Continuous Improvement Report

for the Construction Management Degree Program
Academic Year 2019-2020

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2. Scope

The Continuous Improvement Report is the implementation plan evaluation of the comprehensive assessment at the degree program level. This report explains the results of the review of the degree program objectives and learning outcomes for the academic year 2019-2020.

The report intends to inform the different stakeholders on the annual and continuous improvement activities in the Construction Management Program and the action items for improvement. This report can be shared internally at the university level and externally with other stakeholders and the public.

3. Assessment Report

This report describes the assessment results gathered during the 2019-2020 school year from our surveys and data sets related to the Construction Management Program objectives and the twenty American Council for Construction Education (ACCE) Student Learning Outcomes (SLOs). As indicated in the 2018-2019 report, a new Assessment Implementation Guide was developed to help the department maintain consistency and outline each assessment's types and cycles. Table (1) included on the next page, with the completed implementation year or semester, is highlighted.

The types of assessments reviewed for this report are as follows:

1) Semester Assessments: SLO Direct Assessments, which includes class student work deliverables and their assessment scores, Seniors Exit Survey, in which all surveys are considered indirect assessment tools.
2) Annual Assessments: Employers Survey, Placement/Salary Survey
3) 3-Year Assessments: IAB Course Assessments Review

According to the new ACCE standards updates in 2016-2017, the department decided to change the cycles for collecting direct assessment data for our 20 ACCE SLOs. We have been collecting assessments for all SLOs annually, starting with the 2018-2019 school year. Our goal has been to assess 10 SLOs during the fall semester and the remaining 10 SLOs during the spring semesters.

The program goals and the learning outcomes assessment results are presented with their analyses and conclusions in the following sections. Additionally, the program implemented some action items and will implement others in the coming years.

CONSTRUCTION MANAGEMENT
MINNESOTA STATE UNIVERSITY, MANKATO

Table (1) ASSESSMENT IMPLEMENTATION GUIDE

2017 - 2021

		SEMESTER ASSESSMENTS			ANNUAL ASSESSMENTS				3-YR ASSESSMENTS	
		DIRECT ASSESSMENT - SLOs	INDIRECT ASSESSMENT – SLOs SENIORS EXIT SURVEY		REVIEW OF PROGRAM OBJECTIVES & LEARNING OUTCOMES	EMPLOYERS SURVEY (INTERN EVALUATIONS)	PLACEMENT/SALARY SURVEY (PROVIDED BY UNIVERSITY)		ALUMNI SURVEY (PREVIOUS 5-YEAR GRADS)	IAB COURSE ASSESSMENTS REVIEW
AY 2017	Fall 2016									
	Spring 2017									
AY 2018	Fall 2017									
	Spring 2018		X						X	
AY 2019	Fall 2018	X	X			X	X			
	Spring 2019	X	X		X	X				
AY 2020	Fall 2019	X	X		X	X	X			X
	Spring 2020	X	X			X				X
AY 2021	Fall 2020									
	Spring 2021									

"X" mark inside the yellow color indicates the completeness of the assessment.

4. Part 1: Assessment of Program Objectives

The Construction Management Department has six program objectives: Curriculum, Advising, Student Activity, Faculty Development, External Support, and Assessment and Planning. The first three objectives were evaluated during the 2018-2019 academic year, and the last three of them have been assessed during the 2019-2020 academic year. The results are explained below:

4.1. Faculty Development

"Provide opportunities that enhance professional growth, provide expertise to industry and government partners and promote active learning for faculty and students."

A. Performance Criteria:
   1) The number of professional training events, conferences, etc., will be assessed. The goal is to provide more than one opportunity annually for each faculty for professional training or development.
   2) Additional amounts up to $3000 will be utilized from the Department funding sources if available to each faculty request to offset the university's allocated professional development amounts.

B. Assessment Method;
   The number and the description of the events, total expenditure amount on training and professional development activities will be assessed and analyzed.

