Program-Specific Report Deliverable

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Our team created this Program-Specific Report as a deliverable within our project, Evaluating Program Compliance with ABET Standards within the College of Engineering at the International University of Rabat (UIR). This project fulfills the Interactive Qualifying Project (IQP) Degree Requirement of our university, Worcester Polytechnic Institute.

Our team has compiled findings in both words and visuals as well as recommendations for the UIR College of Engineering's Energy Engineering program. These findings were created based on data collected from direct and indirect evaluations of the program. We conducted a direct evaluation by analyzing course syllabi, which included a general examination of formatting, completeness, and contradictions within them as well as a more in-depth assessment of its alignment of course outcomes and student outcomes. We completed an indirect evaluation of the program by creating and distributing surveys as well as conducting interviews. These were carried out on four UIR stakeholder groups: students, faculty, alumni, and employers.

Implementing or further investigating these recommendations will propel the Computer Science program toward better alignment with ABET Accreditation standards.

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Introduction

Our team completed an accreditation review for the Energy Engineering program. We believe that this program has many positive aspects, but there are also many areas that need to be improved to align with ABET standards. A majority of these are laid out in the following sections.

Students Lack Skills in Various Tools and Softwares

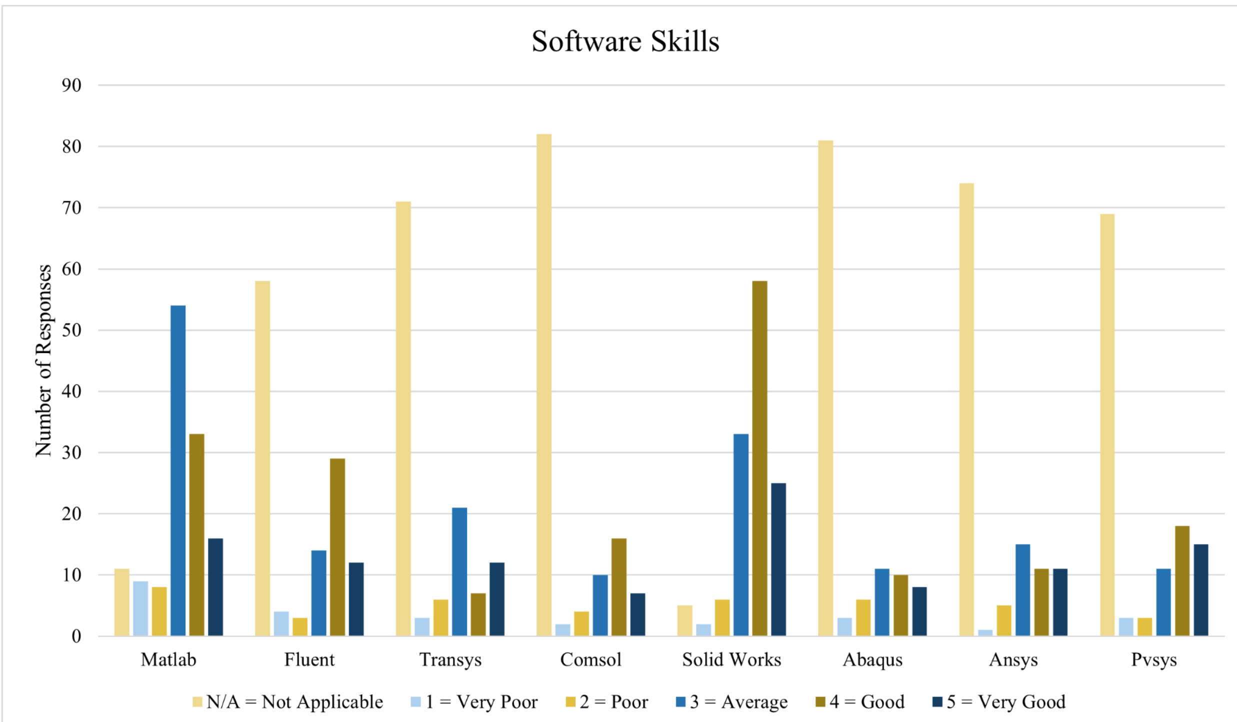


Figure 1: Student Survey Responses Rating Software Skills

Students were asked to evaluate their skills on various softwares and tools. Overall, 46% of the students' responses were Not Applicable meaning they have not been introduced to the software or do not think it is necessary to learn before graduation. Additionally, 13% of the responses (not inclusive of N/A ratings) rated their skills “Poor” or “Very Poor”.

It is imperative that students are introduced to the necessary softwares to succeed in the industry post-graduation. In the first two years we suggest students are introduced to at least two-three softwares. Furthermore, many students noted that they did not learn the basics of certain softwares before they were expected to use them for coursework. If a student is expected to be proficient in any programs or softwares, they should be provided small opportunities in preparatory classes to practice and ask any questions.

It is important to note that our team was not given the specific programs and softwares that are most important to learn when studying Energy Engineering, so this data may not be representative of the true skills of students. If a survey is sent out in the future, our team recommends including the specific tools, programs, and softwares when asking students to rank their proficiency in them.

Students Do Not Rate the Classroom Environment Highly

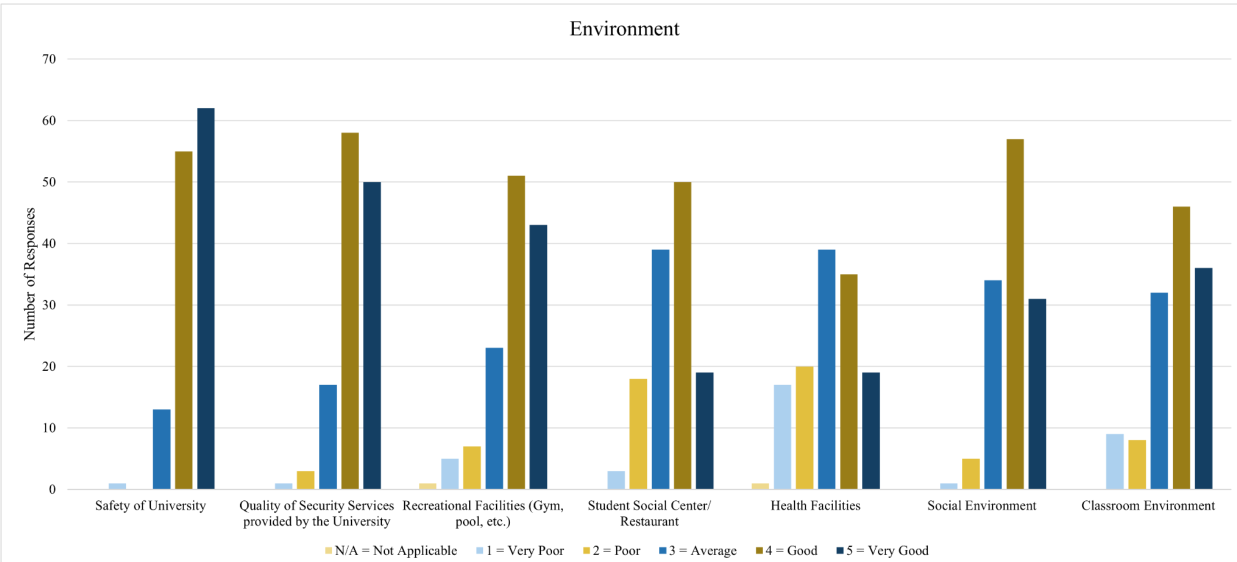


Figure 2: Student Survey Responses Rating Campus Environments

The various environments and spaces on campus, such as their social environment, the recreational facilities, and restaurant were rated by students. While most of these ratings were positive, the health facilities and classroom environment were ranked negatively more frequently. In fact, almost 13% of respondents rated the classroom environment as “Poor” or “Very Poor”. In the Aerospace and Automotive Engineering program as well as the Computer Science program, the classroom environment was ranked very positively.

The Health Facilities received an even more negative rating, with 20.6% of respondents rating it a 1 or a 2. It should be noted, however, that the low ranking of the university’s health services was consistent across all four programs we evaluated. This is not unique to students in the Energy Engineering program but should be addressed with administration if possible.

The classroom environment can be very indicative of how confident students are in a formal learning setting. While this question on our survey did not ask respondents to expand on why they chose their ranking, our team inferred that the classroom environment does not foster as much confidence and drive within students as it should. While 13% of the student population is fairly small, it is still important to address the discomfort that students feel in this area. We recommend assessing what the current classroom environment is like and from there making improvements where possible.

In terms of the low ranking of health facilities, our team recommends notifying UIR about this issue. It was prevalent throughout the programs we assessed and it is likely that students, even outside the College of Engineering, have similar feelings and attitudes about those services.

Quality of Language Lessons Should be Improved

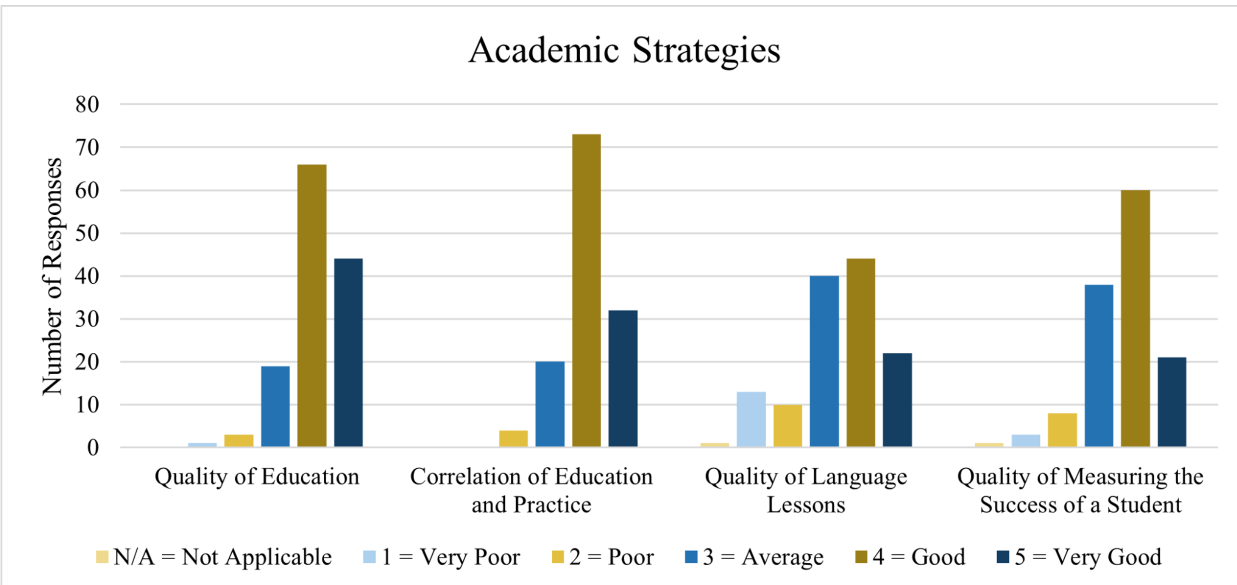


Figure 3: Student Survey Responses Rating different Academic Strategies

While students are generally happy with the quality of education they are receiving, the correlation of education and practice, and how their success is measured, students rated the quality of language more negatively overall. Almost 18% of the student responses indicated discontent in this area and the majority of responses came from students in their first and second year. This idea was confirmed in interviewing students in the Energy Engineering program. 66% of students we spoke with noted that the language offerings within their academic career are very limited and they wish they had the opportunity to go more in-depth in the languages they are studying. They also shared that they wish more languages were offered by UIR.

