The Value of a Curriculum Map to Minimize Harm from Emergency Remote Instruction
By Karen Singer-Freeman and Mitchel Cottenoir

Introduction
The academic disruption initiated by the COVID-19 pandemic created a need for faculty to examine students' continuity of learning. As current assessment professionals and former faculty members, we recognize this as an opportunity to utilize curriculum maps as tools to identify and address possible learning gaps that may have occurred. The intended audience for this article includes faculty considering ways to ensure continuity of learning during academic disruption and assessment professionals working with faculty to develop and make use of curriculum maps.

What is a Curriculum Map and Why is it Useful?
In degree programs students are intentionally exposed to materials and activities that support the development of essential student learning outcomes in multiple courses. Students' increasing mastery is supported by repeated exposure to and practice of knowledge, skills, and abilities. Simply put, a curriculum map is a visual representation of the distribution of a program's student learning outcomes across the program's curriculum.

Sample Curriculum Map

	Program Outcome #1	Program Outcome #2	Program Outcome #3	Program Outcomes #4
Course #1	I		I	I
Course #2		I	R	
Course #3	R	R	R	
Course #4	R			R
Course #5		M	R	
Course #6	M		M	M

I = Introduced, R = Reinforced, M = Mastery

During standard operations, the creation of curriculum maps supports effective curricular design through the identification of curricular strengths (learning outcomes that are thoroughly addressed) and gaps (learning outcomes that need more coverage). Curriculum maps guide appropriate class sequencing and prerequisites (Kopera-Frye, Mahaffy, & Svare, 2008). When faculty are familiar with a program curriculum map, the map helps to ensure that all offerings of a single course include equivalent coverage and that progressive levels of mastery are expected in sequential classes allowing students to move from basic to complete mastery. Finally, curriculum maps can be a tool for communicating with students by providing students with a clear representation of the purpose, content, and expected learning path of their studies (Wijngaards-de Meij & Merx, 2018).

Unique Benefits of Curriculum Maps During Educational Disruptions
The abrupt move to remote instruction last spring may have resulted in limitations to the scope of learning in some courses. In many cases, content coverage was reduced, and many students struggled to access course content, balance competing responsibilities, and remain engaged in coursework (Means & Neiser, 2020). To support students, over 150 institutions adopted a pass/fail grading option (Basken, 2020). To avoid harming students who opted for pass/fail grades, many institutions chose to accept

passing grades in pre-requisite and transfer courses, allowing students to progress in degree programs. When grades of D were converted to grades of pass, some students progressed to advanced classes with lower levels of mastery than would have been accepted during a traditional semester.

Together, these unique elements of the response to the pandemic may have resulted in loss of learning that could impact student retention and success. A recent study found that, for students, the fear of lost learning contributed to psychological distress around COVID-19 (Hasam & Bao, 2020). Now is the moment for faculty to determine whether learning was lost in prerequisite courses. Curriculum maps are a valuable tool for tracking student learning outcomes across a disciplinary major to address gaps before the disruptions impact student success (Jankowski, 2020). The current academic disruptions make it imperative that we identify any gaps in learning that occurred and create plans to provide students with the content and skills they need to succeed (National Institute for Learning Outcomes Assessment, 2020). Luckily, an undergraduate student's education generally spans eight semesters, and curricula include multiple opportunities to master key skills and knowledge. We suggest a three-step approach.

1. **Identify areas of reduced mastery of essential learning outcomes**

Review program learning outcomes to determine whether they capture the essential learning students need to master for success in the major. If anything is missing, this is an excellent time to add it. Once program faculty agree that the appropriate learning outcomes are represented, identify the classes that address these outcomes and consider whether mastery of these outcomes was diminished last spring. A review of the original syllabus can be a starting point for identifying essential knowledge, skills, and abilities that were intended to be covered in a course. A comparison of this to the revised syllabus can highlight reduced areas of coverage. In addition to reviewing teaching content, consider how changes in assignments might have limited opportunities for practice, feedback, and mastery. There is no need to consider every element of the original syllabus. Instead, focus on the elements of the course that are essential for success in future classes.

