Volume **02** (2023) Issue 1 *Innovative Practices*

Cultivating Shared Knowledge of OER

Building Community Through Professional Development for Librarians

Joanna Thompson¹
Joshua Peach²

Keywords: Open Educational Resources, Professional Development, Librarian Training, Labor

Abstract

While open educational resources (OER) programs are often situated in university and college libraries, librarians come to the practice with different levels of exposure and knowledge. At the New York City College of Technology (City Tech) library, we attempted to bridge this gap by offering paid training for all full-time librarians at the college. Our goal for the training was to integrate the philosophy of open education and open educational resources into librarians' everyday work. This article outlines the rationale for our approach to professional development, the program design, participant feedback, and future directions.

Introduction

While open educational resources (OER) programs are often situated in university and college libraries, academic librarians come to the practice with different levels of exposure and knowledge. Most librarians are aware of OER, but many have not used openly licensed materials in their work or received training on adjacent topics like copyright and open licensing. At the New York City College of Technology (City Tech) library, we attempted to bridge this gap by offering paid training for all full-time librarians at the college. Our goal for the training was to integrate the philosophy of open education and open educational resources into librarians' everyday work.

OER initiatives at the City University of New York began as a pilot program in 2014, at several CUNY colleges, including City Tech. Beginning in the academic year 2016-2017, the state of New York invested eight million dollars, split between the City University and State University of New York systems, with an additional renewal of eight million dollars between the two systems annually. "The

¹ Adjunct Open Educational Resources Librarian, New York City College of Technology, Brooklyn, NY, USA; ² Adjunct Open Educational Resources Librarian, New York City College of Technology, Brooklyn, NY, USA E-mail: joanna.a.thompson@gmail.com

short-term goal of the State funds was to reduce costs for students and accelerate their progress through college, but an important secondary goal was to change the University's culture to create systems and structures that better connect curriculum and pedagogy to student learning outcomes" (CUNY, p.4).

Since 2015, the OER initiative at City Tech has taken the form of a semester-long fellowship program that supports full- and part-time faculty members to convert their courses into Zero Textbook Cost (ZTC) courses, replacing costly commercial textbooks with OER and library resources. Faculty members attend multiple seminars over the course of the Fellowship, learning about OER, alongside other topics such as copyright, Creative Commons licensing, accessibility, and open pedagogy. By the end of the semester, faculty have created a website for their redesigned course, hosted on the OpenLab, an open-source digital platform designed to support teaching and learning at City Tech. Beyond the fellowship, the OER team offers additional programming such as workshops, one-on-one/small group consultations, and further faculty development (environmental scan working groups, returning OER fellows course conversion, and authorship projects).

In the Fall of 2020, we offered a new paid training on OER exclusively for City Tech librarians. Over two weeks, participants engaged in OER topics through readings and asynchronous discussions with their peers. As they explored the open educational landscape, they developed projects around their own work and the academic departments that they liaise with. This culminated in a synchronous session during which participants discussed the material covered in the workshop, shared their projects, and discussed further OER opportunities at City Tech.

As we were designing the training, we were aware that continued state funding for OER programming at CUNY was uncertain. While we do not support "doing more with less," nor passing along time and resource intensive OER programming work to our colleagues, we were thinking about how a basic level of knowledge about open education in the library could continue regardless of external funding. Our hope was that our colleagues would take the knowledge they had gathered in our seminar and disseminate it further through their existing work in the college, including emphasizing the selection and creation of free and open resources over proprietary resources with the academic departments they liaise with and providing guidance to faculty members on the basics of OER.

Literature Review

Current Professional Development Landscape

We first explore the current professional development opportunities in the OER space, as well as existing literature on professional development in OER. We then look at inequities in professional development in OER and libraries and identify gaps in advocacy by relevant professional organizations. Last, we touch on literature that frame professional development as a method for developing a community of practice.