Our team recommends that language courses are offered in more than just English. Many students enter the Energy Program with a good understanding of French and they are able to practice English conversation and comprehension in their courses, as it is the language of instruction. The language courses that are offered should be more comprehensive and allow students excelling in the courses to have additional resources for learning that language more in-depth or beginning to study an additional language.

Students Express a Negative Sentiment toward Campus Computer Facilities

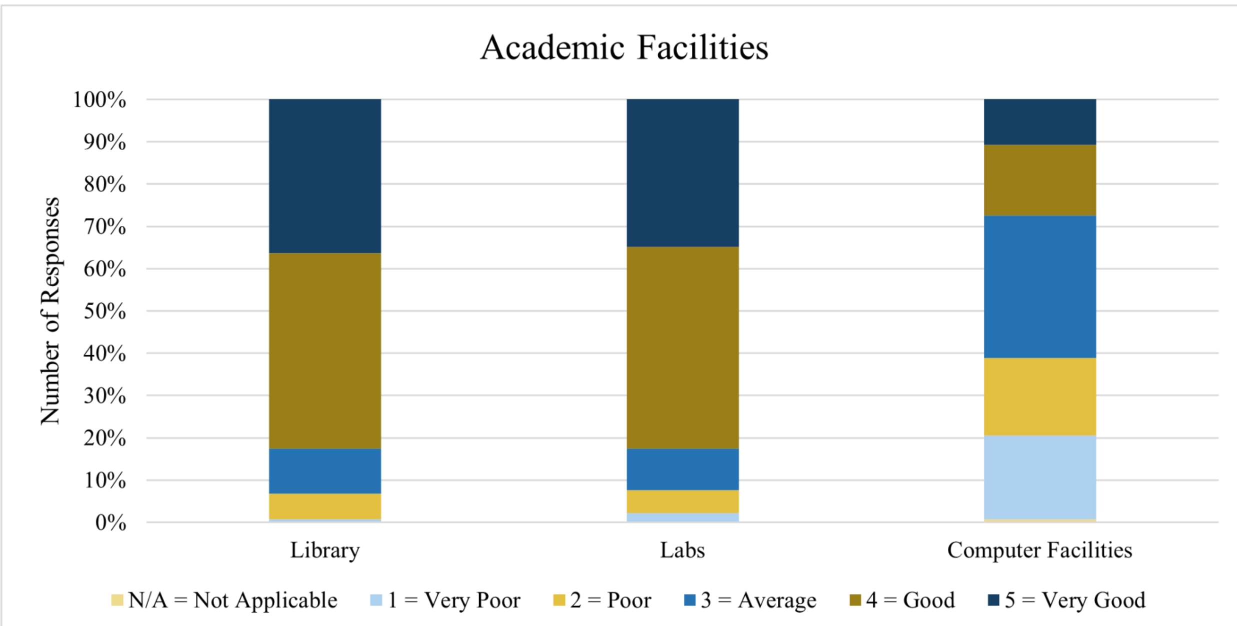


Figure 4: Student Survey Responses Rating Academic Facilities

As shown above, the campus library and laboratories that Energy Engineering students utilized are positively ranked by them. Computer facilities, on the other hand, are perceived more negatively. There are far more responses indicating the computer labs and facilities are “Poor” or “Very Poor”. Students and faculty alike shared that components to computers, such as keyboards, are often missing or damaged and the computers themselves do not run very efficiently.

As our team noted in the general findings report for all four programs we evaluated, programs need to provide more funding for the maintenance and upkeep of their campus technologies. Students tend to rely on the university computers to complete coursework. Once the university is able to well-maintain the equipment they already have, our team suggests investing in more computers that function well and do not cause such a struggle for those trying to use them.

Students in their Fourth Year Rank their Abilities within ABET Student Outcome 5 Poorly

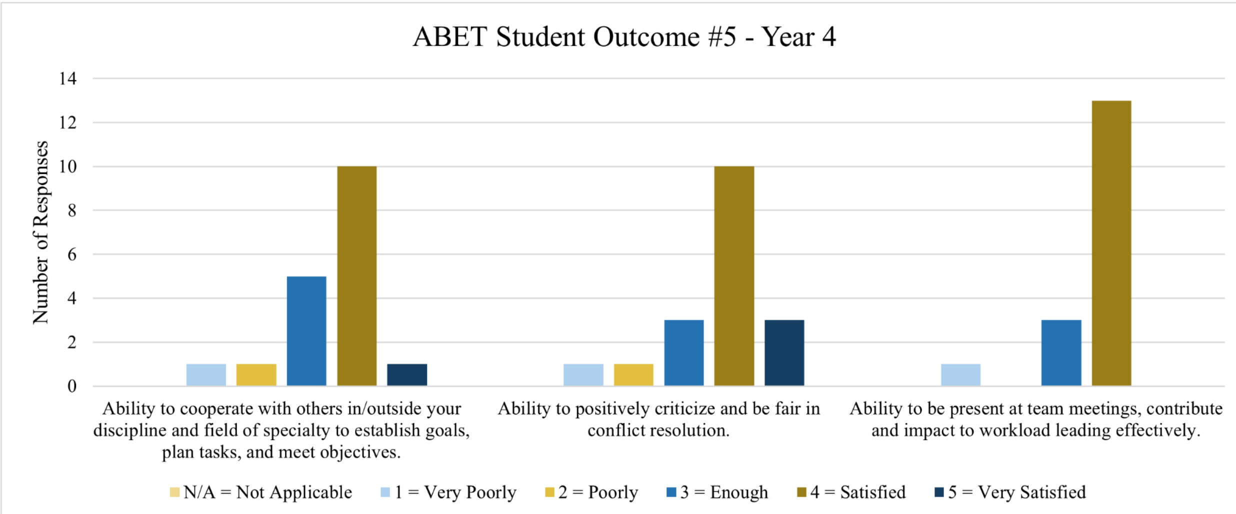


Figure 5: Fourth Year Students Ranking their Abilities within ABET Student Outcome 5

In the fourth year of a student's academic career, they should generally rate their comfort and ability to perform specific ABET Student Outcomes at a three or higher. While the number of "Very Poor" and "Poor" ratings of their ability in Student Outcome 5 is not very high, it is important for the Energy Engineering program to know that some students, this far along in their education, are still not comfortable working on teams.

Our team recommends including more group work in their courses, but emphasizing the development of team dynamics, conflict resolution, accountability, and a fair distribution of work. As engineering students, it is extremely important to perform well on teams as it is a majority of the work present in industry. While students note they collaborate with one another often, it seems like the Energy Engineering students would benefit from more structured group projects or teamwork that are included in their final grade. Once again, we stress that it is imperative for energy students to develop all the skills within Student Outcome 5. This includes, as seen in the chart above, the ability to cooperate with others, establish goals, plan tasks, meet objectives, succeed in conflict resolution and constructive feedback, and equally contribute on project teams.

Students Overall Rank their Abilities within ABET Student Outcomes Highly

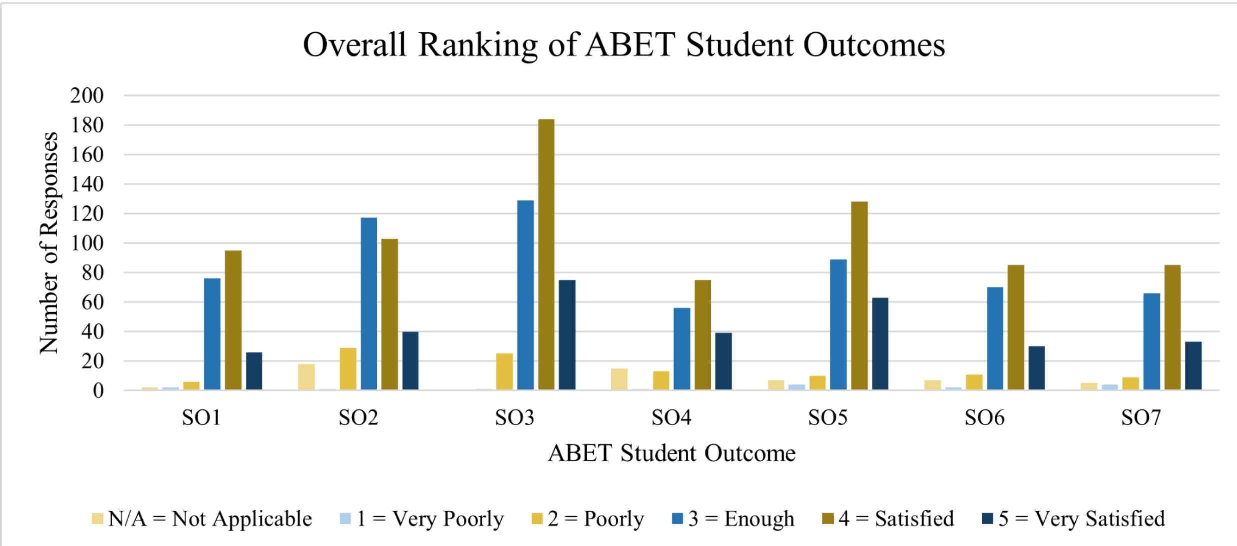


Figure 6: Student Survey Responses Rating Abilities within ABET Student Outcomes 1-7

The visual above represents the overall student ranking from all students in the Energy Engineering program in years one through four. The majority of these bar graphs are left-skewed indicating that students in every year are fairly confident in their ability to perform the student outcomes outlined by ABET. Our team has included this finding to convey the fact that students are learning each of the abilities needed to succeed in the industry post-graduation. However, the syllabi and course documents rarely show the alignment between course and student outcomes.

In order to obtain ABET accreditation, the program must prove that they have documented all alignments between courses and the ABET standards. Correctly aligning course syllabi and course assessments with these outcomes will prove to an ABET Accreditation Team that the Energy Engineering program has a plan for students to meet these success standards. This type of effort will take extreme collaboration from all faculty members to adapt their current course outcomes, assessments, and syllabi.

Please see the general findings below for our team's recommendations on helping faculty understand ABET accreditation and its benefits as well as the ways in which the physical documentation of the program's success and compliance with ABET standards.

Lack of ABET Understanding

It was important for our team to get an idea of faculty's understanding of ABET accreditation and their feelings regarding the program pursuing it. We did this in our interviews with them, which led to another important finding. Based on the faculty responses, we realized they have very little knowledge and understanding of what ABET accreditation is and its benefits, and did not feel that the program could achieve it. When asked directly what they thought of the school pursuing accreditation, most said that the cost would outweigh the benefits. They felt there was too much work to do for it and the process was too difficult for the program to become accredited. This is why our team believes there may be opposition from faculty regarding pursuing accreditation. It is important for all faculty and staff to thoroughly understand ABET and the benefits of accreditation before they are expected to submit to the evaluation process and submit all the necessary materials.

The faculty's lack of understanding will greatly impact the willingness to adopt any other recommendations made for each program, so a precedence should be set on addressing it first. Our team recommends explaining ABET and its benefits to faculty members, hearing their concerns, and answering their questions about accreditation and its processes before expecting them to support all the changes. This implementation could take time, but seminars on the accreditation efforts, infographics, or other means of conveying this information could be greatly beneficial in continuing the efforts of improvement within each academic program.

Once faculty members are well-versed on what the accreditation process entails and the direct benefits they will see in the future, our team believes that opportunities to practice course outcome creation and syllabus development in the French language would be well-received. We offer this suggestion in hopes of increasing faculty's understanding of ABET and, in turn, their willingness to adapt their course structure and methods of assessment.

