de un libro de texto de recursos educativos abiertos y un libro de texto comercial sobre los resultados de los estudiantes en un curso de enfermería en línea

Resumen

Existe un creciente cuerpo de investigación sobre los beneficios del uso de recursos educativos abiertos (REA) en la educación superior y su impacto en los resultados de los estudiantes. Sin embargo, solo hay un estudio sobre datos de resultados relacionados con el uso de REA en la educación universitaria en enfermería en línea.

Este estudio tuvo como objetivo determinar si había una diferencia en los resultados de los estudiantes de enfermería de pregrado para los cursos que utilizan un libro de texto REA desarrollado por el maestro en comparación con los cursos que utilizan un libro de texto comercial (CT). Se utilizó un diseño de estudio de revisión de calificaciones retrospectivo para identificar el foro de discusión, la asignación y las calificaciones finales para todos los estudiantes inscritos en un curso de enfermería en línea. La muestra incluyó a 160 estudiantes; 84 de 7 secciones que utilizaron el maestro desarrollaron REA, y 78 de 6 secciones que utilizaron el CT tradicional. El análisis descriptivo y bivariado encontró diferencias estadísticamente significativas en las puntuaciones medias para una de las tres tareas del curso (p = .04, d = .33), siendo las puntuaciones de REA (M = 89,46) más altas que las del grupo de libros de texto tradicionales (M = 85,70). Para las asignaciones restantes, no hubo

diferencia estadísticamente significativa en la asignación (p <.05), foro de discusión (p <.05) o calificaciones finales (p <.05). Este estudio abordó la brecha actual en el conocimiento relacionado con los resultados cuando se utilizan REA en cursos de educación en enfermería de pregrado en línea. Según los resultados de este estudio, el uso de REA ofreció resultados similares en comparación con la TC.

Palabras clave: REA; Recursos Educativos Abiertos; los resultados del aprendizaje; enfermería; educación en línea

比较分析网络护理课程中开放教育资源课本与商业课本对学生结果产生的影响

摘要

越来越多的研究聚焦于高等教育中使用开放教育资源（OER）的益处，以及对学生结果产生的影响。然而，仅有一项研究聚焦于本科生网络护理教育中OER使用产生的结果数据。本文旨在确定，就课程使用由教师开发的OER课本或使用商业课本（CT）而言，本科护理专业学生的结果是否存在不同。使用一项回溯性成绩评定研究设计，以识别一门网络护理课程中所有学生的论坛、作业和最终成绩。样本包括160名学生，其中84人来自使用由教师开发OER的7个课程部分，78人来自使用传统CT的6个课程部分。描述性分析与二元变量分析发现，三项课程作业中有一项的平均得分存在显著差异（p = .04, d = .33），其中OER分数（M = 89.46）高于传统课本组（M = 85.70）。其余课程作业中不论是作业（p < .05）、论坛（p < .05）或最终成绩（p < .05）均未发现显著差距。本研究填补了当前有关网络本科护理教育课程中使用OER所得结果的研究空白。基于本研究得出的结果，使用OER与使用CT所得出的学生结果相似。

关键词：OER，开放教育资源，学习结果，护理，网络教育

Introduction

Textbook fees represent a significant portion of college costs (Hilton et al., 2014) and signify a sizable barrier to secondary education, especially for those with lower incomes. The Florida Virtual Campus (2019) survey of more than 21,000 students on textbook and course materials found 43.8% spent more than $300 and 13.8% over $500 in 2018. These high costs led to students choosing not to purchase required textbooks (64.2%), taking fewer courses (42.8%), not registering for a specific course (42.5%), earning a poor grade (35.6%), and dropping a course (22.9%). High textbook costs have many adverse impacts, including delayed graduation (Fischer et al., 2015) and higher student debt (Jhangiani & Jhangiani, 2017). Furthermore, Cuttler (2019) found that half of commercial textbooks (CT) were not used enough to justify the purchase. These findings suggest students may decide not to purchase a textbook in the future, resulting in poor engagement in a course, poor performance, dropping courses, and delaying graduation.

One solution to improving access to higher education and reducing college costs is to replace costly CT with Open Educational Resources (OER). OER are resources (textbooks, workbooks, images, videos, music, podcasts, etc.) faculty can integrate into courses at either low or no cost to the student. OER can be found in the public domain or available under an open license, such as Creative Commons. Open licensing gives users the option to revise, redistribute, remix, reuse, and retain the content for future use (United Nations Education Scientific and Cultural Organization [UNESCO], 2019). OER use in higher education has the potential to save students a considerable amount of money without compromising student learning.

Literature Review

In 2002, UNESCO was the first international organization to coin the term OER in support of open courseware for higher education (UNESCO, 2019). A major benefit of using OER is the ability to reuse, remix, and distribute (among others) the content freely, as most resources are openly licensed with Creative Commons. Imberman and Fiddler (2019) found that OER with Creative Commons licensing allowed faculty to share content freely, update outdated content, translate to different languages, and create resources that became "living artifacts." Furthermore, Cuttler (2019) found that OER quality was, in part, due to Creative Commons licensing, where content can be remixed, making it easier to align content with course goals. Student PIRG (2018) studied textbook costs for 40 public and private two- and four-year colleges and found substitution of 10 core introductory courses with OER could save students $1.5 billion annually.

In addition to cost savings, OER are available digitally on the first day of class and can be printed at low cost by the student. Students have unlimited digital access to OER after the course

ends. Brandle et al. (2019) found 70% (n = 886) accessed the OER before the class began and 90% by the first week of class. Similarly, Agnihotri et al. (2017) found students performed better in class with instant access to course materials. Creating an instant access OER helps students who either entered the course late or did not purchase their textbook in advance.

Integration of OER in higher education in the United States has been widely supported by state and federal governments for over a decade. Since 2009, 29 states have either passed laws supporting and facilitating the use of OER in higher education or have bills pending in the legislature (SPARC, 2020). In 2019, the Affordable College Textbook Act was introduced in Congress to reduce the cost of textbooks by expanding the use of OER in higher education (Library of Congress, 2019). Immediate access to course materials has the potential for students to be more engaged in the course, use resources to complete coursework, and ultimately enhance student learning.

Course-Level Outcomes Studies

A growing body of research has been conducted on the outcomes of using OER in higher education. Winitzky-Stephens and Pickavance (2017) conducted a multi-level analysis that included course-level outcomes from 37 general education courses, each with both CT and OER sections. Their results found no statistically significant differences in grades between CT and OER courses.

Hilton's (2016, 2019) and Clinton and Khan's (2019) syntheses of literature reveal some mixed results, though overall, OER offers similar or greater learning gains compared to CT. Hilton (2016, 2019) aggregated data from 25 peer-reviewed studies conducted between 2002–2018; 11 studies favored OER over CT, 10 found either no statistical difference or mixed results. One study favored the CT, although it had confounding variables that may have impacted the outcome. The remaining three studies did not elaborate on the statistical significance. Earlier study designs lacked control for teacher and student effect; Hilton (2019) explained that significant results may disappear when such variables are not controlled. Clinton and Khan's (2019) analyses of 22 studies between 2012 and 2019 found no significant differences between OER and CT in learning outcomes.

Grewe and Preston Davis (2017) compared OER to CT to determine change in student achievement in an online history course by controlling for student effect (prior academic achievement, GPA). Such controls led to a significant outcome with students performing as well or better using OER compared to CT. Engler and Shedlosky-Shoemaker (2019) examined mastery of content in two face-to-face (FTF) introductory psychology courses over two semesters, one class using an OER, one using a CT. In an effort to control for student effect, as suggested by Grewe and Preston Davis (2017), the study controlled for GPA, total college credits, and SAT scores. The researchers also controlled for teacher effect by

using the same experienced instructor for both cohorts. The study found no significant differences in mastery of content for students using the OER. Additional studies (Colvard et al., 2018; Cuttler, 2019; Delgado et al., 2019) controlled for student differences (academic achievement, Pell grant and financial aid recipients, underserved populations) and teacher effect (Allen et al., 2018; Engler & Shedlosky-Shoemaker, 2019; Jhangiani et al., 2018) confirming previous findings supporting adoption of OER. Controlling for both teacher and student differences leads to more compelling results.

Throughput rates (an aggregate of drop, withdrawal, and grades ≥ C) can be considered a measure of student success as they impact time to graduation. It is unknown whether OER are responsible for impacting throughput rates, although recent research finds OER courses have comparable or improved throughput rates than CT. Hilton et al. (2016) investigated throughput rates for an Associate of Science degree program using a teacher developed OER for FTF and online/hybrid classes. Retrospective throughput rate data was analyzed from the college's institutional research database for OER and CT cohorts over four semesters. The results found OER throughput rates performed better than CT in all course types. Students were less likely to drop out and were more successful in their course. Fialkowski et al. (2019) also examined throughput rates for an introductory nutrition class using an OER developed for the institution. One difference from Hilton et al. (2016) involved controlling for teacher effect. Results confirm previous findings. Analysis was not completed between FTF and online cohorts.

Croteau (2017) examined the impact of OER in a university system including 14 institutions, 27 courses, and 3847 students. Measures included drop/fail/withdraw rate (DFW), completion rates, and final/exam/assessment grades. All measures (except for final grades for one college) found that OER offered similar learning gains and performed comparable to CT. Lawrence and Lester (2018) found improved DFW rates, although the authors noted some concern that previous to the study, similar reductions in DFW rates occurred. Nevertheless, continued research on DFW/throughput rates and engagement in OER may further explain the variables that impact student learning and success. One may hypothesize that students who are engaged in an OER course with immediate access to resources will tend not to drop or withdraw and pass the class.

Grimaldi et al. (2019) reported on 42 studies that conducted direct comparisons of grades between OER and non-OER courses. Their analysis found that OER performed equally to CT. In another large funded project conducted as a part of the Achieving the Dream's Open Educational Resources Degree Initiative, the team worked toward scaling OER usage and tracked implementation, student outcomes, and cost-savings (Griffiths et al., 2020). Their aim was to increase college affordability and student success through OER degrees and/or pathways. The initiative involved 38

colleges nationwide, 600 courses, and approximately 160,000 students. Students benefitted from the OER degree initiative by having unrestricted access to course materials, earned more college credit, and saved about $10.7 million in course resources costs. Instructors reported that OER positively impacted their pedagogical practice in terms of how they presented material to students. While the authors stated a broad range of disciplines were covered in the initiative, specific disciplines such as nursing were not mentioned.

There are limited research studies presenting outcomes data related to the use of OER in nursing education, and more specifically online RN to BSN nursing education. Riley and Carmack (2020) investigated the impact of OER on final course grades in an online informatics course in an RN to BSN program. The OER consisted of journal articles, videos, and federal guidelines about informatics found on the Internet. Results found a statistically significant increase (1.9%) in course grades in the OER cohort. No further OER research on outcomes in undergraduate online nursing education has been published.

The present study was conducted to determine the difference in outcomes in grades between courses utilizing a teacher-developed OER and a CT to answer three research questions and hypotheses:

1. Is there a difference in assignment grades between a course that uses a traditional commercial nursing education textbook and a course that uses OER exclusively?
    a. H: There will be no statistically significant differences in assignment grades between the two groups.
2. Is there a difference in online class discussion forum grades between a course that uses a traditional commercial nursing education textbook and a course that uses OER exclusively?
    a. H: There will be no statistically significant difference in discussion forum grades between the two groups.
3. Is there a difference in final grades between a course that uses a traditional commercial nursing education textbook and a course that uses OER exclusively?
    a. H: There will be no statistically significant difference in final grades between the two groups.

Methodology

A retrospective design was used to examine differences in course grades for nursing students enrolled in OER courses compared to those enrolled in courses using a CT during Spring, Summer, and Fall semesters in 2019.

The original study design controlled for student effect by obtaining student demographic data, grant and financial aid data, GPA, time spent using resources, preference for digital/print resources, and a pre/post-test to assess learning gains. Due to poor student

response to a call to participate in the study, the retrospective study design was necessary.

OER

For the purposes of this study, OER is defined as free course resources that can be accessed in the virtual classroom on the first day of class. The OER can also be accessed online at the textbook host site, downloaded to the student's computer and various reading platforms, or printed by a student, college bookstore, or online marketplace.

Creation of the OER for the present study was a result of an OER initiative from New York State. The State University of New York (SUNY) received $4 million between 2017 and 2020 to invest in OER adoption and creation (SUNY OER Services, 2020). The OER textbook was created by the Principle Investigator for an online RN to BSN (baccalaureate level) course at a four-year public institution.

The OER is a 138-page text containing six chapters with a CC-BY Creative Commons license. OER content covers all course topics and learning activities. The OER contains substantially more depth and breadth of course topics compared to the CT. Additionally, some chapters contain content that was not covered in the CT. Each chapter shares links to external websites to offer additional learning opportunities. Images and videos are shared throughout the OER to make it more visually appealing, in hopes of engaging students while using the resource. The OER was peer reviewed by the School of Nursing Curriculum Committee prior to use in this study.

The online class is open to students five days prior to class start. Students can click on selected chapters in the classroom or click on a link that takes them to the SUNY Textbooks website where students can read the entire text online, download it to their computer or e-book reader, or purchase a print copy from an online marketplace for $15 (a substantial cost savings from the $77 CT price). Students also have the option to purchase a print copy from the college bookstore.

Sample and Setting

The sample for this study included 160 nursing students enrolled in an online RN to BSN course during the spring (six sections), summer (two sections), and fall (five sections) semesters in 2019. Seven-week sections are offered twice per semester, with multiple sections running simultaneously. Students used the CT in the Spring semester and the OER in the Summer and Fall semesters.

All courses were delivered via the same learning management system (Moodle) with identical instructional designs. There were no curricular changes during the study period and all sections used the same standardized instruments (discussion forum and assignment grading rubrics). According to Russell (2015), instructional design and mode of delivery can influence student learning outcomes; thus, maintaining the same measurements is necessary for accurate reporting.

To control for teacher effect, the same three instructors taught all sections of the courses throughout the study period. These instructors have taught the course for several years and were proficient in the content. Moreover, each instructor taught similar numbers of students in the CT and OER groups. It is important to note the Principal Investigator of this study was one of the three instructors.

Data Collection

After Institutional Review Board approval, assignment, discussion forum, and final grades from all students enrolled during the study period were retrieved after the courses ended. All data were de-identified.

Measurement

The course requires students to participate in four discussion forums. Each discussion forum requires students to answer a set of questions for their initial post. Students need to respond to two peer posts by (1) reflecting on their peers' work and (2) answering two questions. All students in all sections were graded using the same discussion forum grading rubric. There were no changes to the discussion forum questions or grading rubric during the study period. Discussion forum grades are measured using numerical values (0-100).

The course required students to complete three written assignments. Two were written papers on professional role development and nursing theory. The third assignment was an annotated bibliography on a professional nursing role. All students in all sections were graded using the same grading rubric. There were no changes to assignment expectations or grading rubrics during the study period. Assignment grades are measured using numerical values (0-100).

Final grades were measured using the numerical value (0-100) for each student.

Data Analysis

Data were analyzed in SPSS Version 26.0 for Windows. Checks of data integrity included cleaning for missing data, checking test assumptions, and identifying extreme outliers. Initial data cleaning identified that two students were missing data for more than half of the coursework. These students disappeared from their courses without withdrawing. The decision was made to delete them from the sample.

Data from 160 nursing students were analyzed for this study. Of those, 78 (48.8%) were enrolled in courses that utilized the traditional textbook, and 82 (51.2%) were enrolled in the strictly OER courses. Three instructors taught the sections of courses with distributions as follows: 57 (35%, 24 OER and 33 traditional) taught by Instructor #1, 61 (38.1%, 35 OER and 26 traditional) by Instructor #2, and 42 (26.3%, 23 OER and 19 traditional) by Instructor #3.

Results

Research Question One: *Is there a difference in assignment grades between a course that uses a traditional commer-*

cial nursing education textbook and a course that uses OER exclusively?

Assignment #1 is a written paper on professional role development. One outlier was identified. The outlier was a student in the traditional group that had received a zero for this assignment for non-completion. This data point was removed during analysis, which then revealed a normal distribution. After removing the zero, the min/max ranged from 62-100, for this assignment (M = 86.85). The mean score for the traditional textbook group (n = 77, M = 88.04) was slightly higher than the OER group (n = 82, M = 85.73). An independent sample t-test was completed and found no statistically significant difference between the assignment scores for students in the OER and traditional textbook groups (p = .08) (See Table 1).

Assignment #2 is an annotated bibliography. For this assignment, scores less than 45 were identified as extreme outliers. One student in the traditional textbook group fit these criteria for extended lateness with submission, and was therefore deleted from the analysis of this assignment. Data from 159 students were analyzed for this assignment. The min/max ranged from 45-100 for this assignment. An independent sample t-test was completed and revealed a statistically significant difference (p = .04) between the mean assignment scores for students in the OER (n = 82, M = 89.46) and traditional textbook groups (n = 77, M = 85.70). The OER scores were significantly higher than those of the traditional textbook group, with a small to medium effect size (d = .33).

