

Report to the Provost and Senior Vice President for Academic Affairs on Recommendations to Improve Student Success and Retention

Prepared by Provost's Student Retention Task Force

March 1, 2019



**Michigan
Technological
University**

**Task Force to Improve Student Success and Retention at Michigan Tech
Final Report**

March 1, 2019

Task Force Members

Brian Barkdoll
Katrina Black

Professor, Civil & Environmental Engineering Department
Senior Lecturer and Advisor, Physics

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|-------------------|---|
| Paul Charlesworth | Associate Professor, Chemistry Department |
| Bonnie Gorman | Dean of Students and Associate Provost for Student Affairs |
| David Hemmer | Dean, College of Sciences and Arts |
| Ann Humes | Director of First-Year Mathematics |
| Susan Liebau | Director, Wahtera Center and Assistant Dean of Students |
| Lorelle Meadows | Dean, Pavlis Honors College |
| Mike Meyer | Director, William G. Jackson Center for Teaching and Learning |

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EXECUTIVE SUMMARY

The Task Force was charged in September 2018 to issue final recommendations by March 1, 2019. It was comprised of nine faculty and staff currently involved in teaching and/or delivering support services to students. We held more than a dozen meetings of the whole committee and further divided into four sub-committees. One focused on collecting data while the others looked at teaching and learning, university culture, and policies. We held multiple focus groups and individual meetings with advisors and students, toured learning centers, visited classes, and hosted an open forum for faculty to discuss retention. We also reviewed best practices in the literature and participated in webinars in student success and retention.

We arrived at five specific recommendations and two more overarching areas of emphasis. We evaluated these recommendations for ease of implementation, cost, effectiveness and degree of buy-in required. This analysis informed the prioritization of the five recommendations below:

Priority #1: Develop a comprehensive early intervention system.

Our current academic interventions for first-year students typically come after midterm grades are turned in. By then it is often too late for students to recover academically. We recommend a data-driven intervention within the first few weeks of each semester as students who are retained after the first semester show a dramatic increase in six-year graduation rates (Seirup and Rose, 2011).

Priority #2: Improve first-year instruction and academic support.

The task force found evidence that a number of instructional changes would likely lead to greater first to second year retention. Most recommendations revolve around changing course coordination and design, culture, and support offered for courses typically taken in the first year. Ultimately, these interventions require a consistent cadre of instructors dedicated to early undergraduate instruction who will work closely with learning centers, graduate and undergraduate teaching assistants, advisors, and other learning support systems/services. To coordinate these efforts across disciplines, a formal administrative structure linking instructional design, learning centers, the student success center, and first-year advising should be created.

Priority #3: Revise the academic advising system by school/college.

We spent a significant amount of time examining our advising system, as much of the retention literature points to the important role academic advisors play in providing support and serving as a critical point of contact for degree completion (Hanover Research, 3). We talked with students as well as professional and faculty advisors, looked at a past report on advising and reviewed the results from the Academic Advising component of the National Survey on Student Engagement (NSSE). On the survey, all results from Michigan Tech students were at or below the national mean responses and support our perception that many advisors may often not have adequate time to support students with issues and challenges beyond the perfunctory. One of our recommendations includes recognizing the limits of advisor loads and responsibilities and identifying efficiencies, technology and other resources that would allow them to best support student needs.

Priority #4: Address student mental health and wellbeing through a strategic campus-wide approach.

Michigan Tech students are seeking support to manage their mental health and wellbeing in record numbers. While the University offers prevention education, counseling, and support for students, more needs to be done in a systematic way to foster their success. To that end, in the fall of 2018, Michigan Tech became a JED Campus. This program directs a comprehensive assessment of our current efforts with the goal of developing a strategic campus-wide approach to student mental health and wellbeing. Representatives from the JED Foundation will be on campus to meet with our JED team (comprised of faculty, staff, and students) to discuss our assessment results on March 21, 2019. Our recommendation will be to complete the JED strategic planning process and act on as many of their recommendations as possible.

Priority #5: Introduce flexibility into the curriculum.

The majority of students arriving at university campuses are unclear as to their own interests and strengths and thus their choice of major (Lichtenstein et al, 2007). Flexibility in curricula in the university setting can help students find their strengths and passions and allow them to change direction if needed. This, in turn, helps students complete their studies successfully. The Task Force has several ideas on how to do this, including normalizing being an undeclared major at the onset of college to relieve the pressure of identifying a major for students who are not ready to do so.

Broader Recommendations:

Institutionalize the use of data for informed decision-making.

In the last year, we've done some work with Sightline, a predictive analytics firm, to better understand why students leave the University. Our recommendation will be to institutionalize efforts to obtain and analyze data on a routine basis. This will inform our decision making regarding the services and support we provide.

Reexamine potentially unfriendly university policies.

Many of our policies have the potential to be barriers for student success, although we lack data to conclude this. It is recommended that the University Senate convene a committee that includes students to review policies that may harm retention. These should include: policy on third attempts,

length of degree programs, dropping schedules for unpaid bills, lack of waitlists for classes, academic calendar, policy on retaking classes, etc.

Goals: Finally, the committee was charged with suggesting goals going forward. We recommend a five-year target of 88% for standard first-year retention and 75% for six-year graduation rate.

Improving retention and graduation rates is a slow process that may not be realized for 18 months or more. To that end, these efforts require an on-going commitment from the leadership of the institution for at least five years (Florida State University Student Success Team).

Current Efforts at Michigan Tech Creating a Sense of Belonging

The committee was impressed by the extensive efforts already in place at Michigan Tech. There are many existing structures, services and initiatives that support the success and retention of current undergraduate students.

From the time students indicate they are attending Michigan Tech, systems are in place to assist in referring them to resources that meet their individual needs. Ninety percent of incoming students complete an optional pre-arrival survey that asks questions about their identity, needs and experiences that may be relevant to the services that would support their ongoing success at the University. Areas review these responses and reach out to students before they arrive on campus.

Once students arrive on campus, there are multiple opportunities for them to connect with others and develop a sense of belonging. Orientation is a week-long program where an Orientation Team Leader (OTL) leads a group of about 20 students through a variety of activities to introduce them to academic expectations as well as college life, in general. More than 86% of students agreed or strongly agreed that, "Orientation helped me feel connected to Michigan Technological University." (Orientation and New Student Programs Survey 2017-18)

Students can make connections on campus in a variety of ways. For example, they can participate in undergraduate research, work on campus, and/or enroll in an Enterprise. In addition, using various resources, like academic advising, career services, and learning centers can provide opportunities for building relationships that contribute to a student's sense of belonging.