Course Outcome and Student Outcome Alignment

A major finding that our team came across when analyzing the Energy Engineering program syllabi was the errors regarding course and student outcome alignment. Specifically, many of the course outcomes do not reflect every aspect of a course as denoted in the syllabus. Often, there were areas that a course should have aligned with multiple student outcomes, but the verbiage in the CO didn't show the proper alignment. This was especially prevalent for SOs 4 and 5. Figure __ below, shows this uneven distribution of SOs throughout the Energy program. As is with all tree maps, the size of the box indicates the frequency of alignment.

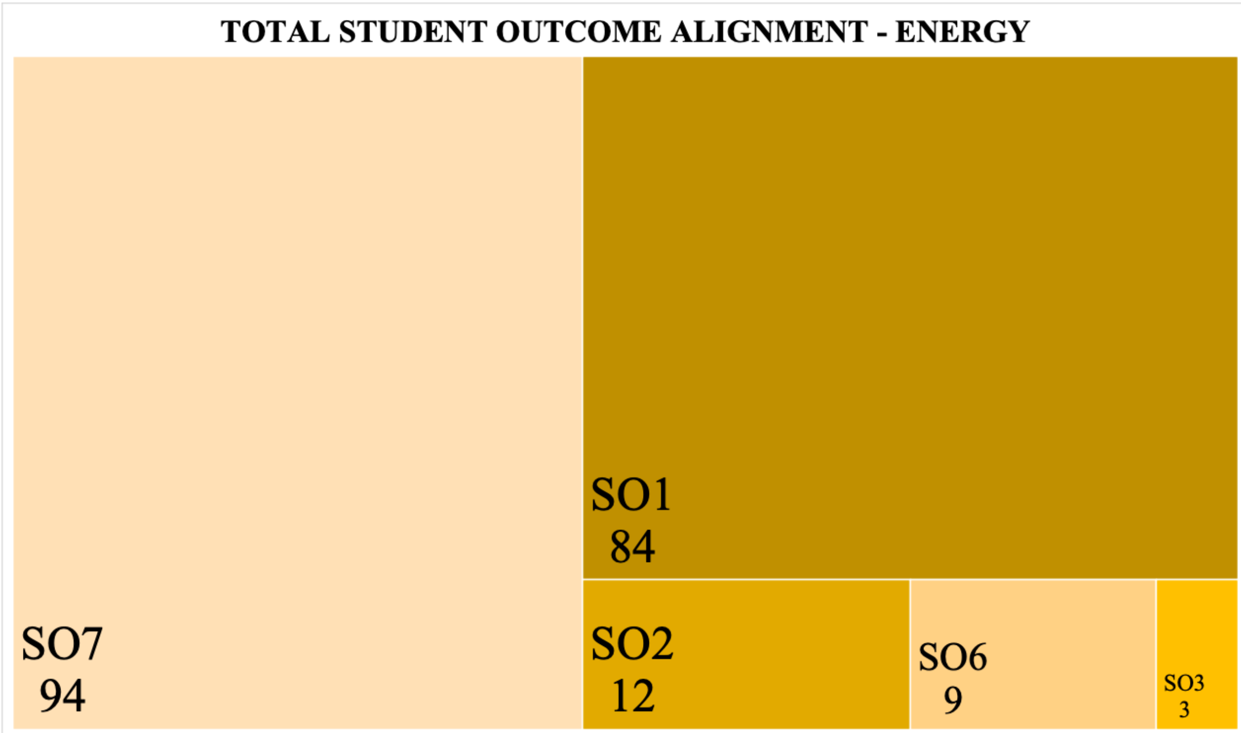


Figure 7: The Total Student Outcome Alignment within the Energy Engineering Program

This visual shows how a majority of COs align with Student Outcomes 1 and 7, and very few align with the other SOs. Student Outcome 7 aligns with 94 of the 95 COs, which amounts to 98.95% of all course outcomes. Comparing this to the other SOs the imbalance is clear, especially when looking at Student Outcomes 4 and 5 which do not align with a single course outcome from any of the syllabi we were given. Our team also broke this distribution down by year to determine if there was a change depending on the year of the program. Figures __ through __ below display the student outcome alignment for years one through five of the Energy program.

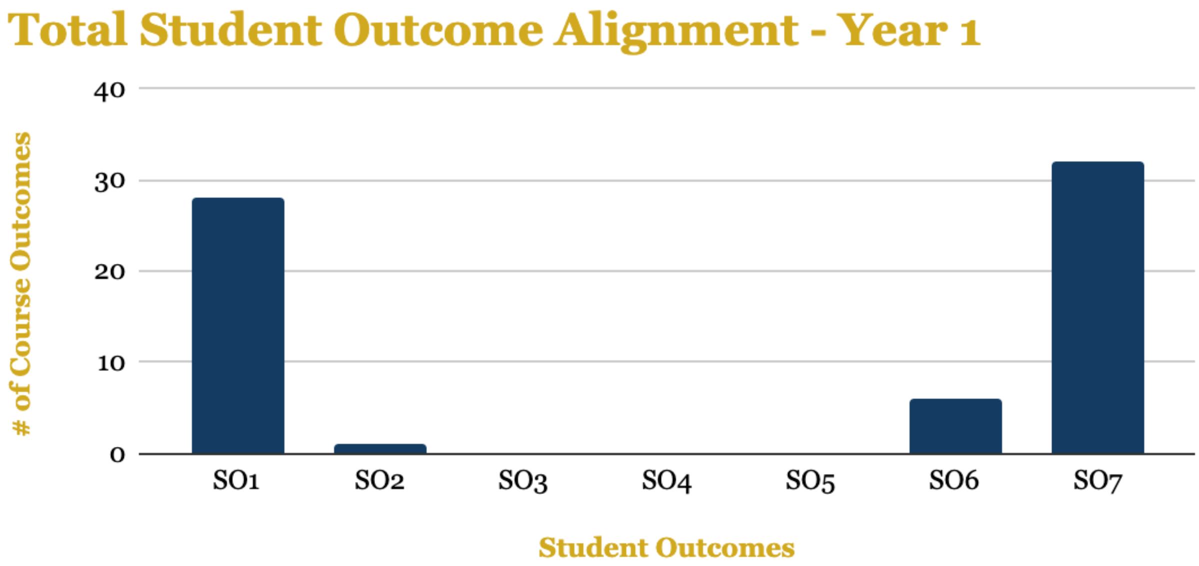


Figure 8: Total Student Outcome Alignment for Year 1 within the Energy Engineering Program

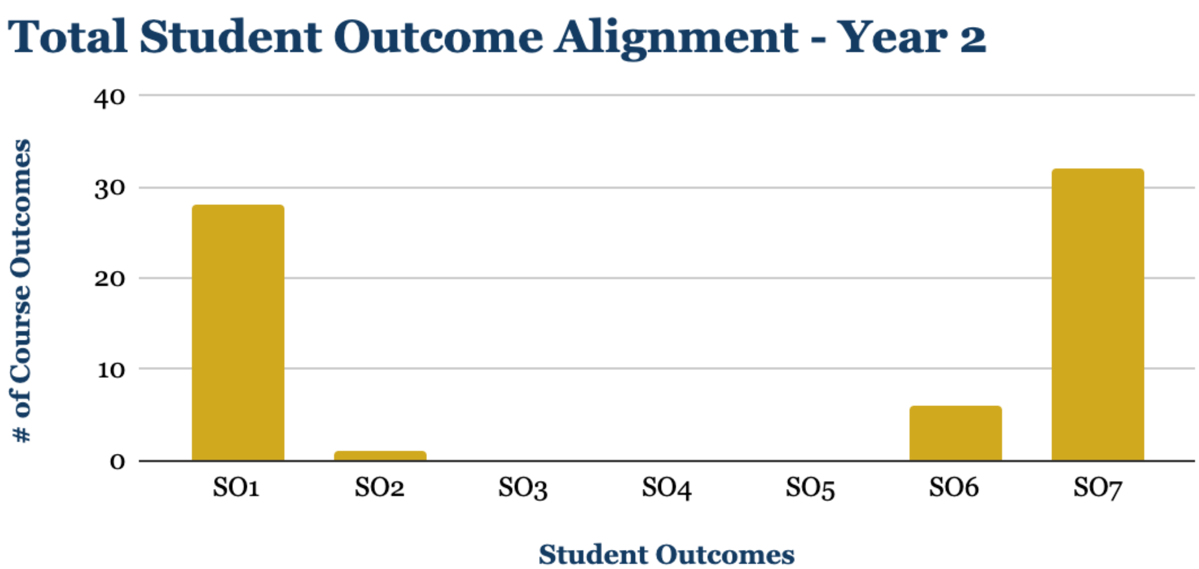


Figure 9: Total Student Outcome Alignment for Year 2 within the Energy Engineering Program

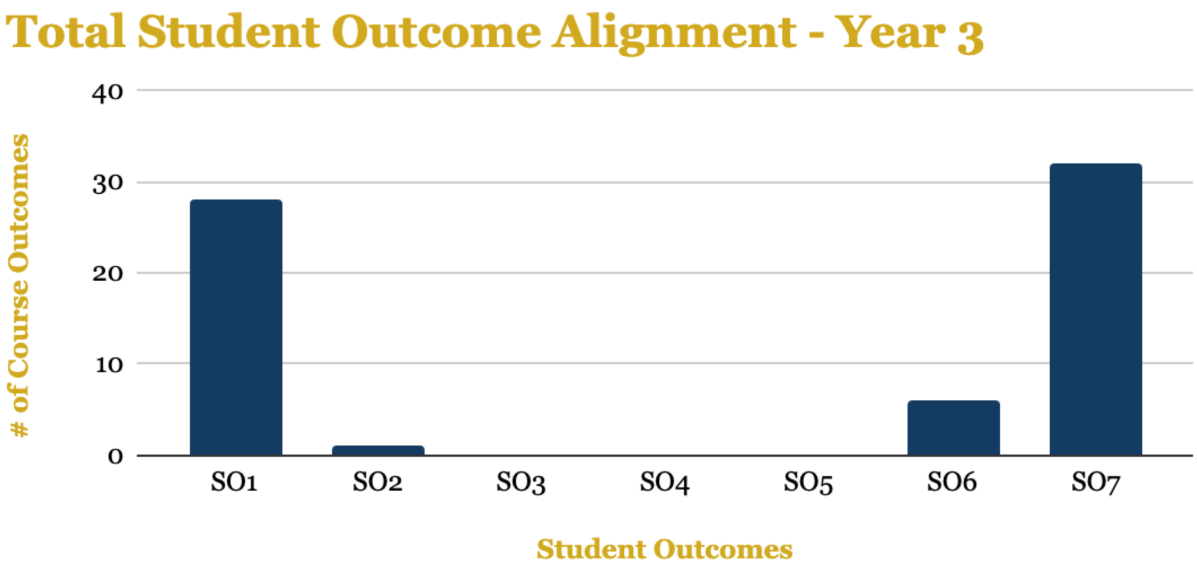


Figure 10: Total Student Outcome Alignment for Year 3 within the Energy Engineering Program

