2013-2014 Assessment Report
Department/Unit: Integrated Design and Construction, MIDC

College of Architecture, Design & Construction

School of Architecture, Planning & Landscape Arch.

Integrated Design and Construction, MIDC

Ability to Collaborate Effectively

Students completing the Masters of Integrated Design and Construction Program will be able to collaborate and participate on teams consisting of members with varying backgrounds and objectives. When discussing collaboration it is certainly about learning how to work together, and the studio environment gives students constant practice in how to do that on a day to day basis. Collaboration is also about Leadership Strategies, Business Organization, Understanding Contracts and Role definition, Conflict Resolution, Scheduling and Fee Structures, as well as Identifying shared goals among diverse parties.

Assessment Method 1: Review of Final Project in INDC 6620

Assessment Method Description
INDC 6620 is offered once a year in the spring semester, and is the second required studio taken by the MIDC students. In the reporting period of 2013-2014, 13 students were enrolled in this course. Data for this group was collected by the faculty member responsible for teaching this course.

The assessment of the students was completed on a rubric/form that was broken into 4 categories that asked for evaluation on a 1-4 scale with 1 equal to low performance and 4 equal to high performance. 4 of the assessment measures (within the categories) relate directly to student performance in the area effective collaboration.

1.1 Student displays evidence in their final project of an ability to work in a group or team project. The work builds off of distinct disciplinary knowledge and combines that knowledge into a coherent solution

1.2 Student is able to explain in their presentation how to collaboratively approach a building project.

1.3 Student is able to explain in their presentation insight into their own discipline’s perspective on collaboration.

1.4 Was there evidence in the project presentation that student teams were able to resolve conflict, identify strengths and weaknesses and maximize effective collaboration?
Findings
1.1 Student displays evidence in their final project of an ability to work in a group or team project. The work builds off of distinct disciplinary knowledge and combines that knowledge into a coherent solution. 46% (6/13) students exhibited work that demonstrated an excellent ability to work together. 54% (7/13) students exhibited work that demonstrated good ability to work together.

1.2 Student is able to explain in their presentation how to collaboratively approach a building project. 54% (7/13) demonstrated an excellent understanding of a collaborative approach to a building project. 46% (6/13) demonstrated a good understanding of a collaborative approach.

1.3 Student is able to explain in their presentation insight into their own discipline’s perspective on collaboration. 46% (6/13) were able to discuss their own disciplines perspective on collaboration with excellent ability. 46% (6/13) were able to discuss their own disciplines perspective on collaboration with good ability. 7% (1/13) exhibited poor ability.

1.4 Was there evidence in the project presentation that student teams were able to resolve conflict, identify strengths and weaknesses and maximize effective collaboration? 46% (6/13) were able to work together in teams with excellent ability. 46% (6/13) were able to work together in teams with good ability. 7% (1/13) exhibited poor ability.

How did you use findings for improvement?
INDC 7550 Collaboration Seminar will add material focused on conflict resolution within teams to strengthen students’ ability to manage this aspect of their team-based assignments.

Like last year, students exhibited strength in their ability to work together, to divide up tasks during a team-based design project, and to divide responsibilities when presenting directly to community partners and stakeholders. They were also able to synthesize and prioritize the concerns of local project stakeholders, which demonstrates an ability to analyze and assess a situation.

Collaboration is never without some degree of conflict. A single student provided the entire class with significant concern because of lack of focused involvement. Comments in the exit surveys reflect on this poor ability exhibited by one classmate in particular.

Additional Comments
The rubric utilized during this reporting cycle has been modified substantially from the previous version. The assessment reported here has been collected from a small group of involved faculty. Data collection during next year’s reporting cycle (which is being collected now) will include external reviewers and industry professionals.

There are other classes in which the student’s ability to effectively collaborate could also be assessed. The INDC faculty is developing an additional rubric through which the theory of collaboration (Leadership Strategies, Business Organization, Understanding Contracts and Role definition, Conflict Resolution, Scheduling and Fee Structures, Identifying shared goals among diverse parties) can be assessed in the student work that is not associated with the studio class but through INDC 7650- Executive Issues which currently being taught.
Assessment Method 2: Student Exit Survey

Assessment Method Description
In the final semester of the INDC program, students are asked to complete an anonymous survey in which they can offer personal perspectives and recommendations for the program. There are 16 questions in the survey, plus 4 open ended written response opportunities. During the 2013-2014 report period, 11 students out of the 13 enrolled students competed the survey. The following 5 question results were selected as they specifically addressed the student’s perception of their own ability to effectively collaborate. The answers were scaled 1-5 with 1 equal to strongly disagree and 5 equal to strongly agree.