The student staff in the residence halls also works hard to create community. A residential curriculum was integrated into Michigan Tech's residence hall communities in fall 2018. The curriculum provides for intentional, learning opportunities that are tied to programmatic learning goals. This allows for meaningful learning opportunities that contribute to students' resilience and personal and professional development.

The Center for Diversity and Inclusion provides support and offers engaging programs for students of multiple social and cultural identities. For example, their newly established Husky Connect Program offers peer-to-peer mentoring to support ethnic minorities, LGBTQIA+ students and women.

Finally, K-Day, or Keweenaw Day, is an opportunity for students to be exposed to the more than 220 student organizations that exist on campus. This event takes place on the shores of Lake Superior and provides the perfect backdrop for new friendships to form over common interests or the desire to try something new. As well, participation in other University traditions, like Cardboard Boat Races, and Winter Carnival also helps foster a sense of belonging and community.

Emotional Health and Wellness

Michigan Tech offers counseling for students. Services include brief, short-term, solution-based therapy for enrolled students. In an effort to provide more resources for students, a variety of groups--such as Stress and Anxiety Management, Mending a Broken Heart, and Building a Healthy Self--have been established.

Student Health and Wellness offers resources and presentations for students on a variety of healthrelated topics, including sleep, drugs and alcohol, sex, stress and mindfulness. They coordinate pet therapy several times a semester, a student health fair, and a snowshoe event during Winter Carnival. Students also have access to an online magazine, *Student Health 101*, enabling them to explore health related issues privately. Most recently, Health and Wellness has partnered with the P.E. Department to offer a co-curricular unit addressing movement, nutrition, mindfulness, and sleep.

Outside of Counseling Services and Student Health and Wellness, students can engage in recreation at the SDC, P.E. classes, intramural sports, and programs offered by the Outdoor Adventure Program (OAP) to help manage their overall wellbeing. Mindfulness initiatives are also being offered through classes in Biological Science, Visual and Performing Arts, and the Pavlis Honors College.

Exploring Majors at Michigan Tech

Exploring Majors at Michigan Tech is a collection of efforts tied to the advisor of the General Sciences and Arts (SGSA) program. This advisor, Sylvia Matthews, advises students who enter the University in this non-degree program. The program itself has a dedicated advisor and course; SA1000: Exploring Majors at Michigan Tech. With the creation of the Wahtera Center, Sylvia began holding office hours in the center and working regularly with that team. The SA1000 course began to be offered in both fall and spring semesters and enrollment was encouraged to students, at any point in their academic career, who were considering major fit or other options. Additionally, the SGSA/Exploring Majors is a one-on-one advising resource for those same students who have questions about major choice.

Outreach Efforts

Students of Concern

There are two standing committees on campus that meet regularly to identify students of concern and develop intervention strategies to provide assistance and support. The early intervention team (EIT) typically discusses students with emotional and/or behavioral concerns. The academic intervention team (AIT) has two specific functions. The first is for the core committee to meet regularly in a similar fashion to EIT, focusing on academic concerns that are brought to the attention of the group. The second, larger, AIT group includes members from throughout the dean of students area and meets with students facing academic challenges to discuss progress at the beginning of fall and spring semester.

Midterm Grades

Midterm grades for first-year students are requested and submitted the end of the 7th week of the semester. Students can access their grades through Banweb. Those grade reports are used by the Wahtera Center to schedule individual meetings with students who have 2 or more Unsatisfactory (UN) grades (indicating they are below a C in any of their courses). Outreach meetings are coordinated through the Wahtera Center and are conducted by dean of students area staff (Wahtera Center, Center for Diversity and Inclusion (CDI), Housing and Residence Life (HRL) and several academic advisors).

Academic Probation/Suspension/Reinstatement

Students who go on academic probation in their first year are registered in the UN1011: Strategies for Success. The course has been developed to help students learn the best practices around academic success while providing some opportunities for self-reflection. Students who find themselves on academic probation receive communication from the dean of students and depending on their specific situation, may receive outreach from the academic intervention team (AIT) at the beginning of each semester.

When students are academically suspended from the University, they are provided the opportunity to appeal the decision and return for the next semester. Students who choose not to appeal or have an appeal denied are not eligible to enroll as students for a designated time; they submit a reinstatement request prior to their return. All students who have an appeal granted or are reinstated are scheduled to meet with a staff member who discusses their academic plan for success for the semester. In fall 2018, the AIT group also conducted outreach to 672 students who met the standing AIT criteria and/or were flagged as at-risk for not being retained by the SightLine LLC consulting firm.

Learning Centers

The Provost provides central funding for learning centers in multi-literacies, math, computer science, chemistry, and physics. All offer free tutoring for students, either in walk-in hours or by appointment. Some help organize study groups. Other departments, for example biology and chemical engineering, fund learning centers from their own budgets.

While we were all very impressed at the extensive efforts already underway at Tech, we did develop five main recommendations.

Prioritized Recommendations:

Priority #1: Develop a comprehensive early intervention system.

To improve student retention, the first few weeks of college are the most critical (Upcraft & Gardner, 1989). Students are away from home, usually for the first time, and often reconsider their decision to attend college or their choice of major. At Michigan Tech our counselors report an uptick in anxiety around week six. But our current academic interventions typically come only after midterm grades are turned in, and often not until after the first semester is over. By then it is often too late for students to recover academically. Students who are retained after the first semester show a dramatic increase in six-year graduation rates (Seirup and Rose, 2011)

Our committee strongly recommends Tech apply data-driven intervention within the first few weeks of each semester, especially for freshman in fall semester. We also recommend considering a bridge program to begin intervention for some students before the semester even begins. These interventions should be based on both academic and other information collected from students.

Southern Utah University increased its first-year retention from 64% to 73% in only three years by implementing such a system. They used their equivalent of our orientation team leaders to survey students, both at the beginning of fall semester and three weeks in. Students were only asked questions that provided actionable information that correlated strongly with retention. “Underperforming” questions were removed from the survey. By having peers administer the survey, participation rates were close to 100%.

Students were asked about their emotional and physical well-being, jobs on campus, homesickness, social adjustment, interactions with professors, etc. Tech could consider retaining our OTLs into the fall semester for this purpose or integrate this into the new residential life curriculum. We are not doing a good job collecting and using this non-academic information in targeting interventions.

Academic early intervention is another opportunity. “Today’s early-alert systems let colleges predict which students are likeliest to struggle, based on individual risk factors, and identify those who need attention and resources early in the semester, before it’s too late.” (Field, 2018) Faculty teaching firstyear courses should understand that providing early feedback, and working with advisors, is part of their job. Quizzes and/or exams should be given in the first 3-4 weeks of the semester, and students who struggle can be targeted for intervention. This would allow more effective intervention by advisors, the Wahtera Student Success Center and the Early Intervention Team. Paul Charlesworth (University Chemistry Instructor) and Susan Liebau (Student Success Center) are currently experimenting with such a direct student referral system.