The final assignment (Assignment #3) is a scholarly paper on nursing theory. For this assignment, a normal distribution was created on a Q-Q plot by filtering out students with scores ranging 0-55, which were found to be extreme outliers. This accounted for one traditional student that achieved a low score (55) for lateness. After removing the outlier, the min/max ranged from 65-100 for this assignment. An independent sample t-test revealed no statistically significant difference (p = .24) between the mean assignment scores for students in the OER (n = 82, M = 91.81) and traditional textbook groups (n = 77, M = 90.36). The OER scores were slightly higher than those of the traditional textbook group. A second analysis was performed without removing the data from the one traditional student with the low score (55), which further revealed no statistically significant difference (p = .14) between grades in the OER (n = 82, M = 91.81) and traditional groups (n = 78, M = 89.88).

Research Question Two: *Is there a difference in online class discussion forum grades between a course that uses a traditional commercial nursing education textbook and a course that uses OER exclusively?*

In this course, there are four weeks of graded discussion forums. For the first discussion forum, no outliers were identified, with a fairly normal distribution on a Q-Q plot. The min/max ranged from 57-100, for this assignment (M = 86.85). The mean score for the traditional textbook group (n = 78, M = 91.27) was slightly lower than

Table 1. Assignment Grades

Assignment	**Course type**	***N***	***M***	***SD***	***SEM***	***p***
Assign #1	Traditional	77	88.04	7.39	.84	.08
	OER	82	85.73	9.07	1.00	
Assign #2	Traditional	77	85.70	10.67	1.22	.04
	OER	82	89.46	11.69	1.29	
Assign #3	Traditional	77	90.36	7.60	.87	.24/.14
	OER	82	91.81	7.93	.88	

the OER group (n = 82, M = 92.89). An independent samples t-test was completed and found no statistically significant difference between the assignment scores for students in the OER and traditional textbook groups (p = .24).

The second discussion forum revealed several low grades with a min/max ranged from 39-100 (M = 90.09). The two lowest scores for both groups were identical (39 and 42), while for the outliers on a Q-Q plot, the scores remained for the initial analysis. The mean score for the traditional textbook group (n = 78, M = 88.97) was slightly lower than the OER group (n = 82, M = 91.16). An independent samples t-test was completed and no statistically significant difference between the assignment scores for students in the OER and traditional textbook groups was found (p = .23).

Analysis of discussion forum #3 identified two outlier scores among the grades of students in the traditional textbook group (32 and 34). These low grades were due to lateness and lack of participation. Therefore, these grades were removed from the final analysis for this discussion (n = 158). The min/max ranged from 64-100 (M = 92.96). The mean score for the traditional textbook group (n = 76, M = 91.92) was slightly lower than the OER group (n = 82, M = 93.91). An independent samples t-test was completed and no statistically significant difference between the assignment scores for students in the OER and traditional textbook groups was found (p = .13).

For the final discussion forum, one student in each group received a 0 for a grade for non-completion. Therefore, those data were removed from analysis (n = 158). After removing the outliers, the min/max ranged from 65-100 for this assignment. An independent samples t-test revealed no statistically significant difference (p = .92) between the mean assignment scores for students in the OER (n = 81, M = 96.06) and traditional textbook groups (n = 77, M = 95.95). The OER scores were slightly higher than those of the traditional textbook group (See Table 2).

Table 2. Discussion Forum Grades

Variable	Course type	*N*	*M*	*SD*	*SEM*	*p*
Discussion #1	Traditional	78	91.27	7.93	.90	.24
	OER	82	92.89	9.30	1.03	
Discussion #2	Traditional	78	88.97	12.03	1.36	.23
	OER	82	91.16	11.01	1.22	
Discussion #3	Traditional	76	91.92	8.95	1.03	.13
	OER	82	93.91	7.68	.85	
Discussion #4	Traditional	77	95.95	6.46	.74	.92
	OER	81	96.06	7.14	.79	

Research Question Three: *Is there a difference in final grades between a course that uses a traditional commercial nursing education textbook and a course that uses OER exclusively?*

Final grades ranged from 63-99 across all sections, with a mean grade of 89.68 (*SD* 6.33). One student grade (63) in the traditional group was identified as an outlier. The initial analysis included all student grades (n = 160). An independent samples t-test revealed no statistically significant difference (p = .22) between the mean assignment scores for students in the OER (n = 82, M = 90.28) and traditional textbook groups (n = 78, M = 89.04). The OER scores were slightly higher than those of the traditional textbook group. A second analysis was performed without removing the data from the one traditional student (n = 159) with the low score (63), which further revealed no statistically significant difference (p = .34) between grades in the OER (n = 82, M = 90.28) and traditional groups (n = 77, M = 89.38) (See Table 3).

Table 3. Final Grades

Variable	Course type	*N*	*M*	*SD*	*SEM*	*p*
Final Grades	Traditional	78	89.04	6.50	.74	.22/.34
	OER	82	90.28	6.14	.68	

To control for teacher effect, the same instructors taught all sections of the courses. A two-way ANOVA was conducted to determine the influence of the instructor on student grades. The Tukey post-hoc test revealed no significant pairwise differences between all grades and the instructor, other than

Discussion #1 (See Table 4). Instructor #3's total mean score was significantly higher than that of both Instructor #1 and #2. It is important to note that Instructor #3 was an adjunct instructor, and not the researcher for this study.

Table 4. Interaction Effects Between Instructor and Grades

Grade Type	Instructor #1	Instructor #2	Instructor #3		
	M(SD)	*M(SD)*	*M(SD)*	*F*	*P*
Assignment #1	84.25(8.45)	87.41(8.27)	89.49(7.49)	.559	.573
Assignment #2	83.82(12.83)	91.07(7.59)	87.84(12.33)	.653	.522
Assignment #3	89.88(7.28)	91.05(8.26)	92.85(7.59)	.397	.673
Final Grades	87.16(6.67)	90.28(6.05)	92.21(5.01)	.404	.669
Discussion #1	89.25(8.64)	91.05(8.75)	97.16(6.21)	5.507	.005
Discussion #2	86.72(11.60)	90.61(11.50)	93.84(10.32)	1.239	.292
Discussion #3	90.63(8.15)	92.15(10.50)	96.02(8.06)	1.413	.247
Discussion #4	94.46(7.71)	96.20(6.03)	97.88(6.09)	1.033	.359

Discussion

Findings from this retrospective study found that a teacher-developed OER for an online nursing course can provide similar student learning outcomes compared to CT. Students that utilized solely OER content had discussion forum, assignments, and final grades that were statistically similar to grades for students that utilized solely CT content. While the OER cohort earned statistically significant higher grades for Assignment 2 ($p = .04$), it is important to note that students utilized less OER content for this assignment compared to other assignments. Assignment 2 required students to search the literature for five articles to write an annotated bibliography on a professional nursing role. Some content about professional nursing roles was reviewed in the OER, such as certifications and interpersonal skills, although much of the bibliography content came from the literature.

An overwhelming majority of studies conducted over nearly two decades reveal OER performs as well as or better than CT. Study findings are consistent with numerous other studies (Allen et al., 2015; Clinton, 2019; Croteau, 2017; Engler & Shedlosky-Shoemaker, 2019). For example, students in an online history course performed better using OER than CT (Grewe & Preston Davis, 2017). It is important to note this study controlled for student achievement, whereas this current study had no student controls. Cuttler

(2019) found online students (compared to classroom) had more difficulty using the OER to answer exam and assignment questions. These results can be related to how the OER was organized, such as glossary, index, or the overall organization of content. The OER readings for the courses used in this study were organized clearly, with one chapter assigned each week.

Findings are supported by Riley and Carmack's (2020) study investigating final grade outcomes in an online RN to BSN informatics course. The OER cohort earned higher final grades compared to CT. The OER in this study was not teacher-developed, but a combination of Internet resources and scholarly journal articles.

For a more exhaustive list of research studies supporting adoption of OER into secondary education, see Hilton (2016, 2019), Clinton and Khan (2019), and Grimaldi et al. (2019).

Integrating an OER into this online RN to BSN course was especially helpful to the student population. The majority of the students are non-traditional, with most working full-time as registered nurses and managing family responsibilities. Students did not need to plan ahead to order a textbook, they were able to complete all course activities using required resources, and having instant, free access to the OER reduced students' cost of college. It is estimated that a total of $12,320 in CT costs was saved during the study period.

Limitations

While the results of the present study are encouraging, it is important to note that there are several limitations to consider. Due to the retrospective design of the study, we were unable to control for student effect, such as GPA, experience with technology, being a Pell grant recipient, demographics, etc. These student-specific effects may have a significant impact on outcomes data.

This study investigated the use of OER in one course in one online RN-BSN program. While similar findings have been seen in previous research, the findings cannot be generalized to other settings. Since this course moved away from a CT to OER, there was no opportunity for random assignment to different groups. Had students had the opportunity to choose between course types, the results may have been different.

Since the Principal Investigator for this study was also an instructor for some of the sections of the course, it is possible that her interest may have had undue influence on course grades. However, the use of three different instructors to teach sections was utilized to minimize this risk. While this study controlled for teacher effect, there are limitations to how each instructor runs the class and interacts with students. For example, there can be variance in how often online instructors answer email, respond to questions, and post announcements and in the quality and frequency of feedback (Grewe & Davis, 2017).

Two of the sections used for analysis were offered in the summer. Summer session students may take fewer classes and earn higher grades, which could skew the data. Lastly, the OER content created for this course was in its first edition compared to the CT, which was in its eighth edition. While the OER content offered considerably more depth and breadth of content related to course objectives, the CT offered additional content that was not available in the OER, such as case studies and discussion forum questions at the end of each chapter. The resources offered different pedagogical approaches, literature, charts, and images, which could have impacted learning outcomes.

Conclusion

The main findings of this study show similar learning gains between OER and CT. This study shares timely knowledge about the use of OER in undergraduate online nursing education, a discipline with minimal OER outcomes data. At a time when competition for nursing program enrollment is high, nursing faculty have an essential tool, the adoption and creation of OER, to attract students to their institution. OER has the potential to retain students by offering free OER on the first day of class. When students can quickly access all required course materials, students may conceivably be more vested in their course and choose not to drop or withdraw, leading to college success.

Colleges also have the potential to benefit from OER adoption. Courses utilizing OER can potentially create environments where students are motivated to learn and can afford to learn, leading to higher enrollment and additional tuition and fees. Supporting faculty to develop and adopt OER content is an essential component to expanding OER usage in higher education.

Recommendations

Future research should investigate the use of the OER developed for this online course in other RN to BSN programs. Prospective designs and those that allow for randomization of students into experimental and control groups should be utilized. Allowing control for student effects such as GPA, experience with technology, being a Pell grants and/or financial aid recipient, and demographics is also important.

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Overcoming Textbook Access Barriers in an Introductory Psychology Course: An OER Study at a Hispanic-Serving Institution

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Abstract

The high cost of college textbooks is an access barrier for students to overcome during their pursuit of a college degree. Perhaps most at risk are community college students, an older, more diverse, and lower-income population in comparison with their university peers. Recently, community colleges have considered replacing traditional, commercially produced textbooks with free open educational resources (OERs). In this work, two aims are addressed. First, a small-scale investigation of the need for a low-cost textbook alternative was conducted in an introductory psychology course. In response to the finding that over a quarter of students could not afford the course textbook, a psychology OER was adapted from existing resources and piloted in three sections of this course. The second aim was to assess the impact of this OER textbook. Findings from this second survey found that the psychology OER was easy to use, was high quality, and supported students in their understanding of course content. Students also reported that the money saved from not having to buy a textbook made taking the course easier. Together, these findings support that OER textbooks are suitable replacements that can reduce the financial burden on low-income students and support them in the achievement of their academic goals.

Keywords: open educational resources (OER), psychology, textbooks, community college, access barriers, low income, Hispanic-serving institution

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Superar las barreras de acceso a los libros de texto en un curso de introducción a la psicología: un estudio de REA en una institución que sirve a hispanos

Resumen

El alto costo de los libros de texto universitarios es una barrera de acceso que los estudiantes deben superar durante su búsqueda de un título universitario. Quizás los que corren mayor riesgo son los estudiantes de colegios comunitarios, una población mayor, más diversa y de menores ingresos en comparación con sus compañeros universitarios. Recientemente, los colegios comunitarios han considerado reemplazar los libros de texto tradicionales producidos comercialmente con recursos educativos abiertos y gratuitos (REA). En este trabajo se abordaron dos objetivos. En primer lugar, en un curso de introducción a la psicología se llevó a cabo una investigación a pequeña escala sobre la necesidad de una alternativa de libro de texto de bajo costo. En respuesta al hallazgo de que más de una cuarta parte de los estudiantes no podían pagar el libro de texto del curso, se adaptó un REA de psicología de los recursos existentes y se puso a prueba en tres secciones de este curso. El segundo objetivo fue evaluar el impacto de este libro de texto REA. Los resultados de esta segunda encuesta encontraron que los REA de psicología eran fáciles de usar, de alta calidad y apoyaban a los estudiantes en su comprensión del contenido del curso. Los estudiantes también informaron que el dinero ahorrado por no tener que comprar un libro de texto facilitó la realización del curso. Juntos, estos hallazgos respaldan que los libros de texto REA son reemplazos adecuados que pueden reducir la carga financiera de los estudiantes de bajos ingresos y apoyarlos en el logro de sus metas académicas.

Palabras clave: recursos educativos abiertos, REA, psicología, libros de texto, colegio comunitario, barreras de acceso, instituciones de bajos ingresos que sirven a los hispanos

克服心理学入门课程中的课本获取障碍：一所拉美裔服务机构的开放教育资源研究

摘要

大学课本的高昂费用是学生在攻读学位阶段需要克服的阻碍。与其他大学的学生相比，社区大学的学生可能是困难最多的群体，因为后者年龄更大、更多样化、收入更低。近年来，社区大学已考虑用免费的开放教育资源（OERs）代替传统商业化课本。本文研究了两个目标。第一，在一门入门心理学课程中对低成本课本替代方案的需求进行了小范围调查。发现超过四分之一的学生无法负担传统课本，因此从现有资源中改编了心理学OER并试用于这门课的三个部分以作为响应。第二，评估了OER课本的影响。从第二个调查中得出的研究发现表明，心理学OER易于使用、质量高、并支持学生理解课程内容。学生也认为，不购买传统课本所省下的钱让其更轻松的参与这门课。总之，这些研究发现表明，OER课本是传统课本的可行替代物，能减少低收入学生的经济压力，并支持他们完成学业目标。

关键词：开放教育资源，OER，心理学，课本，社区大学，获取障碍，低收入，拉美裔服务机构（Hispanic-serving-institution）

Introduction

The cost of college textbooks has ballooned an estimated 945% from 1978 to 2014; a dramatic increase not observed in non-educational book costs or the overall consumer price index during the same period of time (Perry, 2015). This increase, together with rising tuition costs, pushes the goal of obtaining a college degree further from the reach of many students. Despite these difficulties, a total of 16.8 million students in the United States were enrolled at undergradu-

ate institutions in 2017, although this number represents a 7% decrease from 2010 enrollment figures (Snyder et al., 2019). One possible explanation for such high enrollment in light of rising costs is that students are adjusting their college experience in an attempt to reduce financial hardships. In a study conducted by the Florida Virtual Campus (2018), students reported enrolling in fewer courses, not buying a required textbook, not registering for a specific course, or earning a poor grade in a course as a consequence of not being able to afford a textbook. Students engaging in these behaviors may see an immediate reduction in the cost of pursuing a college degree while simultaneously undermining their success in achieving their academic goals.

Perhaps most at risk of experiencing the negative consequences of rising textbook costs are students enrolled in community colleges. Community colleges serve a unique role in postsecondary education, generally enrolling an older, more diverse student population than their university counterparts (Snyder et al., 2019). A higher percentage of independent students from lower income backgrounds enroll in community colleges, close to half of whom earn less than $20,000 per year (Radwin et al., 2018). Additionally, over half of the independent students enrolled in community colleges have their own dependents, further stretching their limited financial resources (Radwin et al., 2018). Despite pursuing this lower-cost route, over 60% of students enrolled in community colleges do not complete a degree or certificate within six years of their enrollment, with financial difficulties regularly cited as a main reason for leaving school (American Association of Community Colleges, 2018; Michalski, 2014). This trend is particularly troubling considering that students who complete an associate degree earn, on average, $5,400 more annually than high school graduates, a figure that outweighs the $3,600 estimated annual cost of attending a community college (Belfield & Bailey, 2017).

Considering their limited financial resources, a reduction in the total cost of attending college could improve the educational experiences of many community college students. Given the current cost of textbooks, replacement with open educational resources (OERs) is an attractive solution for reducing the cost of attending college. OERs "are any type of educational materials that are in the public domain or introduced with an open license" (UNESCO, 2002). Currently OERs for dozens of disciplines can be found online through project-specific websites (e.g., Rice University's OpenStax) or through networks such as OER Commons. Psychology, a popular discipline across many campuses, is fortunate to have a wide array of OERs available for use. A search on OER Commons identified 521 OERs for lower-division psychology courses. However, not all psychology OERs are created equal. While some OERs undergo a review and editing process similar to that of commercially produced textbooks (e.g., OpenStax, Noba), practices are inconsistent. Despite the differences between OERs

and commercially-produced textbooks used in psychology courses, students typically report similar use and perceptions of these two resources (reviewed in Clinton, 2019), although data about performance in courses using OERs is less clear, in part, due to variations in how performance is assessed (e.g., Gurung, 2017; Hilton & Laman, 2012). Taken together, these findings suggest that the replacement of a commercially produced psychology textbook with an OER textbook is a money saving solution that is unlikely to negatively impact the educational experience of students.

