Data Dictionary for Maker Competencies and the Undergraduate Curriculum, Fall 2017-Spring 2018

For reference, the final IRB-approved versions of our pre- and post-self-assessment surveys are posted with the public data on Mavs Dataverse. They will also be included as Appendix 6 and Appendix 7 in the forthcoming final report to the IMLS. I have also posted this data dictionary to help users understand what each column heading means in the data set. Using the self-assessment surveys in tandem with the data dictionary will provide users the best understanding of the data collected.

The data dictionary is not perfect, but should be suitable. I have no plans at this time to make it look prettier or more user-friendly. That said, I will do my best to address requests for improvements that are brought directly to my attention. Before sending your requests, please consider that we will need to compile a whole new data dictionary for the updated surveys that we will begin using in Spring 2019. I reserve the right to hold off on any changes that will be revised again or reversed in version 2 of the data dictionary. If you have any confusion at all about finding information in the data or its dictionary, don't hesitate to contact me for clarification at martin.wallace@uta.edu.

Columns A-E

Course information (self-explanatory)

F. Informed Consent:

1 = Agree, 2 = Do not Agree

G. Intellectual Property Rights:

1 = Agree, 2 = Agree with conditions, 3 or unanswered = Do not Agree

H. Pre Assessment Survey Duration: Amount of time each respondent took to complete the pre assessment survey. Used to identify potentially unreliable responses.

I. Post Assessment Survey Duration: Amount of time each respondent took to complete the post assessment survey. Used to identify potentially unreliable responses.

Values in columns J – Q have been redacted from the public data, for now, until I verify our initial calculations. There is no data for Competencies 7, 8, 10 or 11, thus the missing columns for their Intraclass Correlations.

J. Makerspace Equipment - Intraclass Correlation: Intraclass correlation values computed for all the questions related to makerspace equipment. Used to identify potentially unreliable responses.

K. Competency 1 - Identify The Need - Intraclass correlation coefficient: Intraclass correlation values computed for all the questions related to competency 1. Used to identify potentially unreliable responses.

L. Competency 2 - Design Praxis - Intraclass correlation: Intraclass correlation values computed for all the questions related to competency 2. Used to identify potentially unreliable responses.

M. Competency 3 - Time Management -Intraclass correlation: Intraclass correlation values computed for all the questions related to competency 3. Used to identify potentially unreliable responses.

N. Competency 4 - Assembles Effective Teams - Intraclass correlation: Intraclass correlation values computed for all the questions related to competency 4. Used to identify potentially unreliable responses.

O. Competency 5 - Knowledge Management - Intraclass Correlation: Intraclass correlation values computed for all the questions related to competency 5. Used to identify potentially unreliable responses.

P. Competency 6- Availability of Tools - Intraclass correlation: Intraclass correlation values computed for all the questions related to competency 6. Used to identify potentially unreliable responses.

Q. Competency 9 - understands ethical, legal and socioeconomic issues - Intraclass correlation: Intraclass correlation values computed for all the questions related to competency 9. Used to identify potentially unreliable responses.

R. Pre ever used Makerspace: Before taking this course, have you ever used the equipment in the UTA FabLab? Yes, or No are only valid answers.

Makerspace Equipment: Columns S-CF represent makerspace equipment knowledge. We customized this section of the pre and post surveys for each partner site because each partner offered a different variety of equipment. This explains the large amount of empty cells in the data set.

S. Pre.knowledge of makerspace equipment - 3D Printing: Please rate your knowledge of how to use the types of equipment found at the UTA FabLab and other makerspaces:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

T. Post.knowledge of makerspace equipment - 3D printing, at beginning of semester: Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab, at the beginning of the semester:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

U. Post.knowledge of makerspace equipment - 3D printing, now: Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab now:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

V. Pre.knowledge of makerspace equipment - 3D scanning: Please rate your knowledge of how to use the types of equipment found at the UTA FabLab and other makerspaces:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

W. Post.knowledge of makerspace equipment - 3D scanning, at beginning of semester: Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab, at the beginning of the semester:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

X. Post.knowledge of makerspace equipment - 3D Scanning, now: Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab now:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

Y. Pre.knowledge of makerspace equipment - Laser Cutting/Engraving: Please rate your knowledge of how to use the types of equipment found at the UTA FabLab and other makerspaces:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

Z. Post.knowledge of makerspace equipment - Laser Cutting/Engraving, at beginning of semester: Posttest- Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab, at the beginning of the semester:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

AA. Post.knowledge of makerspace equipment - Laser Cutting/Engraving, now: Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab now:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

AB. Pre.knowledge of makerspace equipment - CNC Vinyl Cutting: Please rate your knowledge of how to use the types of equipment found at the UTA FabLab and other makerspaces:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

AC. Post.knowledge of makerspace equipment - CNC Vinyl Cutting, at beginning of semester: Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab, at the beginning of the semester:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

AD. Post.knowledge of makerspace equipment - CNC Vinyl Cutting, now: Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab now:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

AE. Pre.knowledge of makerspace equipment - Screen Printing: Please rate your knowledge of how to use the types of equipment found at the UTA FabLab and other makerspaces:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

AF. Post.knowledge of makerspace equipment - Screen Printing, at beginning of semester: Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab, at the beginning of the semester:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

AG. Post.knowledge of makerspace equipment - Screen Printing, now: Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab now:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

AH. Pre.knowledge of makerspace equipment - Sewing Machine / Serger: Please rate your knowledge of how to use the types of equipment found at the UTA FabLab and other makerspaces:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

AI. Post.knowledge of makerspace equipment - Sewing Machine / Serger, at beginning of semester: Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab, at the beginning of the semester:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

AJ. Post.knowledge of makerspace equipment - Sewing Machine / Serger, now: Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab now:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

AK. Pre.knowledge of makerspace equipment - CNC Embroidering: Please rate your knowledge of how to use the types of equipment found at the UTA FabLab and other makerspaces:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

AL. Post.knowledge of makerspace equipment - CNC Embroidering, at beginning of semester: Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab, at the beginning of the semester:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

AM. Post.knowledge of makerspace equipment - CNC Embroidering, now: Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab now:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

AN. Pre.knowledge of makerspace equipment - CNC Milling: Please rate your knowledge of how to use the types of equipment found at the UTA FabLab and other makerspaces:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