Comprehensive Bridge and Success Program

One proven way to increase student retention for at-risk students is the creation of a bridge (and beyond) program between high school (or community college) and a four-year institution that targets

goals specific to known student needs. Several programs of this nature exist around the country, the most famous and effective of which is the Meyerhoff Scholars Program at the University of Maryland, Baltimore County, founded in 1988 (Hrabowski, 2005). In 2008 the University of Michigan began the MSTEM program, modeled after Meyerhoff Scholars (Davis et al., 2011), and in 2014, the Howard Hughes Medical Institute, Penn State and the University of North Carolina launched a collaborative project for adaptation and implementation of this model on these two campuses (<https://www.hhmi.org/news/>). These programs are strengths-based programs, focusing on the strengths of the participants rather than on remediating deficiencies (a hallmark of a deficits-based approach).

Such programs typically target talented diverse incoming students who, for reasons of socioeconomic class, first-generation college student status, race, gender, or lack of high school rigor might not be successful in pursuing a STEM degree at a rigorous four-year institution. Key programmatic components include significant financial aid, a summer transition program, study groups, program values, program community, personal advising and counseling, tutoring, summer research opportunities, faculty involvement, and mentors. The Meyerhoff Scholars program has been extraordinarily successful. Students who entered the Meyerhoff program are twice as likely to earn a science or engineering bachelor's degree and 5.3 times as likely to enroll in post-college graduate study as compared to those students who were invited to participate but declined (Summers & Hrabowski 2006).

Based on our evaluation of at-risk students at Michigan Tech, we propose that a program of this nature include the following elements:

- Identification and selection of high potential students demonstrating a combination of factors known to place them at risk of graduation from Michigan Tech
- A summer transition program that promotes social and academic integration and prepares students explicitly for the expectations and requirements of rigorous college courses, including math and science, as well as professional and personal development opportunities
- A living community in a single residence hall to maintain the sense of community fostered during the summer program
- Comprehensive and coordinated advising and academic coaching, attending not only to academic planning and academic success, but also personal challenges
- Required peer study groups, tutoring and supplemental instruction
- Co-curricular learning opportunities including research, internships, international experiences, community service projects or field studies
- Financial aid for successful participation in the summer bridge and maintenance of an average grade in a STEM major.
- Peer mentoring
- Ongoing assessment

Offering a program of this nature has been shown to dramatically increase retention and graduation of a diverse population of students, which, after time, can provide the tuition revenue and resources necessary to fund the program.

Priority #2: Improve first-year instruction and academic support.

The task force discussed and found [evidence](#) that a number of instructional changes would likely lead to greater first to second year retention. Most recommendations revolve around changing coordination, culture, and support in courses typically taken in the first year of instruction. (Introductory Math, Engineering Fundamentals, General Chemistry, Computer Science, General Physics, Composition, and Global Issues.) In order to avoid a sudden change in instruction, some common second year courses (statics, dynamics, EE3010, Organic Chemistry, etc.) might also benefit from some participation in this process.

Learning centers currently provide academic support in almost all of these areas and are clearly a key component of retention support. Based on the 2017 task force report (Gorman, Seely, Meyer), several interventions are already in progress. Learning Center coaches from many centers were trained together this fall for the first time to ensure their awareness of campus policies and resources, resulting in an increase of referrals between centers. Utilization data gathered consistently across core learning centers for the first time this year will help better determine efficacy as we learn which first-year student retain. Rapidly rising DFW rates in Calculus II (MA2160) and University Physics 1 (PH2100) raised particular concern, and it will be important to monitor changes already implemented (The impact of “C” or better grade requirements and the pilot implementation of the PH2101 supplemental course).

But there is room to do more. There is evidence that students who attend supplemental instruction (SI), currently offered only in chemistry, retain at a higher rate. SI, like learning center support, is conducted by undergraduate coaches, but the sessions occur in the residence halls and the coaches have more training. Adding SI for other introductory courses - especially high DFW courses such as physics and math - is therefore recommended.

Since retention is also clearly linked to a feeling of belonging, more effective facilitation of group study teams could be done by learning centers (good models exist currently in chemistry and the Multiliteracies Center) and/or encouraged/required by introductory classes. (Again, recent changes in Engineering Fundamentals, including the use of LEAP leaders who go through SI training might serve as a model.)

But, while learning centers are already engaged in this mission, there is a need for the development of stronger connections between first-year instructors and the support services already in place, as well as a stronger “culture of retention” in both learning centers and the service courses they support. There is evidence, for instance, that students who make at least two learning center visits are more likely to retain. Requiring only at-risk students to visit learning centers, however, has been shown to “mark” them as places for remediation and discourage their use by mid-level students who could benefit. The composition program and the Multiliteracies Learning Center have therefore built into their course requirements that all students visit the learning centers once or twice early during the term to normalize their utilization and get students over the initial angst regarding a visit. In some cases, learning center coordinators are exploring “open-house” type events at which instructors might be present. Similar

collaborations among first-year classes and their respective learning centers are therefore recommended.

There is also agreement in the task force that the current first-year mid-term feedback system identifies struggling students too late for effective intervention. Any data-driven system relies on the instructor. There is a need for clearly communicated expectations that first-year instructors will implement “frequent, low-stakes learning assessments, so students can check their progress early and often” as well as sharing centrally available feedback 3-4 weeks into the term. (See recommendation #1: early intervention.)

A similar consistency is also needed in instructional design. First-year courses are currently designed independently by department, and in some cases, by instructor. This results in a variety of homework tools, textbook requirements, and Canvas (our LMS) course formats, all of which require significant effort by students to decipher a wide variety of learning “systems” in addition to their disciplinary content. While the unique nature of each discipline is acknowledged, discussions among first-year instructors, advisors, and orientation staff could lead to more consistent systems and expectations to not only reduce student effort and improve learning, but also potentially reduce student cost. Three such examples might be more consistent course “templates” in Canvas (recently implemented templates for composition sections might serve as a model), consistent use and availability of lecture capture or other video resources, and consistent use of Inclusive Access textbooks (Engineering Fundamentals) and/or homework systems which ensure all students have all needed learning materials available on the first day of class.

It’s worth noting that implementing most of these interventions involves careful consideration of who is teaching first-year courses. Rather than presuming that all instructors can just “take their turn” with a service course, assigning graduate teaching assistants with limited training or experience, or making such courses “punishment” for failing to bring in research dollars, these interventions require that instructors in first-year courses teach courses multiple times over a period of years, build specific collaborative knowledge of an intentional system, and develop unique skills with educational technologies. The task force therefore also strongly recommends a review of both how first-year instructors are chosen and promotion and tenure policies which currently do not adequately reward this kind of teaching.