The aims of this project were twofold. The first aim was to assess the impact of textbook cost on textbook purchasing and subsequent perceptions of how students felt about their course performance in an introductory psychology course. The second aim was to develop and pilot a psychology OER for this course from existing resources and assess student perceptions of its quality and impact on their experience in the course. It is hypothesized that findings related to textbook cost and purchasing will reflect an inability to afford the course textbook for many students, and that this inability will negatively impact how students feel about their performance in the course. Further, it is hypothesized that students will have positive perceptions of the piloted OER and the impact it had on their experience in the course.

Materials & Methods

Participants, Institute, and Service District Demographics

In total, 148 students participated in two separate surveys. The first survey assessed the need for a low-cost textbook alternative in an introductory psychology course ($n = 56$ respondents) and the second assessed attitudes about an OER textbook piloted that same course the following semester ($n = 92$ respondents). To ensure the anonymity of all data, no personally identifying information including gender, race, or age were collected from participants. All data were collected during the 2014–15 and 2015–16 academic years (2015 calendar year) through the main campus of a two-year community college located in the northwest of the United States. This college is designated as a Hispanic-Serving Institution with over 25% of students identifying as Hispanic. During the 2014–2015 academic year, this institution served a population of 31,800 full and part-time students (11,802 full-time equivalent students of which 3,707 were full-time students) with an average age of 25. Of the total student population, 56.4% identified as female and 48.4% as persons of color or interracial. Sixty-five percent of enrolled students were either degree or certificate seeking. In total, 7,887 students were awarded financial aid or other assistance. The college's service district covers four counties and approximately 618,000 residents. During the time data were collected, the main campus had a population that was 21.8% non-white and a nominal

median household income of $46,069, with 16% living below the poverty level (United States Census Bureau, 2010).

Introductory psychology series and textbook

The introductory psychology course at the institute where data were collected is split into two, term-long courses. The first course in this series covers the history of psychology, research methods, biological bases of behavior, sensation and perception, development, consciousness, memory, and learning, while the second course in the series covers language, cognition, intelligence, motivation, emotions, stress, personality, social psychology, and the diagnosis and treatment of psychological illnesses. The decision to split the introductory psychology course into two smaller courses was, in part, driven by the institution's four-term academic calendar (i.e., fall, winter, spring, and summer). Given the sheer amount of content in a typical introductory psychology course, all topics could not be realistically covered in a single 10-week term.

Additionally, the split allowed for better alignment with degree-level objectives in a number of different programs to meet the needs of university transfer and career/technical education students. For example, a student pursuing a criminal justice path would only be required to take the second course in the series, while one wanting to transfer to a nursing program would be required to take both.

To cover the learning objectives for both of these courses, a single introductory textbook is used across the two-course series. The textbook, a popular college-level text with a retail price of $199.99 for a new hardcover edition, covered all content areas for both courses and included additional chapters on popular topics beyond the scope of a typical introductory course. This book was available for purchase in the campus bookstore in only hardcover format, but could also be purchased online as either a new or used book at a number of different price points (often cheaper) and in a number of different formats (i.e., hardcover, softcover, loose-leaf, or digital). It is worth noting that students receiving financial aid for textbooks were limited to only purchasing those books offered at the campus bookstore and, therefore, had to purchase the most expensive option.

Depending on the specific degree plan, it is possible that a student would have spent $199.99 on a textbook that was only used for a one-term psychology course. If a student happened to purchase this textbook at the end of its publishing cycle for use in one part of the introductory psychology series, it is also possible that they would be expected to purchase the newest edition should they later take the other course. These students would be further impacted by the low likelihood that they would be able to resell their textbook in order to recoup part of their financial investment. These factors, together with the demographic composition of this institution's service

district, motivated interest in exploring low-cost alternatives for the textbook currently being used in the introductory psychology series.

Survey 1: Assessing the need for a low-cost textbook alternative

At the end of the winter 2014–2015 term (March, 2015), an optional survey was administered to a sample of students enrolled in two sections of the first course of the introductory psychology series ($n = 56$). The survey was administered after the submission of final grades and all data were collected without the inclusion of demographic information in order to preserve anonymity. Students completing the survey received a "Thank You" message after submission, with no further academic or monetary compensation.

The survey consisted of five items: four statements that students were asked to rate on a 5-point Likert scale (1: strongly disagree, 3: neutral, 5: strongly agree) and one statement where the students had to respond with either true or false. The survey was administered online and took around three minutes to complete. The survey was designed in such a way that responses needed to be provided for all statements in order for the submit button to function. Because of this, 100% of submitted surveys contained responses for all items. Survey questions were designed to assess attitudes students had toward the cost and usefulness of textbooks, how their own financial situation limited access to these resources, and the impact of textbook access on their performance in the course. Statements were presented in the following order:

1. Textbooks are too expensive (5-point Likert).
2. The usefulness of a textbook is worth the price (5-point Likert).
3. Regardless of format (hardcover, softcover, loose-leaf), I would buy the cheapest available textbook for a course (5-point Likert).
4. I couldn't afford the textbook for this course (True/False)
    a. If the student answered "True," they were given Statement 5. If the answered "False," they were given Statement 6.
5. My performance in this course would have improved if I could have afforded to buy the textbook (5-point Likert).
6. My performance in this course would have suffered if I didn't buy the textbook (5-point Likert).

Building an OER textbook replacement

Based on the expected results of the first study, a decision was made to explore low-cost alternatives for the textbook currently used in the first course of the introductory psychology series. When evaluating options for a textbook alternative, interest immediately turned

to currently available OERs. The aim was to provide a resource that mirrored the currently used textbook in content, format, and readability that was either free or much lower cost than the current book. After evaluation of two psychology OERs (OpenStax Psychology and Noba), a decision was made to adapt Noba for the introductory psychology series. Noba was selected due to the ease of customization, level of readability, accessibility, quality of instructor resources, availability of an extremely low-cost print option (around $10), and eagerness of Noba staff in supporting the adaption of their OER. This resource was also selected due to familiarity on part of the author, who previously wrote a module for inclusion in Introduction to Psychology: The Full Noba Collection (Privitera, 2020).

To mirror the structure and content of the textbook currently used in the first half of the introductory psychology series, modules covering each topic were arranged in the same order. Because Noba is a modular OER, it was often the case that multiple modules had to be included in a single unit in order to cover the full scope of a single textbook chapter. However, given the short length of each module, the total length of one unit was comparable to that of a chapter in the current textbook. The finalized OER textbook was 356 pages long, containing eight units comprised of 20 separate modules.

Students were able to access the OER textbook using a computer or smartphone as either a website or downloadable PDF through a link sent out two weeks before the beginning of class. This link was also included on the course syllabus and website for students that lost the original email. In the event that a student wanted a hard copy of the OER textbook, a low-cost print option was provided through a third party (www.lulu.com). The total cost for a softcover, black and white copy of the textbook was around $10, including postage. Piloting of the OER textbook took place in two face-to-face (n = 67) and one online section (n = 29) of the first course in the introductory psychology series taught by the author.

Survey 2: Assessing student attitudes toward an OER textbook

At the end of the fall 2015–2016 term (December, 2015), an optional survey was administered to a sample of students enrolled across the three OER pilot sections (n = 92). Survey administration details were identical to those of the first survey. The survey consisted of 13 items: nine statements that students were asked to rate on a 5-point Likert scale (1: strongly disagree, 3: neutral, 5: strongly agree), two statements with multiple choices including one that allowed for a single selection to be made and another that allowed for multiple selections, and two statements where the students had to respond with either true or false. The survey was administered online and took around five minutes to complete. Survey questions were designed to assess attitudes students had toward the OER textbook,

how they accessed the book, the impact of this book on their performance in the course, and the impact of textbook cost. Statements were presented in the following order:

1. I normally pay for textbooks (True/False).
2. I have been unable to afford textbooks for some courses. (True/False)
3. Please select the way you accessed your course materials. (Three choices, multiple selection)
4. How much would you have paid for this textbook? (Seven choices, single selection)
5. I had easy access to the textbook. (5-point Likert)
6. The textbook used for this class was easy to use. (5-point Likert)
7. I actually read this textbook. (5-point Likert)
8. I understood the content much better because of the textbook. (5-point Likert)
9. The textbook used for this class was of a high quality. (5-point Likert)
10. I would recommend the use of this textbook to my classmates. (5-point Likert)
11. All sections of this class should use this textbook. (5-point Likert)
12. If I had a choice in the future to take a course that utilized open materials vs. one that did not, I would select the course that did. (5-point Likert)
13. The money I saved by not buying this textbook has made taking this class easier. (5-point Likert)

Data Analysis

Data were analyzed using SPSS software with response percentages rounded to the nearest integer. Due to the nature of this study, survey data were analyzed using descriptive statistics. Student responses for 5-point Likert scale questions were collapsed into agree, disagree, and neutral categories in the interest of reducing the complexity of interpretation. To estimate the average price for Statement 4 in the Survey 2, categorical price options were converted to continuous dollar values (i.e., the "Around $10" option was converted to $10, the "Over $50" option was converted to $51, etc.), multiplied by the frequency, summed, and averaged.

Statement 3 from Survey 1 was included to address an internal concern that switching the print format of the currently offered book to a cheaper format (i.e., softcover or loose-leaf) would decrease student purchasing because of format preferences. Because this item was not related to the research questions, this item was not included in further analysis.

Results

Survey 1: Assessing the need for a low-cost textbook alternative

When assessing general attitudes toward textbook cost and usefulness, 98% of students agreed that textbooks were too expensive with only 12% agreeing that the usefulness of a textbook justified the price. Questions assessing students' personal experience in the introductory psychology course revealed that 33% of students could not afford the assigned textbook, with 19% of these students feeling that their performance in the course would have improved if they had been able to buy it. Of those students that were able to buy the book, 56% felt that their performance in the course would have suffered if they had not purchased the book. These results support that students feel that textbooks are unjustifiably overpriced, that the cost of our current introductory psychology textbook limits access, and that this limit has the potential to impact how a student feels they will do in the course.

Survey 2: Assessing student attitudes toward an OER textbook

Results from the second survey are presented in Table 1 below.

The vast majority of student respondents (96%) are responsible for purchasing their own textbooks, with 45% of students reporting that they had been unable to afford textbooks for some courses. When given access to a free OER textbook for the first course of the introductory psychology series, 87% of students felt that the resource was easy to access, with 82% of students choosing to access the book through the course website, and fewer students utilizing the PDF (38%) or low-cost print options (27%). Most students believed that the OER textbook was easy to use (85%) and of high quality (74%), with 76% reporting that they actually read the book and 65% reporting that they understood the class content much better because of the textbook.

While the OER textbook was entirely free, 99% of students indicated that they would have paid for access (M = 33.62, SD = 15.70), including 25% reporting they would have paid over $50 for it. Although almost all students reported being willing to pay for access to the OER textbook, 79% indicated that taking the course was easier because of the money they saved by not having to buy a book. Seventy-six percent of students reported that they would recommend the textbook to their classmates and 73% believed that the OER textbook should be used in all sections of the first course of the introductory psychology series. Finally, 83% of students expressed a preference for selecting courses that use open materials compared with those that did not. The results from the second survey echo the finding from the previous survey that students struggle to afford textbooks for courses. However, the use of an OER textbook is seen as an accessible, high-quality option that supports students in their understanding of course content and meeting the demands of a college-level course.

Table 1. Student Responses to Assessing Student Attitudes Toward an OER Textbook Survey

Survey Item	True	False
I normally pay for textbooks	96%	4%
I have been unable to afford textbooks for some courses	45%	55%

	Course Website	Downloaded PDF	Ordered Print Copy
Please select the way you accessed your course materials (can select multiple options)	82%	38%	27%

	I wouldn't pay for this textbook	Around $10	Around $20	Around $30	Around $40	Around $50	Over $50
How much would you have paid for this textbook?	1%	16%	14%	22%	10%	12%	25%

	Strongly Agree	Somewhat Agree	Neutral	Somewhat Disagree	Strongly Disagree	Total Agree	Total Disagree
I had easy access to the textbook	74%	13%	8%	5%	8%	87%	13%
The textbook used for this class was easy to use	66%	19%	8%	4%	3%	85%	7%
I actually read this textbook	47%	29%	14%	7%	3%	76%	10%
I understood the content much better because of the textbook	40%	25%	21%	10%	4%	65%	14%
The textbook used for this class was of a high quality	45%	29%	20%	3%	3%	74%	6%
I would recommend the use of this textbook to my classmates	53%	23%	15%	5%	3%	76%	8%
All sections of this class should use this textbook	50%	23%	19%	5%	3%	73%	8%
If I had a choice in the future to take a course that utilized open materials vs. one that did not, I would select the course that did	70%	13%	13%	2%	2%	83%	4%
The money I saved by not buying this textbook has made taking this class easier	64%	15%	13%	2%	5%	79%	7%

Note: Percentages may not sum to 100% due to rounding

Discussion

The results of this study replicate the previously reported finding that students forego purchasing required textbooks due to cost. This behavior could be influenced by the belief that course textbooks are not worth the price, or that purchasing the textbook will not improve performance in the course; explanations that are supported by the current findings. Interestingly, while only 19% of students who did not buy the book believed their grade would have improved with it, 56% of those that bought the book believed their grade would have suffered without it. Given the nature of self-report, students could have selected the response that resulted in them appearing to be most consistent regardless of their true feelings: textbook buyers emphasize the negative impact of not buying the book, while non-buyers claim that the book does not impact their performance. Alternatively, only students purchasing the textbook experienced the benefit of this resource firsthand and, therefore, were likely more aware of how it impacted course performance. While these results were not overly surprising, they do underscore the need for colleges to find ways to better understand the possible barriers that prevent access and undermine college success.

The decision to replace an expensive commercially produced textbook with a free OER textbook

was met with positive feedback from students. Access issues as a result of high textbook costs were directly addressed by providing a free resource, easily accessible in both digital and, for a small fee, print formats. Despite previous studies suggesting a preference for printed over digital textbooks (e.g., Millar & Schrier, 2015), the current results support the opposite, even when the cost of a printed version was extremely low. One possible explanation for this discrepancy is that students have different textbook format preferences for courses in different disciplines, a finding previously reported in business majors (Ciampa et al., 2013). In light of the current finding, colleges looking to utilize OERs may want to consider offering digital resources without delaying their switch until after hard copies can be produced.

Most importantly, the majority of students using the OER textbook felt that it helped them understand the course content. This is perhaps due to students' belief that the resource was easy to use or the large number of students reporting that they were actually reading the textbook, although previous work suggests that self-reported reading rates may be inaccurate (Sappington et al., 2002). It is worth noting that, based on the demographic makeup of the college this study was conducted at, a significant number of respondents were likely English language learners. This, in combination with the high ease of use ratings, suggests that the provided OER was a suitable textbook replacement for students not speaking English as a first language.

Most students also believed that the money they saved from not buying the book actually made taking the course easier. It is unclear how students interpreted this particular statement, but one possible explanation for the high level of agreement is that students could afford to work fewer hours because they did not have to buy this book, allowing more time to be dedicated to school. Considering the $199.99 price of the original textbook, a student would have to work close to 30 hours at a minimum wage job in order to cover the cost. Whether the use of OER textbooks reduces the number of hours students work and how this free time is used were not explored in this study. Further work exploring the impact of OERs outside the classroom can provide additional insight into the benefits of reducing the cost of attending college.

The findings of this work support that free, high-quality alternatives to commercially produced textbooks exist and that their use supports students in the achievement of their academic goals. While these findings mirror those of other studies, they must be interpreted with caution. The present work was conducted in a small number of sections of an introductory psychology course taught by a single instructor and may not generalize to larger samples. While demographic information was not collected in the interest of preserving student anonymity, this decision prevented further exploration of differences between groups based on gender, race, or other significant variables. In some cases, the way in which a survey item was presented could have

prevented a clear answer from being collected. For example, if a student reported that they could afford the textbook for a course, it does not mean they actually purchased it. This study also did not include an assessment of course performance, a common feature of other OER studies, as it was not germane to the research questions. Finally, this work should not be seen as an endorsement of any specific psychology OER and should, instead, be seen as an example of how schools can begin the process of launching and evaluating the impact of OERs on their campus. The high cost of textbooks places a significant hurdle in front of students on their path to a college degree. OER adoption provides a solution that directly addresses this access barrier, supporting students in their academic journey.

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Note

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Moving Toward an Open Educational Resources (OER) Pedagogy: Presenting Three Ways Of Using OER in the Professional Writing Classroom

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Abstract

Open Educational Resources (OER) are changing the face of education. This paper offers some locations where OER may be found before discussing the challenges of using OER in writing courses. An outline of OER's pedagogical use, best practices, and possible parameters for OER evaluation are proffered. After offering a proposed checklist/rubric to aid educators in deciding on the usefulness of OER, the article describes three ways of interfacing with OER in writing classes in general, and business and technical writing classes in particular. Based on teaching experiences at three institutions, the paper is an expansion of my 2019 presentation at the New Jersey Writing Alliance conference.