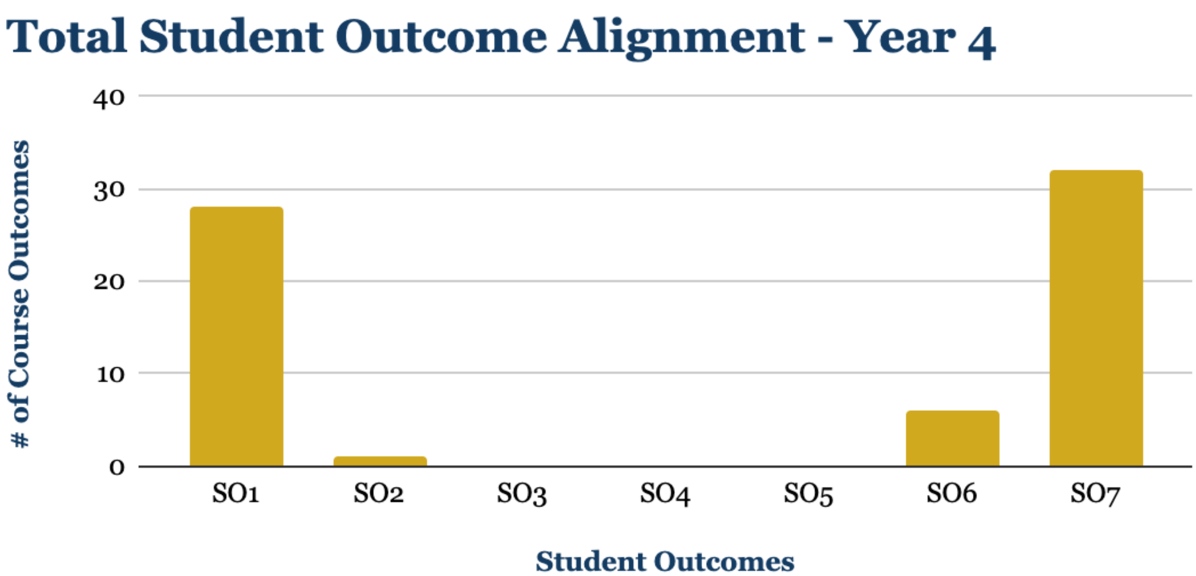


Figure 11: Total Student Outcome Alignment for Year 4 within the Energy Engineering Program

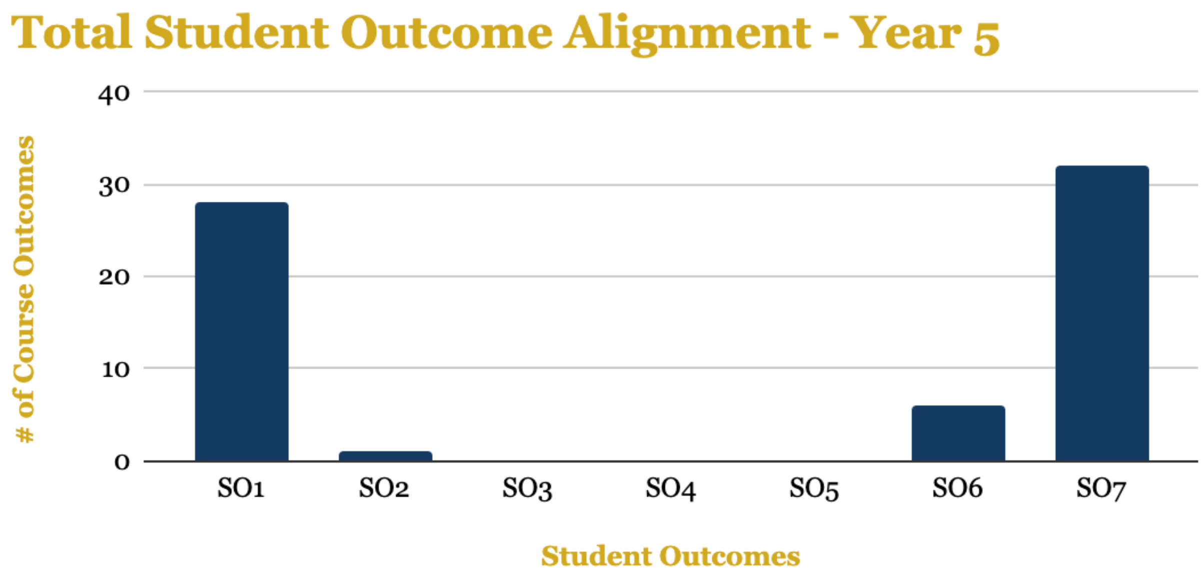


Figure 12: Total Student Outcome Alignment for Year 5 within the Energy Engineering Program

As the charts above show, the issue of uneven student outcome distribution is not within a specific year or two. All years show a promising amount of alignment with SO 6, but it is still much less prevalent than the other student outcomes. Overall, the issue of uneven student outcome distribution is very prevalent throughout all five years of the program and needs to be addressed.

When analyzing the syllabi, there were many instances of discrepancies between the course outcomes and the topics outlined on the syllabus, as mentioned earlier. While this is seemingly irrelevant, it directly makes the issue of uneven distribution more drastic. It is very important to ensure that all aspects of a course are mentioned in the course outcomes. This makes sure that wherever there is alignment of COs and SOs, the mapping demonstrates it. In the Formal Syllabi Notes for the Energy program, our team flagged eight out of the twenty-nine syllabi that needed to verify if teamwork was a component of the course, whether this be in lab experiments, group projects and assignments, or any other area. None of these courses aligned with Student Outcome 5 (which is based on teamwork), but there was some mention of it in the course. This issue is prevalent with other student outcomes also, specifically SOs 2 and 6. Many syllabi mapped course outcomes to these two student outcomes as well, but there was no verbiage in the COs to show alignment.

One thing that stood out positively from the Energy Engineering syllabi, was that the course syllabi had the appropriate amount of course outcomes, which is considered five or less. All the syllabi we were given had four or less outcomes, which is very satisfactory. An evaluation of the rest of the syllabi should be done to ensure this is consistent throughout the remainder of courses within the program.

The Formal Syllabi Notes document for the Energy program should be utilized to fix these errors. In order to correct these course and student outcome alignment issues, the course outcomes must be rewritten in each individual syllabus to ensure that courses are focusing on more than just SOs 1 and 7. The document provides specific phrasing suggestions that fully encapsulate the components of a course within its COs. A specific example from an Energy school syllabus is shown in Figure __below. The syllabus notes that this experiment is done in a group and consists of a final presentation, but due to the verbiage of the CO it only correlates to Student Outcomes 1, 6, and 7. Expanding the CO slightly to include all aspects of the experiment, as shown below, the outcome would then align with SOs 3 and 5 as well as SOs 1, 6, and 7.

CO1: "Design and conduct experiments and basic data analysis based on heat transfer measurements"

↓

"Design and conduct experiments and basic data analysis based on heat transfer measurements **and explain the process and findings in a group oral presentation**"

Figure 13: Increasing Student Outcome Alignment Example

This is also a recommendation to rectify the other finding of inconsistencies between the syllabi and COs. Ensuring that there is verbiage specifically mentioning aspects of each of the SOs that a CO aligns with is crucial.

Our team was made aware that the Energy Engineering program has created video tutorials on how to map course and student outcomes for faculty. During our interviews with professors, we were told that these videos were very informative and helpful to give a better understanding on mapping outcomes. This video should be shown to all of the faculty on a recurring basis to ensure everyone is up to date with their understanding of outcome alignment.

IRE System

Throughout our analysis of the syllabi and course outcomes, there were many findings relating to the IRE system.

There is a small diagram on the bottom of the syllabi below course mapping where IRE is broken down to give professors a better idea of how to use it when mapping their COs, but the explanation itself is incorrect. On the syllabi it is laid out as seen below:

I= Introduce (Weak), **R**= Reinforce (Intermediate), **E**= Emphasize (Strong)

This explanation does not accurately describe the levels of IRE due to the connotation of each level with a degree of “Strong” or “Weak”. Course outcomes that Introduce topics and align with the I level are not weak COs, they are simply introducing a subject using I level verbs. Students are expected to understand these topics and describe them, but nothing more. It is important to have I level COs in classes that are introducing topics as most disciplines build on the information students are taught previously.

Often throughout the syllabi our team was given, course outcomes did not use IRE verbs, which made it impossible for us to map their alignment with ABET’s Student Outcomes. An example of this is shown below in Figure __. As it displays, the original course outcome uses the word “know” which is not an IRE verb. Below is a suggestion to replace this word with the verb “understand” to better align with IRE and clarify the overall message of the CO.

CO3: “Know the basic principles that govern electrical circuits.”

↓

“Understand the basic principles that govern electrical circuits”

Figure 14: Adding IRE Verbs to Course Outcomes Example

There are different variations of this happening throughout the course outcomes within the Energy Engineering syllabi that we were given, and these errors should be addressed.

The IRE distribution was another finding that our team came across when identifying the IRE verbs used throughout the course outcomes. After analyzing the spread of I’s, R’s, and E’s for each course, we found there was a very uneven distribution throughout the years of each program. When an ABET evaluation team is looking at a program, they want to see first and second year courses mainly introducing and beginning to reinforce ideas, and as the courses get harder and more major-specific, the course outcomes should mainly reinforce and emphasize topics. But this was not displayed within the Energy program. As shown in Figure __ below, the distribution of IRE levels throughout the five years within the program is very uneven.

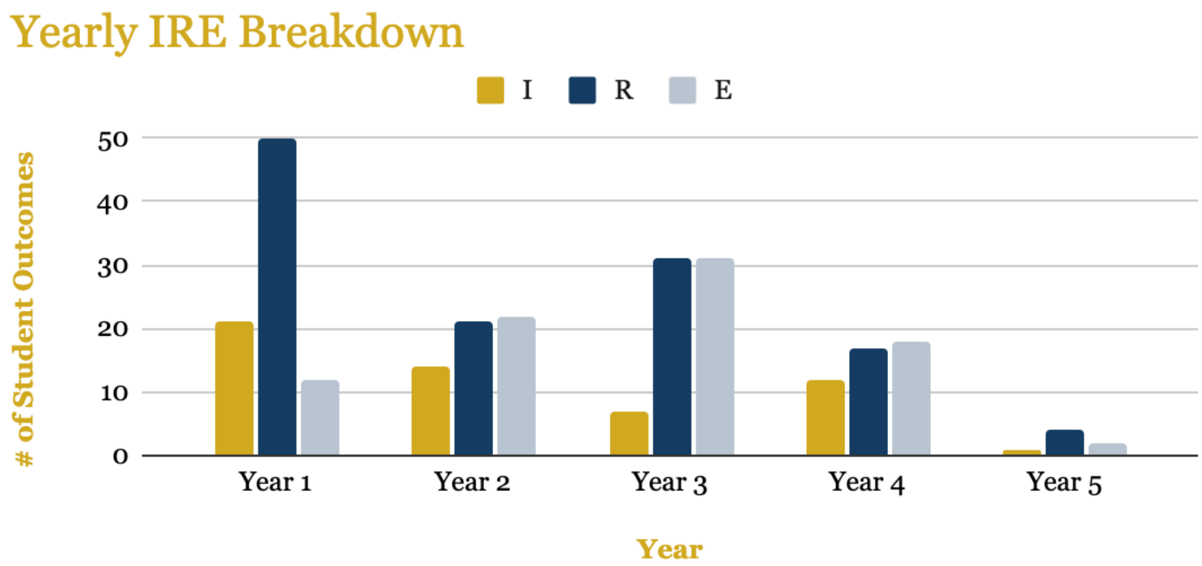


Figure 15: Yearly IRE Level Breakdown within the Energy Engineering Programs

It is important to note that within the Energy Engineering program, our team was only given one syllabi from the fifth year to evaluate, which is why the data looks uneven. But as the figure above shows, a majority of course outcomes are reinforcing topics for the first four years, and in the final year there are more outcomes that are introducing topics than any other level. The level of emphasizing topics should slowly increase throughout the program, whereas in the figure it is staying relatively stagnant and even decreasing in year five. An example of an ideal IRE yearly breakdown is shown below in Figure __.