AO. Post.knowledge of makerspace equipment - CNC milling, at beginning of semester: Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab, at the beginning of the semester:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

AP. Post.knowledge of makerspace equipment - CNC Milling, now: Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab now

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

AQ. Pre.knowledge of makerspace equipment - File Preparation for Digital Fabrication (Umass equivalent is Software and File Preparation for 3D Printing): Please rate your knowledge of how to use the types of equipment found at the UTA FabLab and other makerspaces:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

AR. Post.knowledge of makerspace equipment - File Preparation for Digital Fabrication, at beginning of semester (Umass equivalent is Software and File Preparation for 3D: Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab, at the beginning of the semester:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

AS. Post.knowledge of makerspace equipment - File Preparation for Digital Fabrication, now (Umass equivalent is Software and File Preparation for 3D Printing): Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab now

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

AT. Pre.knowledge of makerspace equipment - Woodshop equipment such as shop bot, table saw, mitre saw, bandsaw, drill press, grinder, and other large equipment: Please rate your knowledge of how to use the types of equipment found at the UTA FabLab and other makerspaces:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

AU. Post.knowledge of makerspace equipment - Woodshop equipment such as shop bot, table saw, mitre saw, bandsaw, drill press, grinder, and other large equipment, at beginning of semester: Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab, at the beginning of the semester:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

AV. Post.knowledge of makerspace equipment - Woodshop equipment such as shop bot, table saw, mitre saw, bandsaw, drill press, grinder, and other large equipment, now: Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab now

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

AW. Pre.knowledge of makerspace equipment - Woodshop equipment such as dremels, drills, hand saws other handheld tools: Please rate your knowledge of how to use the types of equipment found at the Albertsons Library MakerLab, or other makerspaces.

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

AX. Post.knowledge of makerspace equipment - Woodshop equipment such as dremels, drills, hand saws other handheld tools, at the beginning of the semester: Now that you have completed an assignment in the Albertsons Library MakerLab, please rate your knowledge of how to use the types of equipment found at this or other makerspaces, both now and from the beginning of the semester.

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

AY. Post.knowledge of makerspace equipment - Woodshop equipment such as dremels, drills, hand saws other handheld tools, now: Now that you have completed an assignment in the Albertsons Library MakerLab, please rate your knowledge of how to use the types of equipment found at this or other makerspaces, both now and from the beginning of the semester.

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

AZ. Pre.knowledge of makerspace equipment - Robotics, Physical Computing, and Electronics fabrication, including soldering irons, PCB printing, microprocessors (Arduino, Raspberry Pi), and products such as Sphero, Ozobot and Makey Makey: Please rate your knowledge of how to use the types of equipment found at the UTA FabLab and other makerspaces.

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

BA. Post.knowledge of makerspace equipment - Robotics, Physical Computing, and Electronics fabrication, including soldering irons, PCB printing, microprocessors (Arduino, Raspberry Pi), and products such as Sphero, Ozobot and Makey Makey, at beginning of semester: Now that

you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab, at the beginning of the semester.

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

BB. Post.knowledge of makerspace equipment - Robotics, Physical Computing, and Electronics fabrication, including soldering irons, PCB printing, microprocessors (Arduino, Raspberry Pi), and products such as Sphero, Ozobot and Makey Makey, at beginning of semester: Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab now

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

BC. Pre.knowledge of makerspace equipment - Computer programming and microcontroler languages (such as the language used to program an Arduino): Please rate your knowledge of how to use the types of resources found at the UMass-Amherst Libraries Digital Media Lab or other similar makerspaces.

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

BD. Post.knowledge of FabLab equipment - Computer programming languages and microcontroler languages (such as the language used to program an Arduino), at beginning of semester: Now that you have taken this course, please rate your knowledge of how to use the resources in the UMass-Amherst Libraries Digital Media Lab, both now at the beginning of the semester.

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

BE. Post.knowledge of FabLab equipment - Computer programming languages and microcontroler languages (such as the language used to program an Arduino), now: Now that you have taken this course, please rate your knowledge of how to use the resources in the UMass-Amherst Libraries Digital Media Lab, both now at the beginning of the semester.

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

BF. Pre.knowledge of makerspace equipment - Green Screen Room: Please rate your knowledge of how to use the types of equipment found at the UTA FabLab and other makerspaces:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

BG. Post.knowledge of makerspace equipment - Green Screen Room, at beginning of semester: Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab, at the beginning of the semester:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

BH. Post.knowledge of makerspace equipment - Green Screen Room, now: Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab now

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

BI. Pre.knowledge of makerspace equipment - Video Production Equipment: Please rate your knowledge of how to use the types of equipment found at the UTA FabLab and other makerspaces:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

BJ. Post.knowledge of makerspace equipment - Video Production Equipment, at beginning of semester: Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab, at the beginning of the semester:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

BK. Post.knowledge of makerspace equipment - Video Production Equipment, now: Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab now

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

BL. Pre.knowledge of makerspace equipment - Video Production Software: Please rate your knowledge of how to use the types of equipment found at the UTA FabLab and other makerspaces:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

BM. Post.knowledge of makerspace equipment - Video Production Software, at beginning of semester: Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab, at the beginning of the semester:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

BN. Post.knowledge of makerspace equipment - Video Production Software, now: Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab now

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

BO. Pre.knowledge of makerspace equipment - Sound Room: Please rate your knowledge of how to use the types of equipment found at the UTA FabLab and other makerspaces:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

BP. Post.knowledge of makerspace equipment - Sound Room, at beginning of semester: Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab, at the beginning of the semester:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

BQ. Post.knowledge of makerspace equipment - Sound Room, now: Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab now

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

BR. Pre.knowledge of makerspace equipment - Audio Production Equipment: Please rate your knowledge of how to use the types of equipment found at the UTA FabLab and other makerspaces:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

BS. Post.knowledge of makerspace equipment - Audio Production Equipment, at beginning of semester: Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab, at the beginning of the semester:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

BT. Post.knowledge of makerspace equipment - Audio Production Equipment, now: Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab now

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

BU. Pre.knowledge of makerspace equipment - Audio Production Software: Please rate your knowledge of how to use the types of equipment found at the UTA FabLab and other makerspaces:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

BV. Post.knowledge of makerspace equipment - Audio Production Software, at beginning of semester: Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab, at the beginning of the semester:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