Keywords: Open Educational Resources (OER), business writing, technical writing, professional writing, OER locations, Bloom's taxonomy

Hacia una pedagogía de recursos educativos abiertos (REA): presentación de tres formas de utilizar los REA en el aula de escritura profesional

Resumen

Los recursos educativos abiertos están cambiando la faz de la educación. Este documento ofrece algunos lugares donde se pueden encontrar recursos educativos abiertos (REA) antes de discutir los desafíos de usar los recursos educativos abiertos en cursos de redac-

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ción. Se ofrece un resumen del uso pedagógico, las mejores prácticas y los posibles parámetros de los Recursos Educativos Abiertos para la evaluación de los Recursos Educativos Abiertos. Después de ofrecer una lista de verificación / rúbrica propuesta para ayudar a los educadores a decidir sobre la utilidad de los recursos educativos abiertos, el artículo describe tres formas de interactuar con los recursos educativos abiertos en las clases de redacción en general, y en las clases de redacción comercial y técnica en particular. Basado en experiencias de enseñanza en tres instituciones, el artículo es una expansión de mi presentación de 2019 en la conferencia New Jersey Writing Alliance.

Palabras clave: Recursos educativos abiertos, redacción comercial, redacción técnica, redacción profesional, ubicaciones de REA, taxonomía de Bloom

迈向开放教育资源（OER）教学法：专业写作课堂中使用OER的三种方法

摘要

开放教育资源（OER）正在改变教育模式。本文提供了一些可能发现开放教育资源的场所，随后探讨了写作课中使用开放教育资源所面临的挑战。提供了开放教育资源教学法使用概述、最佳实践、以及用于评价开放教育资源的可能参数。在提出一个协助教育者决定开放教育资源的有用性的清单/说明之后，本文描述了三种从整体上让开放教育资源与写作课相连接，尤其是与商务写作课及技术写作课相连接的方法。基于在三所机构的教学经验，本文是我于2019年在新泽西写作联盟（New Jersey Writing Alliance）会议上所作报告的进一步扩展。

关键词：开放教育资源，商务写作，技术写作，专业写作，开放教育资源场所，布鲁姆分类学

Introduction

Open Educational Resources (OER) are changing the face of education. As free resources, they bring the distant close and make learning free, open, and multifaceted. OER mean different things to different people and are often confused with Internet resources. While the Internet hosts a wealth of multimedia sources that may or may not have educational value, OER are different. They may be hosted on and be open like Internet sources, but unlike Internet sources, they are vetted for educational value. Another important differentiator between OER and Internet sources is that the OER sites that host multimedia resources allow reuse, rework, and curation. While it may be foolish not to take advantage of the educational tools that open educational assets can be, using them without a pedagogical understanding and an evaluation method can create havoc instead of promoting engagement, and divert learners instead of enhancing their learning experience. While much research has been conducted on the growth, possibilities, the technical aspects, and the radical economic re-shifting that the OER revolution has ushered in, there are not many studies on how OER impact the teaching of writing. This may perhaps be the first study that highlights how OER have been used to enhance the business and technical writing of students and instructors. The article has been organized thus. Section one offers a brief history of OER, its various definitions, and classifications and provides a quick review of various repositories. Section two presents a taxonomy, best practices, and a checklist/rubric to help educators in general, and writing instructors in particular, choose OER sources they deem appropriate. Section three discusses how three business and technical writing programs use OER.

What Are OER & OER Repositories?

The term OER was first used at the 2002 UNESCO forum on Open Courseware to designate "teaching, learning, and research materials in any medium—digital or otherwise—that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions." OER came into being as a fallout of the massive open online course (MOOC) phenomenon when the world's most prestigious institutions, which were not considered to be "open," began creating free and open online courses. Looking for OER thus is not the same as "googling" and finding something educational, since OER now include full courses, course materials, modules, textbooks, streaming videos, tests, software, and any other tools, materials, or techniques used to support access to knowledge from universities, foundations, corporate houses, and institutions like NASA. Littlejohn et al. (2008) therefore characterize OER as:

> Digital assets—(e.g. an image, video, or audio clip), sometimes called a "raw media asset."

> Information objects—a structured aggregation of digital assets, designed purely to present information.
>
> Learning objects—an aggregation of one or more digital assets which represents an educationally meaningful stand-alone unit.
>
> Learning activities—tasks involving interactions with information to attain a specific learning outcome.
>
> Learning design—structured sequences of information and activities to promote learning. (p. 759)

In fact, as far back as 2002, UNESCO noted that the central point of the open provision is that the "educational resources enabled by information and communication technologies" can be used for consultation, use, and adaptation by a community of users for non-commercial purposes (p. 24). The vision of OER movement was to enable the creation of universally accessible educational materials, which anyone could use freely for teaching or learning purposes around the world. In the intervening years, much has been done to bring to pass the vision stated at the Paris conference and OER are now accessible globally.

Digitization is a key feature of OER. As the Institute for the Study of Knowledge Management in Education (ISKME) stated in 2007, OER are "digitized materials offered freely and openly for educators, students and self-learners to use and reuse for teaching, learning and research" (30). If "digitized" implies that OER can be podcasts or multimedia assets and not just textbooks or print articles, the "reuse" aspect highlights the fact that OER are editable and shareable.

In 2012, the OER movement gained momentum during the first World OER Congress held in Paris, France June 20–22, 2012. This event brought together Education Ministers from a variety of countries to agree on an OER strategy and way forward to make OER mainstream. The outcome of the OER World Congress led to the Paris OER Declaration, which contains recommendations to:

a. foster awareness and use of OER;

b. facilitate enabling environments for use of information and communication technologies (ICT);

c. reinforce the development of strategies and policies on OER;

d. promote the understanding and use of open licensing frameworks;

e. support capacity building for the sustainable development of quality learning materials;

f. foster strategic alliances for OER;

g. encourage the development and adaptation of OER in a variety of languages and cultural contexts;

h. encourage research on OER;

i. facilitate finding, retrieving, and sharing of OER; and

j. encourage the open licensing of educational materials produced with public funds. (p. 2)

Since the World OER Congress in Paris and its recommendations for OER development, the OER movement has undergone a shift and has catapulted quite a few countries and institutions into action. Many new OER initiatives are emerging, and policy developments on the national and regional levels, and even on some institutional levels, are underway worldwide.

The most important development of the OER movement has been the growth of OER repositories. Open educational projects and repositories are being created and maintained by universities, community colleges, nonprofits, educational nonprofits, corporate organizations, and even governments. Some repositories housing educational documentation, textbooks, videos, podcasts, assessments, and full courses include Merlot (merlot.org), OER Commons (oercommons.org), MIT's Open Courseware (ocw.mit.edu), to name a few. Plenty of vetted OER may be found in these repositories: the World Digital Library site (wdl.org/en/), the Community College Consortium for OER site (https://www.cccoer.org/learn/find-oer/), Princeton University's multimedia repository (https://mediacentral.princeton.edu/), University of Cambridge's OER site (http://oer.educ.cam.ac.uk/wiki/Home), Oxford University's open resources beta site (https://open.conted.ox.ac.uk/), the Canadian Athabasca University's site (https://oerknowledgecloud.org/), India's Shodhganga, an open access repository of doctoral dissertations (http://shodhganga.inflibnet.ac.in/), Hewlett-funded OER Africa (https://www.oerafrica.org/), and Australia's national digital learning repository (http://www.scootle.edu.au/ec/p/home). See Appendix 1 for a screenshot of more OER repositories.

Such OER repositories serve as sites where OER are collected, collated, and validated. While OER texts and materials may be produced by instructors, citizens, and organizations who desire to raise their profiles or want to share from altruistic motives, what is significant is that neither governments nor universities have policies or pedagogies in place for a large scale or exclusive adoption of educational resources that include complete courses and open textbooks. As it stands today, OER are being adopted by individual departments and instructors. In this context, it becomes important to understand, as Wiley (2007) noted, that OER are OER if they subscribe to the Four R's:

1. Reuse: the users can use the OER for their own purposes.
2. Redistribute: the users can share the OER with other individuals.
3. Revise: the user can adapt the OER.
4. Remix: the user can combine two or more OER to create a new OER resource.

In 2014, Wiley updated the four R's with the addition of Retain, in recognition of the copyrighting needs of OER creators.

5. Retain: the user can retain ownership and control the open educational resource. (*An Open Education Reader*, Chapter 16)

Since openness, adaptability, and flexibility are hallmarks of OER, it is easy to assume that attribution is not necessary. Most often than not, OER use a Creative Commons license. As per OER Commons, OER are "teaching and learning materials that are freely available online for everyone to use, whether you are an instructor, student, or self-learner" (https://www.oercommons.org/). However, there are gradations of openness, as Figure 1 shows.

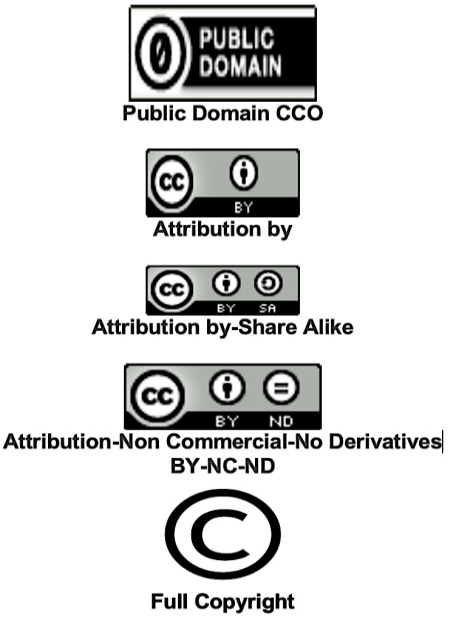

Figure 1. Gradations of Openness
Source: OER commons.

OER that are of interest to writing instructors can be of two broad kinds. The first kind is textbooks, and the second is course outcome enhancement materials. Currently, several options are available to locate high-quality open textbooks, a subset of OER often used to substitute for traditional textbooks. Among those providers are Openstax (openstaxcollege.org), The Saylor Foundation (saylor.org), Washington State's Open Course Library (opencourselibrary.org), and the Minnesota Open Textbook Library (open.umn.edu/opentextbooks/). While quite a few open writing textbooks are available at Openstax (http://cnx.org/), OER commons, Merlot, Project Guttenberg (guttenberg.org), E-books collection (Manybooks.net), and Read Print Books (readprint.com) house free literary texts. Quite naturally, an individual instructor cannot prescribe an open text for students, as they need to first seek approval of the dean or departmental head. As there is a growing realization that OER portals are poised to be information centers that can bring

down costs for entire institutions and countries, two of the three case studies presented here discuss adoptions that are institution-driven. One case study deals with a single department's adoption of an open text and the second discusses how an institution adopted OER textbooks and materials as a policy and process university-wide. Since the OER revolution does not always have to be top-down, the third instance is that of a single instructor's adoption of open educational multimedia material as an enhancement tool.

When the instructor replaces the publisher textbook, whether it is a CC-BY or CCO license with an OER textbook, or introduces supplemental material to supplement a conventional textbook, it creates what Vanasupa et al. (2016) described as "the first moment of building trust between professors and their students" (p. 200). Even more importantly, it is "an acknowledgment by the faculty member that the art of teaching is constantly evolving and that multimedia should be included in their teaching styles" (Vanasupa et al., 2016). In the words of Littlejohn et al. (2008):

> Open learning resources are fundamental to good quality education; using only print sources may not be enough now. While the use of print-based resources as an integral part of teaching across all sectors of education and their use has evolved over a long period of time, especially in conventional, didactic modes of teaching, it is now time to move on. The last few decades have seen major changes, both in ideas about effective teaching methods and in the availability and affordances of new types of resources based on digital technologies. Understanding how to employ these new resources is still evolving and teaching staff are in the position of learners as they explore effective ways of using them .... It is the ways in which resources can be used by practitioners, both as learners and as instructors that are important. This duality of characteristics is particularly evident in our survey of resources that are specifically designed to change eLearning practice. (pp. 757-771)

Embracing OER is in many ways also embracing technology. Technology should be viewed as user-friendly. An instructor must be able to pick OER, find a link between them, curate them for easy use during classes, and eventually, contribute to them. Many repositories, such as OER Commons, offer curating capabilities as well.

To use OER effectively requires an understanding of not only OER copyright laws and their peculiarities, but also an understanding of technology as an access tool and for curation purposes. Repositories and open courseware mostly host OER using universal design principles. To emphasize this point, the mission of the 2002 UNESCO conference that began the OER movement was focused on open software and open courseware. With hosting becoming more common and technology becoming more familiar and available

for both instructors and students, the open educational creator and educator are in a position today to close what Vanasupa et al. (2010) described as the educational gap and "open possibilities for the university to function more as a community" (p. 210). The open educational technological revolution has made it possible for students to spend no or minimal amounts of money on textbooks while offering educators and educational institutions valuable tools to enhance the learning classroom and educational experience at no or minimal cost. Notwithstanding the growth in OER and despite the advantages of using them, Allen and Seaman (2014), in their nationally representative survey of 2144 faculty members in the United States, found that only 34% of respondents expressed awareness of OER (p. 38). While OER creators are using open principles and design for ownership, it does not automatically, as Moore (2018) correctly noted, "create an Open Educational Resources community of practice" (pp. 38-39). More needs to be done to popularize and pedagogize it. To make this happen, "prospective instructors or OER users need to conduct formative and summative evaluations" (Moore, 2018, pp. 42-43). In order for faculty to replace commercial textbooks with OER, they, as Allen and Seaman (2014) noted, not only need to be aware of OER, but also need to be sure that OER texts have proven efficacy and trusted quality (p. 11). This brings us to the importance of peer review.

OER materials and textbooks can be registered under Creative Commons license even when they can be repurposed. The location where OER are found is as important as the understanding of the difference between free to read and free to reuse. Hence, the use of OER-exclusive repositories has led to better reuse and educational outcomes. The advantage of going to university repositories is that instructors and students alike are assured of their authenticity, accuracy, and educational value. When institutions evaluate resources and repositories before recommending or hosting them, they tend to evaluate OER using institutional factors such as how well the resources or repositories have resources that meet institutional requirements and strategies. Since peer review is intrinsic to judging the educational quality of the OER, the appearances of open repositories that vet, collect, and curate is a positive development for instructors eager to participate and share in this new world of learning without barriers. Much work needs to be done to aid instructors who are willing to use multimedia resources in class but may need some technological input in the curation area.

OER can be a godsend for any writing instructor. Santos-Hermosa et al. (2017) proposed three core dimensions for evaluating OER: general/descriptive factors to establish types of OER, a focus on drivers for OER reuse, and a focus on educational aspects (p. 88). While it is undeniable that a secure and reusable platform is an important design factor that contributes to OER reuse, the real driver to their use can only come from pedagogy and bottom-up approaches, as these increase the educational usefulness and reuse of OER. This

implies that when institutions come up with assessment criteria, they may differ from what an individual department or instructor may want to evolve and use. Again, validation by repository creators alone cannot drive the adoption of open educational repositories.

> One could assume that educational features are more present in Open Educational Resources-exclusive repositories, which are created to meet an educational need ... [yet] such repositories are not currently achieving their fullest potential. Although there is more educational information in this kind of repository (just over sixty percent), there are still many cases of Open Educational Resources described and retrieved by type or format instead of by detailed educational metadata that better meets the users' needs. (Santos-Hermosa et al., 2017, p. 113)

To facilitate better sharing and use of repositories there is a need to evolve and share best practices at the instructor level.

Best Practices with OER

Leonard Bloom (1956) segregated learning into cognitive categories: knowledge, comprehension, analysis, application, synthesis, and finally evaluation. Instructors were encouraged to move students from level 1 to level 6 learning categories, namely from knowledge to evaluation.

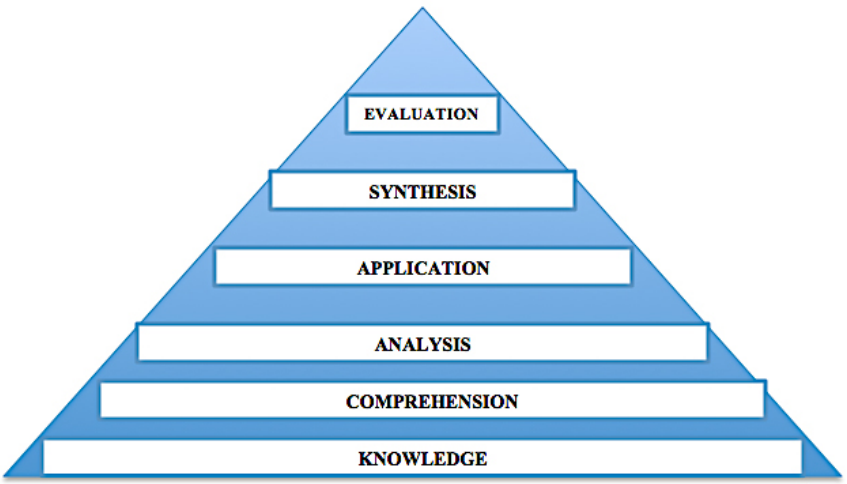

Figure 2. Bloom's Taxonomy

With OER, the instructor needs to move from identifying and collecting resources to connecting and curating them for use in the class. Otherwise, the resource, however interesting and relevant, becomes extra work for the student. Unless the sources are connected to an assignment or the resources, whether videos and PowerPoints, are curated, using OER will not be gainful. Since curation implies sorting, sifting, and combining, it requires both ped-

agogical and technical awareness. It is only when instructors have achieved good results in class with their curated OER that they reach the highest level —that of contributing and sharing for reuse. So like Bloom's taxonomy, a taxonomy of OER, as Valenza et al. (2014) noted, would show a movement up over the four action categories: collect, connect, curate, and contribute.