1.1 Since starting the Program, have you developed useful insight into your industry counterparts’ perspective on collaboratively approaching a building project?

1.2 Since starting the Program, have you further developed significant insight into your own discipline’s perspective on collaboration between design and construction?

3.4 Do you think that all sustainable or otherwise “high performance” building projects can benefit from some type of collaborative delivery by which the builder is involved early in the design process?

4.1 Has the team format of the MIDC program helped develop your perspective of integrated delivery?

4.2 As a part of the Program, did you enhance your ‘soft skills’ that might be used to work in a collaborative environment (communication and presentation)?

Findings
1.1 Since starting the Program, have you developed useful insight into your industry counterparts’ perspective on collaboratively approaching a building project? Of the 10 respondents, the mean was 4.8 with a standard deviation of .42.

1.2 Since starting the Program, have you further developed significant insight into your own discipline’s perspective on collaboration between design and construction? Of the 10 respondents, the mean response was a 4.6 with a standard deviation of .52

3.4 Do you think that all sustainable or otherwise “high performance” building projects can benefit from some type of collaborative delivery by which the builder is involved early in the design process? Of the 11 respondents, the mean response was 4.73 with a standard deviation of .47.

4.1 Has the team format of the MIDC program helped develop your perspective of integrated delivery? Of the 11 respondents, the mean response was 4.00 with a standard deviation of 1.10.
4.2 As a part of the Program, did you enhance your ‘soft skills’ that might be used to work in a collaborative environment (communication and presentation)? Of the 11 respondents, the mean response was a 4.09 with a standard deviation of 1.22.

How did you use findings for improvement?
Findings for 2013-2014 were strikingly similar to the previous year report. Students from this reporting period felt very strongly in their ability to effectively collaborate. They felt they understood the perspective of team members who did not share the same educational background. They also felt strongly in the development of their collaborative soft skills. Interestingly a few students felt that the collaborative nature of the studio and the proximity of to their design or construction counterparts was actually detrimental or counterproductive. There were additional written comments concerning specific underperforming students.

Recruitment is still an important issue for this program. During this reporting cycle, a group of highly qualified students were brought into the program. But having such a small group of master’s students inevitably causes some friction as the teams work together over time and become overly familiar with each other.

Additional Comments
Course content and assignments from other classes can be used to assess this area of student performance. INDC 7550 and INDC 6640 have assignments that discuss many aspects of successful collaboration. Rubrics aligned to these other classes will be developed.

Effective Visual and Oral Communication
Students completing the Masters of Integrated Design and Construction Program should be able to effectively present a project with visual aids (drawings, models and animations). Students, regardless of discipline, should be able to generate drawings, diagrams and charts that communicate their design and construction ideas. It is important for students to exhibit the ability to communicate complex ideas and proposals easily and effectively, as clarity in the presentation often reflects a clarity of thought and a strong design process.

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The assessment of the students was completed on a rubric/ form that was broken into 4 categories that asked for evaluation on a 1-4 scale with 1 equal to low performance and 4 equal to high performance. 6 of the assessment measures (within the communication category) relate directly to student performance in the area effective Visual and Oral Communication.
3.2 As a group, each team is able to transition between the various sections of the presentation without hesitation or confusion.

3.3 Each team is able to naturally respond to questions without conflict nor a dismissive attitude toward the critic.

3.4 Each team was able to maintain a professional demeanor throughout the presentation as well as into the question and answer period.

3.5 Each team had a professional quality digital presentation.

3.6 Each team had a presentation of a high graphic quality (clear graphics, organized with a sense of composition).

3.7 Each team was able to incorporate technical drawings of a high quality into their presentation.

Findings

3.2 As a group, each team is able to transition between the various sections of the presentation without hesitation or confusion. 100% of the students (13/13) exhibited excellent ability in this area.

3.3 Each team is able to naturally respond to questions without conflict nor a dismissive attitude toward the critic. 54% of the students (7/13) exhibited excellent ability, while 46% (6/13) exhibited good ability in this area.