C. Assessment Results:
   1) Below is the list of conferences, training, etc. attended by each faculty since the last reaccreditation:

Faculty	AY 2016-2017	AY 2017-2018	AY 2018-2019	AY 2019-2020
Diab, Mohamed	- ASC Conf. (Seattle) presented a paper - ACCE Training/ Conf. (Seattle) - ACCE Conf. (Orlando) - ACCE Visiting Team (TX)	- ACCE Training/Conf. (Colorado Springs) - PCI Convention & National Bridge Conf. (Denver) - ASC Intl Conf (MN) - PMI Conf. (Germany) - PMI Leadership Institute Mtg (Los Angeles)	- Received PMP Certification - PMI Leadership Inst. Meeting of North America (Los Angeles) - ASC Conf. (Denver) - ACCE Conf. (Canada) - PCI Foundation Professors Seminar, presenter (Raleigh)	- CITC Global Construction Conf. (London) - ACCE Conf. (FL) - ACCE Annual Mtg (Philadelphia) - ASCE Conf. (Los Angeles) - ARM of MN workshop (MN) - PMI Global Conf. (Philadelphia) - Several accreditation visits through ACCE

Fee, Scott	n/a	Sabbatical	n/a	n/a
Kim, Seong-Jin	- ASC Conf., presented paper (Seattle)	- ASEE Conf. (Hartford) - ASC Conf. (MN)	- ASC Intl. Conf., presented paper (Denver)	- ABC Safety & Construction Conf. (MN)
Roue, Leah	Sabbatical	- MN Construction Summit (MN) - ASC Conf. (MN)	- AutoCAD University Conf. (Las Vegas)	- Southern MN Equity Summit (MN)
Wasserman, Brian	- ACCE Conf. (Orlando) - ACCE visiting team (Auburn) - Intl. Conf. on Human Settlements (Port Elizabeth, South Africa)	- ACCE Conf. (Tucson) - Constructed Environment Conference (Detroit) - Intl Week at Han University (Netherlands) - ACCE Conf (Colorado Springs) - Common Ground Conf.	n/a	- ACCE visiting team (TX) - World of Concrete Convention, as faculty chaperone for students (Las Vegas)

2) The university allocates professional development funding for every full-time faculty member each year. This amount has increased since the last reaccreditation:

Academic Year 2019-2020 - $1450/ea
Academic Year 2018-2019 - $1450/ea
Academic Year 2017-2018 - $1380/ea
Academic Year 2016-2017 - $1380/ea

3) The total amount spent through the department's main operating fund as well as the designated professional development fund is as follows:

<u>Academic Year 2019-2020</u>
Operating Account - $5422.69
Professional Development Account - $3942.03
Total = $9364.72

<u>Academic Year 2018-2019</u>
Operating Account - $2403.81
Professional Development Account - $6836.84
Total = $9240.65

<u>Academic Year 2017-2018</u>
Operating Account - $7723.04
Professional Development Account - $2973.38
Total = $10696.42

<u>Academic Year 2016-2017</u>
Operating Account - $636.42

Professional Development Account - $3185.32
Total = $3821.74

D. Actions Taken:

The program supported all faculty to enhance their professional development opportunities in addition to their consulting activities. The department explored additional professional development opportunities to enhance the project-based learning best practices. The program faculty members chose to participate in a summer workshop by WPI's Center for Project-Based Learning. The goal to advance project-based learning pedagogy and curriculum development.

4.2. External Support

"Maintain a stable and effective Advisory Board to provide industry perspective and financial support to faculty and to grant students scholarships and job opportunities."

A. Performance Criteria:
   1) We maintain a sustainable collaboration with the Industry Advisory Board (IAB) members each academic year through two meetings annually.
   2) The total number of awarded scholarships and the dollar amount of funding awarded will be assessed to increase scholarship total amounts by $5,000 annually. At least $20,000 will be secured for scholarships.
   3) More emphasis on enhancing the involvement of IAB members will be requested, including curriculum reviews and other professional and academic support that benefit the program and its students.

B. Assessment Method;

   We are hosting and promoting industry advisory board (IAB) meetings, collaborating with the IAB members in the different committees to provide the appropriate curriculum, program development, sponsorship, and financial support opportunities. All activities will be assessed and their impact on the program's success.

C. Assessment Results:
   1) IAB consists of approximately 28 industry members who have consistently been meeting twice a year with program faculty to discuss faculty and student

support, curriculum, and program development issues and activities. Meeting dates since the last reaccreditation were as indicated below:

- Academic Year 2019-2020 - October 11, 2019, and March 06, 2020
- Academic Year 2018-2019 - September 14, 208 and March 29, 2019
- Academic Year 2017-2018 - October 05, 2017, and April 06, 2018
- Academic Year 2016-2017 – November 04, 2016, and April 14, 2017

2) The total number/amount of awarded scholarships in the following years are;

- 33 awards for $61,000 in the academic year 2020-2021
- 22 awards for $37,300 in the academic year 2019-2020
- 21 awards for $35,500 in the academic year 2018-2019
- 11 awards for $16,000 in the academic year 2017-2018

3) IAB provided feedback for a number of our SLO Direct Assessments. This feedback is beneficial because it gives the faculty insight into whether the content and assessment tools given to students are sufficient and/or relevant to what the industry expects graduates to know.