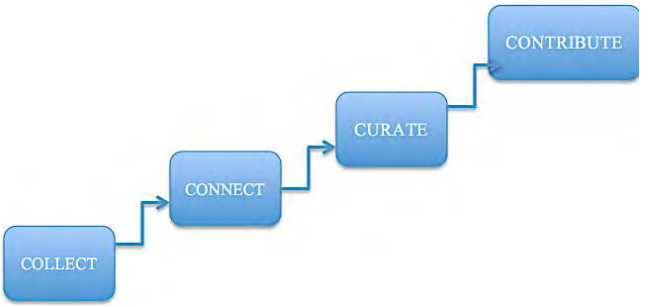

Figure 3. Taxonomy of OER Use

The Collect Phase

In stage one, the writing instructor learns about open educational repositories and OER attribution norms and *collects* useful and relevant content that can enhance the classroom and student understanding of the subject matter. While checking for available multimedia resources that have the proper Creative Commons licenses and that align with the content, writing instructors can find educational resources textbooks on the subject matter that could be prescribed. Even if they do not have the authority to prescribe it, they could recommend it as additional reading(s).

The Connect Phase

In the second stage, writing instructors *connect* the sources with course outcomes as they preserve them for a specific purpose or for its appeal to the student audience. At this stage, it might be useful to have a checklist or select a list of parameters. While each instructor probably has a sense of what they want, I have found these five to be useful: content, format, accessibility, shelf life, and "wow factor." While the relevance and accuracy of the content cannot be overemphasized, the format is equally important. Although students have various learning styles, printed materials help the textual learner but not the auditory, visual, or kinesthetic learner. OER provide the opportunity for the instructor to use audio or video to engage all kinds of learners. Instructors save time and energy by using OER without having to give up on being able to appeal to all learning styles. They are also able to engage, interest, and encourage pupils to interact with the material at hand without having to create audio, video, and visuals themselves, since not everyone has the skill to create multimedia materials. However, it is important at this point to remember the

accessibility factor. Resources need to be easily accessible and downloadable, since not all students have access to a 5G network or fast modems. Accessibility factors notwithstanding, writing instructors do not teach core courses, so the "wow factor" that multimedia resources have need to be tapped. The wow factor is an important criterion as it can drive and enhance students' interest and engagement in the class. Unlike those found in OER repositories, shelf life can be an issue when OER sources are used from YouTube, for instance, since they can be removed at the will of the creator. Not all criteria in the checklist are equally important; hence, I do not give equal weight to each parameter. The wow factor and shelf life can be assessed at half the weight of the other three.

The Curate Phase

In stage three, instructors move on to *curate* the OER they found, collated, and preserved. At this stage, the instructors analyze, evaluate, and contextualize the resource and hold discussions within the OER. Although numerous curating resources exist (see Appendix 2 for a picture of the many tools available – even if it is not an exhaustive list), I recommend Storify, Evernote, Scoop it, Curriki, and TedEd lessons, as I have used these successfully. In my Evernote lesson (screenshots presented in Appendix 3), the curating tool gave me the ability to comment on the Richard Branson's beer mat pitch video that I wanted to incorporate in the context of the writing course project. As you can see, I discuss the OER to provide the larger picture, the context, and the value of the project assignment. The video not only provides an interesting start to the project pitching, but also allows me to provide a scaffolding form to brainstorm on the semester-long assignment. Pedagogically, I use the curating resource to localize the resource.

The Localize Phase

The need to *localize* to curate and integrate the resources into the classroom cannot be overemphasized, because this is what turns it into a pedagogic entity. Localization refers to the process of taking educational resources developed for one context and adapting them for other contexts. These contexts can, for example, be geographical, pedagogical, political, or technical. The practice of localization encompasses more than the translation of materials into a local language or swapping a photo to reflect a culture. Rather, localization is at the heart of the OER process. It is the process through which educational resources are adapted to meet local teaching and learning needs. According to ISKME (2007),

> Open educational resource localization refers to the process of taking educational resources developed for one context and adapting them for other contexts. These contexts can, for example, be geographical, pedagogical, political, or technical. The practice of localization encompasses more than the translation of materials into a local language or swapping a photo to reflect

> a culture. Localization is at the heart of the Open educational resource process—it exemplifies diversity, openness, and reusability. (p. 45)

Localization happens when modification happens, irrespective of what is being taught or where it is being taught.

Localization occurs in proportion to the reasons that drive the instructors to use OER. While most writing instructors may opt to use OER to broaden horizons and be current and hence use them as supplementary coursework, some may opt to use it to improve their teaching practices and form a sharing community with like-minded instructors. Whatever the motivation, here are a few reasons that OER are generally localized:

> To address a particular teaching style or learning style
>
> To adapt to a different grade level
>
> To adapt to a different discipline
>
> To adjust for a different learning environment
>
> To address diversity needs
>
> To address a cultural preference
>
> To support a specific pedagogical need
>
> To address either a school or a district's standardized curriculum. (ISKME, 2007, p. 45)

The "format" criterion of the checklist or rubric to judge the OER material, therefore, needs to account for the ease or lack thereof in assisting instructors in their efforts to localize and curate.

The Contribute Phase

The fourth and final step of the OER taxonomy moves beyond curation to creation and *contribution*. When writing instructors have not just used an open resource after localizing it but have converted it into a new modified resource in the process of adaptation and localization, they may be ready to go public with it. At this point, the OER becomes a redefined resource that can be shared with fellow instructors to use and re-use. At this stage, writing instructors contribute to the movement by collaborating with the source, and trans-creating it for the benefit of the academic community.

The 10-point open educational sources checklist that evolves out of the best practices of an OER pedagogy can be envisaged as a possible rubric (opposite page). This rubric has helped me immensely in my teaching as an OER teacher and can be molded according to individual instructor needs.

As we move toward an OER pedagogy, it is a good practice to share how individual instructors and institutions are going about their evolution into being open instructors. There are numerous ways that OER can be used by the writing instructor in teaching professional and technical writing, for instance, as the next section highlights.

CONTENT **1) Is the content accurate?** **2) Has it been vetted? Did I pick it up for an** OER **repository that uses peer review to validate content?**	5
ACCESSIBILITY **3) Can I localize it?** **4) Can all my users access it?**	5
FORMAT **5) What form or multimedia format is it in?** **6) Can my or my institution**'s **server handle the load? Will it present problems on my** student's **device/connection?** **7) Does it allow easy remix for reuse and** updatability**?**	5
SHELF LIFE **8) How long do I assume its shelf life will be? Is the expected time of use worth the effort I have to put in to localize it?** **9) Can it be updated seamlessly? Or will it have to be completely replaced?**	2.5
WOW FACTOR **10) How will it engage my student in learning? Will it wow my online and on-site students equally?**	2.5

Three Ways of Using OER in the Business and Technical Writing Classroom

OER may be used as additional resources by an instructor, as a prescribed textbook by a department, or as exclusive educational material by an institution. It may be useful to study how three educational institutions used OER in these three different ways.

Using OER as Additional Resources

At Rutgers University, NJ, the prescribed texts by Magrino and Goeller (2013) operate on the Six P principles of project writing, where each P symbolizes one aspect of the project that students need to develop in to complete their real-world course project. The Six Ps are Patron, Problem, Public, Paradigm, Plan, and Price. Students work toward their 6P projects through four assignments: the white paper elaborating on the Six Ps-based proposal pitch, the midterm sales letter to the patron with a validation plan for the Six Ps, the simulated presentation to the patron at the three-quarter point, and the final project proposal, where all six Ps, including the plan and the price, are explained in full detail. Students have to validate their approach and plan by finding and situating case studies within a theoretical framework as a way to persuade the patron to give them an opportunity to implement their technical or business proposal. Teaching this class offers instructors plenty of

opportunities to use OER to facilitate student research into models of success (or failure) so they can build a feasible real-world plan. Personally, I use a TedEd lesson to curate my OER-integrated lesson to demonstrate how students can best present their proposal. In it, I reused a Steve Jobs launch video analysis (an OER) and integrated it into a lesson that involves explaining the assignment, highlighting how students can meet rubric expectations, and hold a discussion if necessary, to answer questions on the assignment. (For screenshots, please see Appendix 4). As per student feedback, the Evernote lesson increased both interest and retention for both online and onsite classes, whereas the TedEd lesson was particularly useful for the onsite classes where students came up with their own "wow" factors based on their takeaway from the Steve Jobs video. There as many ways that curated lessons can be used to increase student engagement and performance as there are writing instructors who use OER that best fit their students' profiles and enhance their understanding.

Using Open Text

A second way of interfacing with open education resource is the use of an open text. Cogswell Polytechnical College in Silicon Valley, CA was faced with the problem of students complaining of the high price of the prescribed textbook in the Technical Writing class. When the Dean of Education, Jerome Solomon, approached me as a subject matter expert for a solution, I suggested an open text, The Mayfield Handbook of Technical & Scientific Writing, written by Massachusetts Institute of Technology (MIT) professors James Paradis, Leslie C. Perelman, and Edward Barrett. Not only was the suggestion to an open source text accepted right away, but it also led to extremely positive outcomes including student savings and student retention, prompting the Director of Online Learning, Richard Schimpf, to state that the course had become "one of our most popular online courses" (see Appendix 5).

An important clarification is required here. *The Mayfield Handbook* is not just an OER text: it is an open text, because it is both scholarly and peer-reviewed like open access journals. Conceived as a text for MIT's open courseware initiative (http://ocw.mit.edu/courses/audio-video-courses/), the handbook is now open for the world to use. As author James Paradis states, "We were always thrilled to imagine that we could field a useful guide to Science and Technical Communication that would be free in a digital and easy-to-use format. Long live the principles and practices of Open Education! *The Mayfield Handbook* was a born-digital project that then made its way into print. At any rate, we have made it open access, and hope it continues to serve science and technical communicators everywhere" (personal email communication, May 25, 2019). Another textbook available in the field of technical writing is Technical Writing by Allison Gross, Annemarie Hamlin, Billy Merck, Chris Rubio, Jodi Naas, Megan Savage, and Michele Desilva, which can be found in Oregon University's OER repository,

Open Oregon Educational Resources (https://openoregon.pressbooks.pub/technicalwriting/). Again, a Saylor Foundation-sponsored business writing textbook by McLean and Moman, titled Business English for Success, is available at the University of Minnesota's open textbook library (https://open.umn.edu/opentextbooks/textbooks/business-english-for-success) and is being used in 13 institutions of higher learning (see site for list). Despite the availability of such open texts, challenges to the production and adoption of open textbooks remain. According to Baker et al. (2009), they are:

1) faculty members' and students' expectations of high production quality and ancillaries for open textbooks,
2) methods for documenting and maintaining control over various versions, and
3) the process of converting existing open content to digital and accessible formats. (p. 7)

When there is a university-wide decision to adopt open resources and open texts, however, the problems and resistance can be surmounted. University of Maryland Global Campus (UMGC), offering classes across USA and in Europe, the Middle East, and Asia, is one such institution whose use of OER will be discussed in the next section.

Using OER materials exclusively as university-wide policy

University of Maryland University College, now UMGC, was able to surmount obstacles to OER use successfully when it successfully put to the test what Baker et al. (2009) called the premise of open textbook proof of concept, whereby "a system of publicly financed textbook production could co-exist alongside the system of copyright monopolies, allowing for a market test of the relative efficiency of the two systems." Such an alternative system could offer large savings to students, more flexibility to professors, and efficiency gains to the economy as a whole. By converting all texts to OER texts and resources, universities can reduce costs, encourage retention, and increase enrollment, and is the third and perhaps the most effective way of interfacing with OER.

The UMGC story of sustained effort at using OER across courses, departments, and countries is significant. As per an *Inside Higher Ed* article on UMGC by Mckenzie (2018), "In 2014, the university told *Inside Higher Ed* that if it couldn't increase enrollment by 5 to 7 percent per year, it would be forced to raise its tuition. The university's worldwide enrollment had shrunk to its lowest level since 2006. Fast-forward to today, and UMUC [now UMGC] is reporting ... 52,987 new and returning U.S.-based students enrolled in the summer and fall terms of 2017—the highest in the university's 70-year history." As per Javier Miyares, president, the increased U.S. enrollment had been the result of a multipronged strategy that involved "moving away from traditional textbooks and transitioning fully to OER. In the 2013-14 academic year, UMUC [now UMGC] reported its average books and supplies cost was $1,000

per student. In 2014-15, it was $600. And by 2015-16, it was zero" (Mckenzie, 2018). Unless UMGC changes its policy, student's books and supplies cost will stay at zero.

The Writing Across the Curriculum Department at the University of Maryland Global Campus was at the forefront of the shift to OER including open textbooks. While business writing courses at UMGC opted for McLean and Moman's Business Communication, the technical writing class used the Mayfield text and an open corporate produced textbook titled Tech Writing Handbook by Kyle Wiens and Julia Bluff as an additional text. Also, both the business and technical writing courses use numerous open educational podcasts, videocasts, video reviews, work instructions, user manuals, video tutorials, blogs, white papers, guides, manuals, and articles that have been carefully curated and organized week-by-week in keeping with weekly deliverables and progressive outcomes so each builds onto the other so that they fulfill course objectives. Having taught at UMGC, I know firsthand the delight of students of having a no-cost option of textbooks and learning materials.

Discussion and Conclusion

The use of OER in professional writing classes, whether as additional materials, as prescribed textbooks, or as exclusive educational materials at the institutions just discussed, show that OER can enhance the project writing classroom successfully. Whether used singly, additionally, or exclusively, OER offer educators ways to raise engagement levels by providing a repository of multimedia materials. OER thus expand the toolbox for instructors to connect with students with multiple learning styles at multiple levels while saving them time and offering them an opportunity to collaborate, contribute, and create with colleagues. However, the OER revolution can reach its full potential not just with business and technical writing classes, but with all courses—only when the following happens. Instructors need to acquire the expertise to move up the OER taxonomic scale, while methods of documenting and maintaining control over the various resources used in a department are found. This can come about only when the will to migrate to OER grows stronger in institutions. As the Hewlett Foundation put together its new OER strategy for 2020, they acknowledged that "While scale and access have been the focus of OER's initial growth, we see considerable interest and opportunities for OER to enhance student and instructor agency. We are at a point in time when we can begin to more deeply explore questions about how open education can engage learners who come to school with different experiences, needs, and interests. This work calls on the field to advance the sustainability of open education models, to increase opportunities for collaboration among organizations in the open education ecosystem, and to intentionally invite new voices and perspectives for leadership and insight" (DeBarger, 2019). In other words, irrespective of what universities and OER organizations decide, the role

and importance of open faculty—or faculty who use OER—will continue to be important and critical, as it is they who localize information and provide it to the students. As Anderson (2010) put it,

> Institutions should value intellectual diversity, and by this, I mean that institutions *need* open faculty in the same way they need extraordinary instructors and expert researchers. Open digital faculty are exceptionally good connectors—open communities of learning usually span many disciplines, countries, and levels of educational institutions. These faculty can be extremely valuable for connecting faculty in one field with those who have similar ideas in another field, or at a different level of education. Because they share on the web, open digital faculty can maintain good ties with former students (now alumni) and with colleagues in other countries. (p. 49)

To conclude, here are ways that open faculty can become involved in and strengthen the OER movement:

- Know that OER are academically feasible.
- Keep using OER to connect to students.
- Begin working with digitized materials and curation tools.
- Move up the OER use taxonomy scale.
- Help develop models and processes to support OER textbooks.
- Spread the word about OER and share best practices.
- As adoption grows, prepare for the OER revolution that will eventually overhaul curriculum, pedagogy, and assessment.