These interventions prescribe a consistent cadre of instructors dedicated to early undergraduate instruction who work closely with learning centers, graduate and undergraduate teaching assistants, advisors, and other learning support systems. Since these instructors would need to coordinate their efforts across disciplines, the creation of an administrative structure with both authority and responsibility for first-year student success in addition to their home department might provide a needed connection. (An associate dean within the College of Sciences and Arts has been suggested as one possible appropriate leader.) A number of structures are already in place that could be leveraged: “Course coordinators” for many of these courses are already in place, learning center coordinators are already engaged in collaboration but need formal leadership, and non-tenure track faculty

(lecturers/senior lecturers/principal lecturers) are already occupying many of these roles. In addition to providing much needed consistency, such collaboration might also provide better support/value for instructors currently “siloeed” in departments where their teaching role and experience is unique.

Creating such a unit would also allow professional development regarding best practices for retention to be focused on this instructional group. Examples include ways to set clear but high expectations with lots of support, an encouraging tone, and an inclusive climate. The current wide variations in instructional quality could be reduced by consistent implementation of methods to hold students accountable without anxiety producing “surprises”, ways to provide multiple opportunities and modes for learning, choice where possible to improve motivation, and universal design techniques. Finally, direct efforts to build a supportive learning community and a growth mindset for students could be reinforced across all classes.

Recommendations:

- Create a formal administrative structure that coordinates first-year efforts across disciplines, linking instructional design, learning centers, and first-year advising.
- Use this structure along with new data gathered by learning centers to select, showcase, train, and reward first-year instructors, provide better early intervention, and more tightly link instruction to learning centers and advising.
- Expand the number of disciplines offering supplemental instruction through their learning centers.

Priority #3: Revise academic advising systems.

There is an abundance of research and literature that supports the importance of academic advising with regard to student retention and experience. The task force recognized academic advising as an important part of the overall student experience and students’ sense of belonging. As part of these efforts, a number of sessions focused on academic advising were convened to gather information about the advising experience for undergraduate students and staff or faculty advisors alike. Advising done well improves the student learning experience and therefore connects advising to the educational process, making it a critical component of student engagement, retention, and persistence to graduation (Campbell & Nutt, 2008).

With specific exceptions, students in interviews and feedback sessions indicated they were mostly satisfied with their advising experience. The students recognized that their advisor’s workloads and styles played a big part in their experience. The students interviewed made note of availability and approachability as some traits they appreciated and recognized advisors were “busy”. Regardless of advising style, students indicated that their advisors were knowledgeable and, in most instances, would find or confirm information if they did not know it.

Student caseloads vary a great deal between departments and as indicated from feedback from students and advisors alike, it impacts the experience. The National Academic Advising Association

(NACADA) provided guidance on assessing appropriate caseloads for advisors and also referred to in the Council for the Advancement of Standards in Higher Education (CAS) publication. Neither group is committed to providing specific numbers for caseloads as there are many factors that impact that experience. NACADA's 2011 National Survey of Academic Advising indicates the mean caseload for advisors nationally is 296 students. The mean caseload for medium sized colleges at 333 and the mean for 4-year public doctorate institutions at 285. There are many instances at Michigan Tech where the advising load is well above these means (see Appendix IV) without considering other responsibilities like meeting with prospective students, attending recruiting events, committee work, or teaching.

Staff and faculty advisors commented on their need for time, training and resources. All advisors have other duties in addition to advising responsibilities and the balance can be challenging for staff and faculty advisors alike. There are a variety of ways to address the time constraints advisors face and aid them in managing their workload. Centralized advising models are successful at many institutions and in a session with staff advisors, an advising center and sharing of resources were suggested as opportunities to aid advisors in their work. Centralizing advisors/resources would likely benefit from happening on the school/college level versus the institutional level, as the academic departments could capitalize on shared knowledge and similar curriculum.

First-year advising also has potential to address advising workloads while contributing to a welcoming and supportive environment for students beginning their academic career at Michigan Tech. Moving to a model with common first-year advising would reduce the workload for current advisors and allow them to focus on the needs of upper level students. First-year students typically account for about 20% of the workload for advisors across disciplines. Integrating first-year advising and components of centralized advising are not mutually exclusive.

Currently, a number of staff advisors are 9- or 10-month positions. Extending these positions to 12 months would provide additional time during the year for advisors to devote to projects they don't have time to complete during the regular academic year. It also provides a consistent contact for addressing student needs through the summer months.

There are regular workshops, informal advisor breaks, and some resources for advisors, but there is currently no standardized process for training new advisors. The outcome of this decentralized advising model means there are not consistent expectations for advisors. Additionally, advisors do not receive regular, meaningful feedback from the students they serve, something that was mentioned repeatedly in both advisor and student comments.

While some advisors have individual systems for tracking and scheduling appointments, advisors do not share centralized systems for tracking visits, note takings and meeting scheduling. Tracking systems are crucial to understanding the work flows and sharing relevant information about students. It is also beneficial when students transfer from one department to another.

Advisors receive direction and encouragement from their academic departments, student affairs, the Registrar and Provost, but there is not a centralized position dedicated to the oversight and support of

academic advisors on campus. A position that has authority to introduce and monitor expectations for advisors as a whole could improve the experience for students and advisors alike. Currently, home grown initiatives like AdvisorHub and the Canvas advising course, and even some support for training are managed and updated by advisors taking on the additional responsibility. Advising Council meets to discuss overarching issues and plan for the workshops and other trainings each semester. An advising “manager” would allow for some accountability among the advisors and take the burden of training and other responsibilities from individual advisors.

In spring 2018, Michigan Tech participated in the National Survey for Student Engagement (NSSE), a long-running survey that assesses undergraduate student engagement for first-year and senior level students. As part of that participation, the University completed the optional Academic Advising component of that survey. All results from Michigan Tech students were at or below the national mean responses and support the discussion that many advisors may often not have adequate time to support students with issues and challenges beyond the perfunctory.

Both first-year and senior level student responded below the national mean to the questions, related to their experiences with academic advising in the past academic year: “helped you when you had academic difficulties,” “discussed your career interests and post-graduation plans,” “reached out to you about your academic progress or performance.” While the Academic Intervention Team, dean of students, Waino Wahtera Center for Students Success and some academic advisors do a variety of scheduled and unscheduled outreach to students who are facing challenges, students do not appear to be regularly using their academic advisors for these types of issues. The expectation is not that advisors would do more, but rather have the time and resources to create an environment where they have the time to provide focused attention to students, whatever direction they are looking for.