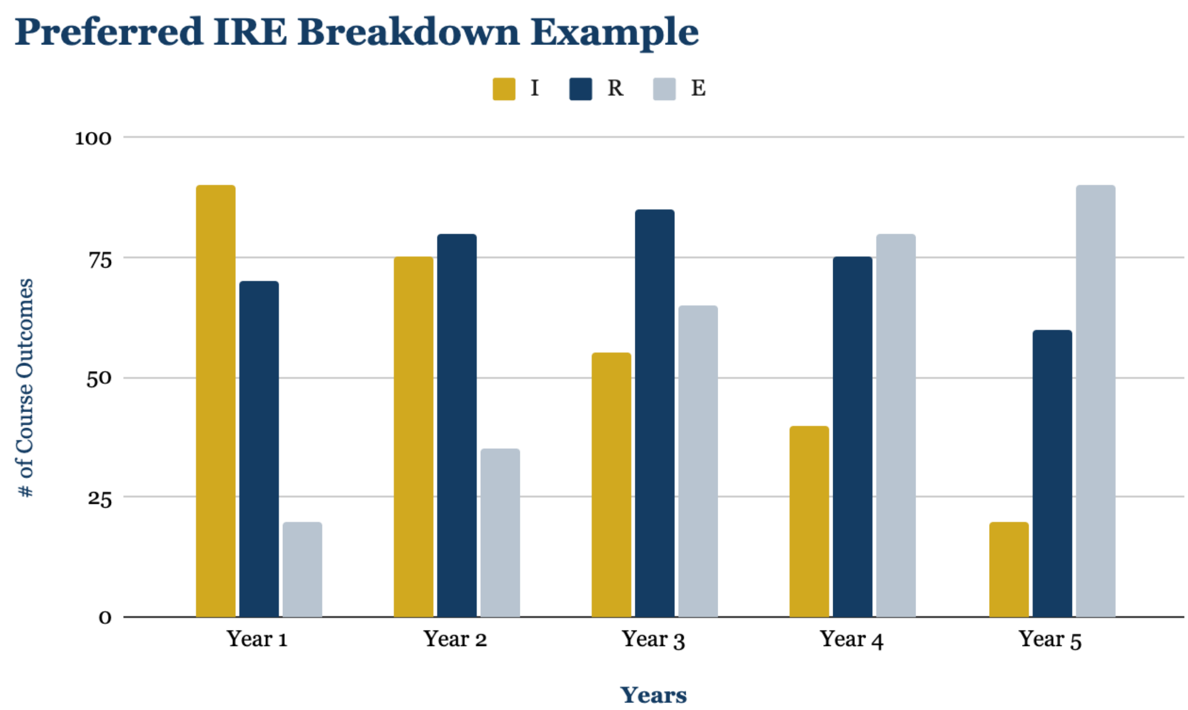


Figure 16: Preferred IRE Breakdown Example

This graph shows how I's, R's, and E's should be distributed throughout the years of a program. Level I should be largely used in the first two years, steadily decreasing as courses get more major-specific and complex. Level R should begin slightly lower than I, with a slight peak in the third year and marginally decreasing throughout the remainder of the program. Finally Level E should be used very rarely in the first two years, steadily increasing to be heavily used in the final year. This is important to address because it is something that ABET will specifically look for and is an important aspect of achieving accreditation.

Lack of Syllabi Consistency

Through an analysis of the general contents within each syllabus, we found ourselves having to flag a significant amount of syllabi. Essentially our team found that, while the Energy Engineering program has a standardized syllabus, instructors lack a cohesive understanding of what content belongs in each outlined subsection.

Often, the syllabi lacked basic information such as the course ID, credit hours, or the prerequisites required to succeed in the course. The lack of basic syllabi components indicates that faculty members are not dedicating enough time to creating their syllabi or do not have enough time/resources to do so.

Additionally, this finding led our team to believe that syllabi are not returned to course instructors and supervisors and directors do not provide professors with feedback on how to improve them. If instructors are given feedback on their syllabi, our team found that it is not edited and the existing, incomplete document is dispersed to students. There were some syllabi that had comments on them, which implied some of the syllabi were reviewed, but the comments had not been addressed. Furthermore, the same mistakes will likely be made in the development of future syllabi as the feedback was not provided or not reviewed.

The Catalog Description included in the syllabi should offer a general overview of the topics and concepts covered within the course. However, we often came across descriptions that were incredibly vague or were not written at all. It should be noted that catalog descriptions can likely be recycled for that course once they are created and instructors would not need to create new ones every semester.

Lastly, the Course Goals section was where the most inconsistencies lied between courses. The formatting of the course goals varied from paragraphs to bullet points and some were constructed almost identically to the course outcomes. From this inconsistency, we can infer that instructors don't know the difference between the Course Goals and course outcomes needed to be outlined for each course. In fact, our team also had trouble finding a description for what was expected in those sections. Course Goals are more general concepts the course covers and aligns with the Catalog Description while course outcomes specify the direct concepts or actions a student must understand or perform in order to receive a good mark and develop their skills within the ABET Student Outcomes.

Based on all the findings described above, our team recommends providing program-specific workshops for faculty members where they learn how to correctly create a course syllabus using the template provided to them. In this workshop, faculty should be given the opportunity to learn what belongs in each section, practice writing and formatting the sections, and given exemplary syllabi to reference and model as they create the documents on their own.

Time should be spent walking faculty through each step to ensure that mapping is done correctly. It is also crucial to give faculty the time and space to ask any questions they have about mapping so they completely understand the need for it and its benefits. Overall, it would be beneficial to create a condensed guide on how to map COs properly so that professors can have the guide and syllabus side by side while they are mapping.

We also recommend that these faculty workshops are held in both French and English. This is due to the fact that, as mentioned previously, English is not the first language for professors. Giving them an understanding of the student outcomes in French first will ensure that they comprehend all aspects of the outcomes and how to align COs with them, which they can then translate into English on their syllabi.

Most importantly, we recommend that the timeline of syllabus creation and collection be altered with the intention of providing feedback to faculty members about what was done incorrectly on their syllabus and how to fix it. This should be followed up with the expectation of editing the syllabus until it meets the needs expected within each program. Essentially, our team suggests that syllabi are collected a few weeks prior to the start of a semester and reviewed by the instructor's supervisor. Then, it is returned to the instructor and they are asked to submit a revised version within a set deadline, before the semester begins.

We make these recommendations in hopes of furthering the benefits of the standard syllabus created last year. While the template exists, it is not currently achieving all it set out to because faculty members do not have standardized directions on the content nor a cohesive understanding of CO/SO mapping. The adoption of these recommendations will benefit the students within each course, as well as the faculty, administration, and future accreditation evaluators.

Limitations & Considerations

Our team only distributed surveys to the students in their first through fourth year. Fifth year students were in their final semester projects when we completed our evaluations. Therefore the opinion of students in their final year is not represented in the findings above. Additionally, we did not receive all course syllabi for the Energy Engineering department. Therefore, we suggest using our findings and recommendations to fix course outcome creation and the alignment of outcomes on syllabi, and then using the methodology in our final report to complete another direct evaluation of the Energy Engineering Program

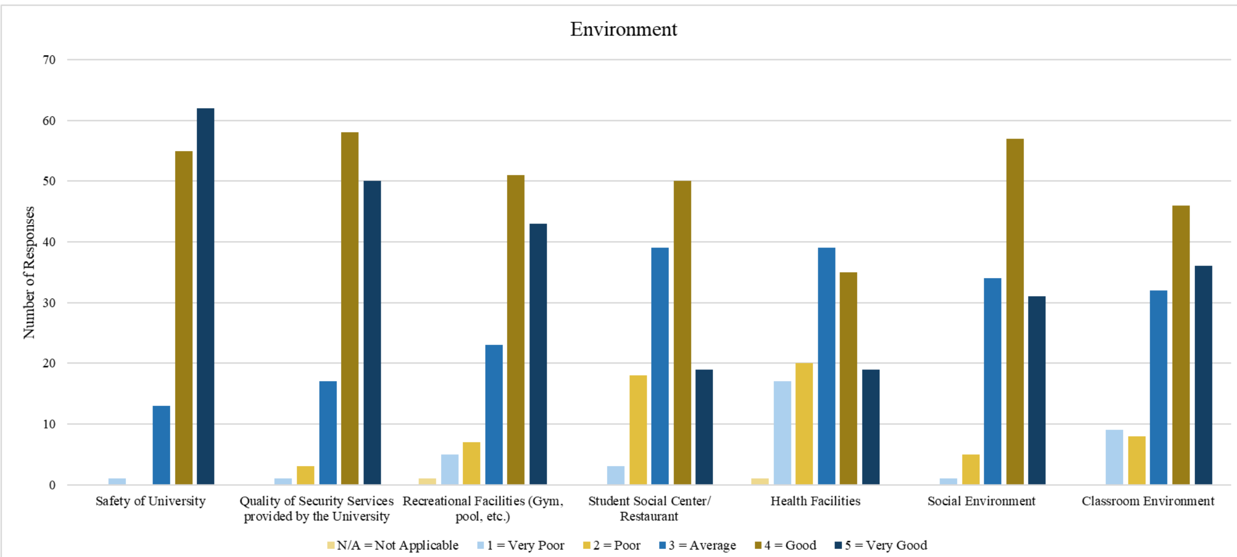
Conclusion

Overall, the Energy Engineering programamazed our team with their progress toward ABET accreditation. The faculty members in this department were the most knowledgeable about course outcomes, student outcomes, the benefits of accreditation, and more. We believe that after another semester or two of collecting and correcting course syllabi, as well as making continuous improvements to the program, Energy Engineering will be ready to officially complete a Readiness Review and place a Request for Evaluation with ABET.

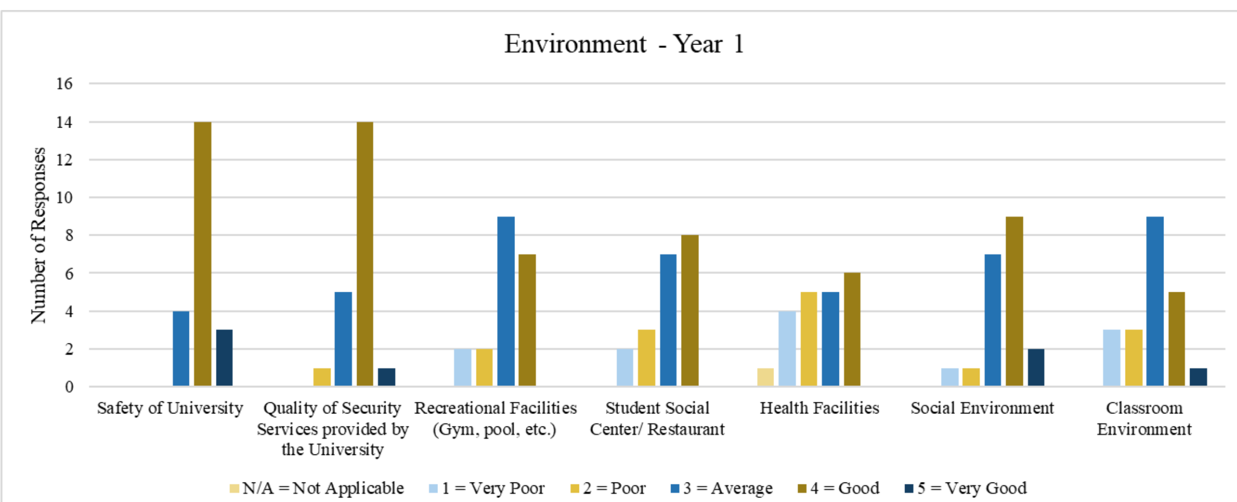
Appendix A. Student Survey Responses

Included below are all visual representations of the data we received from Energy Engineering students on a survey distributed in late March. The raw data has been shared with the Energy Engineering program. In this appendix you will find each section of survey questions along with the total responses as well as responses filtered by class year.