Professional development literature about OER is focused heavily on librarians and other OER advocates providing professional development opportunities for teaching faculty members. As the number of OER programs in libraries continues to grow, we are seeing more opportunities for and

literature about professional development for OER advocates. Thornton (2021) wrote about the importance of structured professional development about OER to meet academic librarians' knowledge and training needs. Chan and Auster (2005) also describe the importance of a supportive manager and working environment in motivating librarians to take part in professional development opportunities. However, as Comanda et al. (2021) explain, a lack of funds for professional development can be a barrier to access, no matter how motivated a worker might be. There are currently several longer-term programs that teach information professionals about OER, copyright, open licensing, and open pedagogy, including the Creative Commons Certificate program, the SPARC Open Education Leadership program, and the Open Education Network Certificates in Open Educational Practice and OER Librarianship. These programs typically come at a cost to participants, from \$500 to about \$4,000 for programs that range in length from 10 weeks to a full academic year. These costs may not be covered by employers and may be unaffordable for many library workers who are already economically disadvantaged in the field, often due to precarious or part-time employment.

Inequities in access to professional development in the academy are well documented (Comanda et al., 2021; Gelman et al., 2022; Neigel, 2016). Comanda et al. describes a landscape where academic librarians feel they are expected to attend expensive professional development conferences to advance in their career, often tied to requirements for tenure and promotion. Financial support from their home institutions can be meager relative to the size of the college, highly competitive for the limited pot of money offered, and often mired in "unclear, inconsistent, burdensome logistics" (Comanda et al., 2021) such as long and complicated reimbursement processes. Professional organizations within the field offer little support for attendees, often charging high attendance costs even if the librarian is presenting at the conference. Many librarians are making the hard choice to not attend professional development opportunities due to their unaffordability.

Anecdotally, some college library departments are recognizing the need and picking up the slack, providing internal professional development to their librarians and staff. They are paying librarians to design and participate in professional development activities or at the very least providing it at no cost. This manifests as lunchtime talks, webinars, and multi-part workshops. Scull (2021) discusses how a staff development program at Dartmouth College Biomedical Libraries supported the cultivation of a community of practice at their libraries. The inclusion of both librarians and staff in these trainings allowed for the sharing of expertise across job titles and "encouraged social learning as a group" (Scull, 2021). Their professional development model moved away from a one-off approach into a more sustained engagement throughout the library.

Program Design & Process

The framework for this training was based on the curriculum designed for teaching faculty who participate in the City Tech Open Educational Resources Fellowship, but we tailored the curriculum to meet the unique needs and work of academic librarians. Topics that we retained from the original programming include the basics of OER, copyright, licensing, fair use, and open pedagogy. Our primary goal for the training was for non-OER librarians to learn the basics of OER so that they could use the

language and concepts of OER and open pedagogy in their own practices as a librarian, particularly in their role as liaison to specific academic departments. The syllabus is available in Appendix A.

We designed the training to be primarily asynchronous. We split the curriculum into two sections, with two asynchronous units and one synchronous group session to wrap up. Because it was largely asynchronous, we tried to think carefully about how to engage with our colleagues and build some sense of community and connectedness. In addition to the synchronous discussion session, we maintained regular contact with librarians via email and Google Docs to help them feel more connected to the training and to us.

We expected participants to complete approximately ten hours of work over the course of the training. At the start of the training, we provided a survey asking librarians what they already knew about OER, copyright, and open pedagogy and what they wanted to know about the same topics. The survey helped us understand pre-existing knowledge about OER, as well as identify gaps in knowledge on which we should focus our training.

The first section was an introduction to OER and copyright. In addition to reading introductory texts created by the City Tech OER team, participants answered questions in a shared Google Doc. These questions included whether participants had encountered Creative Commons licenses before, the significance of these licenses for their work and for faculty members with whom they work, and the remixing and adapting that the licenses often allow. The first section was followed by a homework assignment in which participants were asked to identify four to six open resources across the disciplines that they liaise with at the college. They were also asked to share reflections on their search process, including where they found gaps in existing OER, features they appreciated in particular resources, and whether the resources they found were accessible.

The second section of the training focused on instruction and open pedagogy. Librarians read pieces from *Visible Pedagogy* about hybrid courses and creating "intersectional, interventionist" syllabi (Gelles, 2020), as well as an introduction to open pedagogy. Like the first section of the training, librarians reflected on the readings and responded to their colleagues' contributions. As we will discuss in the final section of this report, we found this mode of discussion to be sufficient but not ideal.