- Recognize the limits of advisor loads and responsibilities and identify efficiencies, technology and other resources that would allow them to best support student needs.
- Direct individual schools and colleges to develop plans to streamline and/or centralize advising in ways that make sense for their student populations.
- Centralize training and provide regular assessment and feedback opportunities for all advisors.
- Implement a standardized tracking system, that will enable advisors to track meetings, take notes and schedule meetings. Such a system should also contribute to collecting data about students who use advisors and those who don't.

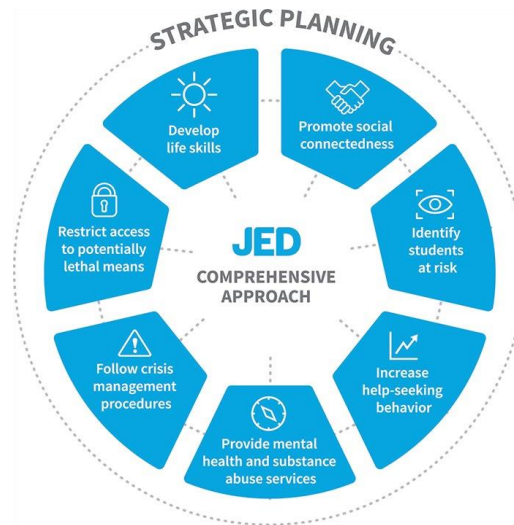
Priority #4: Address student mental health in a comprehensive way.

Like colleges and university across the country, students at Michigan Tech are seeking support to manage their mental health and wellbeing in record numbers. In the 2017-18 school year, Counseling Services saw 13% of the student body. More specifically, in 2016, the American College Health Association’s National College Health Assessment completed by our students revealed that

- 86% felt overwhelmed by all they had to do
- 63% felt very lonely

- 56% felt overwhelming anxiety
- 39% felt so depressed it was difficult to function
- 12% seriously considered suicide

While the University offers prevention education, counseling, and support for students' wellbeing, more needs to be done in a systematic way to foster their success. To that end, in the fall of 2018, Michigan Tech became a JED Campus. This program directs a comprehensive assessment of our current efforts with the goal of developing a strategic campus-wide approach to student mental health and wellbeing.



We completed JED's review and assessment in the fall and expect recommendations in each of the areas identified on their strategic planning model above. Representatives from the JED Foundation will be on campus to meet with our JED team (comprised of faculty, staff, and students) to discuss our assessment results on March 21, 2019.

We recommend the following:

- Recognize that student emotion health and wellbeing is a campus-wide, shared responsibility. To this end, JED recommends developing a cross-campus, multi-disciplinary team to work on campus-wide strategy, planning, and communications related to emotional health, substance use, and suicide prevention.
- Complete the JED strategic planning process and act on as many of the recommendations as possible.
- Fund prevention programming, outside the scope of JED, that supports students' development of healthy lifestyles (Mindfulness, substance use, sleep, healthy relationships, etc.).

Priority #5: Introduce flexibility into the curriculum.

Flexibility is a necessary characteristic of higher education in order to meet the needs of a diverse student body. This includes students who are more commonly facing challenges in their college years

related to health, finances, familial responsibilities, among others, that can lead to reduced performance, or withdrawal. It also includes non-traditional students who carry higher levels of responsibility for family members outside of their academic responsibilities.

In addition, the majority of students arriving at university campuses are unclear as to their own interests and strengths and thus their choice of major (Lichtenstein et al, 2007). Flexibility in curricula in the university setting can help students find their strengths and passions and allow them to change direction if needed. This, in turn, helps students complete their studies successfully. In programs with limited choice or flexibility, students can be left feeling trapped in an education that no longer matches their interests or strengths, or unable to migrate into inflexible curricula (CAEE, 2010).

Universities offer flexibility through programmatic choice (e.g. electives, or different ways to satisfy learning goals), the use of technology to provide a variety of ways to engage with course material (e.g. lecture capture), and alternative scheduling formats (e.g. half-semester offerings).

To facilitate a more flexible environment for students at Michigan Tech, we recommend the following:

- Removing the stigma associated with being undeclared upon entry to the university and affording students a developmentally appropriate opportunity to explore interests and map a major onto their unique mission and goals. This could be accomplished in a variety of ways, such as a common first-year experience or a required first-year course that encourages young adult development and exploration of pathways to success. In addition, normalizing an undeclared state at the onset of college would relieve the pressure to identify a major from students who are not ready to do so.
- Clarify the pathways to exploring and/or changing majors through a stronger web presence, enhanced advising opportunities, supportive policies and intentional communication with students.
- Alleviating pinch points in registration and scheduling that prevent students from being able to enroll in sequenced courses and inadvertently extending their time to graduation, placing undue financial stress on the student.

Broader Recommendation #1: Institutionalize the use of data for informed decision-making.

First-year retention at Tech hovers around the 83% mark, while rates of academic probation average 12% and academic suspension average 4% at the end of the first year. While these statistics seem to indicate that low academic success is much of Tech's first-year attrition, there is little specific data regarding the underlying causes, both for students who are ineligible to return due to grades and students who choose not to return for other reasons.

In theoretical models for student retention, many underlying variables affect students' decisions to reenroll. [Bean, 2005] Although academic (including GPA, course experiences, advising, and interactions with faculty) and financial factors are some of the most accepted reasons for failing to re-enroll, retention research suggests that other factors, such as student intentions and attitudes, institutional fit,

social and bureaucratic factors, student background, and the external environment all play significant roles in retention. Because bad grades and low funds are socially acceptable reasons to drop out, students may lean more heavily on these factors when asked to retrospectively describe their enrollment decisions, even when another factor was a stronger cause. For example, one study [Martin, 2015] that focused on student narratives of positive and negative events during their first year in college in at a Midwestern university showed, unsurprisingly, that non-returning students wrote more frequently about negative school-related events than positive school-related events. However, more than two-thirds of the negative school-related narratives were related to students' living experiences rather than academics.

A predictive model for retention at Tech developed by SightLine LLC shows five main variables that correlate strongly to retention: academic performance as measured by term and overall GPA, being enrolled in an engineering major or the School of Forestry, being enrolled in 15 or more credits, being involved in a student organization, and being employed on campus. Although these variables should not be taken as prescriptive (that is, we should not encourage all students to switch majors to engineering), they may point to underlying variations in social-psychological factors. For example, engineering majors may have stronger feelings of institutional fit than business majors and students who have close friends on campus may be more likely to be involved in student organizations. Because the model was created based on institutionally-available demographic data, it does not currently directly take into account students' own perceptions of their experience.

To institutionalize the use of data to improve retention, we recommend the following:

Institutionalize efforts to obtain and analyze data on a routine basis. This will inform our decision making regarding the services and support we provide.

