



# **Making at the Research University Survey**

**QUALITY ENHANCEMENT PLAN:  
LEARNING BY CONNECTING, DOING, AND MAKING**



THE UNIVERSITY  
*of* NORTH CAROLINA  
*at* CHAPEL HILL

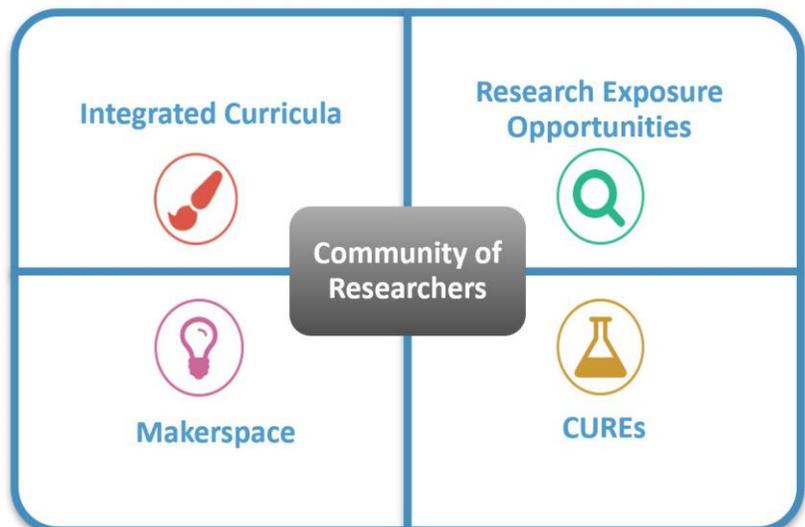


## UNC QEP

In 2017, the University of North Carolina at Chapel Hill launched its Quality Enhancement Plan (QEP), “Learning by Connecting, Doing, and Making”, closely aligned with the institution’s identity, mission, and strategic plan. Through this five-year initiative, the institution engages students in **learning** through connecting ideas and skills across disciplinary areas, **doing** authentic research beyond reading about the process, and applying their synthesis of data and novel ideas into **making**.

The QEP includes four programs:

- Course-based Undergraduate Research Experiences (CUREs)
- Integrated Curricula
- Makerspace
- Research Exposure Opportunities





## MAKERSPACE AT UNC

As one of the key QEP programs, the makerspace program was designed to expand the existing Be A Maker (BeAM) network of makerspaces on campus. BeAM offers any UNC student, staff, or faculty member the opportunity to design and create physical objects for education, research, entrepreneurship, and recreation (<https://beam.unc.edu/>). The materials, tools, consultations and trainings are all provided at no cost to the user. Integrating makerspace as one of the QEP programs offered an opportunity for the institution to engage more students across disciplinary areas in making activities through the integration of making in curriculum and disciplinary learning in both sciences and arts and humanities.

Student learning outcomes are specified for all QEP makerspace courses. Students who complete a makerspace course are expected to: (1) apply a design-thinking and/or iterative processes to developing ideas related to course concepts; (2) articulate specific ways experiential learning through Making has enhanced their understanding of course concepts; (3) produce work that shows evidence of innovation, risk-taking, collaboration, a design process, fabrication, documentation, and communication of process; and (4) effectively critique others' work and use critiques of their own work for improvement.