BW. Post.knowledge of makerspace equipment - Audio Production Software, now: Now that you have taken this course, please rate your knowledge of how to use the equipment in the UTA FabLab now

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

BX. Pre.knowledge of DML equipment - Online collaboration and version control systems (such as the Open Science Framework, SLACK, GitHub, etc.): Please rate your knowledge of how to use the types of resources found at the UMass-Amherst Libraries Digital Media Lab or other similar makerspaces:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

BY. Post.knowledge of FabLab equipment - Online collaboration and version control systems (such as the Open Science Framework, SLACK, GitHub, etc.), at beginning of semester: Now that you have taken this course, please rate your knowledge of how to use the resources in the UMass-Amherst Libraries Digital Media Lab, at the beginning of the semester:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

BZ. Post.knowledge of FabLab equipment - Online collaboration and version control systems (such as the Open Science Framework, SLACK, GitHub, etc.), now: Now that you have taken this course, please rate your knowledge of how to use the resources in the UMass-Amherst Libraries Digital Media Lab, now

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

CA. Pre.knowledge of makerspace equipment - Projection Mapping: Please rate your knowledge of how to use the types of equipment found at the Albertsons Library MakerLab, or other makerspaces.

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

CB. Post.knowledge of makerspace equipment - Projection Mapping, at the beginning of the semester: Now that you have completed an assignment in the Albertsons Library MakerLab, please rate your knowledge of how to use the types of equipment found at this or other makerspaces, both now and from the beginning of the semester.

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

CC. Post.knowledge of makerspace equipment - Projection Mapping, now: Now that you have completed an assignment in the Albertsons Library MakerLab, please rate your knowledge of how to use the types of equipment found at this or other makerspaces, both now and from the beginning of the semester.

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

CD. Pre.knowledge of makerspace equipment - VR Development, e.g. HTC Vive: Please rate your knowledge of how to use the types of equipment found at the BeAM makerspaces:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

CE. Post.knowledge of makerspace equipment - VR Development, e.g. HTC Vive, before taking this course: Now that you have taken this course, please rate your knowledge of how to use the equipment in the BeAM Makerspaces, before taking this course:

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

CF. Post.knowledge of makerspace equipment - VR Development, e.g. HTC Vive, now: Now that you have taken this course, please rate your knowledge of how to use the equipment in the BeAM Makerspaces, now

1 = None, 2= Beginner, 3= Novice, 4= Intermediate, 5=Competent, 6= Advanced, 7= Expert

CG. Pre.how 3D printer works: In your own words, describe briefly how a 3D printer works.

Has a descriptive response

CH. Post.how 3D printer works: Now that you have taken this course, In your own words, describe briefly how a 3D printer works

CI. Pre.how CNC works: In your own words, describe briefly how CNC technologies work.

CJ. Post.how CNC works: Now that you have taken this course, In your own words, describe briefly how CNC technologies work.

CK. Pre.evaluation of need Likert - Recognize unmet needs that may be filled by creating something: Below is a list of effective strategies for evaluating how to meet a perceived need. Select the frequency with which you do the following.

1 = Never, 2= Sometimes, 3= About half the Time, 4= Most of the time, 5=Always

CL. Post.evaluation of need Likert - Recognize unmet needs that may be filled by creating something, before taking this course: Below is a list of effective strategies for evaluating how to meet a perceived need. We would like to know the frequency with which you will use those strategies now, after having taken this course. For comparison, we would also like to know how often you used the strategies before taking the course.

1 = Never, 2= Sometimes, 3= about half the Time, 4= Most of the time, 5=Always

CM. Post.evaluation of need Likert - Recognize unmet needs that may be filled by creating something, after having taken this course: Below is a list of effective strategies for evaluating how to meet a perceived need. We would like to know the frequency with which you will use those strategies now, after having taken this course. For comparison, we would also like to know how often you used the strategies before taking the course.

1 = Never, 2= Sometimes, 3= about half the Time, 4= Most of the time, 5=Always

CN. Pre.evaluation of need Likert - Recognize unmet needs that may be filled by creating a derivative of something that already exists: Below is a list of effective strategies for evaluating how to meet a perceived need. Select the frequency with which you do the following.

1 = Never, 2= Sometimes, 3= about half the Time, 4= Most of the time, 5=Always

CO. Post.evaluation of need Likert - Recognize unmet needs that may be filled by creating a derivative of something, before taking this course: Below is a list of effective strategies for evaluating how to meet a perceived need. We would like to know the frequency with which you will use those strategies now, after having taken this course. For comparison, we would also like to know how often you used the strategies before taking the course.

1 = Never, 2= Sometimes, 3= about half the Time, 4= Most of the time, 5=Always

CP. Post.evaluation of need Likert - Recognize unmet needs that may be filled by creating a derivative of something, after having taken this course: Below is a list of effective strategies for evaluating how to meet a perceived need. We would like to know the frequency with which you will use those strategies now, after having taken this course. For comparison, we would also like to know how often you used the strategies before taking the course.

1 = Never, 2= Sometimes, 3= about half the Time, 4= Most of the time, 5=Always

CQ. Pre.evaluation of need Likert - Express curiosity about how things are made and how they work: Below is a list of effective strategies for evaluating how to meet a perceived need. Select the frequency with which you do the following.

1 = Never, 2= Sometimes, 3= about half the Time, 4= Most of the time, 5=Always

CR. Post.evaluation of need Likert - Express curiosity about how things are made and how they work, before taking this course: Below is a list of effective strategies for evaluating how to meet a perceived need. We would like to know the frequency with which you will use those strategies now, after having taken this course. For comparison, we would also like to know how often you used the strategies before taking the course.

1 = Never, 2= Sometimes, 3= about half the Time, 4= Most of the time, 5=Always

CS. Post.evaluation of need Likert - Express curiosity about how things are made and how they work, after having taken this course: Below is a list of effective strategies for evaluating how to meet a perceived need. We would like to know the frequency with which you will use those strategies now, after having taken this course. For comparison, we would also like to know how often you used the strategies before taking the course.

1 = Never, 2= Sometimes, 3= about half the Time, 4= Most of the time, 5=Always

CT. Pre.evaluation of need Likert - "Hack"• and "tinker" to learn how things are made and how they work: Below is a list of effective strategies for evaluating how to meet a perceived need. Select the frequency with which you do the following.