- Collection of demographic, academic, and student self-perception data “early and often” in the semester.
- Immediate, predictive analysis of data to identify at-risk students before midterms, with continuous improvement of prediction algorithms based on student outcomes.
- Consider hiring an outside firm to provide data analysis and predictive analytics. Consider contracting for a survey of our departed students.

Broader Recommendation #2: Reexamine potentially unfriendly university policies.

The Task Force discussed university policies that may harm student success and retention, although there is very little data available to confirm or debunk this. We discuss some of these policies below.

Repeating Classes/Third attempts

The Task Force looked at what other schools like Clarkson, Missouri S&T, and Georgia Tech permitted with regard to third attempts and our policies align. Michigan State University allows the following: “An undergraduate student who received a grade of 2.0 or above, CR, or P in a course may not repeat the

course on a credit basis. An undergraduate student may repeat no more than 20 credits in courses in which grades below 2.0 were received.

Whenever a course is repeated on a credit basis, the last grade and credits earned completely replace the previous grade in the satisfaction of requirements and computation of the cumulative grade-point average. All entries remain a part of the student's permanent academic record."

Long degree programs

Many of Tech's degree programs are 124, 128 or even 130 credit hours, sometimes with only zero or one free elective. This is especially true in the College of Engineering. It leaves students no room for error and can make it difficult for students who change majors to finish in four years. The 2019 U.S. News rankings report our four-year graduation rate at only 28%, compared to 82% at WPI and 58% at Clarkson.

No waitlist for classes

There is no waitlist feature for Tech's registration system. This introduces unnecessary stress for students and makes it difficult for decision makers. For example, a large waitlist could support adding additional sections.

Re-taking classes

Tech does not allow students to retake a class having earned a grade of C or better. Students report failing classes on purpose to evade this policy.

Academic calendar

The task force identified two concerns around Michigan Tech's academic calendar. The first weeks of school are broken up with Labor Day and K-Day. These interruptions early in the semester are seen as disruptive to the rhythm of classes.

Another concern is the fact that there is no break in the fall semester until Thanksgiving. That this is viewed as a grind for students is evidenced, in part, by the spike in the use of Counseling Services every October. Faculty find this stretch, as well as the period between Thanksgiving and the end of the term, particularly challenging. Schools like Carnegie Mellon University and Purdue, among others, provide a short (one or two day) mid-semester break in October.

Financial Barriers

Financial barriers, such as unmet need, a delay in loan disbursements, or account holds can contribute to a student leaving the University. This can be further compounded by late fees being added to a student's account and schedules being dropped. A \$50 late fee is assessed between the payment due date the Wednesday before classes until 5pm the Wednesday of the first week of the semester bringing an average of \$63,500 in annually. A \$100 late fee assessed after the registered not paid process run at 5pm the first Wednesday of the semester (not charged in the summer) and another \$13,500 annually.

In addition, when students lose scholarships because of academic performance, they are not notified that the scholarship is available once they return to good standing. Students have to ask to have the scholarship reinstated.

We recommend the following:

- Charge the University Senate to convene a committee that includes students to review University policies with an eye on retention.
- Adjust the bill due date so students have more time to resolve issues before their schedule is dropped and late fees are assessed.
- Improve financial aid communications to be more transparent.

Recommended Retention and Graduation Rate Targets.

Collegefactual.com [reports](#) “Given the academic preparedness of the first-time / full-time students accepted to Michigan Tech, we expected that after six years about 74.7% of them would have completed their undergraduate degrees.” The committee agrees that a 75% six-year graduation rate is a reasonable target. Our most recently available rate is 68.4% (Fall 2012 entering cohort), up from 63.6% four years earlier. We note that the most recent goal suggested by the 2012 AQIP report was 70%, a goal that has almost been achieved.

Tech’s first-year retention has been around 83% for at least a decade, with an unexplained one-year surge to 87% for the first-year class in 2015. The 2012 AQIP suggested a target of 85%. Based on the data in Appendix V, and the fact that we achieved 87% at one point, the committee recommends a goal of 88%.

APPENDICES

Appendix I: Charge to the Committee

Charge

This project will examine student success/retention and graduation rates of undergraduate students at Michigan Technological University with the goal of increasing both. The team will be asked to complete the following:

- Use data from Michigan Tech and other sources to identify and document the types of issues as well as policies, practices and structures that either contribute to retention/graduation or detract from the goal of improving student success outcomes.
- Summarize past reports/recommendations related to student success at Michigan Tech as well as evidence of their impact.
- Provide examples of evidence-based practices that have been successful at Michigan Tech or elsewhere (best practices).

- Recommend possible innovations to improve retention and graduation rates. Examples may include changes in course design, curriculum scaffolding, general education, grading practices, developmental advising strategies, etc.
- Suggest strategies to promote development of a growth mindset among students and faculty.
- Develop a set of recommendations and relevant documentation to be delivered in a final report to the provost and vice president for student affairs and advancement by March 1, 2019 with forward-looking metrics for increased 1st-to-2nd year retention rates and 6-year graduation rates.

Appendix II: Summary and Updates from Previous Reports

AQIP Advising Project

The 2009-10 advising project followed six advising task forces or committees since 1994. The recommendations that were developed by this committee included:

- Centralizing authority and responsibility for coordinating and assessing academic advising through the Assistant Provost, who would be responsible for working with academic advisors, COMPASS (now the Waino Wahtera Center for Student Success), and ExSEL;
- Planning and implementing assessment of academic advising on an institution-wide, continuous cycle;
- Expanding the role of the current advisor for general sciences and arts to include undecided, exploring and re-admitted students;
- Set standards for advising and assure that departments have adequate resources to meet those standards.

There has been and is a designee in the Provost area that is tied to academic advising and connected to advising needs, advising training and professional development. Currently, the Registrar and a volunteer advisor representative serve as co-chairs for the University Advising Council. The Advising Council has advisor membership from each school and college as well as representation from the Registrar's area, Student Affairs Information Services and the Waino Wahtera Center for Students Success. This group, along with efforts from other advisors, have been critical in creating some shared resources that have the potential to create common standards for academic advisors like the AdvisorHub, a Google site dedicated to advising information and the Canvas Advising Course, an online advising curriculum for students that advisors can opt into utilizing with their population.

Assessment for academic advising has not been centralized beyond questions on the Undergraduate Student Satisfaction Survey conducted every other year or one-time participation in additional topical areas on surveys like NSSE. Individual advisors may gather feedback, but it is not clear who does that or with what frequency. The Canvas Advising course includes some potential checkpoints for assessment, but the course is not used consistently across advisors.