4) Industry involvement in supporting our program includes the following:

- Providing construction site visits to students and faculty
- Mentoring students in early college learning period through the program mentors program
- Providing co-op for six months in addition to the summer internship opportunities to students
- More information on the program website:

  https://cset.mnsu.edu/academic-programs/construction-management/about-construction-management/collaborations/

D. Actions Taken:

An effort to increase the scholarship amounts started with the support of the university foundation. Due to the COVID 19 pandemic and students' financial burdens, the program decided to award double the last year to $61,000.

The program will reach out to our industry donors to increase scholarships for underrepresented student groups due to the diversity, inclusion, and equality initiative that started in spring 2020.

4.3. Assessment & Planning

"Implement planning and assessment methods that anticipate program needs to maximize available resources in support of our mission and goals."

A. Performance Criteria:
   1) Developing performance assessment implementation reports that align with the strategic program plan, university policies, and accreditation requirements will maintain the American Council for Construction Education (ACCE) accreditation.
   2) Executing the needed continuous improvement activities.

B. Assessment Methods:

   The program focuses on the renewal of ACCE accreditation and assesses any related report as needed with the follow-up action items

C. Assessment Results:
   1) After completing our reaccreditation visit in spring 2016, the department chair submitted three annual reports and was approved by ACCE for the new quality assessment activities.
   2) An updated assessment cycle starting fall 2018 was developed, including all Student Learning Outcomes assessments to be assessed annually, with continuous improvement evaluation reports. The executed activities improved our curriculum quality and sustainability. We were able to update different class contents and strengthen our students' advising.

D. **Action Taken:**
   1) A curriculum update and developed changes will be submitted to the college curriculum committee for approval in 2021. New courses were introduced, and the current courses were updated to adjust our degree requirements.

2) The reaccreditation visit is scheduled for fall 2021, and the program will prepare the required documents to be submitted on June 01, 2021.

5. Part 2: Assessment of Student Learning Outcomes

5.1. SLO Direct Assessments

Each SLO is assessed in one of our required program courses. We asked the instructors of these courses to provide a sample of the assessment tool used (tests, presentations, projects, etc.), what the targeted performance criteria were, what the class average was, as well as the instructor's reflection on the assessment and plan of action moving forward. Below in Table (2) is a list of the 20 ACCE Student Learning Outcomes we assessed:

Table (2) Direct Assessment of SLOs Data

Student Learning Outcome	Assessed in	Assessment Method	Semester Assessed	Target %	Actual %	Previous Year %
SLO #1 – Create written communications appropriate to the construction discipline.	CM 450	Professional Development Plan	Fall '19	70%	**94%**	97%
SLO #2 – Create oral presentations appropriate to the construction discipline.	CM 410	Presentation	Fall '19	70%	**81.9%**	79%
SLO #3 – Create a construction project safety plan.	CM 300	Term Project (Safety Plan)	Fall '19	70%	**77.6%**	64.7%
SLO #4 – Create construction project cost estimates.	CM 410	Assignment	Fall '19	70%	**79.4%**	80.3%
SLO #5 – Create construction project schedules.	CM 330	Term Project	Spring '20	70%	**92.5%**	93.4%
SLO #6 – Analyze professional decisions based on ethical principles	CM 340	AGC Case Study Report	Fall '19	70%	**90.5%**	86.4%
SLO #7 – Analyze construction documents for planning and management of construction processes.	CM 330	Term Project	Spring '20	70%	**92.5%**	80.7%
SLO #8 – Analyze methods, materials, and equipment used to construct projects.	CM 380	Test	Spring '20	70%	**86.7%**	69%
SLO #9 – Apply construction management skills as a member of a multidisciplinary team.	CM 497	Internship report	Spring '20	70%	**97%**	96%
SLO #10 – Apply electronic-based technology to manage the construction process.	CM 340/CM 120	Procore Assignments	Fall '19	70%	**75.8%**	93.1%