The final project for the training was to create an openly licensed educational object (broadly defined) informed by the training and directly related to the participants' work. Below was our project prompt:

Create an openly licensed educational object. It can be an instructional material or assignment, for classroom instruction or that highlights library resources, the audience doesn't necessarily need to be students. The topic can be related to the discipline(s) you liaise with, your work in the library, your scholarship, or the topics we discussed during the training. Assign a Creative Commons license for your educational object. For example, you might create:

- A worksheet
- Slides, video, screencast, or other instructional object to enhance a LibGuide
- A quiz

• A zine

We are flexible, so be creative! Create something that will be useful to you and/or the students and faculty with whom you work.

The training concluded with a two-hour synchronous meeting of all seminar participants via Zoom. This session included information about OER programming at City Tech, a designated time for questions about what had been learned asynchronously and concluded with sharing ideas and first drafts of final projects.

Final projects were initially due a week after the synchronous sessions, a month after the beginning of the training, so that the training would be wrapped up before the end of the semester. However, after several requests for extensions, we changed the deadline to January, after the end of a busy semester. As projects were submitted, we provided feedback to participants via email on accessibility, licensing, and choice of platforms for sharing their projects. After completing their final projects, all participants completed an exit survey to assess their satisfaction with the training.

Impact & Assessment: Participant Feedback

Participants overwhelmingly enjoyed and learned a lot from the training but offered minor suggestions related to platform, number of synchronous sessions, and timeline. Below are the questions and responses taken directly from the exit survey.

Question: What did you enjoy most about the training?

- Discussing the readings with colleagues
- Gaining a better understanding of the perspectives of fellow librarians
- Synchronous sessions
- Thinking about what [they] want to develop and reflecting on instructional design materials [they] made this past semester through the OER lens.
- Synchronous meeting; it was nice to actually talk through some of the readings and whatnot with colleagues.
- The readings and the Zoom class
- Our conversation on Zoom. And also felt it was surprisingly easy to communicate in the google docs. I was a little daunted by it at first, but it reminded me of the more enjoyable parts of online coursework.

Question: What is something that you learned from this training that you will take into your work as a librarian?

- Reflected on interface design and accessibility
- Inclusive design
- More about copyright and fair use
- Colleagues' approaches to and understanding of OER and open pedagogy
- Urgency of refreshing materials offered to colleagues during this time

• Appreciation for the difficulty of instructional design

Question: What would you change about the training?

- A different channel for communication; Slack instead of Google docs
- 2 synchronous sessions [instead of 1]
- Less asynchronous discussion; more synchronous sessions
- Longer sessions; more time for final project
- Wait until spring term
- More time for final project
- More synchronous time with colleagues

A clear theme running through the feedback was a desire for more time to meet with colleagues and share ideas and expertise. In our experiences, the onus has largely been on individual library workers to pursue professional advancement opportunities. Library leaders should be intentional about valuing the strengths and expertise in their libraries and give space and time during working hours for library workers to share knowledge and skills with one another.

Recommendations

In addition to the suggestions given on the librarian survey, we used our own impressions of the asynchronous discussion and experience in the synchronous sessions to form recommendations for future iterations of our training.

While we found the synchronous session discussions lively and engaging, some of the librarians would have liked more opportunities for conversation with fellow participants outside of the one session that they attended. We support continuing the conversation through optional mini discussion sessions, such as lunch hour chats, or adding additional required synchronous meetings. In acknowledgment of our colleagues' varied schedules, we chose to provide just two dates for participants to take part in the synchronous session in order to accommodate scheduling conflicts and to minimize video conferencing burnout.

We used Google Docs as the platform for the training's asynchronous discussion. Some participants felt this platform stunted the conversation in a way that would not happen with an in-person discussion. Library faculty felt challenged on what to contribute to the conversation in the written document, especially when a colleague had already added a point that they agreed with. Additional challenges to answering discussion prompts in a shared online document included readability and legibility. It was not easy to visually discern responses between participants, requiring them to manipulate the text (changing text color to differentiate their responses) and possibly making their text inaccessible for low-vision or colorblind readers. The document format required participants to scroll through several pages to find the next response or the end of a discussion thread. This lack of organization hindered participants' ability to scan the discussion quickly and, in some cases, may have impeded comprehension and ability to participate. We would recommend the use of another platform in the future that can accommodate "chunking" responses into more digestible sections of text for better

comprehension. In the most recent iteration of the OER Fellowship at City Tech website, we have found using the comment feature on the OpenLab/WordPress platform more useful in preserving a discussion thread.