The advisor for the General Arts and Sciences program is commonly referred to as the "Exploring Majors" advisor. While this advisor had often met with students who had questions about their major

choice, there has been far more traction in getting information out to students. The Exploring Majors advisor is a member of the Scholastic Standards Committee, the group that reviews academic appeals and requests for reinstatement. Each student who has an appeal granted or is reinstated is assigned to meet with an appropriate staff member to develop an academic plan, essentially a plan for success for the current semester. This advisor meets with some of these students as well as many students who are referred to them for direction and information about major choice. Additionally, they teach sections of the course “Exploring Majors at Michigan Tech” each semester, a requirement for incoming students in the SGSA program but open to all students. The advisor is also an ambassador for major exploration, giving presentations at Orientation and throughout the year.

There is still a wide variance among advising loads and expectations for individual programs, regardless of school or college. Faculty and staff advisors have a variety of commitments that extend beyond the scope of their roles and have to strategize to address commitments. High volume times like the first week of the semester and registration are especially stressful points in the academic year. Training, especially for new advisors, is decentralized and inconsistent even when advisors often volunteer to help one another.

AQIP Student Success Initiative

The 2012 AQIP Action Project focused on reviewing first-to-second year retention rates, six-year graduation rates and time to degree completion. At the time the group recommended setting goals of 85% for first-year retention and 70% for six-year graduation rates. To impact those rates an initiative aimed at first-year retention was suggested, to be developed by a task force connected to areas who would be critical its development and success.

The Student Success Initiative (SSI) was suggested to address first-year students that were considered to be potentially “at-risk” for retention/graduation. The students identified to be participants were receiving need-based aid through Michigan Tech in the form of an Undergraduate Student Award (USA). A course, UN1005: Initiatives for Success was developed and implemented for fall 2013. The course captured aspects of other success courses like best practices for college students and developing community while also requiring a learning center component (from the Multiliteracies Learning Center, the Chemistry Learning Center, or the Math Learning Center).

The intention was to run the initiative for a minimum of three years, with adjustments made to the original programming as needed. Review of the retention of the first two cohorts indicated that the programming wasn’t improving performance for this group and they were still significantly below firstyear retention at the time. The major difference between this initiative and other efforts on campus like participation in Pavlis Honors College, a residential themed community or ExSEL is that the SSI was required and not something that students opted in to. The decision was made to discontinue this initiative and put focus on other opportunities. There were still positive residuals from this pilot. Instructor feedback (from individual meetings and in class participation) indicated that students felt they may not have used a learning center in their first semester if they had not been required to do so for class and that it encouraged them to use other learning centers.

Learning Center Task Force

There were several recommendations from the task force including:

- Standardized training that includes expectations around Title IX, FERPA, University policies, student learning;
- Tracking how many and who uses the learning centers and their academic success
- Department support for centers--a minimum of one faculty director involved in the day-to-day functions of the Center;
- Centers explore options for space to host group events to take some of the burden off individual tutoring and help;
- An individual responsible for the coordination of centralized activities for all learning centers including regular meetings with learning center coordinators and/or a board;
- Formal establishment of an “Engineering Learning Center” that focuses on foundational skills and knowledge from more than one department or discipline (i.e. statics, circuits, dynamics);
- Revisit whether an end of the year banquet is necessary or if it could be scaled back and or if there could be events each semester;
- Establish basic requirements for a learning center to be considered a “Michigan Tech Learning Center” and receive funds from the Provost.

The “core” learning center group has been meeting regularly, typically once a semester, for a few years. In fall 2017, post-task force, the group has been very diligent about setting standards for University Learning Centers and are vetting area participation by the recommendations referred to in the original report: participation in coaches in a mandatory training, gathering of data via the University’s standard software and participation in the monthly activities convened by the Core Learning Center Group Coordinator.

In 2017-18, all the original “core” learning centers: the Multiliteracies Center, Math Learning Center, Chemistry Learning Center, Computer Science Learning Center, Physics Learning Center, with the additional of Academic Success Coaches met regularly. The First-Year Engineering Learning Center joined the group in the summer, prior to fall training. The group has been exceptionally productive around developing and implementing training and offered a combination of Canvas and in-person training for all coaches (new and returning) in both fall 2018 and spring 2019. Door tappers are being used to track attendance and a WebFocus form has been created that uses the collected information and allows for easier report generation.

The monthly meetings are well attended and as of February 2019, the Biology Learning Center had joined the post-task force core learning center group. Much progress has been made on training (another session was offered in spring 2019), data collection, ensuring “learning centers” have designated space and staff, and generally sharing of best practices. More needs to be done to address other suggestions from the task force, but the group is cohesive and motivated.

Appendix III. Best Practices

In *Leaving College, Rethinking the Causes and Cures of Student Attrition*, Vincent Tinto identifies five categories of retention strategies: transition assistance, early contact and community building, academic involvement and support, monitor and early warning, and academic counseling and advising. Similarly, the Hanover Research group describes seven constructs that influence student retention. These include academic advising, social connectedness, student involvement, faculty and staff approachability, business procedures, learning experiences, and student support services. The recent APLU Draft of the Student Journey Framework would add financial assistance and health and wellbeing to both lists. Examples of programs and services that support these categories/constructs are below.

Another key finding in the Hanover Research Report was that few colleges allocate the necessary resources to impact long-term change. This was reiterated in Florida State University’s Report on Improving Retention and Graduation Rates. Not only were resources necessary, but the Florida report also argues for:

- an individual to drive retention efforts;
- a process, based on detailed data, be developed, measured, and monitored for a five-year period;
- a team of individuals from across campus who are committed to student success and who meet weekly to assess progress. (p.4)

Most recently, [Georgia State University](#) has been held up as a national model for student success. They base their success on the use of predictive analytics to track all their students. For example, armed with data, they have been able to effectively intervene to improve advising (responding when a student receives their first C), establish a summer success academy for at-risk students, develop adaptive learning software for introductory classes, provide mini grants to students whose tuition shortfall might have resulted in their dropping out. Investing in these, and other programs, GSU has increased their graduation rate by 23 percent over the last ten years.