1 = Never, 2= Sometimes, 3= about half the Time, 4= Most of the time, 5=Always

CU. Post.evaluation of need Likert - "Hack"• and "tinker"• to learn how things are made and how they work, before taking this course: Below is a list of effective strategies for evaluating how to meet a perceived need. We would like to know the frequency with which you will use

those strategies now, after having taken this course. For comparison, we would also like to know how often you used the strategies before taking the course.

1 = Never, 2= Sometimes, 3= about half the Time, 4= Most of the time, 5=Always

CV. Post.evaluation of need Likert - "Hack"• and "tinker" to learn how things are made and how they work, after having taken this course: Below is a list of effective strategies for evaluating how to meet a perceived need. We would like to know the frequency with which you will use those strategies now, after having taken this course. For comparison, we would also like to know how often you used the strategies before taking the course.

1 = Never, 2= Sometimes, 3= about half the Time, 4= Most of the time, 5=Always

CW. Pre.evaluation of need Likert - Evaluate the costs & benefits of making as an alternative to buying or hiring: Below is a list of effective strategies for evaluating how to meet a perceived need. Select the frequency with which you do the following.

1 = Never, 2= Sometimes, 3= about half the Time, 4= Most of the time, 5=Always

CX. Post.evaluation of need Likert - Evaluate the costs & benefits of making as an alternative to buying or hiring, before taking this course: Below is a list of effective strategies for evaluating how to meet a perceived need. We would like to know the frequency with which you will use those strategies now, after having taken this course. For comparison, we would also like to know how often you used the strategies before taking the course.

1 = Never, 2= Sometimes, 3= about half the Time, 4= Most of the time, 5=Always

CY. Post.evaluation of need Likert - Evaluate the costs & benefits of making as an alternative to buying or hiring, after having taken this course: Below is a list of effective strategies for evaluating how to meet a perceived need. We would like to know the frequency with which you will use those strategies now, after having taken this course. For comparison, we would also like to know how often you used the strategies before taking the course.

1 = Never, 2= Sometimes, 3= about half the Time, 4= Most of the time, 5=Always

CZ. Pre.evaluation of need essay: Please describe how you have applied the evaluative strategies listed above that you have used in the past.

DA. Post.evaluation of need essay: In your own words, please describe how you might apply the strategies listed above, now that you have taken this course.

DB. Pre.general design praxis: Please rate how accurately the following statement describes you: "I am an expert at recognizing a problem and identifying, implementing, and evaluating a solution."
1= Very untrue of me, 2= somewhat untrue of me, 3= Neutral, 4= somewhat true of me, 5= Very true of me

DC. Post.general design praxis: Please rate how accurately the following statement describes you: "I am an expert at recognizing a problem and identifying, implementing, and evaluating a solution."

1= Very untrue of me, 2= somewhat untrue of me, 3= Neutral, 4= somewhat true of me, 5= Very true of me

DD. Pre.design praxis practices Likert - Defining the problem: Please rate your level of experience in the following activities.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

DE. Post.design praxis practices Likert - Defining the problem, before taking this course: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course:

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

DF. Post.design praxis practices Likert - Defining the problem, now: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course:

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

DG. Pre.design praxis practices Likert - Analyzing the problem and breaking it into component parts: Please rate your level of experience in the following activities.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

DH. Post.design praxis practices Likert - Analyzing the problem and breaking it into component parts, before taking this course: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course:

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

DI. Post.design praxis practices Likert - Analyzing the problem and breaking it into component parts, now: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course:

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

DJ. Pre.design praxis practices Likert - Acquiring reliable and relevant background information: Please rate your level of experience in the following activities.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

DK. Post.design praxis practices Likert - Acquiring reliable and relevant background information, before taking this course: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course:

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

DL. Post.design praxis practices Likert - Acquiring reliable and relevant background information, now: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course:

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

DM. Pre.design praxis practices Likert - Identifying stakeholders: Please rate your level of experience in the following activities.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

DN. Post.design praxis practices Likert - Identifying stakeholders, before taking this course: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course:

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

DO. Post.design praxis practices Likert - Identifying stakeholders, now: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course:

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

DP. Pre.design praxis practices Likert - Specifying project requirements: Please rate your level of experience in the following activities.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

DQ. Post.design praxis practices Likert - Specifying project requirements, before taking this course: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course:

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

DR. Post.design praxis practices Likert - Specifying project requirements, now: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course:

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

DS. Pre.design praxis practices Likert - Identifying and working effectively within project constraints, be they financial, temporal, proximal, or material: Please rate your level of experience in the following activities.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

DT. Post.design praxis practices Likert - Identifying and working effectively within project constraints, be they financial, temporal, proximal, or material, before taking this course: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course:

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

DU. Post.design praxis practices Likert - Identifying and working effectively within project constraints, be they financial, temporal, proximal, or material, now: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course:

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

DV. Pre.design praxis practices Likert - Brainstorming for a variety of solutions & chooses the best one: Please rate your level of experience in the following activities.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

DW. Post.design praxis practices Likert - Brainstorming for a variety of solutions & chooses the best one, before taking this course: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course:

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

DX. Post.design praxis practices Likert - Brainstorming for a variety of solutions & chooses the best one, now: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course:

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

DY. Pre.design praxis practices Likert - Evaluating the costs & benefits of using off-the-shelf parts or kits as opposed to making from scratch: Please rate your level of experience in the following activities.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

DZ. Post.design praxis practices Likert - Evaluating the costs & benefits of using off-the-shelf parts or kits as opposed to making from scratch, before taking this course: Please rate your level

of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course:

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

EA. Post.design praxis practices Likert - Evaluating the costs & benefits of using off-the-shelf parts or kits as opposed to making from scratch, now: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course:

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

EB. Pre.design praxis practices Likert - Creating and testing prototypes: Please rate your level of experience in the following activities.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

EC. Post.design praxis practices Likert - Creating and testing prototypes, before taking this course: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course:

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

ED. Post.design praxis practices Likert - Creating and testing prototypes, now: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course:

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

EE. Pre.design praxis practices Likert - Revising and modifying prototype design over multiple iterations: Please rate your level of experience in the following activities.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

EF. Post.design praxis practices Likert - Revising and modifying prototype design over multiple iterations, before taking this course: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course:

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

EG. Post.design praxis practices Likert - Revising and modifying prototype design over multiple iterations, now: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course:

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

EH. Pre.design praxis practices Likert - Taking intelligent risks and learns from failures: Please rate your level of experience in the following activities.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

EI. Post.design praxis practices Likert - Taking intelligent risks and learns from failures, before taking this course: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course:

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

EJ. Post.design praxis practices Likert - Taking intelligent risks and learns from failures, now: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course:

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

EK. Pre.design praxis essay: In your own words, describe your experience with design thinking

EL. Post.design praxis essay: In your own words, describe any new experiences that you had with "design thinking" while taking this course.