We also recommend that part-time library faculty be included in a training like this. It provides a professional development opportunity supported by the department, as well as a chance to interact with full-time colleagues and other adjunct librarians. Opportunities for engaging with colleagues can be limited when you only work one or two days a week in a college library, and precariously employed colleagues often cannot afford or do not have the time for professional development that is expected of librarians. Professional development opportunities such as this can help foster community among coworkers and create a more unified workplace.

Conclusion

We found this training to be a success both for participants and for ourselves as facilitators. We felt that by sharing our knowledge of and experience with OER, open pedagogy, copyright, and accessibility with our colleagues, we contributed to the continued growth of open initiatives at City Tech and to the sustainability of OER programming despite uncertain funding.

Colleges and universities can be very stratified workplaces, and this training was an opportunity to break down some of these hierarchical structures within the library and to challenge ideas about who can learn from whom. In every instructional design decision, we were mindful of our full-time colleagues' expertise while also recognizing the need to not downplay our own knowledge. As part-time librarians, we appreciated the opportunity to get to know our full-time colleagues and share our experience and skills; teaching our peers allowed us to expand and grow within our professional careers. This experience made us feel more connected to our fellow librarians and the work of the wider library. We also concluded that the process of familiarizing ourselves with our colleagues and their work can not only help us understand how to best work together in the library, but it also make us feel less like atomized individuals and more like part of a cohesive whole.

We encourage other libraries to continue to provide opportunities for all library workers to share knowledge with their colleagues, and in the future we would like to expand similar opportunities to all library workers, regardless of title.

Acknowledgements

We would like to express gratitude to Cailean Cooney, who supported us in designing the OER curriculum and in writing this piece.

Conflict of Interest Statement

The authors declare that there are no conflicts of interest.

References

Chan, D. & Auster, E. (2005). Understanding librarians' motivation to participate in professional development activities. In: P. Genoni & G. Walton (Eds.), Continuing professional development -Preparing for new roles in libraries: A voyage of discovery (pp. 157-169). K.G. Saur. https://doi.org/10.1515/9783598440168.3.157

- City University of New York. (2018). New York State open educational resources CUNY year one report.

 https://www.cuny.edu/wp-content/uploads/sites/4/page-assets/libraries/open-educational-resource s/CUNY OER Report Web Accessible-1.pdf
- Comanda, B., Wilkinson, J., Bradham F., Koziura, A., & Seale, M. (2021). Service ceiling: The high cost of professional development for academic librarians. In The Library With The Lead Pipe. https://www.inthelibrarywiththeleadpipe.org/2021/service-ceiling/
- Gelles, B. (2020, August 14). Embracing radical inclusivity: Practical steps for creating an intersectional, interventionist syllabus. Visible Pedagogy: a teach@CUNY Project. https://vp.commons.gc.cuny.edu/2020/08/14/embracing-radical-inclusivity-practical-steps-for-creating-an-intersectional-interventionist-syllabus/
- Gelman, C., Gandel, J., & Bausman, M. (2022). A multi-faceted, adjunct-centered initiative to support part-time faculty. Journal of Teaching in Social Work, 42(1), 82-99. 10.1080/08841233.2021.2013000
- Neigel, C. (2016). Professional development for library workers: Exposing the complicated problems of equity and access. Partnership: The Canadian Journal of Library and Information Practice and Research, 11(2), 1-7. https://doi.org/10.21083/partnership.v11i2.3795
- Scull, A. (2021). Creating community, learning together: Designing and delivering a program for staff professional development. College & Research Libraries News, 82(3), 117–120. https://doi.org/10.5860/crln.82.3.117
- Thornton, E. (2021). Academic librarian experiences and perceived value of OER professional development: A case study. [Doctoral dissertation, University of Arkansas, Fayetteville]. Graduate Theses and Dissertations.

Appendix

Appendix A. Librarian O.E.R. Training Syllabus

Greetings library colleagues and welcome to our training on Open Educational Resources! To prepare for our synchronous meeting, please complete the readings/discussions and assignments.

Estimated breakdown of your time commitment (10 hours total):

Readings: 1 hour

Asynchronous Discussion: 2 hours

Assignment 1: 2 hours Assignment 2: 3 hours

Synchronous Discussion: 2 hours

Introduction

O.E.R. training participants will become knowledgeable about open educational resources (O.E.R.), principles of open pedagogy, and strategies to create usable and accessible O.E.R.s on the OpenLab. The training will cover copyright, Creative Commons licensing, resources to help locate discipline specific O.E.R.s, and strategies to generate cohesive and engaging course materials.