Best Practice Retention Strategies

| Category/Construct | Examples |
|---------------------------|---|
| Transition assistance | <ul style="list-style-type: none"> ● Bridge programs ● Learning and study skills courses ● Pre-arrival contact ● Parent contact |

| | |
|--|--|
| <p>Early contact and community building Social connectedness Student involvement Faculty/staff approachability</p> | <ul style="list-style-type: none"> ● Peer mentoring or success coaching ● Campus activities, clubs and organizations ● Living/learning communities ● Places for socializing ● Orientation ● On campus employment ● Structured first-year student/faculty interaction through seminars, meals, dialogue ● Faculty mentoring program |
|--|--|

| | |
|--|---|
| | <ul style="list-style-type: none"> ● Incentivize faculty interactions |
| <p>Academic involvement/Learning experiences</p> | <ul style="list-style-type: none"> ● Small classes in the first year ● Courses designed specifically for the beginning students ● Establish collaborative learning models ● Faculty training ● Emphasize the growth mindset ● Examine courses with a high percentage of D,W,F grades ● Involve students in research ● Take attendance ● Expand opportunities for high-achieving students---honors college, fellowships |
| <p>Academic advising</p> | <ul style="list-style-type: none"> ● Invest in appreciative/developmental advising model ● Use predictive analytics to reach out to students in need of support ● Integrate advising as part of the educational process ● First-year advising centers ● Required advising meetings ● Provide advisor training |

| | |
|--------------------------|--|
| | <ul style="list-style-type: none"> ● Online degree audit systems ● Drop in advising ● Provide support for undecided students ● Strategic engagement between faculty and advisors |
| Early warning system | <ul style="list-style-type: none"> ● Use predictive analytics to “catch” students having difficulties as early in the term as possible ● Structured system to nudge faculty to report concerns so outreach can occur ● Develop an infrastructure to intervene ● Develop a system that focuses communication on content, tone, and effective delivery ● Develop a “map” of critical courses--if the courses are not successfully completed, put a hold on and require an advisor meeting |
| Business procedures | <ul style="list-style-type: none"> ● Provide high quality service ● Eliminate bureaucratic policies that are barriers to student success |
| Student support services | <ul style="list-style-type: none"> ● Offer tutoring services ● Academic success coaching ● Special programming for first generation and Pell students |
| Financial assistance | <ul style="list-style-type: none"> ● Improve communication about financial aid ● Learn and earn grants ● Finishing fellowships ● Mini-grants to address tuition shortfalls |
| Health and Wellbeing | <ul style="list-style-type: none"> ● Belonging/Growth mindset interventions ● Prevention programs--fitness, yoga, nutrition, mentoring |

- Integrated wellness programming- courses, minors, residence halls, research, speakers

Appendix IV. Current Academic Advising Student Workloads

| 2018-19 Academic Advising Student Workloads | Total Undergraduate Enrollment | Advisor | Primary Type of Advisor |
|--|---------------------------------------|-----------------------------|--------------------------------|
| Biological Sciences (Biochemistry & Molecular Biology, Bioinformatics, Biological Sciences) | 139 | Marc Madigan | Staff |
| Biomedical Engineering | 293 | Michael LaBeau | Staff |
| Business and Economics (School of) | 319 | Jodie Filpus-Paakola | Staff |
| Chemical Engineering | 459 | Katie Torrey | Staff |
| Chemistry | 60 | Jeremy Brown | Staff |
| Civil and Environmental Engineering | 519 | Julie Ross | Staff |
| Computer Science | 489 | Sarah Kuhl | Staff |
| Electrical and Computer Engineering | 649 | Judy Donahue/Trever Hassell | Staff |
| Engineering Fundamentals (Bachelor of Science in Engineering (geospatial, mining, systems), General Engineering (undecided)) | 130 | Amy Monte | Staff |

| | | | |
|---|------|---|---------|
| "Exploring Majors"/Sciences and Arts Undeclared | 33 | Sylvia Matthews | Staff |
| Forest Resources and Environmental Sciences (School of) | 168 | Stacey Cotey | Staff |
| Geological and Mining Engineering and Sciences (Applied Geophysics, Geology, Geological Engineering) | | Jeremy Shannon/John Gierke | Faculty |
| Humanities (Humanities, Liberal Arts, Communication, Culture and Media, English, Scientific & Technical Communication) | 65 | Maria Bergstrom | Staff |
| Kinesiology and Integrative Physiology (Exercise Science/Sports and Fitness Management) | 87 | Kathryn Carter | Staff |
| Materials Science and Engineering | 122 | Dan Seguin | Staff |
| Mathematical Sciences (Actuarial Science, Applied and Computational Mathematics, Business Analytics, Discrete Mathematics, General Mathematics, Statistics) | 88 | David Olson, Mark Gockenbach, Melissa Keranen, Qiuying Sha) | Faculty |
| Mechanical Engineering/Engineering Mechanics | 1447 | Ryan Towles/Trish Stein | Staff |
| Medical Lab Science | 81 | Karyn Fay | Faculty |
| Physics | 53 | Ravi Pandey/Katrina Black/Robert Weidman) | Faculty |
| Psychology | 42 | Susan Amato-Henderson | Faculty |

| | | | |
|----------------------------|-----|--|---------|
| Social Sciences | 26 | Susanna Peters/Carl Blair/Laura Walikainen Rouleau/Kari Henquinet | Faculty |
| Technology (School of) | 357 | Danise Jarvey | Staff |
| Visual and Performing Arts | 57 | Josh Loar, Christopher Plummer, Patricia Helsel, Mary Carol Friedrich, Kent Cyr | Faculty |

These counts were taken from the University Compendium and Banner/WebFocus (as necessary).

Appendix V: Retention and admission data

Table 1: First to Second Year Retention Rates

| | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 |
|-------------------|---------|---------|---------|---------|---------|
| Michigan Tech | 82 | 85 | 87 | 83 | 83 |
| BLM R2 Benchmarks | 77 | 78 | 78 | 78 | 78 |
| Colorado Mines | 92 | 94 | 94 | 92 | 93 |
| MSU | 91 | 92 | 92 | 91 | 92 |
| Missouri U.S.T | 83 | 86 | 87 | 83 | 81 |
| Northern Michigan | 72 | 73 | 74 | 75 | 78 |
| Wayne State | 77 | 76 | 77 | 72 | 71 |

Table 2: Retention, graduation and class profile

| School | ACT Middle 50% | High School GPA | 1 st -2 nd Yr. Retention | 6 Yr. Graduation Rate | Acceptance Rate | Pell Eligible Students |
|--------------------------|----------------|-----------------|--|-----------------------|-----------------|------------------------|
| Michigan Tech | 25 - 30 | 3.54 - 3.99* | 83.40% | 66.50% | 75% | 24% |
| Colorado School of Mines | 30 - 34 | 3.75 - 4.00* | 92% | 78% | 49% | 15% |
| Missouri Univ. S&T | 25-31 | 3.64 | 81% | 63.30% | 84% | 26% |
| WPI | 28-32 | 3.86 | 94.9 | 84.40% | 48% | 12% |
| Purdue | 25 - 32 | 3.50 - 3.90* | 91.60% | 81.20% | 57% | 18% |
| U. of Michigan | 31 - 34 | 3.88 - 4.00* | 97% | 90% | 26% | 15% |
| Michigan State | 24-29 | 3.5-3.9* | 91% | 79% | 66% | 23% |
| Wayne State | 21-28 | 3.36 | 82% | 45% | 67% | 45% |
| UW-Madison | 28 - 32 | 3.80 - 4.00* | 95.40% | 87.30% | 54% | 13% |

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