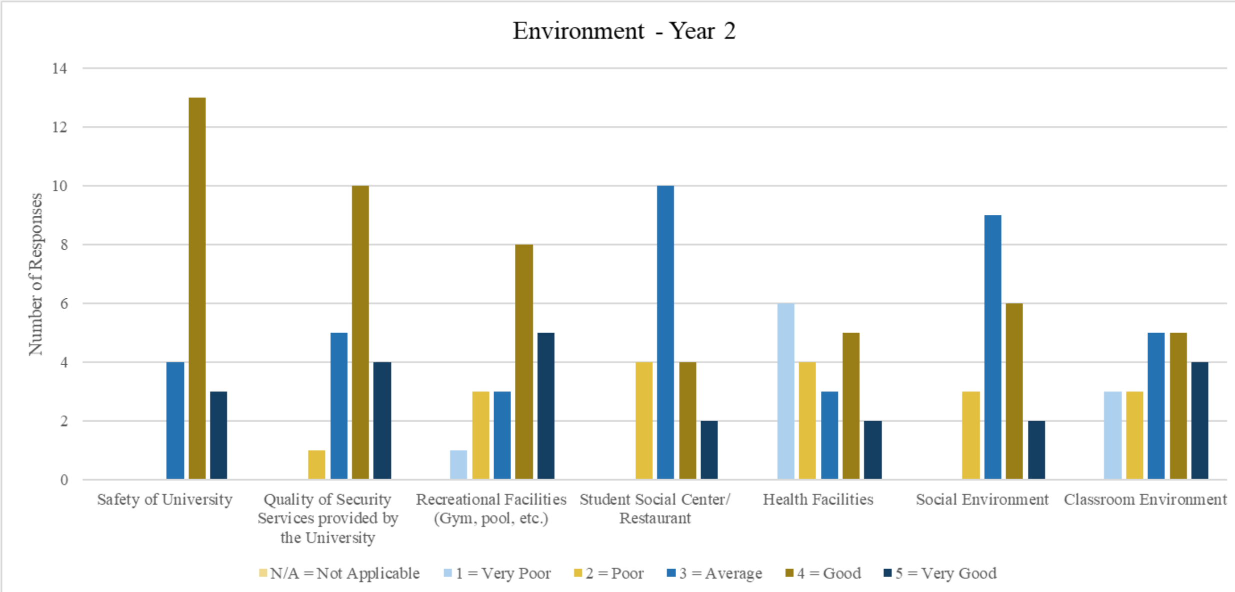
Campus Environments



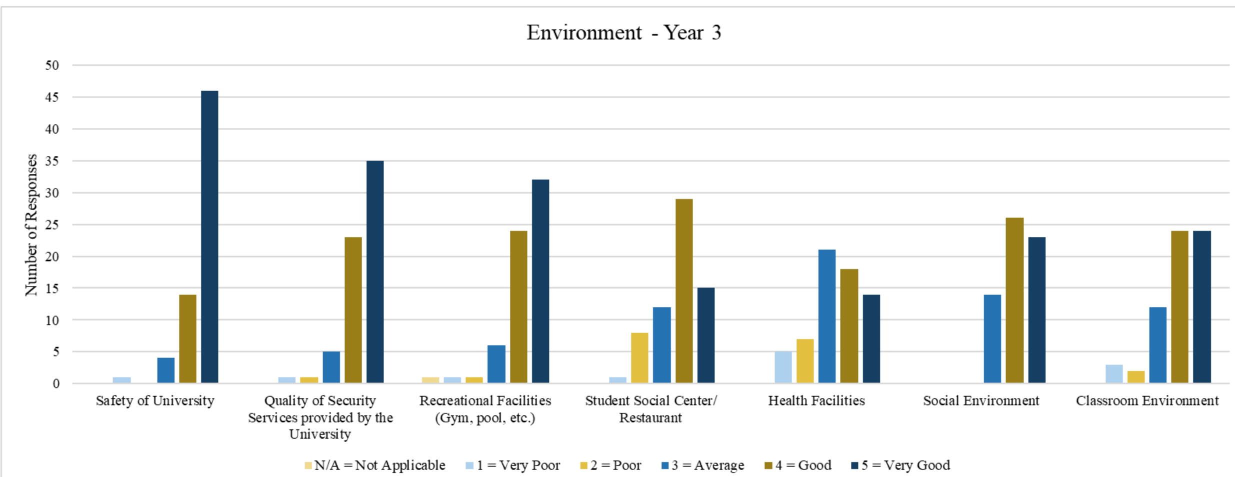
Overall Student Ratings of Various Environments and Spaces



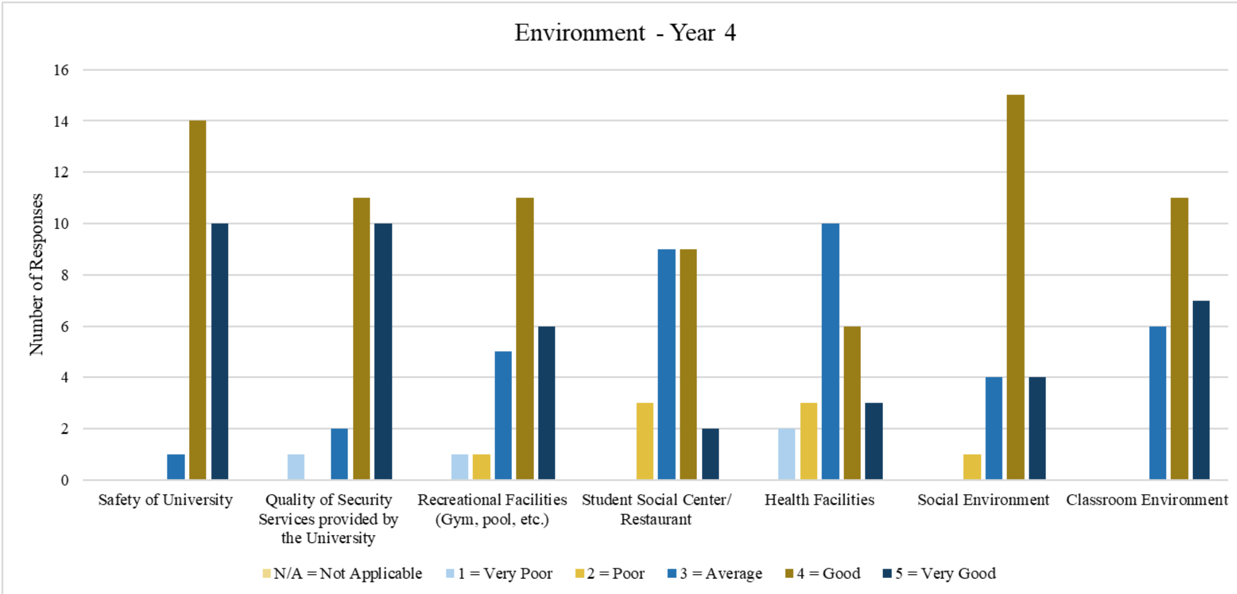
Year 1 Student Ratings of Various Environments and Spaces