Learning outcomes

By the end of the training, participants will be able to:

- Define open educational resources
- Distinguish O.E.R., open access, and free materials
- Understand copyright and Creative Commons licenses
- Understand how accessibility, universal design, and instructional design best practices intersect with O.E.R. and improve access to instructional materials
- Consider open pedagogy concepts in conversation with your teaching philosophy and practices
- Understand and share City Tech O.E.R. programming and resources with the college community

Requirements

- Complete all assignments by due dates, prior to synchronous meeting
- Participate in group discussions and activities

Homework Assignments

Due Dates

MM/DD/YYYY Fill out Pre-training O.E.R. survey

MM/DD/YYYY Complete Section 1 reading prompt(s)

MM/DD/YYYY Respond to colleagues' Section 1 prompts

MM/DD/YYYY Assignment 1 due

MM/DD/YYYY Complete Section 2 reading prompt(s)

MM/DD/YYYY Respond to colleagues' Section 2 prompts

MM/DD/YYYY First draft of Assignment 2 due

MM/DD/YYYY Final version of Assignment 2 due

Reading and Discussion

Section 0: Pre-training Survey

Please fill out a short survey by MM/DD/YYYY.

- What do you already know about OER, copyright, and open pedagogy?
- What do you want to learn about OER, copyright, and open pedagogy?

Section 1: Introduction to O.E.R. at City Tech

As the cost of course materials (and higher education more broadly) increases every year, instructors are turning to alternatives to expensive commercial textbooks. How can we help instructors and students navigate open resources and copyright?

Please complete the following readings below and respond to each of the framing questions in our group discussion doc by MM/DD/YYYY. Reply to two colleagues' responses by MM/DD/YYYY.

- 1. Read <u>Introduction to Copyright</u> (Approx. reading time: 7 mins)
- Context: Before we discuss the meaning of the term "open educational resources," we need to familiarize ourselves with copyright, a form of protection for creative expressions granted by the law. This is a content heavy reading with a good bit of intellectual property and licensing jargon (hold tight!). But knowing about copyright (for historical grounding and because it is current law) is essential for us to understand why and how educational materials do or don't get shared, and more practically, what is ok to post publicly (openly) and what isn't.
- Framing question(s): Was this useful for you? Do you think it would be useful for other faculty members with various levels of knowledge?
- 2. Read <u>Introduction to Open Educational Resources and the Fellowship</u> and complete the low stakes <u>quiz</u> to test your knowledge (Approx. completion time: 8-10 mins)
- Context: This reading builds on the Intro to Copyright reading and talks more about how Creative Commons licensing is the real vehicle for being able to call learning materials "open

educational resources." It will also attempt to clarify / drill down how these terms, and the concepts underpinning them, will inform your project in a more practical sense. More specifically, it will help participants understand and share City Tech O.E.R. programming and resources with the college community.

• Framing question(s): Was this content useful to you? Do you think it would be useful for other faculty members with various levels of knowledge? Have you encountered Creative Commons licenses before? What is the significance of being permitted to remix (make derivatives / adaptations) by 4 of the 6 types of Creative Commons licenses?

Assignment 1

Familiarize yourself with some of the resources available to find O.E.R. (Creative Commons licensed learning materials).

Part 1: Select 4-6 open course materials, across the departments you liaise with, from the resources listed below, as well as utilizing your own search strategies. Share your resources in our group discussion doc, <u>using descriptive hyperlinking</u>, because we'll use them for an activity during our synchronous meeting.

Search each of these resources:

- Open Textbook Library
- BC Campus OpenEd
- Teaching Commons
- MERLOT II

If you want to take a deeper dive into the world of O.E.R. repositories, look at the Community College Consortium O.E.R. Find O.E.R. page.

Some additional search strategies we often recommend to faculty:

- Google your subject + "O.E.R." Ex.: "chemistry O.E.R."
- Filter with Google advanced search & add "edu" after your keywords
- Check resources from professional organizations/associations
- Search Twitter for #BlackLivesMatterSyllabus "O.E.R." + "libguide"

Part 2: Share your reflections on this process. After adding your selected resources to our group discussion doc, reflect on the resources you identified and how the search process went for you. Some questions you might address include:

- Did you notice gaps in the existing O.E.R. in your discipline(s)?
- What features did you like or dislike about the resources? Explain.
- Are your selected resources accessible? Why or why not?