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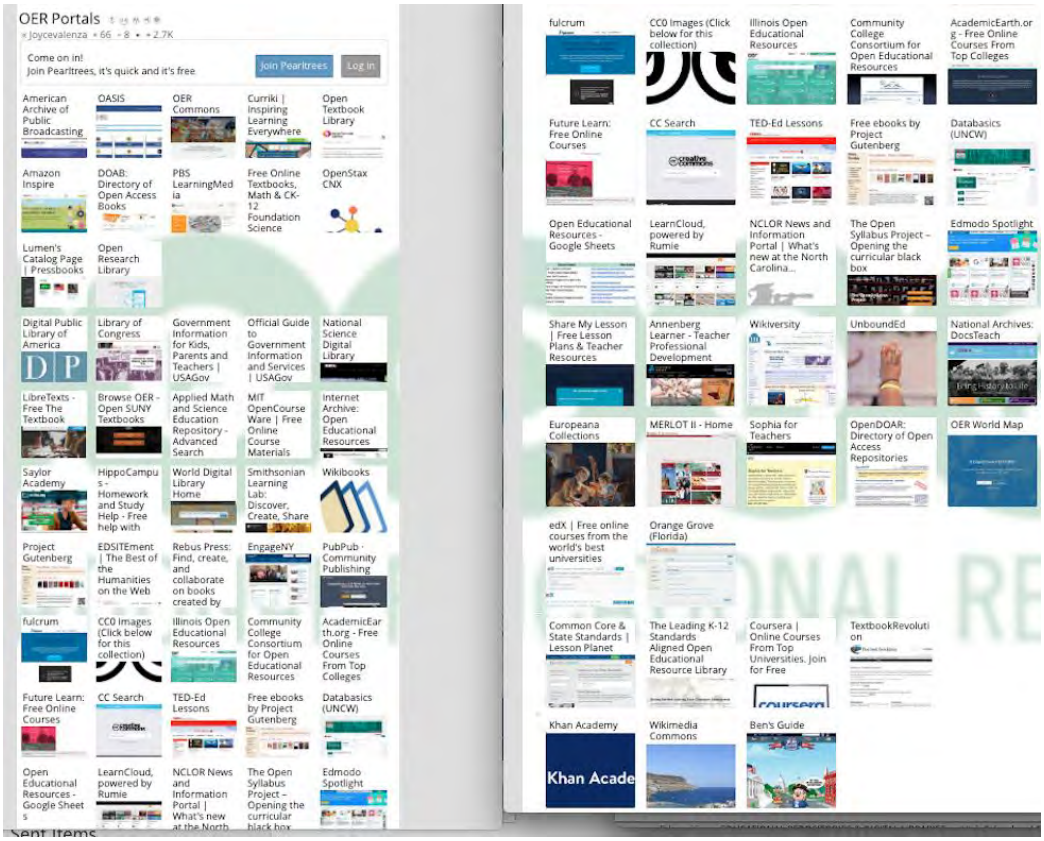
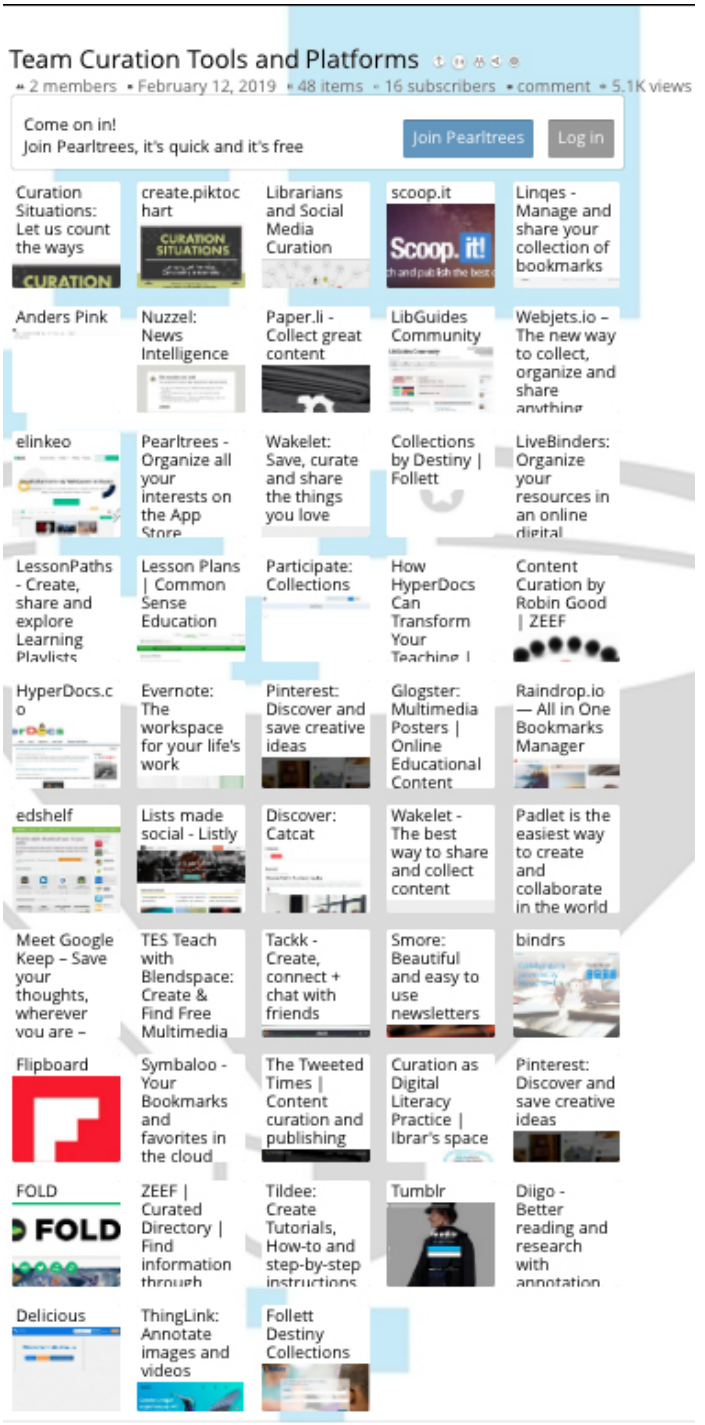
Appendix 1: List of OER Repositories

Retrieved from Prof Joyce Valenza's post @
http://www.pearltrees.com/joycevalenza/oer-portals/id17856381#l958



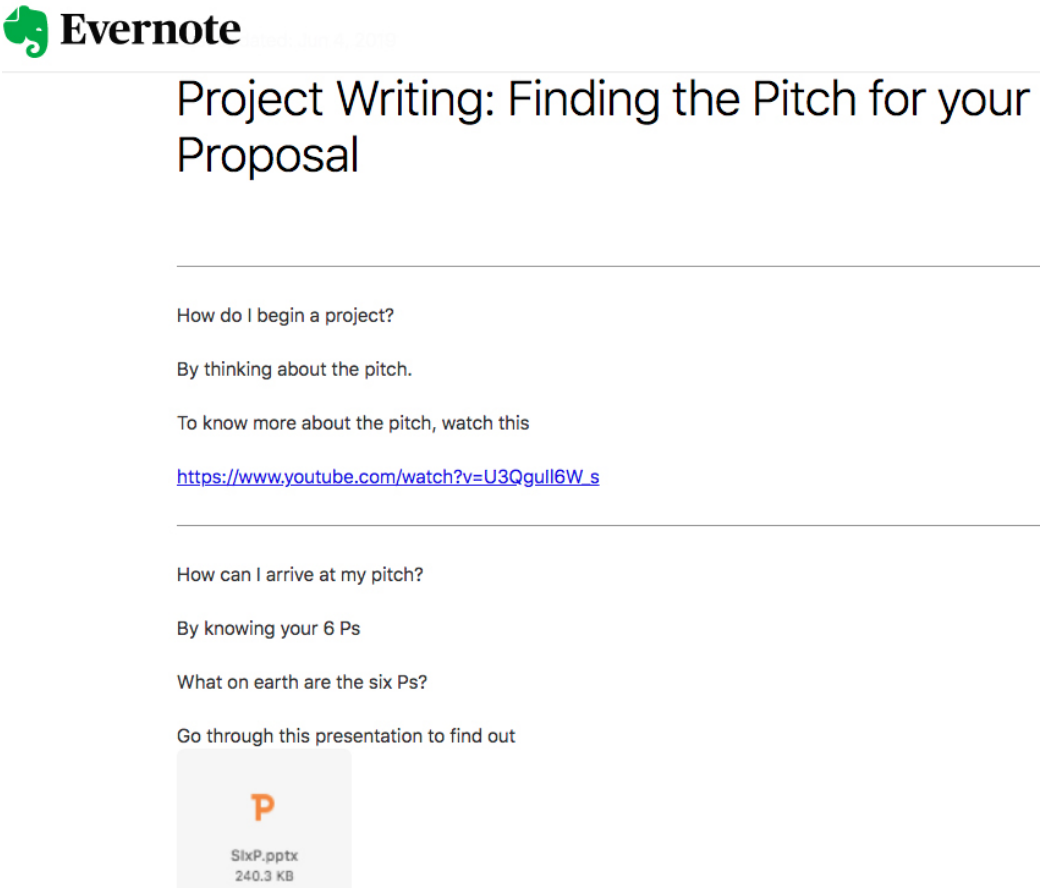
Appendix 2-List of Curation tools

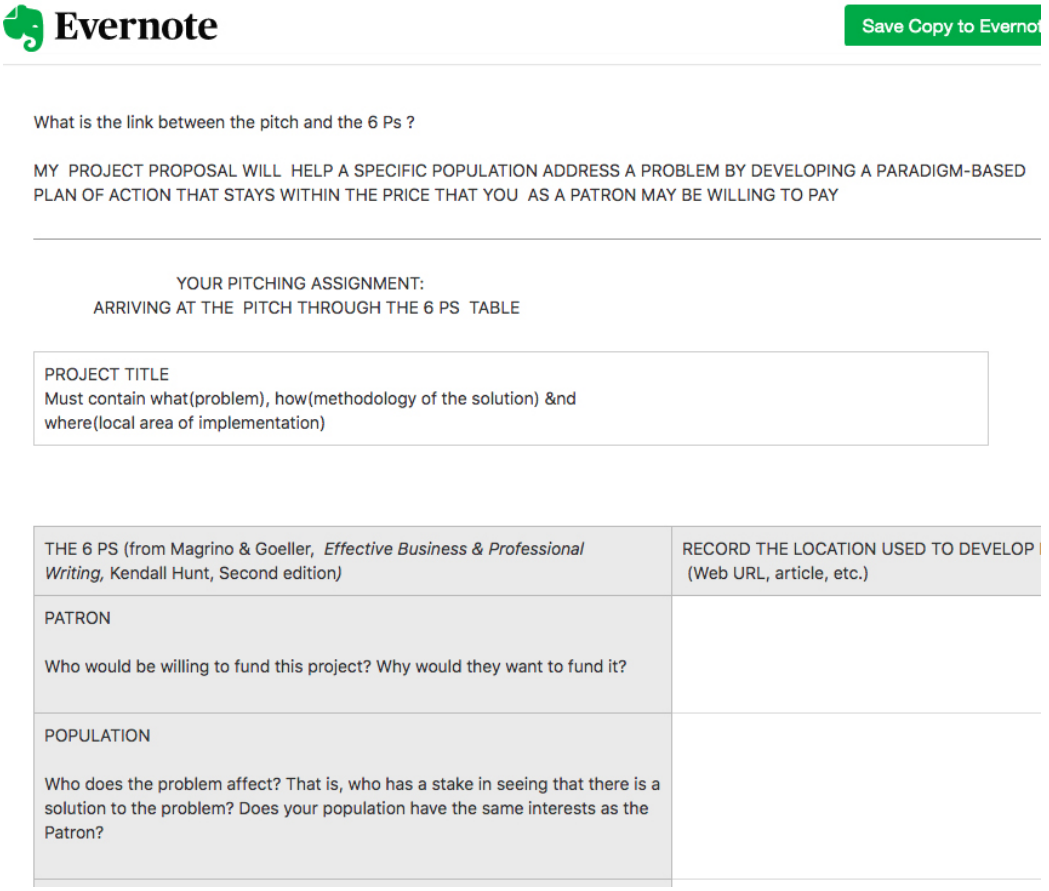
Link: J. Valenza's post @
http://www.pearltrees.com/t/curation-tools-platforms/id17762089



Appendix 3: Evernote Use Screenshots

Link: https://bit.ly/2YTlVyQ





Evernote

Save Copy to Evernot

What is the link between the pitch and the 6 Ps ?

MY PROJECT PROPOSAL WILL HELP A SPECIFIC POPULATION ADDRESS A PROBLEM BY DEVELOPING A PARADIGM-BASED PLAN OF ACTION THAT STAYS WITHIN THE PRICE THAT YOU AS A PATRON MAY BE WILLING TO PAY

YOUR PITCHING ASSIGNMENT:
ARRIVING AT THE PITCH THROUGH THE 6 PS TABLE

PROJECT TITLE Must contain what(problem), how(methodology of the solution) &nd where(local area of implementation)

THE 6 PS (from Magrino & Goeller, *Effective Business & Professional Writing,* Kendall Hunt, Second edition)	RECORD THE LOCATION USED TO DEVELOP (Web URL, article, etc.)
PATRON Who would be willing to fund this project? Why would they want to fund it?	
POPULATION Who does the problem affect? That is, who has a stake in seeing that there is a solution to the problem? Does your population have the same interests as the Patron?	

Evernote

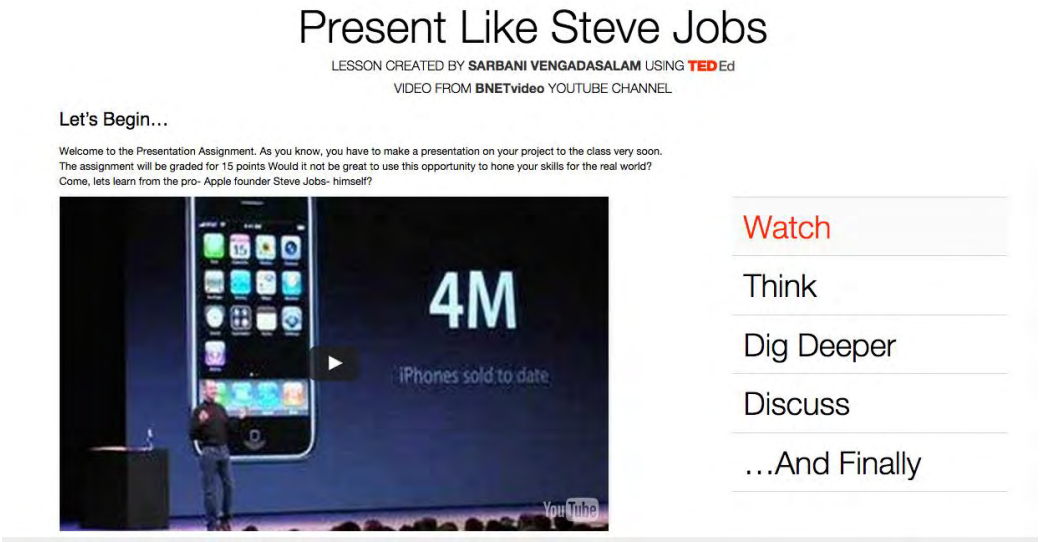
Save Copy to Evernote

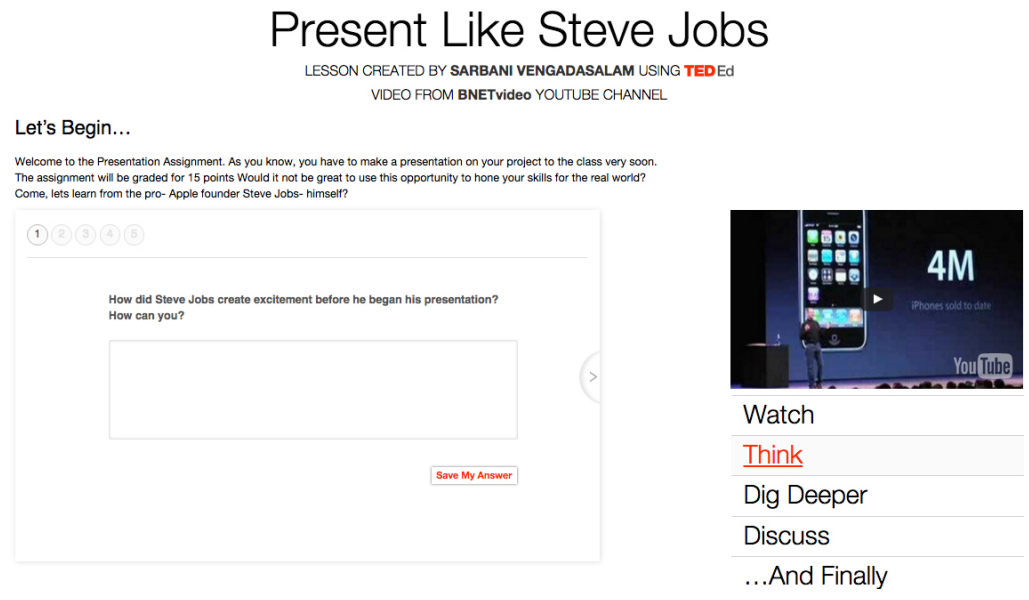
PROBLEM What are the main problems that need to be addressed? How could research shed light on these problems to emphasize their scale, scope, and significance? What sources of information about the problem would the patron find most persuasive?	
PARADIGM Any case studies that can prove your idea will work? Where might models be found to help shape the plan? What research would help? What disciplinary matrix will guide you? If you have found models already, attach the links in the adjacent column.	
PLAN What plans are some possible plans? If you are doing an experiment, what procedures will you use? What will you need to know in order to develop a logical plan?	
PRICE How might your budget be limited? How much do you think the project might cost?	