Year 2 Student Ratings of Various Environments and Spaces

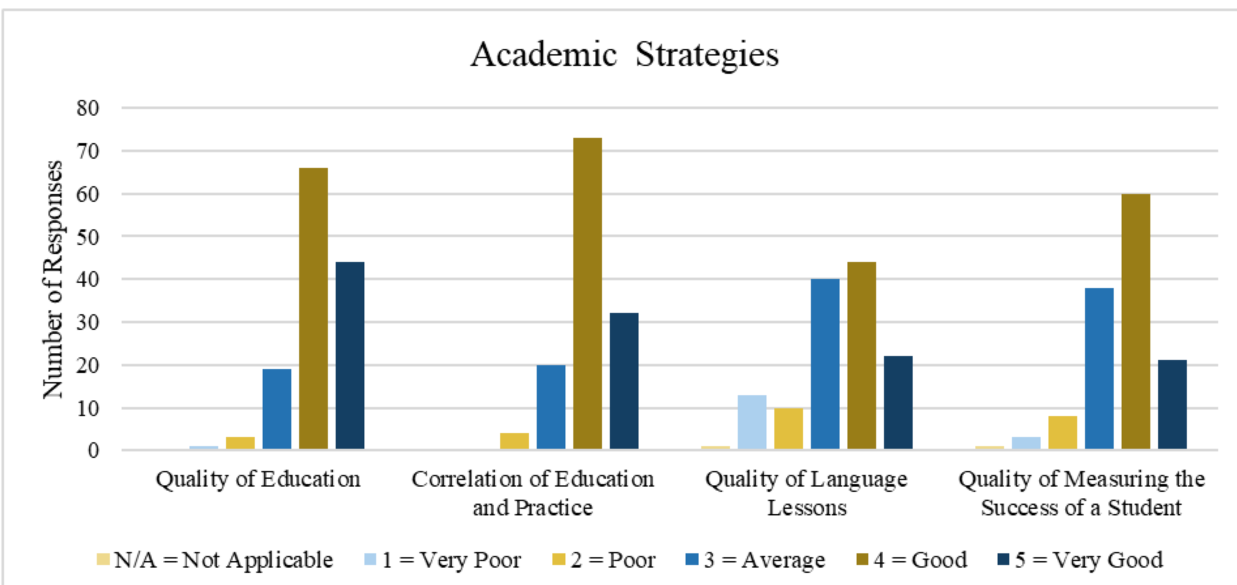


Year 3 Student Ratings of Various Environments and Spaces

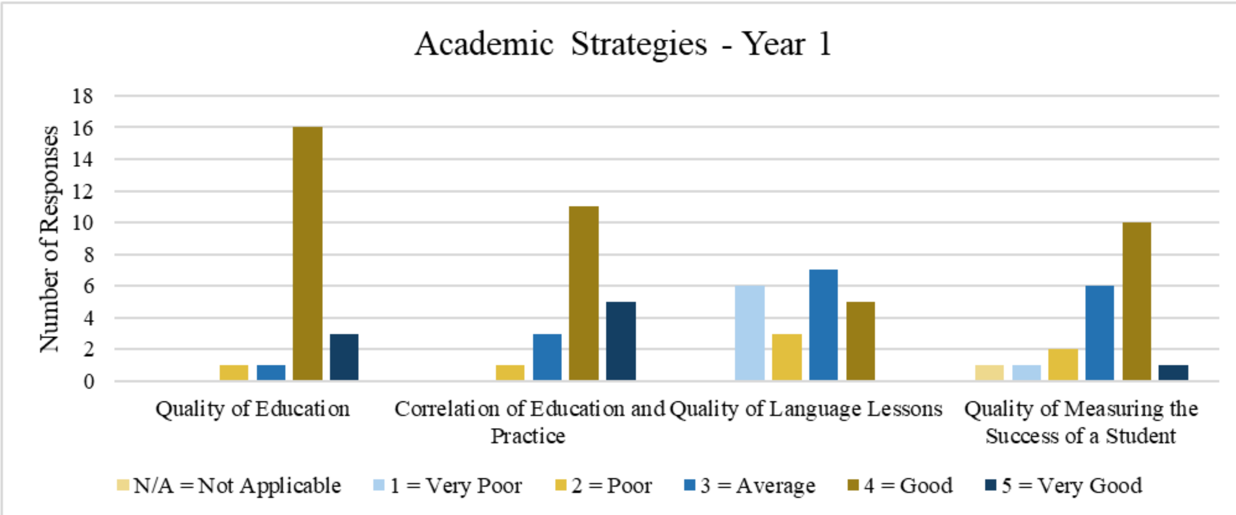


Year 4 Student Ratings of Various Environments and Spaces

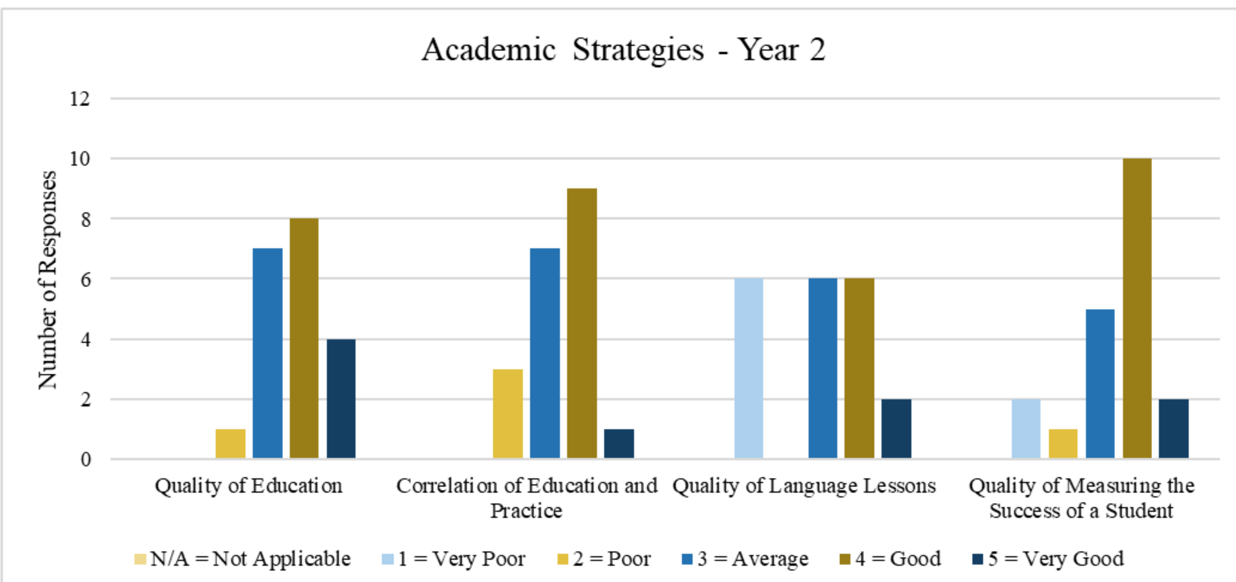
Academic Strategies



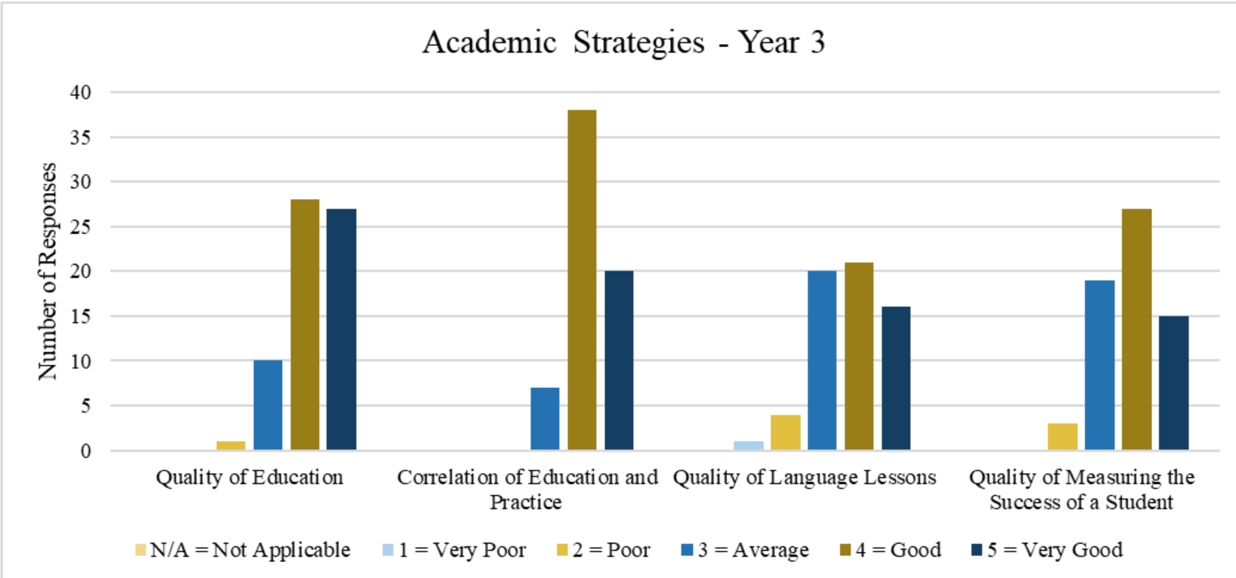
Overall Student Rankings of Academic Strategies



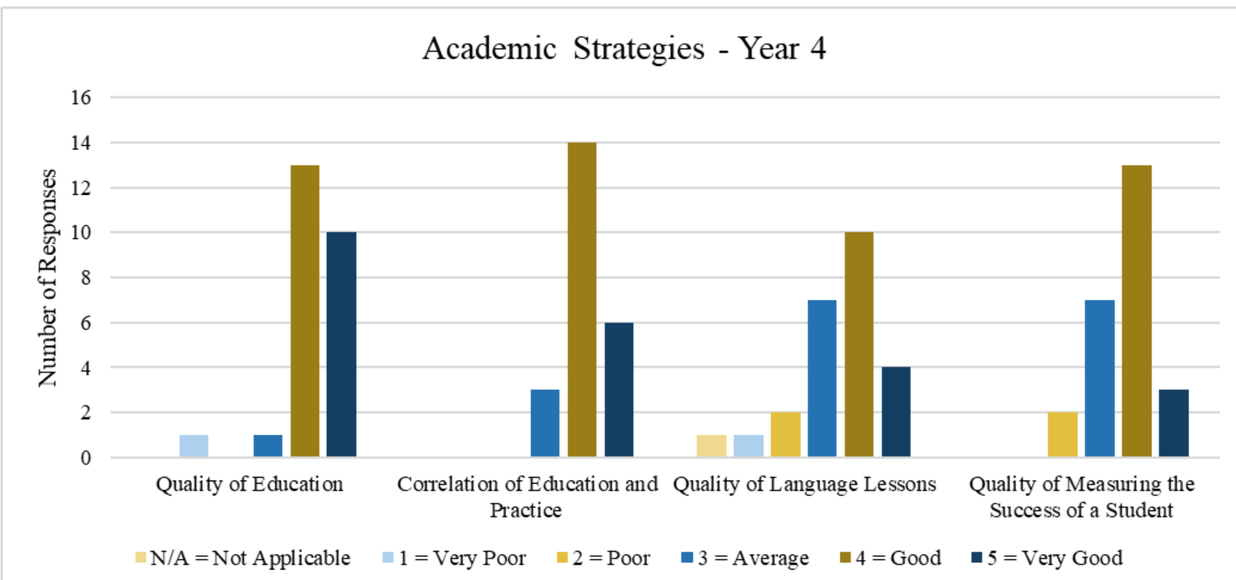
Year 1 Student Rankings of Academic Strategies