SLO #11 – Apply basic survey techniques for construction layout and control.	CM 271	Final Exam	Fall '19	70%	**86%**	83%
SLO #12 – Understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process.	CM 340	Exam #1 & Exam #2	Spring '20	70%	**90.8%**	71.4%
SLO #13 – Understand construction risk management.	BLAW 476	Exam	Fall '19	70%	**80%**	84.3%
SLO #14 – Understand construction accounting and cost control.	CM 410	Assignment & Test	Spring '20	70%	**96.4%**	76%
SLO #15 – Understand construction quality assurance and control.	CM 340	Exam #1 & Exam #2	Spring '20	70%	**90.8%**	71.4%
SLO #16 – Understand construction project control and processes.	CM 330	Assignment #5 & Assignment #6	Spring '20	70%	**94%**	77.8%
SLO #17 – Understand the legal implications of contract, common, and regulatory law to manage a construction project.	BLAW 476	Exam	Fall '19	70%	**80%**	80%
SLO #18 – Understand the basic principles of sustainable construction.	CM 350	Building Automation Paper	Spring '20	70%	**91%**	90%
SLO #19 – Understand the basic principles of structural behavior.	CM 222	Test #2	Spring '20	70%	**82%**	83%
SLO #20 – Understand the basic principles of mechanical, electrical, and piping systems.	CM 350	Plumbing Test, HVAC Test, & Electrical Test	Fall '19	70%	**86.7%**	88%

All assessments met or exceeded the targeted performance criteria. When compared to the previous year's data, all assessments either met or exceeded those numbers. No further action is required based on this data.

5.2. SLO Indirect Assessment: Seniors Exit Survey

Each semester we conduct our Seniors Exit Survey through our CM 450 class. In this survey, we ask how well students think they can perform each of our 20 ACCE Student Learning Outcomes after completing their education in our program. They can answer "Strongly Agree" (5), "Agree" (4), "Neither Agree nor Disagree" (3), "Disagree" (2), "Strongly Disagree" (1), or "N/A" (0). We considered the weighted average as the basis for overall student satisfaction. Having SLOs with a weighted average of 70% or higher was the satisfaction goal. For Academic Year 2020 (2019-2020), all Student Learning Outcomes had a weighted average of at least 70% or higher of surveyed students being satisfied.

6. Part 3: Other Assessment Data

6.1. Indirect Assessment: Internship Employer Survey (data collected annually)

We receive employer evaluations about our student's performance and knowledge during the internship with their company through our required student internship course.

Fifty-one employer evaluations were returned to the department out of the total 62 registered internships during Academic Year 2020. A review of these employer surveys submitted during AY 2020 yielded an average ranking of 4.4 out of 5 for the 12 areas surveyed: overall competency of the intern, the complexity of duties given, understanding of construction process, knowledge of administrative procedures, quality of work, productivity, communications, leadership, personal appearance, initiative, interaction, and problem-solving. See Table (3) below.

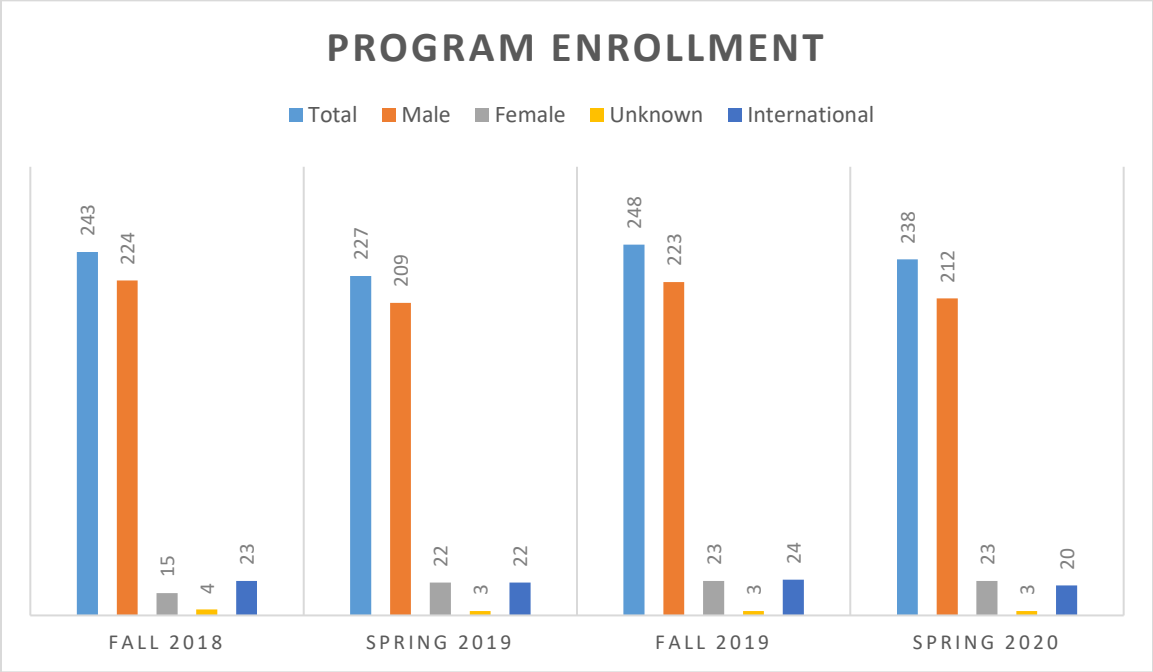
Table (3) ACADEMIC YEAR 2020
INTERN EMPLOYER EVALUATIONS