3.4 Each team was able to maintain a professional demeanor throughout the presentation as well as into the question and answer period. 100% of the students (13/13) exhibited excellent ability in this area.

3.5 Each team had a professional quality digital presentation. 54% of the students (7/13) exhibited excellent ability, while 46% (6/13) exhibited good ability in this area.

3.6 Each team had a presentation of a high graphic quality (clear graphics, organized with a sense of composition). 54% of the students (7/13) exhibited excellent ability, while 46% (6/13) exhibited good ability in this area.

3.7 Each team was able to incorporate technical drawings of a high quality into their presentation. 100% of the students (13/13) exhibited excellent ability in this area.

How did you use findings for improvement?
Students exhibited strength in their ability to work together to develop compelling visual aids for a project that was developed to a comprehensive level. This would include architectural drawings, scheduling charts, and spreadsheets for estimates and phasing proposals.
Presentations are happening all the time in the other classes associated with this program. Additional rubrics for classes such as INDC 7550 and INDC 7650 need to be developed and utilized based on the model of this report.

**Additional Comments**
The assessment device is brand new this year and is trying to directly assess student performance in Effective Visual and Verbal Communication. It appears to be useful, and needs to be utilized by more individuals than just the faculty teaching the course, but also other school faculty and external reviewers.

Communication skills require practice and instruction. The assessed class submitted the student work to a national competition (the EPA’s et Zero Challenge Energy Home Competition). One of the student groups received an award for the “Best Presentation” which included a face-to-face presentation in front of the jury. These students spent two weeks practicing and refining their presentation.

**Assessment Method 2: Student Exit Survey**

**Assessment Method Description**
In the final semester of the INDC program, students are asked to complete an anonymous survey in which they can offer personal perspectives and recommendations for the program. There are 16 questions in the survey, plus 4 open ended written response opportunities. During the 2013-2014 report period, 11 students out of the 13 enrolled students competed the survey. The following 3 question results were selected as they specifically addressed the student’s perception of their own ability to effectively present their ideas to an audience. The answers were scaled 1-5 with 1 equal to strongly disagree and 5 equal to strongly agree.

1.3 Since starting the Program, have you enhanced your problem solving and decision making skills associated with the design and construction process?

1.4 As a result of the courses in the INDC curriculum, have you enhanced your ability to think critically about issues associated with integrated design and construction?

4.3 Has the utilization of real clients in the program’s projects and assignments been a positive characteristic?

**Findings**

1.3 Since starting the Program, have you enhanced your problem solving and decision making skills associated with the design and construction process? Of the 10 respondents, the mean response was 4.60, with a standard deviation of .52.

1.4 As a result of the courses in the INDC curriculum, have you enhanced your ability to think critically about issues associated with integrated design and construction? Of the 10 respondents, the mean response was 4.40 with a standard deviation of .70.
4.3 Has the utilization of real clients in the program’s projects and assignments been a positive characteristic? Of the 11 responses, the mean response was a 4.45 with a standard deviation of .69.

How did you use findings for improvement?
Students from this reporting period felt very strongly in their ability to solve open ended problems and then communicate to an audience the complexity of their proposed solution. They feel equally strong about their ability to think critically. This area of assessment concentrates on the student’s ability to then communicate this critical reasoning to many different audiences (professors, invited professionals, community stakeholders). This form of communication can be oral or through drawings, charts and spread sheets. Survey questions are too broad currently and need to be brought into closer alignment with the learning objective.

Additional Comments
Having used this survey for a significant time period, it is necessary to refine the scope of the survey to include more objectives and to align the prompts with the areas of assessment. Revisions to the rubric which were discussed in the previous assessment method need to be correlated more directly the student survey.

Course content and assignments from other classes can be used to assess this area of student performance. INDC 7550 and INDC 6640 have assignments that discuss many aspects of successful communication. Rubrics aligned to these other classes will be developed and utilized as suggested in the previous section.

Ability to Utilize and Integrate Technology
Students completing the Masters of Integrated Design and Construction Program will be able to utilize and integrate technology into the workflow of their project team. Students will be able to conceptually understand when certain tools may be appropriate for certain tasks, or when a new tool needs to be invented to bridge the gap between existing digital tools. The Design and Construction industries are experiencing rapid change brought on by new digital tools. Students will be exposed to these tools, will be given opportunities to experiment with them, but will also understanding their limitations and effectiveness. Building Information Modeling, Energy Performance Modeling, Cloud computing, 3d Printing and Presentation Software should be essential skills of every MIDC student.