EM. Pre.general time management: Overall, how would you rate your time management skills?

1=poor, 2=below average, 3=average, 4= above average,5=excellent

EN. Post.general time management thinking back: Thinking back to the beginning of the semester, how would you have rated your time management skills then?

1=poor, 2=below average, 3=average, 4= above average,5=excellent

EO. Post.general time management: After having taken this course, how would you rate your time management skills?

1=poor, 2=below average, 3=average, 4= above average,5=excellent

EP. Pre.time management tools essay: In your own words, describe some of the tools and practices that you use to help manage your time. Be specific, for example, instead of saying "calendar" write "Outlook calendar" or "Google calendar".

Has a descriptive response

EQ. Post.time management tools essay: In your own words, describe some of the tools and practices that you use to help manage your time. Be specific, for example, instead of saying "calendar" write "Outlook calendar" or "Google calendar".

Has a descriptive response

ER. Pre.time management Likert - I schedule work to meet deadlines in time: Select the frequency with which you use each.

1=never, 2=sometimes, 3=about half the time, 4= most of the time, 5= always

ES. Post.time management Likert - At the beginning of the semester, I scheduled work to meet deadlines in time: Select the frequency with which you used each at the beginning of the semester.

1=never, 2=sometimes, 3=about half the time, 4= most of the time, 5= always

ET. Post.time management Likert - Now I schedule work to meet deadlines in time: Select the frequency with which you use each now

1=never, 2=sometimes, 3=about half the time, 4= most of the time, 5= always

EU. Pre.time management Likert - I use a calendar for appointments, deadlines, and daily tasks: Select the frequency with which you use each.

1=never, 2=sometimes, 3=about half the time, 4= most of the time, 5= always

EV. Post.time management Likert - At the beginning of the semester, I used a calendar for appointments, deadlines, and daily tasks: Select the frequency with which you used each at the beginning of the semester.

1=never, 2=sometimes, 3=about half the time, 4= most of the time, 5= always

EW. Post.time management Likert - Now I use a calendar for appointments, deadlines, and daily tasks: Select the frequency with which you use each now

1=never, 2=sometimes, 3=about half the time, 4= most of the time, 5= always

EX. Pre.time management Likert - I make a daily to-do list and refer to it several times per day: Select the frequency with which you use each.

1=never, 2=sometimes, 3=about half the time, 4= most of the time, 5= always

EY. Post.time management Likert - At the beginning of the semester, I made a daily to-do list and referred to it several times per day: Select the frequency with which you used each at the beginning of the semester.

1=never, 2=sometimes, 3=about half the time, 4= most of the time, 5= always

EZ. Post.time management Likert - Now I make a daily to-do list and refer to it several times per day: Select the frequency with which you use each now

1=never, 2=sometimes, 3=about half the time, 4= most of the time, 5= always

FA. Pre.time management Likert - I outline project milestones, identify their dependencies, and follow critical paths to accomplish goals: Select the frequency with which you use each.

1=never, 2=sometimes, 3=about half the time, 4= most of the time, 5= always

FB. Post.time management Likert - At the beginning of the semester, I outlined project milestones, identified their dependencies, and followed critical paths to accomplish goals: Select the frequency with which you used each at the beginning of the semester.

1=never, 2=sometimes, 3=about half the time, 4= most of the time, 5= always

FC. Post.time management Likert - Now I outline project milestones, identify their dependencies, and follow critical paths to accomplish goals: Select the frequency with which you use each now

1=never, 2=sometimes, 3=about half the time, 4= most of the time, 5= always

FD. Pre.time management Likert - I plan extra time to allow for failures and multiple tests and iterations: Select the frequency with which you use each.

1=never, 2=sometimes, 3=about half the time, 4= most of the time, 5= always

FE. Post.time management Likert - At the beginning of the semester, I planned extra time to allow for failures and multiple tests and iterations: Select the frequency with which you used each at the beginning of the semester.

1=never, 2=sometimes, 3=about half the time, 4= most of the time, 5= always

FF. Post.time management Likert - Now I plan extra time to allow for failures and multiple tests and iterations: Select the frequency with which you use each now

1=never, 2=sometimes, 3=about half the time, 4= most of the time, 5= always

FG. Post.3D printing time: If you used a 3D printer in the UTA FabLab this semester, describe in your own words what you did with your time while waiting for your object to print.

Has a descriptive response.

FH. Pre.team building practices - Recognizing opportunities to collaborate with others: Please rate your skill level in the following team building practices.

1=beginner, 2=novice, 3=competent, 4=advanced, 5=expert

FI. Post.team building practices - Recognizing opportunities to collaborate with others, at the beginning of the semester: Now that you have taken this course, rate your skill level in the following team building practices at the beginning of the semester

1=beginner, 2=novice, 3=competent, 4=advanced, 5=expert

FJ. Post.team building practices - Recognizing opportunities to collaborate with others, now: Now that you have taken this course, rate your skill level in the following team building practices now.

1=beginner, 2=novice, 3=competent, 4=advanced, 5=expert

FK. Pre.team building practices - Evaluating the costs & benefits of "Doing-it-Together" (DIT) vs. "Doing-it-Yourself"• (DIY): Please rate your skill level in the following team building practices.

1=beginner, 2=novice, 3=competent, 4=advanced, 5=expert

FL. Post.team building practices - Evaluating the costs & benefits of "Doing-it-Together"• (DIT) vs. "Doing-it-Yourself"• (DIY), at the beginning of the semester: Now that you have taken this course, rate your skill level in the following team building practices at the beginning of the semester

1=beginner, 2=novice, 3=competent, 4=advanced, 5=expert

FM. Post.team building practices - Evaluating the costs & benefits of "Doing-it-Together"• (DIT) vs. "Doing-it-Yourself"• (DIY), now: Now that you have taken this course, rate your skill level in the following team building practices now.