2. **Mitigate the impact of limited mastery on future courses**

To address the impact of reduced mastery on future courses, identify the level of learning students were intended to gain from an affected course. If an introduction to a new learning outcome was omitted from a disrupted class, it is important to add an introduction to this learning outcome and an assignment that allows practice. To avoid removing essential content from a course to make room for the more basic introductory content, faculty could consider whether any current content is not essential. Alternatively, the opportunity to become familiar with and practice a skill might be added as an optional or ungraded video lecture and assignment. If the learning outcome was introduced in a previous course and was being reinforced in the disrupted class, it may be sufficient to provide an additional assignment or opportunity for practice in a subsequent course.

3. **Plan for long term course adjustments**

It is likely that changes to disrupted classes will ripple throughout subsequent semesters as students take courses in different sequences. When considering the impact, we naturally think about any classes for which the affected class was a prerequisite. However, even if the class was not a prerequisite for another class, consider ways in which limited mastery will affect students' overall attainment of mastery within the major. Effective plans for course adjustments should include a method of assessing student readiness and methods for providing access to and practice of missed content both within individual classes and across the curriculum. Early assignments that align with student learning outcomes from prerequisite

classes can indicate if students possess the prior knowledge or skills necessary to be successful. Student self-evaluations of previous learning and readiness for a course can also identify areas of lost learning.

Once learning gaps have been identified, increase attention to these areas in the class and across the program using the curriculum map**.** A good guiding principle for coverage of essential learning outcomes is to err on the side of over-exposure rather than under-exposure. It is likely that learning gaps will vary by student. The use of just-in-time materials can provide coverage and opportunities for practice to students. Accompany assignments that require mastery of a learning outcome with links to Open Educational Resources, adaptive learning platforms, or online lectures from prerequisite courses.

We are increasingly aware that learning was compromised during emergency remote instruction at many institutions. To adequately serve students, we must consider the place of each course within the context of the student's complete education. It is our responsibility to identify material or skills that were not taught or not mastered, ask students about their mastery, and create remedies within individual classes and across the curriculum.

References

Basken, P. (2020, April 6). US colleges adopt pass-fail rules, stirring wider reform. *Times Higher Education.*

Jankowski, N. A. (2020, August). *Assessment during a crisis: Responding to a global pandemic*. Urbana, IL: University of Illinois and Indiana University, National Institute for Learning Outcomes Assessment.

Kopera-Frye, K., Mahaffy, K., & Svare, G. M. (2008). The map to curriculum alignment and improvement. *Collected Essays of Learning and Teaching 1*, 8-14. https://files.eric.ed.gov/fulltext/EJ1055004.pdf

Means, B., & Neisler, J., with Langer Research Associates. (2020). *Suddenly online: A national survey of undergraduates during the COVID-19 pandemic*. San Mateo, CA: Digital Promise.

Najmul, H. & Bao, Y (2020). Impact of 'e-learning crack-up' perception on psychological distress among college students during COVID-19 pandemic: A mediating role of 'fear of academic year loss. *Children and Youth Services Review* 118 (2020): 105355. https://doi.org/10.1016/j.childyouth.2020.105355

National Institute for Learning Outcomes Assessment. (2020, April). Program planning in a time of COVID-19. Urbana, IL: University of Illinois and Indiana University, Author.

Wijngaards-de Meij, L. & Merx, S. (2018). Improving curriculum alignment and achieving learning goals by making the curriculum visible. *International Journal for Academic Development, 23:3*, 219-231, DOI: 10.1080/1360144X.2018.1462187

About the Authors

Dr. Karen Singer-Freeman is the Director of Academic Planning and Assessment at the University of North Carolina at Charlotte. She can be reached at ksinger@uncc.edu.

Dr. Mitchel Cottenoir is the Director of Assessment in the Office of Assessment and Accreditation at the University of North Carolina at Charlotte. He can be reached at mcotteno@uncc.edu.

Intersection: A Journal at the Intersection of Assessment and Learning, Volume 2, Issue 1. Emerging Dialogues, Fall 2020

3