Appendix 4

Screenshots of my use of TED-Ed to introduce and discuss the presentation assignment. I utilized the tool so I could hold a conversation about the upcoming presentation assignment along with rubrics and samples while presenting it in class and asynchronously online using a Steve Jobs video as a hook and centerpiece

Link: https://ed.ted.com/on/9NPbqYnF





Present Like Steve Jobs

LESSON CREATED BY **SARBANI VENGADASALAM** USING **TED** Ed

VIDEO FROM **BNETvideo** YOUTUBE CHANNEL

Let's Begin…

Welcome to the Presentation Assignment. As you know, you have to make a presentation on your project to the class very soon. The assignment will be graded for 15 points Would it not be great to use this opportunity to hone your skills for the real world? Come, lets learn from the pro- Apple founder Steve Jobs- himself?

Additional Resources for you to Explore

The Oral Presentation Assignment Particulars:

The Oral Presentation is a 10 to 15 minute spoken proposal addressed to your patron (i.e.: the person or people who might fund your idea). This is a formal presentation and you must use visual aids to help convey information clearly and effectively. The point of the presentation is to make a leadership statement for a specific audience that puts information into action by proposing a research-justified solution to a well-defined problem.

The oral presentation is both a useful step in the process of developing your project and a unique assignment for which you will receive a grade. It therefore serves two sometimes competing purposes:

- As an "oral draft" of the final project, it's an opportunity to rehearse your audience-awareness, to organize your research, to develop your plan, and to get feedback from the

Watch

Think

Dig Deeper

Discuss

…And Finally

Present Like Steve Jobs

LESSON CREATED BY **SARBANI VENGADASALAM** USING **TED** Ed

VIDEO FROM **BNETvideo** YOUTUBE CHANNEL

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4 Guided Discussions 0 Open Discussions

Sarbani Vengadasalam
Lesson Creator

Start a Discussion

Can your WOW factor be simple yet memorable? Why or why not?
03/21/2014 · / 0 Updates 0 Responses

What was the WOW element used by Jobs? How can you WOW the audience?
03/21/2014 · / 0 Updates 0 Responses

What can be the ONE or the many, different WOW factors you introduce in your presentation?
03/21/2014 · / 0 Updates 0 Responses

Carmine Gallo talks about giving them a show. Can you do that through your WOW factor?
03/21/2014 · / 0 Updates 0 Responses

Watch

Think

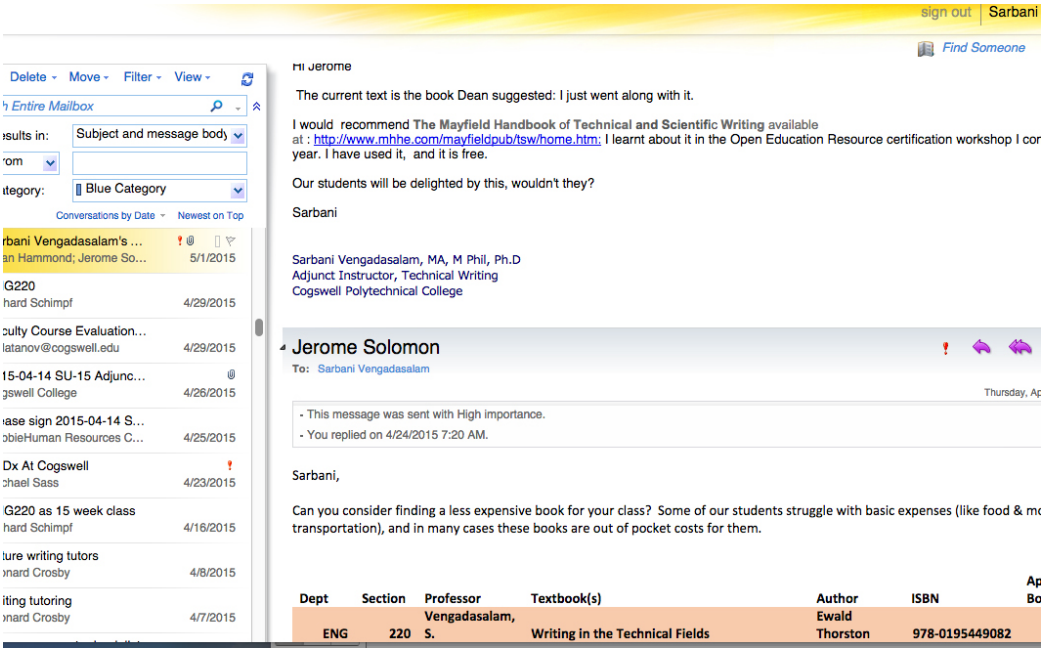
Dig Deeper

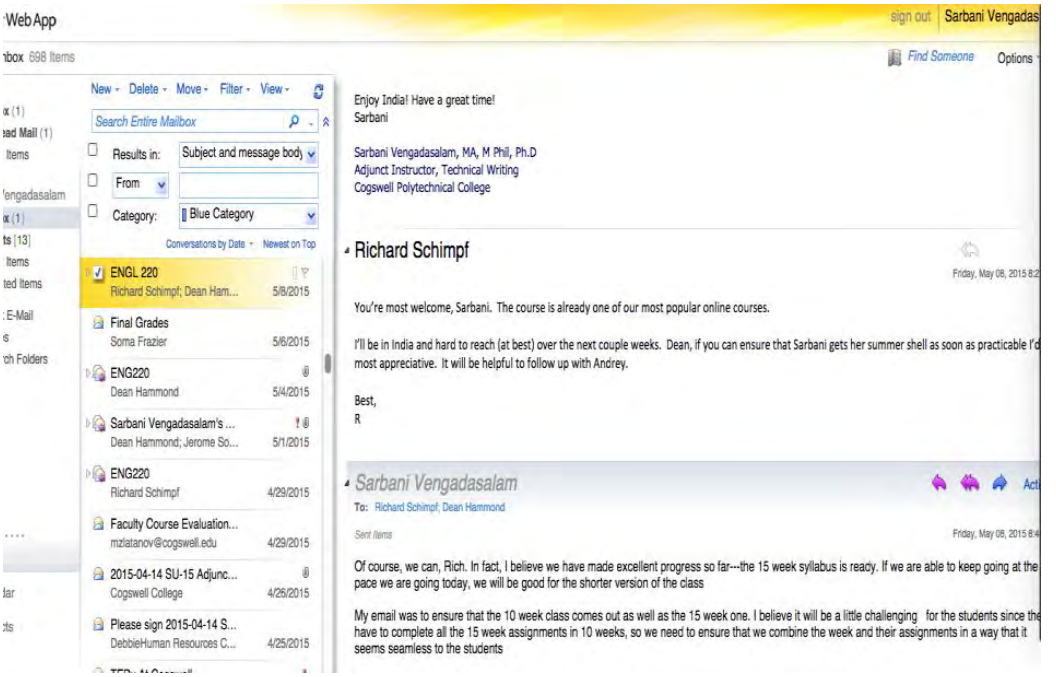
Discuss

…And Finally

Appendix 5

Cogswell Email Exchange Screenshots





Meta-syntheses of OER Transition in Online Higher Education

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Jeanelle Verwayne, Jessie Pablo
Indiana Wesleyan University

Abstract

This article is a meta-analysis of research on the use of Open Educational Resources (OER) in educational communities. OER's are free educational resources that are openly available on the internet for faculty or student use (as cited in Annand, 2015). According to Senack & Donahue (2016) the cost of textbooks can cause an undue burden on students and hinder their educational experience. OER's are given consideration and in use in some educational environments as a means of lowering textbooks costs for students. This article further addresses research regarding student and faculty response to the use of OER's in the higher education milieu. Research demonstrates a divide among students, i.e. some students that appreciate the open availability of OER's, but others who prefer printed materials for their educational experience (Brandle et. Al, 2019). The research also speaks to faculty perception regarding the adoption of OER's. Faculty seek institutional support through provision in their schedules for time and investment needed to ful-

 doi: 10.18278/ijoer.3.2.13

ly implement OER's (Annad, 2015). The authors provide research that indicates the importance of faculty being educated on the use of these resources and given consideration in the application of their use. The article finally reports the results of the use of OER's in educational communities.

Keywords: OER, textbook costs, student, faculty

Meta-síntesis de la transición a los REA en la educación superior en línea

Resumen

Este artículo es un metaanálisis de la investigación sobre el uso de Recursos Educativos Abiertos (REA) en comunidades educativas. Los REA son recursos educativos gratuitos que están disponibles abiertamente en Internet para uso de profesores o estudiantes (como se cita en Annand, 2015). Según Senack & Donahue (2016) el costo de los libros de texto puede causar una carga indebida a los estudiantes y obstaculizar su experiencia educativa. Los REA se tienen en cuenta y se utilizan en algunos entornos educativos como un medio para reducir los costos de los libros de texto para los estudiantes. Este artículo aborda además la investigación sobre la respuesta de estudiantes y profesores al uso de REA en el entorno de la educación superior. La investigación demuestra una división entre los estudiantes, es decir, algunos estudiantes aprecian la disponibilidad abierta de REA, pero otros prefieren materiales impresos para su experiencia educativa (Brandle et. Al, 2019). La investigación también habla de la percepción de los profesores con respecto a la adopción de REA. Los profesores buscan apoyo institucional a través de la provisión en sus programas de tiempo e inversión necesarios para implementar completamente los REA (Annad, 2015). Los autores proporcionan investigaciones que indican la importancia de que los profesores sean educados sobre el uso de estos recursos y se les dé consideración en la aplicación de su uso. El artículo finalmente informa los resultados del uso de REA en comunidades educativas.

Palabras clave: REA, costos de libros de texto, estudiantes, profesores

关于网络高等教育中开放教育资源过渡的综合集成法

摘要

本文对教育界开放教育资源（OER）使用的相关研究进行了元分析。OER是供教师和学生使用的、在网络上开放获取的免费教育资源（Annand, 2015）。学者Senack & Donahue （2016）认为，课本费用能对学生产生过度压力，并阻碍其教育体验。OER在一些教育环境中被作为一种降低学生课本费用的方式予以考量和使用。本文进一步研究了高等教育背景下学生和教师对OER使用的响应。研究证明，学生之间存在分歧，即一些学生喜欢OER的开放获取性，另一些偏好使用纸质材料（Brandle et. Al, 2019）。研究还证明了教师对OER采纳的感知。教师寻求机构支持，以获得用于全力执行OER的时间和资金（Annad, 2015）。作者提供的研究表明了“教师就如何使用这些资源接受培训并考量应用OER资源”一事的重要性。文章最后汇报了教育界OER使用的结果。

关键词：开放教育资源，课本费用，学生，教师

The term Open Education Resources was originally utilized by United Nations Educational, Scientific and Cultural Organization (UNESCO) in 2002 (Abramovich & McBride, 2018). UNESCO defined OER as non-commercial educational resources freely available on the Internet useable by teachers for course development and instruction or by students for assignment resources and course material supplementation (as cited in Annand, 2015). Open education resources consist of educational materials existing within the public domain for the sole purpose of being freely used by educators and students to decrease student expenses (Coleman-Prisco, 2016).

The use of open education resources also serves to increase an institution's competitive advantage by making it more attractive to prospective students, providing a public service, and advancing the institution's reputation (Annand & Jensen, 2017). Well known universities are already committed to the OER movement such as MIT's Open Course Ware Program, which offers open resources for over 1,800 courses, Carnegie Mellon's Open Learning Initiative, and Stanford's Engineering Everywhere courses (Hilton & Wiley, 2010). Experts argue that the academic community has a responsibility to promote the OER philosophy that knowledge should be constructed and circulated freely through the open network in a way that profits a diversified community of users (Alves, Miranda, & Morais, 2014).

Textbook Costs

Student financial debt is currently a significant issue in the United States, with undergraduate students having over 57 million dollars in federal student loans (Coleman-Prisco, 2016). Abdul-Alim (2016) relayed that in 2012, textbooks and supplies cost full time students about $1,200 per year, and further research indicates that these costs are rising. The College Board Advocacy and Policy Center (2016) found that during the 2015-16 academic year, textbook costs for the U.S. undergraduate exceeded $1200 and projected a continued upward trend in the coming years. Senack & Donahue (2016) cite that between 2006 to 2016, the cost of textbooks has increased approximately four times the rate of general inflation in the United States. Textbook costs now comprise about 25% of the total cost of a full-time student's higher education, and over $3 billion of federal student aid in the United States is utilized for textbooks (Senack & Donahue, 2016). These increasing costs create an undue burden on students and negatively impacts their learning experience (Senack & Donahue, 2016).

In a 2015 survey involving approximately 12,000 students in 22 California Community Colleges, students reported traditional textbook costs being a serious source of anxiety (Cochrane & Szabo-Kubitz, 2016). Students further reported that even two traditional textbooks, required for one class, could cost them an entire paycheck (Cochrane & Szabo-Kubitz, 2016). In a similar study, participants shared that there had been times when they had to choose between buying textbooks or buying food (Martin, Belikov, Hilton, Wiley, and Fischer, 2017). Martin et al. (2017) also received comments from students indicating that if textbook costs decreased, they would be able to work fewer hours and focus more on school. Cochrane and Szabo-Kubitz (2016) found that due to the financial strain created by the high costs of textbooks, 32% of financial aid recipients, who responded to their survey, stated that they could not afford them, and instead attempted to take the class without purchasing those materials.

The 2015 National Survey of Student Engagement (NSSE) results indicate that 31% of first year students do not purchase textbooks, citing high cost as the reason (as cited in Abdul-Alim, 2016). Recent research with students shows that the high costs of high costs of textbook on full time college and university students in the United States, has resulted in approximately 65% of students refusing to purchase textbooks assigned to their courses, even though they acknowledge it will negatively impact their grade (Annand & Jensen, 2017). Flatworld (2018) conducted a study with higher education institutions in the 2018 Fall semester, and found that during that time, participants spent $403 on textbooks. One-third of the students Flatworld (2018) surveyed indicated that textbook prices have impacted their decision on whether to take a course. A trend is also emerging where students who are not able to afford assigned readings, attempt to use outside materials to substitute text-

books (National Association of College Stores, 2018). The National Association of College Stores (2018) found that a growing number of students wait to attend the first week of courses, before deciding if they are going to purchase the class materials or seek free alternative sources. Nearly 20% of their participants subsequently chose to download their materials (NACS, 2018.)

Five publishing firms are reported to control 80% of the textbook market in a virtual oligopoly (Senack & Donahue, 2016). One strategy aimed at financial sustainability, in an increasingly digital market, is for textbook companies to frequently produce unnecessary updates, requiring students to purchase new versions of their texts (Senack & Donahue, 2016). Another tactic involves making it necessary for students to purchase online supplements to their textbooks, which caused over 80% of students in the 2015-2016 academic year to incur unexpected extra costs (Senack & Donahue, 2016). Students are aware of these methods; and in a study by Martin, Belikov, Hilton, Wiley, and Fischer (2017) reported that they are especially detrimental to those in lower socioeconomic statuses.

Benefits and worth of OER

Recent research identifies the benefits of open education resources (OER) including lowering the cost of education to students and making education more equitable for everyone (Park, Plumer, & DeForest, 2018). In a time of rising textbook costs and widespread educational debt, achieving affordability is an important endeavor (Flatworld, 2018). Ruth and Boyd (2016) report that OER texts are now being utilized in about 20% of US degree-granting institutions. Their research showed that those institutions cited the desire to lower student costs as the main reason for the shift to OER (Ruth & Boyd, 2016). The incorporation has been proven successful by saving students over $39 million in academic costs in the 2015-16 academic year (Ruth & Boyd, 2016).

The financial savings achieved through a commitment to OER is well-documented. An OER pilot project involving five U.S. higher education institutions used full-time faculty incentives in the form of internal grants to promote adoption of OER and resulted in students saving about $128 per academic course (Annand & Jensen, 2017). The University of Massachusetts allocated $60,000 in internal grants to full-time faculty over four years to adopt OER and gained an estimated savings of almost $1 million in the initial semester after the project (Annand & Jensen, 2017). Kansas State University invested $96,250 in an OER adoption grant program that resulted in student savings more than $1.1 million in textbooks cost (Annand & Jensen, 2017). Additionally, Tacoma Community College invested approximately $240,000 in a OER adoption program which resulted in more than $1.1 million student textbook cost savings (Annand & Jensen, 2017).

OER in higher education institutions (HEIs) effectively address rising textbook costs for students;

but empirical studies show that OER implementation also provides improved student access to course materials without losing quality (Ozdemir & Hendricks, 2017). The adoption of these resources allows faculty members to design their courses in a way that is tailored to their educational viewpoint, creating a more specialized experience for the student (Ozdemir & Hendricks, 2017). These curriculum advantages have important implications on improving student success and increasing student retention (Park, Plumer, & DeForest, 2018). The motivation for higher education institutions to adopt OER certainly include a savings for their students; however, they can also hope to achieve a positive impact on student learning, and lowered attrition rates (Ozdemir & Hendricks, 2017). Despite these benefits, higher education institutions are reluctant to adopt OER because of concerns about their relative value compared to traditional course materials (Park, et al, 2018).