1=beginner, 2=novice, 3=competent, 4=advanced, 5=expert

FN. Pre.team building practices - Seeking team members with skills appropriate for specific project requirements: Please rate your skill level in the following team building practices.

1=beginner, 2=novice, 3=competent, 4=advanced, 5=expert

FO. Post.team building practices - Seeking team members with skills appropriate for specific project requirements, at the beginning of the semester: Now that you have taken this course, rate your skill level in the following team building practices at the beginning of the semester

1=beginner, 2=novice, 3=competent, 4=advanced, 5=expert

FP. Post.team building practices - Seeking team members with skills appropriate for specific project requirements, now: Now that you have taken this course, rate your skill level in the following team building practices now.

1=beginner, 2=novice, 3=competent, 4=advanced, 5=expert

FQ. Pre.team building practices - Joining teams where your skills are sought and valued: Please rate your skill level in the following team building practices.

1=beginner, 2=novice, 3=competent, 4=advanced, 5=expert

FR. Post.team building practices - Joining teams where your skills are sought and valued, at the beginning of the semester: Now that you have taken this course, rate your skill level in the following team building practices at the beginning of the semester

1=beginner, 2=novice, 3=competent, 4=advanced, 5=expert

FS. Post.team building practices - Joining teams where your skills are sought and valued, now: Now that you have taken this course, rate your skill level in the following team building practices now.

1=beginner, 2=novice, 3=competent, 4=advanced, 5=expert

FT. Pre.team building practices - I can solicit advice, knowledge and specific skills succinctly from experts: Rate how well the following statements describe you

1= Not well at all, 2= slightly well, 3= moderately well, 4= very well, 5= extremely well

FU. Post.team building practices - I could solicit advice, knowledge and specific skills succinctly from experts, before taking this course: For comparison, please rate how well the following statements describe you, both now and before you took this course.

1= Not well at all, 2= slightly well, 3= moderately well, 4= very well, 5= extremely well

FV. Post.team building practices - I can solicit advice, knowledge and specific skills succinctly from experts, now: For comparison, please rate how well the following statements describe you, both now and before you took this course.

1= Not well at all, 2= slightly well, 3= moderately well, 4= very well, 5= extremely well

FW. Pre.collaborative writing: In your own words, describe your experience with team-based or collaborative writing projects.

FX. Post.collaborative writing: In your own words, describe your experience with team-based or collaborative writing projects.

FY. Pre.In your own words, describe your experience revising or rewriting documents that were written by someone else: In your own words, describe your experience revising or rewriting documents that were written by someone else.

FZ. Post.In your own words, describe your experience revising or rewriting documents that were written by someone else: In your own words, describe your experience revising or rewriting documents that were written by someone else.

GA. Pre.knowledge management Likert - I communicate clearly with team members and stakeholders: Below is a list of effective knowledge management practices. Select the frequency with which you use each.

1=never, 2=sometimes, 3=about half the time, 4=most of the time, 5=always

GB. Post.knowledge management Likert - At the beginning of the semester, I communicated clearly with team members and stakeholders: Below is a list of effective knowledge management practices. Select the frequency with which you used each at the beginning of the semester.

1=never, 2=sometimes, 3=about half the time, 4=most of the time, 5=always

GC. Post.knowledge management Likert - Now I communicate clearly with team members and stakeholders: Below is a list of effective knowledge management practices. Select the frequency with which you use each now.

1=never, 2=sometimes, 3=about half the time, 4=most of the time, 5=always

GD. Pre.knowledge management Likert - I restate technical and "maker" jargon in lay language: Below is a list of effective knowledge management practices. Select the frequency with which you use each.

1=never, 2=sometimes, 3=about half the time, 4=most of the time, 5=always

GE. Post.knowledge management Likert - At the beginning of the semester, I restated technical and "maker" jargon in lay language: Below is a list of effective knowledge management practices. Select the frequency with which you used each at the beginning of the semester.

1=never, 2=sometimes, 3=about half the time, 4=most of the time, 5=always

GF. Post.knowledge management Likert - Now I restate technical and "maker" jargon in lay language: Below is a list of effective knowledge management practices. Select the frequency with which you use each now.

1=never, 2=sometimes, 3=about half the time, 4=most of the time, 5=always

GG. Pre.knowledge management Likert - I document my work clearly, concisely and in a timely manner: Below is a list of effective knowledge management practices. Select the frequency with which you use each.

1=never, 2=sometimes, 3=about half the time, 4=most of the time, 5=always

GH. Post.knowledge management Likert - At the beginning of the semester, I documented my work clearly, concisely and in a timely manner: Below is a list of effective knowledge management practices. Select the frequency with which you used each at the beginning of the semester.

1=never, 2=sometimes, 3=about half the time, 4=most of the time, 5=always

GI. Post.knowledge management Likert - Now I document my work clearly, concisely and in a timely manner: Below is a list of effective knowledge management practices. Select the frequency with which you use each now.

1=never, 2=sometimes, 3=about half the time, 4=most of the time, 5=always

GJ. Pre.knowledge management Likert - I use version control to manage project outputs and documentation: Below is a list of effective knowledge management practices. Select the frequency with which you use each.

1=never, 2=sometimes, 3=about half the time, 4=most of the time, 5=always

GK. Post.knowledge management Likert - At the beginning of the semester, I used version control to manage project outputs and documentation: Below is a list of effective knowledge management practices. Select the frequency with which you used each at the beginning of the semester.

1=never, 2=sometimes, 3=about half the time, 4=most of the time, 5=always

GL. Post.knowledge management Likert - Now I use version control to manage project outputs and documentation: Below is a list of effective knowledge management practices. Select the frequency with which you use each now.

1=never, 2=sometimes, 3=about half the time, 4=most of the time, 5=always

GM. Pre.knowledge management Likert - I preserve project outputs and documentation for long-term access: Below is a list of effective knowledge management practices. Select the frequency with which you use each.

1=never, 2=sometimes, 3=about half the time, 4=most of the time, 5=always

GN. Post.knowledge management Likert - At the beginning of the semester, I preserved project outputs and documentation for long-term access: Below is a list of effective knowledge management practices. Select the frequency with which you used each at the beginning of the semester.