• Did you find O.E.R. that might be more useful than traditional course materials in your discipline(s)? Explain.

Section 2: Rethinking Instruction

As the COVID-19 pandemic took hold in the United States, professors at CUNY had to make a rapid unplanned transition to online learning during the Spring semester. In this moment, while having to respond to emergency situations to provide resources to our constituents, we might reconsider how we approach service and teaching.

Please read the following readings below and respond to each of the framing questions in our group discussion doc by MM/DD/YYYY. Reply to two colleagues' responses by MM/DD/YYYY.

- 1. Read <u>Hybrid Courses: the best of both worlds (or the worst)?</u> by Jesse Rappaport (Approx. reading time: 2 mins)
- Context: This is a short piece, part of the Visible Pedagogy series, contributed to by faculty across CUNY. It is meant to get us in a reflective mindset about our instructional practices and ways of engaging with library users through various modalities.
- Framing question(s): What in this piece resonates with you about course design, regardless of teaching mode (face to face / online / hybrid)?
- 2. Read <u>Embracing Radical Inclusivity: Practical Steps for Creating an Intersectional,</u>
 <u>Interventionist Syllabus</u> by Barrie Gelles, posted on <u>Visible Pedagogy</u> (Approx. reading time: 12 mins)
- Context: When we are not bound to commercial textbooks, it opens the possibility of rethinking teaching and selection of resources that we otherwise might not have considered or foregrounded (different modalities, points of view, content, etc.).
- Framing questions: What opportunities do you see in this? What are the possible downsides?
- 3. Read *Open Pedagogy* by Robin DeRosa and Rajiv Jhangiani (Approx. reading time: 20 mins)
- Context: At the beginning of this article, the authors pose several questions to open up a broader conversation about education, en route to the ideas of Open Pedagogy. How does one synthesize educational theory and personal philosophies into daily practice? Thinking of this, our first two questions are pulled directly from the text.
- Framing questions: How do you see the roles of the learner and the teacher? What challenges do your students face in their learning environments, and how does your pedagogy address them?
- As librarians, our interactions with the community at City Tech are often brief and momentary. What are ways that we can activate engagement and participation in the library space?

4. How might you use the concepts introduced in Section 2's readings to inform the creation of an educational object that could be used in your work in the library (instruction, outreach, reference, technical services, collection development, etc.)?

- 5. Optional: Watch <u>Introduction to Open Pedagogy with Robin DeRosa and Rajiv Jhangiani (video)</u> (Approx. viewing time: 1 hour 7 minutes)
- 6. Optional: Listen to <u>Trauma-Informed Pedagogy (podcast)</u> by Tea for Teaching
- What did you learn from the trauma-informed teaching and learning podcast? In what ways did it change (or not!) how you think about your teaching and your students' learning?
- What are you doing for self-care during this time?

Assignment 2

Create an openly licensed educational object. It can be an instructional material or assignment, for classroom instruction or that highlights library resources, the audience doesn't necessarily need to be students. The topic can be related to the discipline(s) you liaise with, your work in the library, your scholarship, or the topics we discussed during the training. Assign a <u>Creative Commons license</u> for your educational object. For example, you might create:

- A worksheet
- Slides, video, screencast, or other instructional object to enhance a LibGuide
- A quiz
- A zine

We are flexible, so be creative! Create something that will be useful to you and/or the students and faculty with whom you work.

Deadline: Email us your instructional object by MM/DD/YYYY. After submitting your object, you will be asked to fill out a short post-training survey:

- Name (if you would like to remain anonymous, leave this blank):
- Did you think the readings were useful to the training? Explain.
- What did you enjoy most about the training?
- What did you find most challenging, content-wise?
- What is something that you learned from this training that you will take into your work as a librarian?
- What would you change about the training?
- Anything else you'd like to add about the training or OER and open pedagogy at City Tech:

"Librarian O.E.R. Training Syllabus" by Joanna Thompson and Joshua Peach, New York City College of Technology, is licensed under CC BY-NC 4.0