Student perceptions

A study was conducted with two universities over the 2013-2014 academic year to ascertain which OER features were most valued by college students, how much college students understood what OER were, and how well college students knew how to use OER (Alves, Miranda, & Morais, 2014). Alves et al. (2014) found that college students surveyed lacked knowledge of OER and only a moderate ability to utilize what they did know, but reported that the most valued aspects of OER were the free access and open availability. In a later study conducted in 2018, students reported the "ease of access" and mobility of their digital materials as the second greatest benefit of OER, behind financial savings (Brandle et al., 2019, p. 93). The comparison of these studies would suggest that as technology enhances the accessibility of these resources, student perceptions of their use in courses will continue to improve.

Open Educational Resources (OER) is widely believed to be financially beneficial for students, but students are also concerned with the relative value of their materials (Abramovich & McBride, 2018). In a study by Abramovich and McBride (2018) regarding the replacement of traditional textbooks with OER, results indicated a positive perception of the impact OER had on the class experience, even though traditional course materials still rated higher in financial value. Brandle et al. (2019) surveyed 898 students and half of those participants found zero drawbacks to the use of OER; the other half were primarily apprehensive about the quality of the materials, or relayed personal preferences for printed versus digital resources. Brandle et al. (2019) suggested that OER be optimized for printing and accessible on mobile devices in order to alleviate student concerns.

Faculty perceptions

A recent study of students and faculty reported an overwhelmingly positive response from

students regarding the accessibility, relevancy, and costs savings of OER (Ozdemir & Hendricks, 2017). Faculty shared this positive perception of OER, and reported an improvement in student retention especially in the first few weeks of their courses (Ozdemir & Hendricks, 2017). Faculty members interviewed also indicated that OER material was of a quality equal to or better than traditional textbooks (Ozdemir & Hendricks, 2017). In a study conducted across ten Dutch higher education institutions, the conclusion was drawn that the motivation for instructors and administrators to use OER is directly related to their commitment to provide the best educational environment to students (Schuwer & Janssen, 2018).

However, disconnects do exist between student and faculty perceptions of OER. A study of over 6,000 participants including students and faculty members, determined that 80% of students believed that using OER in their courses would save them money, while only 38% of faculty believed the same thing (Arcos, Farrow, Perryman, Pitt, & Weller, 2014). The results indicated that students were more in favor of using OER as a valid option than faculty in large part due to differing motivations (Arcos et al., 2014). Arcos et al. (2014) reported that instructors' opinions of OER were impacted by the increased time and effort, away from teaching, to develop a course using OER over a prepackaged textbook. Abdul-Alim (2016) supported this assertion in a study citing free cost and accessibility as benefits of OER, while noting that as a drawback, faculty were required to do extra work to account for the lack of richness of OER in comparison to traditional textbooks.

A recent study of 3,000 faculty member in the United States regarding their perceptions on OER resulted in an understanding to the barriers of OER adoption in higher education (Allen & Seaman, 2016). Study conclusions showed that faculty cited their greatest reluctance to using OER was their perception of the intense time investment needed to identify, review, assess, and build OER materials into their courses (Allen & Seaman, 2016). Secondary concerns involved OER quality, resistance to change, workload issues, and lack of institutional supports (Allen & Seaman, 2016). There are additional faculty concerns about OER regarding lack of control of intellectual property once published, apprehensions about information quality, and anxieties about being replaced as subject experts (Annand, 2015).

As previously stated, the strongest argument in support of OER is the free cost to students, but one of the biggest obstacles to using OER is financial as well. In order for a course to transition to the use of OER, universities must financially invest in the process of faculty review of the proposed OER materials (Annand, 2015). The primary way higher education institutions have consistently achieved successful OER adoption in courses is to engage their faculty in the process through grants and scholarship (Coleman-Prisco, 2016). The results achieved by an institution are an extension of the institution's out-

reach, increased collaboration among faculty, and a positive impact on the global community (Coleman-Prisco, 2016). Benefits appear to be great for institutions that manage to engage faculty into the process and share their intellectual energies (Coleman-Prisco, 2016).

A descriptive case study was conducted with Durban University of Technology (DUT) faculty members in 2011 to gauge perceptions towards OERs, while also measuring their potential to be developers of OER grounded courses (Van der Merwe, 2013). A total of eighty faculty members responded to a standardized questionnaire and survey, which found that despite acknowledgement of OER benefits, faculty did not share the value of educational material openness and identified the need for financial incentives to be a part of the OER adoption process (Van der Merwe, 2013). The study concluded that in order for higher education institutions to retain their relevancy in the evolving educational landscape, in addition to financial investment, they also need to foster a culture of openness among their faculty to the sharing of educational materials and to value OER scholarship (Van der Merwe, 2013).

In a survey of faculty at twenty community colleges and universities, who had already begun the institution of OER into their courses, 93.75 percent of participants indicated they felt strongly that OER was well-matched with their educational values, with zero participants disagreeing (Coleman-Prisco, 2016). 87.5 percent of faculty participants agreed that their students benefited from the use of OER in the higher education classroom and again no participants disagreed (Coleman-Prisco, 2016). Further indicating faculty concern for the experience of their students, 81.25 percent of participants reported that OER allowed them to more fully address the learning needs of their students, with no disagreement (Coleman-Prisco, 2016). The conclusion can be made that once faculty members finish the process of integration, and begin using OER in their higher education class rooms, they view the impact of OER as positive for both themselves and their students (Coleman-Prisco, 2016).

OER adoption

The success of OER integration in academic institutions is closely tied to the faculty culture (Abramovich & McBride, 2018). Research shows that instructors tend to be focused on change, rather than innovation (Coleman-Prisco, 2016). Instructors require support and tested processes before they will endorse an innovation (Coleman-Prisco, 2016). Traditional instructors can be suspicious of innovations, wanting to first see evidence of their success, and isolation can increase this suspicion (Coleman-Prisco, 2016). Coleman-Prisco (2016) concluded that in order to combat this reluctance, innovation should have trialability, be compatible with instructor values, have perceivable advantages, and not be overly complex. Therefore,

it is important that administrators partner with their faculty, so that they can meet these needs and involve them in every step of the OER implementation process (Coleman-Prisco, 2016).

A study of online faculty perceptions of OER adoption was conducted using Roger's Model of Diffusion of Innovations as its framework. This theory differentiates institutional change, involving something becoming different, from innovation as positive progress; and also categorizes stakeholders by their enthusiasm to adopt innovation (Schuwer & Janssen, 2018). Diffusion is then the process by which such innovation flows through institutional social system and impacts its stakeholders (Schuwer & Janssen, 2018). In this study, the innovation was identified as the adoption of OER, and the stakeholders were administrators, support staff, and instructors (Schuwer & Janssen, 2018). Researchers found that accomplishment of innovation relies on collective member buy in to a five-phase progression involving knowledge, persuasion, decision, implementation, and confirmation (Schuwer & Janssen, 2018). During the five-step process there exist variables that can significantly impact the rate of adoption such as members role, the decision process, social dynamics, communication channels, and need for innovation (Schuwer & Janssen, 2018).

Schuwer and Janssen (2018) reported that institutional policies appear to have a more positive impact when they involve educating instructors about OER, providing incentives for their inclusion, and recognize the scholarship value of said materials. (Schuwer & Janssen, 2018). Instructors should be educated about the value and quality of OER in a way that addresses their individual perspective on its inclusion; and institutions should create an environment of experimentation and innovation with ample support and incentives for educators to embrace OER use (Schuwer & Janssen, 2018). Participating instructors noted that the use of shared educational materials reflected their core values of equitable educational for all students (Schuwer & Janssen, 2018). However, results showed that it is critical for administrators to recognize and honor an instructor's autonomy in choosing to be a part of the OER adoption process, and to be aware of the unique levels of enthusiasm for innovation held by their faculty (Schuwer & Janssen, 2018). Schuwer and Janssen (2018) found that half of an institution's stakeholders will either be late to adopt OER, or resist this innovation all together. They concluded that institutions should identify their most eager innovators to participate in OER integration efforts, so that those stakeholders could inspire investment from their cohorts (Schuwer & Janssen, 2018).

Athabasca University in Canada is an example of an institution fully actualizing the potential of its faculty in the integration of OER. This institution transitioned away from commercial textbooks by utilizing university employed production teams, including full time faculty, to create in house textbooks (Annand & Jensen,

2017). They continued to build on this savings by converting their printed textbooks to digital copies in future editions, which then became offered as OER (Annand & Jensen, 2017). This progression to OER took several years and funding initiatives, but resulted in a total textbook cost savings to students of $217,500 per year and increased student retention rates (Annand & Jensen, 2017).

Researchers in Tanzania found barriers to OER use in higher education institutions beyond faculty resistance, including lack of student access to an online environment, lack of instructor understanding of how to use OER, and a lack of faculty motivation to create OER grounded courses (Mtebe & Raisamo, 2014). Mtebe and Raisamo (2014) recommended that one way to address these barriers was for institutions to invest in the preliminary work of creating and promoting pro-OER policies, before initiating the conversion process. A case study exploring the incorporation of OER into courses at the University of the South Pacific (USP) reinforced the correlation of extensive preparation and research to the success of OER integration (Koroivulaono, 2014).

USP felt that OER offered them an opportunity to address the disparity of educational availability and economic hardships of their students, so they began exploratory studies to determine how faculty and students would perceive and value the use of OER in class rooms (Koroivulaono, 2014). After gauging stakeholder interest, USP pushed their practices and pedagogy to grow to new levels by creating a new transformative learning system, employing frequent tests to improve technical aspects of the system (Koroivulaono, 2014). USP proceeded to engage their faculty and students in the integration process, with a series of OER awareness seminars aimed at educating their stakeholders about the benefits of this innovation (Koroivulaono, 2014). Throughout the process, USP continually revised their strategic plan to account for feedback from all stakeholders (Koroivulaono, 2014). The university was able to achieve the goal of increasing educational availability in its region as a result of its methodical approach to OER integration.

Preparation of this scale will result in universities incurring upfront costs. Institutions will need to commission their faculty as subject matter experts to explore, examine, and identify valid OER for coursework, and build those materials into the instructional design of their courses (Annand, 2015). However, these investments will result in educational savings for students, creating a competitive market advantage leading to higher enrollment (Annand, 2015). As higher enrollment alleviates the costs associated with initial OER integration, universities, including online institutions, will find that OER use in their courses is financially viable for their students, and also cost effective for the university (Annand, 2015).

Conclusion

OER's are resources that can be used at no cost to educators or students. These resources are determined to reduce the burden of textbook costs for students by minimizing the likelihood that students will bypass purchasing course textbooks resulting in a negative impact their learning (Senack & Donahue, 2016). The research demonstrates that the use of OER's does provide greater access of course materials for students without losing the quality (Osdemir & Hendricks, 2017).

Institutions of higher education and faculty have shown some hesitation in the adoption of OER resources due to concern about the value and quality of these resources (Park et al., 2018). Faculty have been cautious as they seek the institutional investment that provides faculty with time to identify, review, and asses OER resources before building them into courses (Allen & Seaman, 2016). The use of grants and scholarships has been one way that institutions have been able to get faculty to invest their time and talents in the process of adopting OER's (Annand & Jensen, 2017). Van der Merwe (2013) concluded that institutions must financially invest and provide a culture of openness for faculty to share educational materials as well as value the quality of OER's in scholarship. The adoption of OER's is connected to the faculty culture (Abramovich & McBride, 2018). Research concluded that faculty members who integrate OER's in their classrooms view the impact as positive for themselves and for students (Coleman-Prisco, 2016; Ozdemir & Hendricks,2017). With the adoption of OER's students do value the financial relief that the use of these resources provide, although Brandle et al.(2019) did identify that some students were apprehensive about the quality of the materials. The bottom line is that institutional adoption of OER's need to be to be guided by faculty culture. The research shows that educating faculty on OER's, providing resourcing to evaluate their use, and continuous feedback from all constituents are factors in the effective integration of OER's in higher education environments (Coleman-Prisco, 2016; Koroivulaono, 2014; Schuwer & Janssen, 2018).

This study recommends that higher education administration fund research into OER adoption, allow for faculty time to adapt OER resources, invite faculty scholarship in OER, and integrate OER into strategic planning. The advantage of OER's for students is particularly clear in terms of relieving financial burden that may inhibit their educational experience. The research demonstrates that investigation of the use of OER's in higher education is worthwhile and can provide quality educational materials for faculty and students. Noticeably, faculty are a critical part of institutions moving forward with the adoption of Open Educational Resources.

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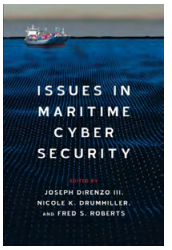
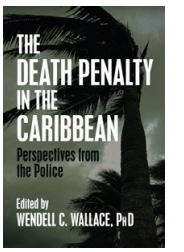


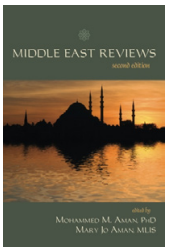
Issues in Maritime Cyber Security Edited by Nicole K. Drumhiller, Fred S. Roberts, Joseph DiRenzo III and Fred S. Roberts

While there is literature about the maritime transportation system, and about cyber security, to date there is very little literature on this converging area. This pioneering book is beneficial to a variety of audiences looking at risk analysis, national security, cyber threats, or maritime policy.

The Death Penalty in the Caribbean: Perspectives from the Police Edited by Wendell C. Wallace PhD



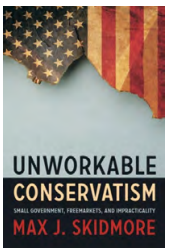
Two controversial topics, policing and the death penalty, are skillfully interwoven into one book in order to respond to this lacuna in the region. The book carries you through a disparate range of emotions, thoughts, frustrations, successes and views as espoused by police leaders throughout the Caribbean



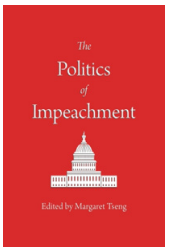
Middle East Reviews: Second Edition
Edited by Mohammed M. Aman PhD and Mary Jo Aman MLIS

The book brings together reviews of books published on the Middle East and North Africa. It is a valuable addition to Middle East literature, and will provide an informative read for experts and non-experts on the MENA countries.

Unworkable Conservatism: Small Government, Freemarkets, and Impracticality by Max J. Skidmore



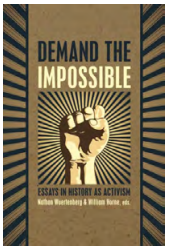
Unworkable Conservatism looks at what passes these days for "conservative" principles—small government, low taxes, minimal regulation—and demonstrates that they are not feasible under modern conditions.



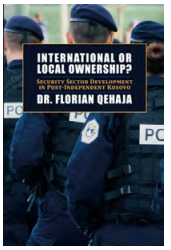
The Politics of Impeachment
Edited by Margaret Tseng

This edited volume addresses the increased political nature of impeachment. It is meant to be a wide overview of impeachment on the federal and state level, including: the politics of bringing impeachment articles forward, the politicized impeachment proceedings, the political nature of how one conducts oneself during the proceedings and the political fallout afterwards.

Demand the Impossible: Essays in History as Activism
Edited by Nathan Wuertenberg and William Horne



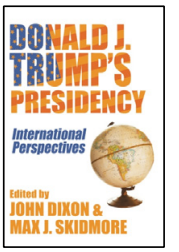
Demand the Impossible asks scholars what they can do to help solve present-day crises. The twelve essays in this volume draw inspiration from present-day activists. They examine the role of history in shaping ongoing debates over monuments, racism, clean energy, health care, poverty, and the Democratic Party.



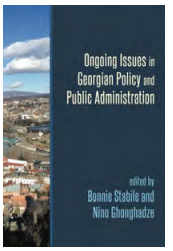
International or Local Ownership?: Security Sector Development in Post-Independent Kosovo
by Dr. Florian Qehaja

International or Local Ownership? contributes to the debate on the concept of local ownership in post-conflict settings, and discussions on international relations, peacebuilding, security and development studies.

Donald J. Trump's Presidency: International Perspectives
Edited by John Dixon and Max J. Skidmore



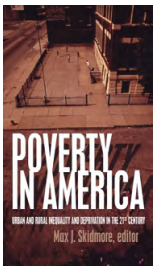
President Donald J. Trump's foreign policy rhetoric and actions become more understandable by reference to his personality traits, his worldview, and his view of the world. As such, his foreign policy emphasis was on American isolationism and economic nationalism.



Ongoing Issues in Georgian Policy and Public Administration
Edited by Bonnie Stabile and Nino Ghonghadze

Thriving democracy and representative government depend upon a well functioning civil service, rich civic life and economic success. Georgia has been considered a top performer among countries in South Eastern Europe seeking to establish themselves in the post-Soviet era.

Poverty in America: Urban and Rural Inequality and Deprivation in the 21st Century
Edited by Max J. Skidmore



Poverty in America too often goes unnoticed, and disregarded. This perhaps results from America's general level of prosperity along with a fairly widespread notion that conditions inevitably are better in the USA than elsewhere. Political rhetoric frequently enforces such an erroneous notion.