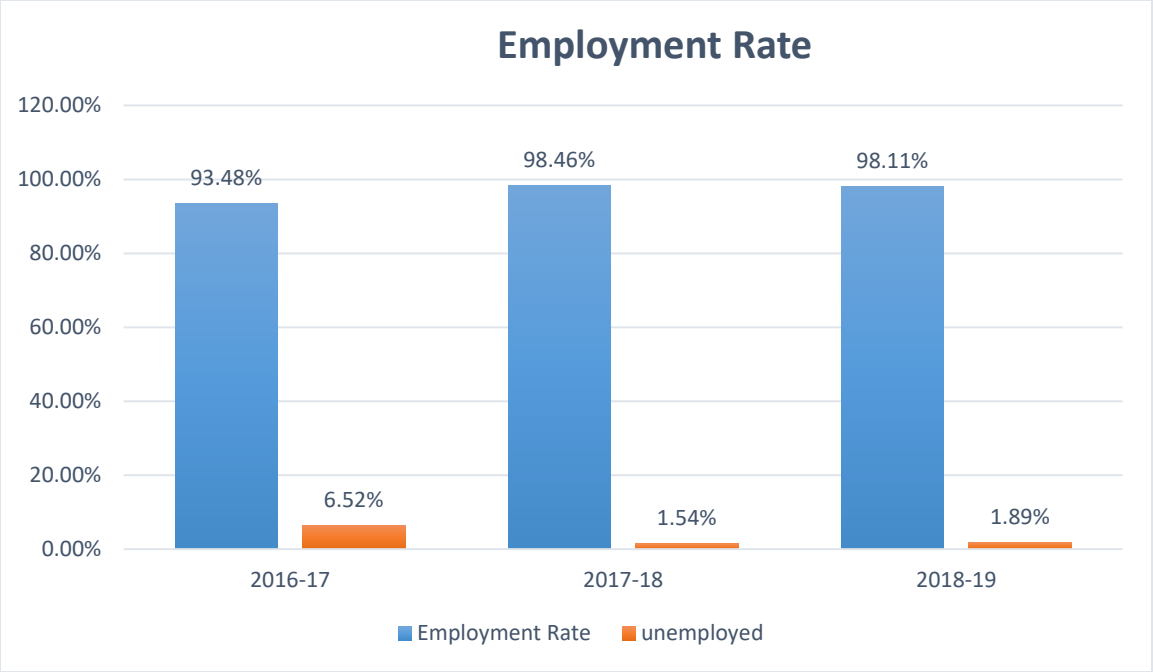
SKILL, KNOWLEDGE, OR TRAIT EVALUATED	TOTALITY OF RATINGS	# OF STUDENTS	AY 2020 AVERAGE RATING	AY 2019 AVERAGE RATING
Overall Competency of Intern	212.5	48	**4.4**	4.4
Complexity of Issues	201.5	48	**4.2**	4.2
Construction Process	226	51	**4.4**	4.3
Administration Procedures	228	51	**4.5**	4.4
Quality of Work	227.5	51	**4.5**	4.3
Productivity	223.5	51	**4.4**	4.3
Communications	218	51	**4.3**	4.7
Leadership	200.5	50	**4.0**	4.1
Personal Appearance	239	51	**4.7**	4.5
Initiative	226	51	**4.3**	4.3
Interaction	224	51	**4.4**	4.4
Problem Solving	214	50	**4.3**	4.4
The totality of Average Ratings			**52.7**	52.3
÷ Number of Categories			**12**	12
Total Average Rating			**4.39**	4.36

Note that the data from AY 2019 has been included as a basis for comparison. The results between AY 2019 and AY 2020 are close. Based on this feedback, it can be concluded that employers are overall delighted with the student interns from our program. No action is needed at this time.