1=never, 2=sometimes, 3=about half the time, 4=most of the time, 5=always

GO. Post.knowledge management Likert - Now I preserve project outputs and documentation for long-term access: Below is a list of effective knowledge management practices. Select the frequency with which you use each now.

1=never, 2=sometimes, 3=about half the time, 4=most of the time, 5=always

GP. Pre.knowledge management Likert - I recognize the applicability of different Creative Commons, Free/Libre, and/or Open Source licenses: Below is a list of effective knowledge management practices. Select the frequency with which you use each.

1=never, 2=sometimes, 3=about half the time, 4=most of the time, 5=always

GQ. Post.knowledge management Likert - Now I recognize the applicability of different Creative Commons, Free/Libre, and/or Open Source licenses: Below is a list of effective

knowledge management practices. Select the frequency with which you will use each now, and the frequency with which you used each at the beginning of the semester.

1=never, 2=sometimes, 3=about half the time, 4=most of the time, 5=always

GR. Post.knowledge management Likert - At the beginning of the semester, I recognized the applicability of different Creative Commons, Free/Libre, and/or Open Source licenses: Below is a list of effective knowledge management practices. Select the frequency with which you will use each now, and the frequency with which you used each at the beginning of the semester.

1=never, 2=sometimes, 3=about half the time, 4=most of the time, 5=always

GS. Pre.knowledge management Likert - I select appropriate licenses for new projects: Below is a list of effective knowledge management practices. Select the frequency with which you use each.

1=never, 2=sometimes, 3=about half the time, 4=most of the time, 5=always

GT. Post.knowledge management Likert - Now I select appropriate licenses for new projects: Below is a list of effective knowledge management practices. Select the frequency with which you will use each now, and the frequency with which you used each at the beginning of the semester.

1=never, 2=sometimes, 3=about half the time, 4=most of the time, 5=always

GU. Post.knowledge management Likert - At the beginning of the semester, I selected appropriate licenses for new projects: Below is a list of effective knowledge management practices. Select the frequency with which you will use each now, and the frequency with which you used each at the beginning of the semester.

1=never, 2=sometimes, 3=about half the time, 4=most of the time, 5=always

GV. Pre.knowledge management Likert - I select Creative Commons or Free and Open-Source Software licenses for longitudinal or cross-organizational projects: Below is a list of effective knowledge management practices. Select the frequency with which you use each.

1=never, 2=sometimes, 3=about half the time, 4=most of the time, 5=always

GW. Post.knowledge management Likert - Now I select Creative Commons or Free and Open-Source Software licenses for longitudinal or cross-organizational projects: Below is a list of effective knowledge management practices. Select the frequency with which you will use each now, and the frequency with which you used each at the beginning of the semester.

1=never, 2=sometimes, 3=about half the time, 4=most of the time, 5=always

GX. Post.knowledge management Likert - At the beginning of the semester, I selected Creative Commons or Free and Open-Source Software licenses for longitudinal or cross-organizational projects: Below is a list of effective knowledge management practices. Select the frequency

with which you will use each now, and the frequency with which you used each at the beginning of the semester.

1=never, 2=sometimes, 3=about half the time, 4=most of the time, 5=always

GY. Pre.knowledge management Likert - I use the Internet to find information to help me solve problems that I face on my projects: Below is a list of effective knowledge management practices. Select the frequency with which you use each.

1=never, 2=sometimes, 3=about half the time, 4=most of the time, 5=always

GZ. Post.knowledge management Likert - Now I use the Internet to find information to help me solve problems that I face on my projects: Below is a list of effective knowledge management practices. Select the frequency with which you will use each now, and the frequency with which you used each at the beginning of the semester.

1=never, 2=sometimes, 3=about half the time, 4=most of the time, 5=always

HA. Post.knowledge management Likert - At the beginning of the semester, I used the Internet to find information to help me solve problems that I faced on my projects: Below is a list of effective knowledge management practices. Select the frequency with which you will use each now, and the frequency with which you used each at the beginning of the semester.

1=never, 2=sometimes, 3=about half the time, 4=most of the time, 5=always

HB. Pre.tool availability Likert - Selecting the best tools for the job: Please rate your level of experience in the following activities:

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

HC. Post.tool availability Likert - Selecting the best tools for the job, before taking this course: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

HD. Post.tool availability Likert - Selecting the best tools for the job, now: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

HE. Pre.tool availability Likert - Acquiring the necessary tools or revising project to conform to tool availability: Please rate your level of experience in the following activities.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

HF. Post.tool availability Likert - Acquiring the necessary tools or revising project to conform to tool availability, before taking this course: Please rate your level of experience in the following

activities. For comparison, we would also like you to recall your level of experience from before taking this course.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

HG. Post.tool availability Likert - Acquiring the necessary tools or revising project to conform to tool availability, now: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

HH. Pre.tool availability Likert - Seeking alternate tools when a required tool is not available: Please rate your level of experience in the following activities.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

HI. Post.tool availability Likert - Seeking alternate tools when a required tool is not available, before taking this course: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

HJ. Post.tool availability Likert - Seeking alternate tools when a required tool is not available, now: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

HK. Pre.tool availability Likert - Creating necessary tools that can't be acquired or when an alternate is not an option: Please rate your level of experience in the following activities.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

HL. Post.tool availability Likert - Creating necessary tools that can't be acquired or when an alternate is not an option, before taking this course: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

HM. Post.tool availability Likert - Creating necessary tools that can't be acquired or when an alternate is not an option, now: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

HN. Pre.How much experience do you have with 3D modeling and digital fabrication techniques?

1= none at all, 2= A little, 3= A moderate amount, 4= A lot, 5= A great deal

HO. Pre.How knowledgeable are you about the digital fabrication process?

1= Not knowledgeable at all, 2= slightly knowledgeable, 3= moderately knowledgeable, 4= Very knowledgeable, 5= extremely knowledgeable

HP. Post.Digital Fabrication Knowledge End: After having taken this course, how knowledgeable are you about the digital fabrication process?

1= Not knowledgeable at all, 2= slightly knowledgeable, 3= moderately knowledgeable, 4= Very knowledgeable, 5= Extremely knowledgeable

HQ. Post.Digital Fabrication Knowledge Beginning: Thinking back to the beginning of the semester, how knowledgeable were you about the digital fabrication process then?