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The assessment of the students was completed on a rubric/form that was broken into 4 categories that asked for evaluation on a 1-4 scale with 1 equal to low performance and 4 equal to high performance. 3 of the assessment measures (within the categories) relate directly to student performance in the area of technological workflow integration.

4.1 Student displays evidence in their final project of an ability to work with Building Information Modeling and related technologies in a collaborative design and construction scenario.

4.2 Student is able to demonstrate in their presentation how BIM positively or negatively affected the workflow of their team collaboration.

4.3 Student is able to demonstrate in their project the ability to utilize a variety of other digital modeling and estimating tools.

Findings

4.1 Student displays evidence in their final project of an ability to work with Building Information Modeling and related technologies in a collaborative design and construction scenario. 54% of the students (7/13) exhibited excellent ability, while 46% (6/13) exhibited good ability in this area.

4.2 Student is able to demonstrate in their presentation how BIM positively or negatively affected the workflow of their team collaboration. 54% of the students (7/13) exhibited excellent ability, while 46% (6/13) exhibited good ability in this area.

4.3 Student is able to demonstrate in their project the ability to utilize a variety of other digital modeling and estimating tools. 54% of the students (7/13) exhibited excellent ability, while 46% (6/13) exhibited good ability in this area.

How did you use findings for improvement?
In general students have been curious in their approach to new software and digital tools. These tools are often the device through which collaboration and teamwork are executed during the development of studio projects it is essential that every student have some facility with the basic programs like Revit or AutoCAD. As a school, we do not want to become a computer training program, but it is important to find better ways to increase our specific instruction in these types of tools.

Additional rubrics for classes such as INDC 7550 and INDC 7650 need to be developed as this student ability can be assessed in other settings other than just studio.

Additional Comments
This new assessment method will be utilized by not just the faculty member teaching the class, but also other program faculty and external reviewers.

There are other classes in which the student’s ability to integrate technology in to a team workflow strategy could also be assessed. The INDC faculty is developing an additional rubric through which these skills can be assessed in the student work that is not associated with the studio class.
Assessment Method 2: Student Exit Survey

Assessment Method Description
In the final semester of the INDC program, students are asked to complete an anonymous survey in which they can offer personal perspectives and recommendations for the program. There are 16 questions in the survey, plus 4 open ended written response opportunities. During the 2013-2014 report period, 11 students out of the 13 enrolled students competed the survey. The survey is administered through AU Access and Qualtrics. The following 3 question results were selected as they specifically addressed the student’s perception of their own ability to effectively collaborate. The answers were scaled 1-5 with 1 equal to strongly disagree and 5 equal to strongly agree.

2.1 As part of the coursework and assignments within the INDC program, have you developed a better understanding of the application of Building Information Modeling and related technologies in collaborative design and construction?

2.2 Since starting the program, have your skills in related technology and software improved measurably?

2.3 Do you think that the MIDC Program’s use of Building Information Modeling and related technologies in the curriculum is at an appropriate level?

Findings
2.1 As part of the coursework and assignments within the MIDC program, have you developed a better understanding of the application of Building Information Modeling and related technologies in collaborative design and construction? Of the 11 respondents, the mean response was 4.09 with a standard deviation of 1.14.

2.2 Since starting the program, have your skills in related technology and software improved measurably? Of the 11 respondents, the mean response was 3.91 with a standard deviation of 1.14.

2.3 Do you think that the MIDC Program’s use of Building Information Modeling and related technologies in the curriculum is at an appropriate level? Of the 11 respondents, the mean response was 3.18 with a standard deviation of 1.33.

How did you use findings for improvement?
Students from this reporting period felt very strongly that they had not developed a better understanding of Building Information Modeling, nor that this technology being taught in the curriculum at an appropriate level. More directed training in these areas has been offered to the current group of students through the Executive Issues INDC 7650 course. Additional instruction is still required.

Additional Comments
These responses were some of the most significant to this program as there is a small disconnect between the faculty perception of skills and the students perception of their instruction in this area.