## QEP ASSESSMENT FOR MAKERSPACE

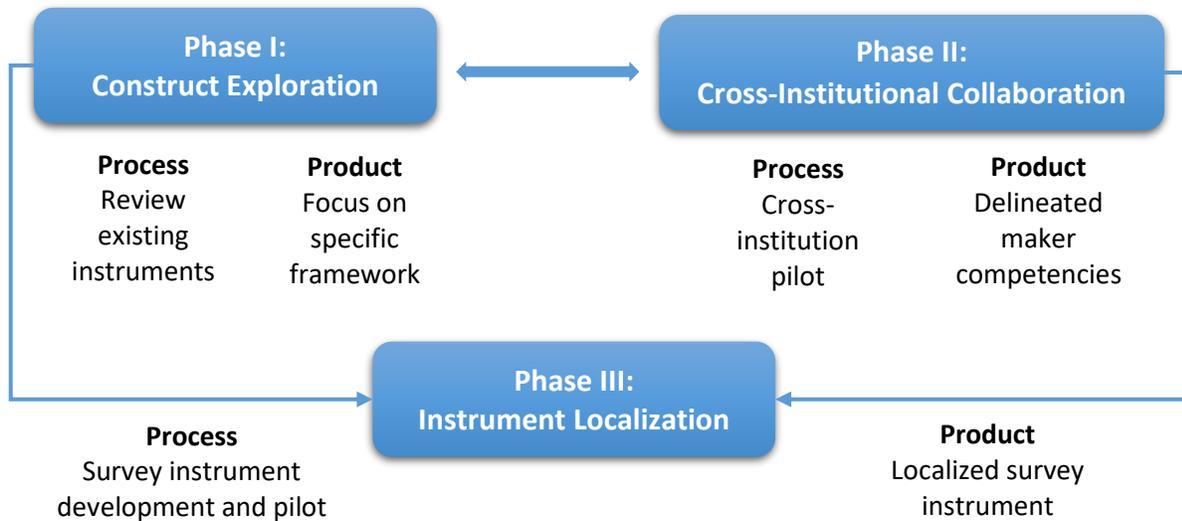
Both direct and indirect measures are used in the QEP assessment for the makerspace program. Direct measures include course-based content measures such as pre/post tests of course concepts and evaluation of projects based on rubrics. Indirect measures include a locally developed instrument, the ***Making at the Research University*** survey.

### ***Instrument Development***

Even though makerspaces are widely implemented in higher education institutions, there was no validated instrument that measures college students' making engagement and the relationship between making and their mastery of the content. The UNC QEP leadership team determined the need to develop such an instrument to be used as a pre/post indirect measure as an element of the QEP assessment. A working group comprised of the QEP assessment team and making content experts were formed in spring 2018 to develop the instrument.

The instrument was developed in three phases: 1) construct exploration; 2) cross-institutional collaboration; and 3) instrument localization. During the initial construct exploration phase, the working group reviewed existing instruments designed for makerspace-type programs or making experiences. The Remake Learning Cross-Cutting Competencies (<http://competencies.remakelarning.org/>) was identified as the framework that guided the survey development. To further the impact of making on student development, during the second phase, the working group participated in a National Leadership Grant from the Institute of Museum and Library Services (<https://www.ims.gov/grants/awarded/lg-97-17-0010-17>) led by the University of Texas at Arlington. This effort led to the delineation of maker competencies

(<https://library.uta.edu/makerliteracies/competencies>) that informed the survey development. During the third phase, the working group created survey items that reflected transdisciplinary maker competencies. The survey instrument has been modified based on two iterations of implementation in makerspace courses at UNC Chapel Hill.



### ***Instrument Description***

The ***Making at the Research University*** survey measures students’ experiences, dispositions, and self-efficacy in terms of making. In addition, the survey invites students’ to share their perception of the impact of making experiences on their dispositions and mastery of the course content.

Constructs	Pre	Post
<b>Experiences</b>	Prior Experiences (n=14) Open-ended – course experience expectations (n=1)	Course Experiences – Collaboration, Iteration, Discovery, networking, project ownership (n=26) Open-ended – rewarding and challenging experiences (n=2)
<b>Dispositions</b>	Interests in making (n=4) Making community values (n=6)	Same as pre
<b>Self-efficacy</b>	Self-efficacy in making-related skills (n=5)	Same as pre
<b>Impact of Making Experiences</b>	N/A	Impact on dispositions (n=6) Impact on content mastery (n=12) Open-ended - content learning (n=1)

The survey is designed to be implemented in a pre/post manner. Survey items regarding disposition and self-efficacy are included on both the pre and post surveys. On the pre-survey, items regarding experiences focus on students' prior experiences with making and materials. On the post-survey, students' experiences with collaboration, iteration, discovery, networking, and project ownership are included. Two open-ended questions invite students to share rewarding and challenging experiences through the makerspace courses. Survey items regarding the impact of making experiences are only included on the post-survey. The impact items include the impact of making experiences on students' dispositions as well as the impact on their content mastery. One open-ended question is also included for students to share their perception of the making experiences on their content mastery.



## NEXT STEPS

The QEP assessment team plans to continue to work with content experts and instructors teaching makerspace courses to modify and refine the survey instrument and its implementation. In addition, preliminary data collected based on the instrument has been used to measure the general impact of the QEP in addition to supporting makerspace course development specifically.

To learn more about the *Making at the Research University* instrument, contact Bryant Hutson at [bhutson@email.unc.edu](mailto:bhutson@email.unc.edu).