1= Not knowledgeable at all, 2= Slightly knowledgeable, 3= Moderately knowledgeable, 4= Very knowledgeable, 5= Extremely knowledgeable

HR. Pre.Additive v Subtractive Fabrication: In your own words, explain the difference between additive and subtractive fabrication techniques.

HS. Post.Additive v Subtractive Fabrication: In your own words, explain the difference between additive and subtractive fabrication techniques.

HT. Pre.3D Modeling Software: List the graphic design and 3D modeling software that you have used. If you have never used graphic design or 3D modeling software, type "none".

HU. Post.3D Modeling Software: List the graphic design and 3D modeling software that you have used.

HV. Pre.3D Modeling Principles: In your own words, describe the 3D modeling principles that you might consider during the digital design and fabrication process?

HW. Post.3D Modeling Principles: In your own words, describe the 3D modeling principles that you might consider during the digital design and fabrication process?

HX. Pre.ethical, legal, and socio-economic general: How knowledgeable are you about intellectual property rights and protections as they relate to making?

1= I am unfamiliar with this, 2= I have heard about this before, 3= I am familiar with this, 4= I have a good understanding of this, 5= I am an expert about this

HY. Post.ethical, legal, and socio-economic general, before: Before taking this course, how knowledgeable were you about intellectual property rights and protections as they relate to making?

1= Not knowledgeable at all, 2= Slightly knowledgeable, 3= Moderately knowledgeable, 4= Very knowledgeable, 5= Extremely knowledgeable

HZ. Post.ethical, legal, and socio-economic general, now: After having taken this course, how knowledgeable are you about intellectual property rights and protections as they relate to making?

1= Not knowledgeable at all, 2= Slightly knowledgeable, 3= Moderately knowledgeable, 4= Very knowledgeable, 5= Extremely knowledgeable

IA. Pre.ethical, legal and socio-economic issues Likert - Identifying project outputs that may be protectable by trade secret, patent, trademark or copyright: Please rate your level of experience in the following activities.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

IB. Post.ethical, legal and socio-economic issues Likert - Identifying project outputs that may be protectable by trade secret, patent, trademark or copyright, before taking this course: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

IC. Post.ethical, legal and socio-economic issues Likert - Identifying project outputs that may be protectable by trade secret, patent, trademark or copyright, now: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

ID. Pre.ethical, legal and socio-economic issues Likert - Comparing the costs & benefits of seeking intellectual property protections v. making project outputs open and freely available to others: Please rate your level of experience in the following activities.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

IE. Post.ethical, legal and socio-economic issues Likert - Comparing the costs & benefits of seeking intellectual property protections v. making project outputs open and freely available to others, before taking this course: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

IF. Post.ethical, legal and socio-economic issues Likert - Comparing the costs & benefits of seeking intellectual property protections v. making project outputs open and freely available to others, now: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

IG. Pre.ethical, legal and socio-economic issues Likert - Evaluating the costs & benefits of open source and proprietary systems: Please rate your level of experience in the following activities.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

IH. Post.ethical, legal and socio-economic issues Likert - Evaluating the costs & benefits of open source and proprietary systems, before taking this course: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

II. Post.ethical, legal and socio-economic issues Likert - Evaluating the costs & benefits of open source and proprietary systems, now: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

IJ. Pre.ethical, legal and socio-economic issues Likert - Recognizing and respecting the intellectual property rights of other makers: Please rate your level of experience in the following activities.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

IK. Post.ethical, legal and socio-economic issues Likert - Recognizing and respecting the intellectual property rights of other makers, before taking this course: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

IL. Post.ethical, legal and socio-economic issues Likert - Recognizing and respecting the intellectual property rights of other makers, now: Please rate your level of experience in the following activities. For comparison, we would also like you to recall your level of experience from before taking this course.

1= Beginner, 2= Novice, 3= Competent, 4= Advanced, 5= Expert

IM. Pre.ethical, legal, and socio-economic essay: In your own words, please explain the significance, or lack thereof, of ethical, legal, and socio-economic factors to making.

IN. Post.ethical, legal, and socio-economic essay: In your own words, please explain the significance, or lack thereof, of ethical, legal, and socio-economic factors to making.

IO. Pre.Comfort in Teaching: How comfortable are you teaching what you know to less experienced makers?

1=extremely uncomfortable, 2=somewhat uncomfortable, 3=Neither Comfortable nor uncomfortable, 4=somewhat comfortable, 5= extremely comfortable

IP. Post.Thinking back to the beginning of this course, how comfortable were you teaching what you knew to less experienced makers at that time?

1=extremely uncomfortable, 2=somewhat uncomfortable, 3=Neither Comfortable nor uncomfortable, 4=somewhat comfortable, 5= extremely comfortable

IQ. Post.After having taken this course, how comfortable are you teaching what you know to less experienced makers?

1=extremely uncomfortable, 2=somewhat uncomfortable, 3=Neither Comfortable nor uncomfortable, 4=somewhat comfortable, 5= extremely comfortable

IR. Pre.Transfer to real world situations: How comfortable are you applying technologies to solve real world problems?

1=extremely uncomfortable, 2=somewhat uncomfortable, 3=Neither Comfortable nor uncomfortable, 4=somewhat comfortable, 5= extremely comfortable

IS. Post.Transfer to real world situations, before: Thinking back to the beginning of this course, how comfortable were you then about applying technologies to solve real world problems?

1=extremely uncomfortable, 2=somewhat uncomfortable, 3=Neither Comfortable nor uncomfortable, 4=somewhat comfortable, 5= extremely comfortable

IT. Post.Transfer to real world situations, now: Having taken this course, how comfortable are you applying technologies to solve real world problems?

1=extremely uncomfortable, 2=somewhat uncomfortable, 3=Neither Comfortable nor uncomfortable, 4=somewhat comfortable, 5= extremely comfortable

IU. Pre.Transfer to real world situations essay: Please describe how you think maker technologies and projects can be used to solve social science and public policy problems?

IV. Post.Transfer to real world situations essay: Please describe how you think maker technologies and projects can be used to solve social science and public policy problems?

IW. Post.Seek Help from Staff? Did you seek guidance from makerspace employees for your course project? Yes or No are valid answers

IX. Post.How helpful was the guidance of guidance of makerspace staff?

1= Not helpful, 2= A little helpful, 3= Somewhat helpful, 4= Very helpful