

learned that students who have access to all course materials from day one have greater success. If students had to pay, Lumen would have to restrict access to those who paid. Right from the start, their stance was that they would not put their content behind a paywall. Lumen invests zero dollars in technologies and processes for restricting access—no digital rights management, no time bombs. While this has been a challenge from a business-model perspective, from an open-access perspective, it has generated immense goodwill in the community.

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In most cases, development of their courses is funded by the institution Lumen has a contract with. When creating new courses, Lumen typically works with the faculty who are teaching the new course. They're often part of the institution paying Lumen, but sometimes Lumen has to expand the team and contract faculty from other institutions. First, the faculty identifies all of the course's learning outcomes. Lumen then searches for, aggregates, and curates the best OER they can find that addresses those learning needs, which the faculty reviews.

Sometimes faculty like the existing OER but not the way it is presented. The open licensing of existing OER allows Lumen to pick and choose from images, videos, and other media to adapt and customize the course. Lumen creates new content as they discover gaps in existing OER. Test-bank items and feedback for students on their progress are areas where new content is frequently needed. Once a course is created, Lumen puts it on their platform with all the attributions and links to the original sources intact, and any of Lumen's new content is given an Attribution (CC BY) license.

Using only OER made them experience firsthand how complex it could be to mix differently licensed work together. A common strategy with OER is to place the Creative Commons license and attribution information in the

website's footer, which stays the same for all pages. This doesn't quite work, however, when mixing different OER together.

Remixing OER often results in multiple attributions on every page of every course—text from one place, images from another, and videos from yet another. Some are licensed as Attribution (CC BY), others as Attribution-ShareAlike (CC BY-SA). If this information is put within the text of the course, faculty members sometimes try to edit it and students find it a distraction. Lumen dealt with this challenge by capturing the license and attribution information as metadata, and getting it to show up at the end of each page.

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Lumen's commitment to open licensing and helping low-income students has led to strong relationships with institutions, open-education enthusiasts, and grant funders. People in their network generously increase the visibility of Lumen through presentations, word of mouth, and referrals. Sometimes the number of general inquiries exceed Lumen's sales capacity.

To manage demand and ensure the success of projects, their strategy is to be proactive and focus on what's going on in higher education in different regions of the United States, watching out for things happening at the system level in a way that fits with what Lumen offers. A great example is the Virginia community college system, which is building out Z-Degrees. David and Kim say there are nine other U.S. states with similar system-level activity where Lumen is strategically focusing its efforts. Where there are projects that would require a lot of resources on Lumen's part, they prioritize the ones that would impact the largest number of students.

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As a business, Lumen is committed to openness. There are two core nonnegotiables: Lumen's use of CC BY, the most permissive of the