6.2. Indirect Assessment: Placement-Salary Survey (data collected annually)

Minnesota State University Mankato's Instructional Research, Planning, and Assessment Office (IRPA) provides annual reports regarding retention, awards, demographics, student success, and post-graduation employment. During the 2019-2020 Academic Year, data was published through this Office for the previous Academic Year (2018-2019), which is what is shown below. Critical data relating to the success of our program and its students are as follows:





6.3. SLO Indirect Assessment: IAB Course Assessments Feedback

(conducted every three years)

For our 3-Year IAB Course Assessments Feedback, we shared eight direct assessments with our Advisory Board's Curriculum Committee members during AY 2020. This feedback's goal was to gauge whether the content being assessed and taught in our classes is relevant or sufficient for what the industry needs our students to know upon graduation. All feedback and comments received for each of the 8 SLO Assessments reviewed by each class instructor and class materials and activities implemented for continuous improvement.

Actions Taken (Student Learning Outcomes, direct and indirect assessment data):

Several faculty improved their class materials based on industry feedback. The COVID-19 Pandemic started in spring 2020, and all the program classes moved to online delivery. The transition impacted our program assessment activities, but we were able to maintain our students' learning experiences sustainability. The following are some of the actions taken this year:

1) The faculty continued their curriculum evaluation and developed an updated list of new courses with some changes in the existing course description and sequence. Due to the COVID-19 pandemic, the changes will be visited at the end of spring 2021 to be submitted to the curriculum college committee in fall 2021.
2) The eleven students who joined the study abroad program to Germany did not travel due to the travel restrictions and the program put on hold.
3) With the support of the advisory board, the program started a diversity, inclusion, and equality initiative. The goal is to enhance the faculty, staff, and students' understanding of the current challenges in our society and industry and develop some higher values and expectations to maintain our ethical and civil standards.
4) A new seminar course in Construction Technology offered in fall 2019 will present more evaluations of this course in 2021.
5) The Construction Management Women's Association was created under Dr. Leah Roue's leadership to enhance our female students' enrollment, extra-curricular, and leadership opportunities.
6) Starting fall 2019, the program faculty engaged in discussion with the industry advisor board on initial strategic directions for the coming five years, which we will discuss in summer 2021 to develop different measurable goals. Below are the five strategic directions narrative:

Strategic Directions Proposal – Fall 2019

The **first strategic direction** for the next five years is to expand the project-based learning approach in our curriculum. This approach should help our program to enhance hands-on and project planning and execution experiences. Utilizing some real project documents that our engineering and construction industry firms worked on or are working on or even planning to work on has been very useful. The goal is to enhance our student learning and active class learning; project-based learning replaces traditional teaching approaches with a more engaging class environment.

The **second strategic direction** is expanding, utilizing more technology tools in our classes and curriculum to enhance student creativity and technology utilization skills. Our industry is heading in this direction, and we are committed to supporting our companies with technology-savvy graduates. We have been updating our classroom and computer lab's digital capabilities. We use much-advanced construction software in project planning and execution like Revit, Primavera, Procore, Bluebeam, and Navisworks. We are utilizing these types of software and 3D camera technology to capture real construction activities from project sites. They are incorporated into the project drawings and building information modeling (BIM) files. This enables faculty to visualize these activities to students and be discussed and analyzed digitally in class to provide visual information that enhances student learning experiences.

The **third strategic direction** we adopted is pursuing a construction management innovation space on our campus or in the Mankato area. This space will be used to provide more hands-on activities to our students, which could include building construction mockups for different building components, testing materials, and experimenting with more advanced technology tools. Our industry has continually been supporting our program to be successful and recognized both nationally and globally. This space would take our program to a whole new level.
We look forward to working more with our industry partners to complete this project soon.

Enhancing our professional and inclusion practices is our **fourth strategic direction**. Faculty, staff, and students are committed to increasing the opportunities to improve their professional development, which applies respect, equality, transparency, and leadership in their day-to-day activities. Our program works with all stakeholder to enhance our ability to be the program which develops global citizens for our built environment nationally and globally.

The **fifth strategic direction** is to maintain our program as the best value program nationally. We will continue our strong connections with the engineering and construction industry, which will increase our student retention and satisfaction. Maintaining our quality standards aligned with our accreditation requirements will improve our student graduation rate and enhance our curriculum to be relevant to the industry's development and growth.