Year 2 Student Rankings of Academic Strategies

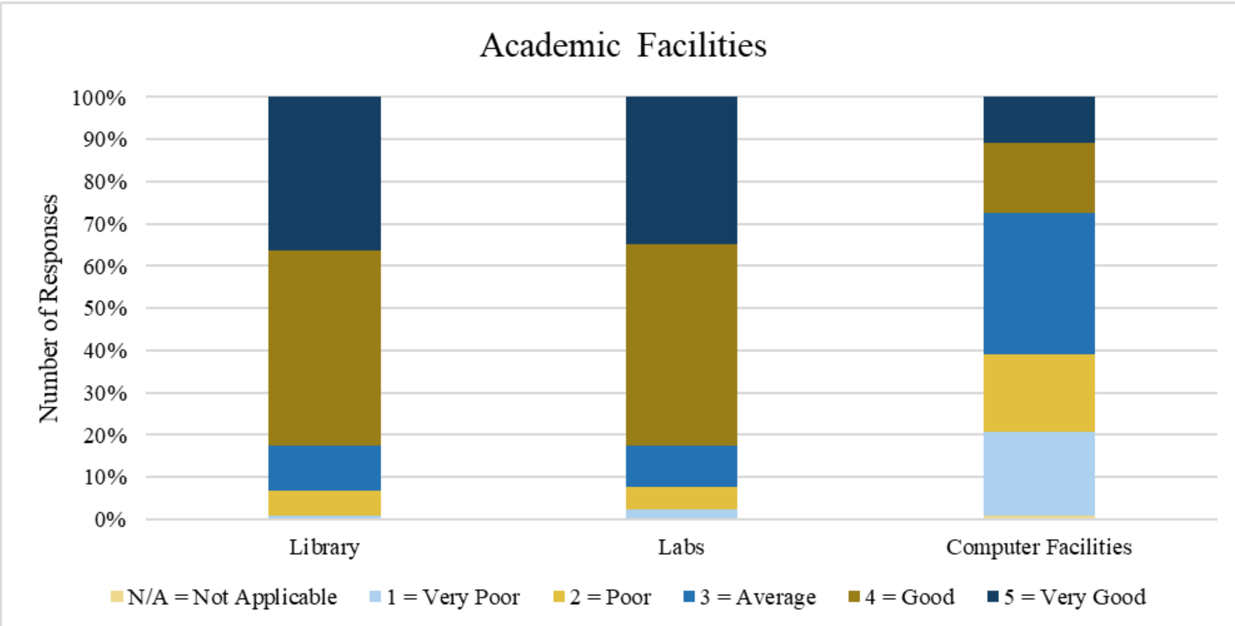


Year 3 Student Rankings of Academic Strategies

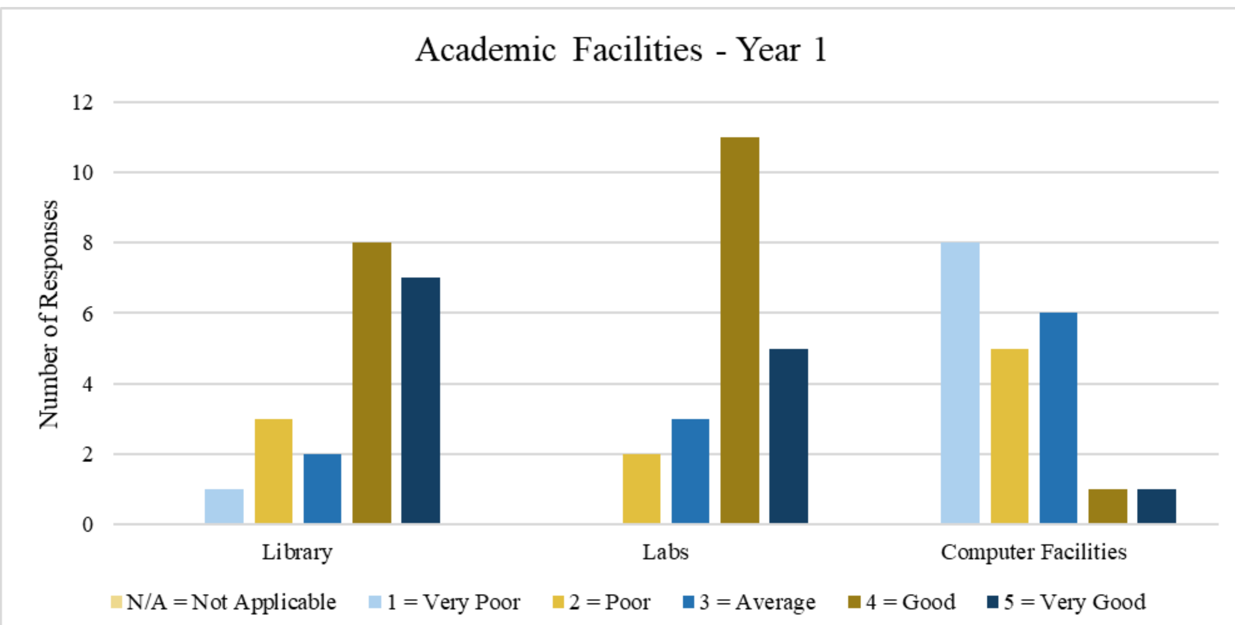


Year 4 Student Rankings of Academic Strategies

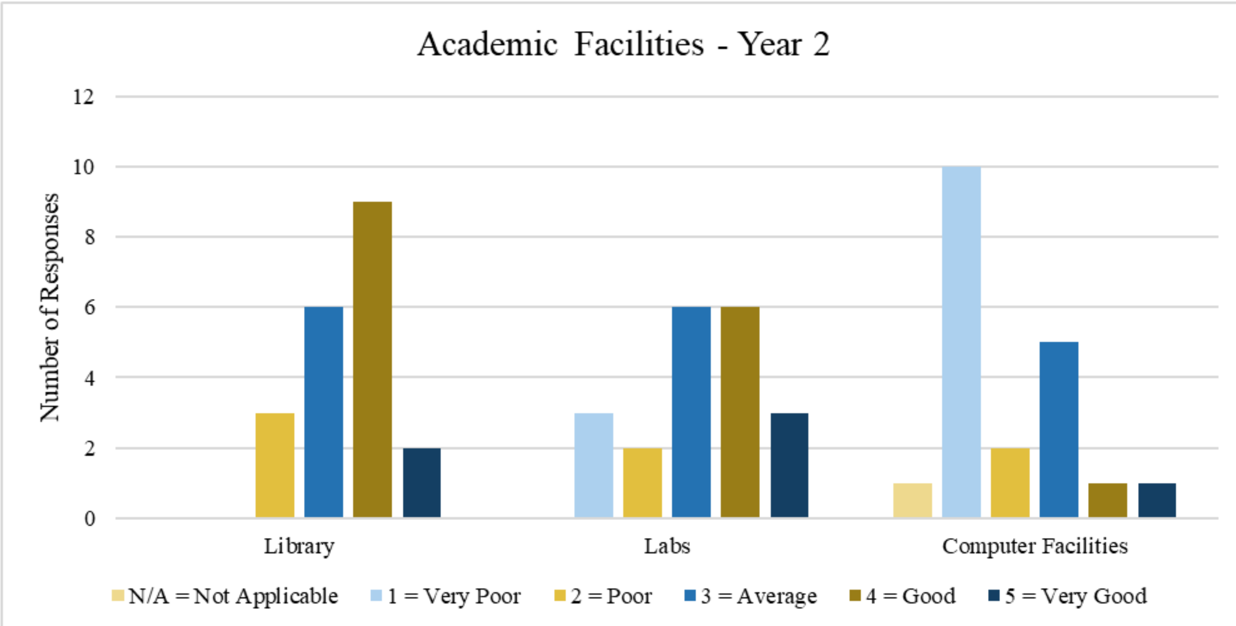
Academic Facilities



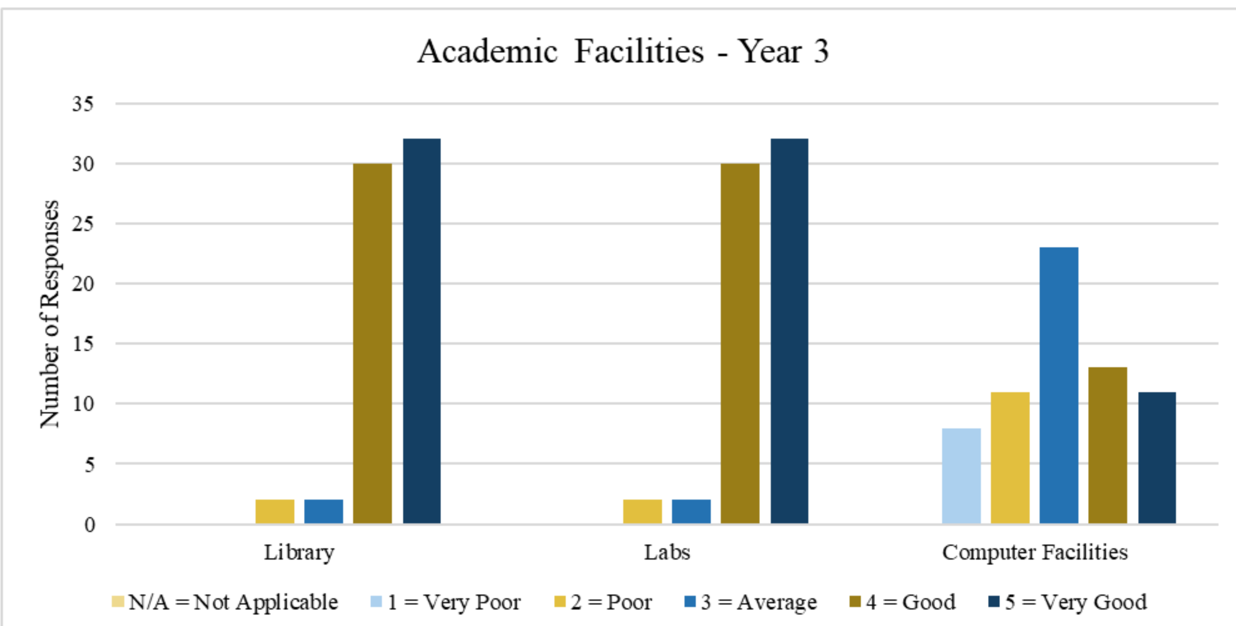
Overall Student Rankings of Academic Facilities



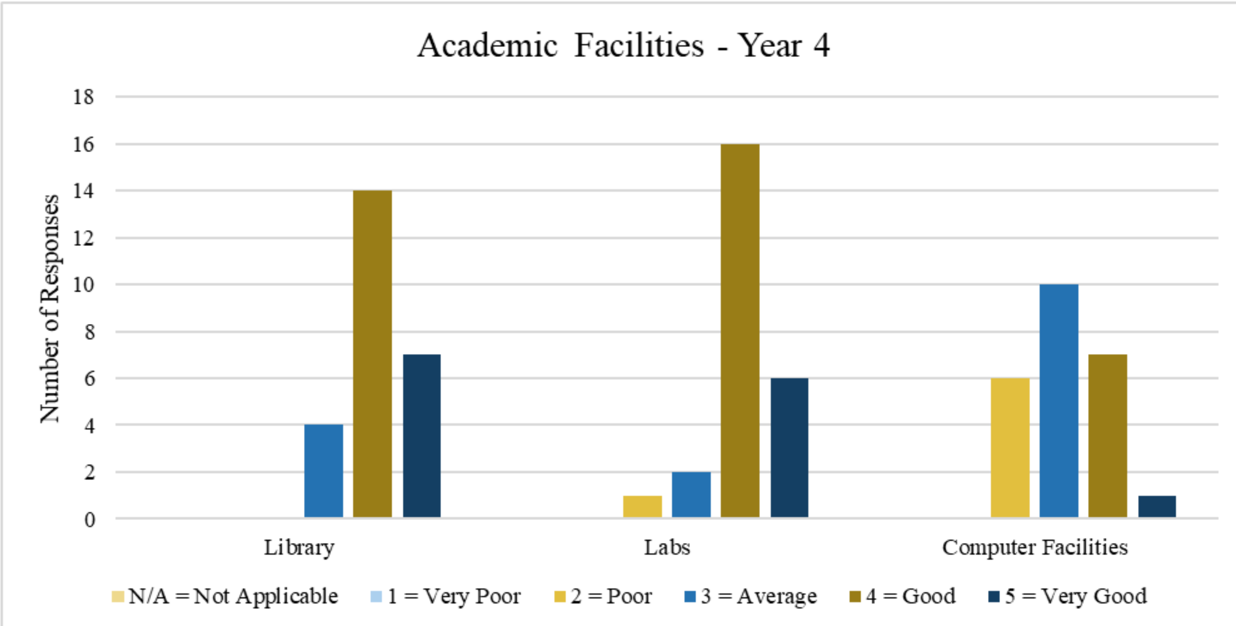
Year 1 Student Rankings of Academic Facilities



Year 2 Student Rankings of Academic Facilities

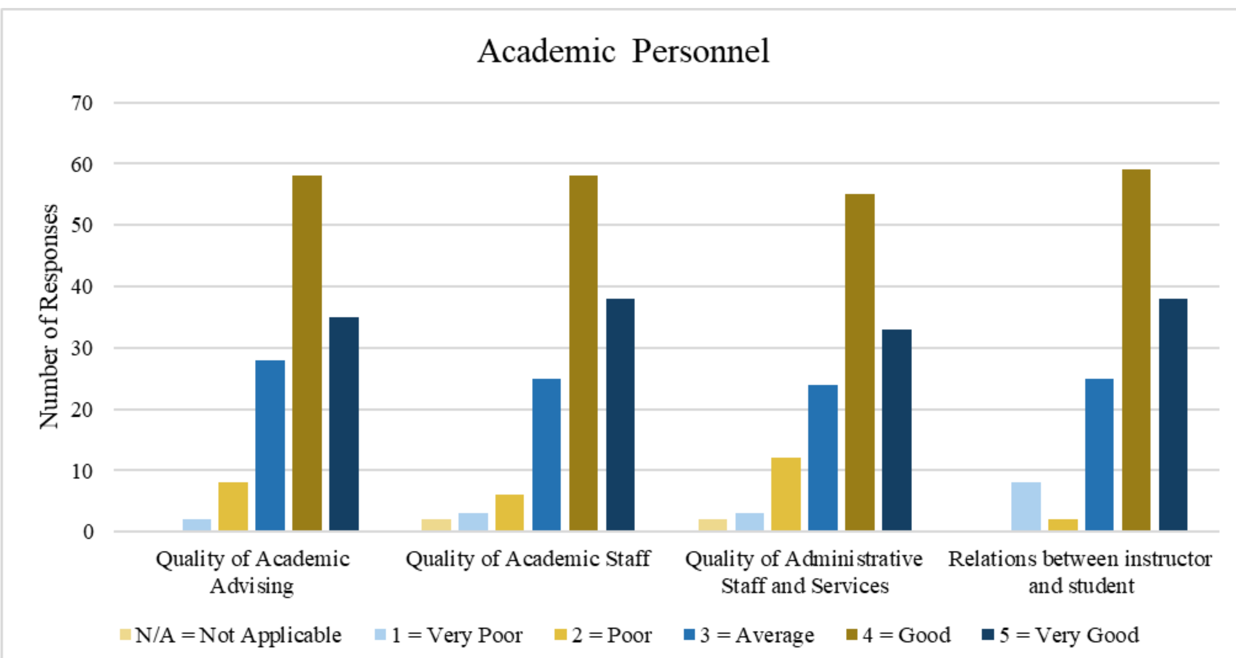


Year 3 Student Rankings of Academic Facilities

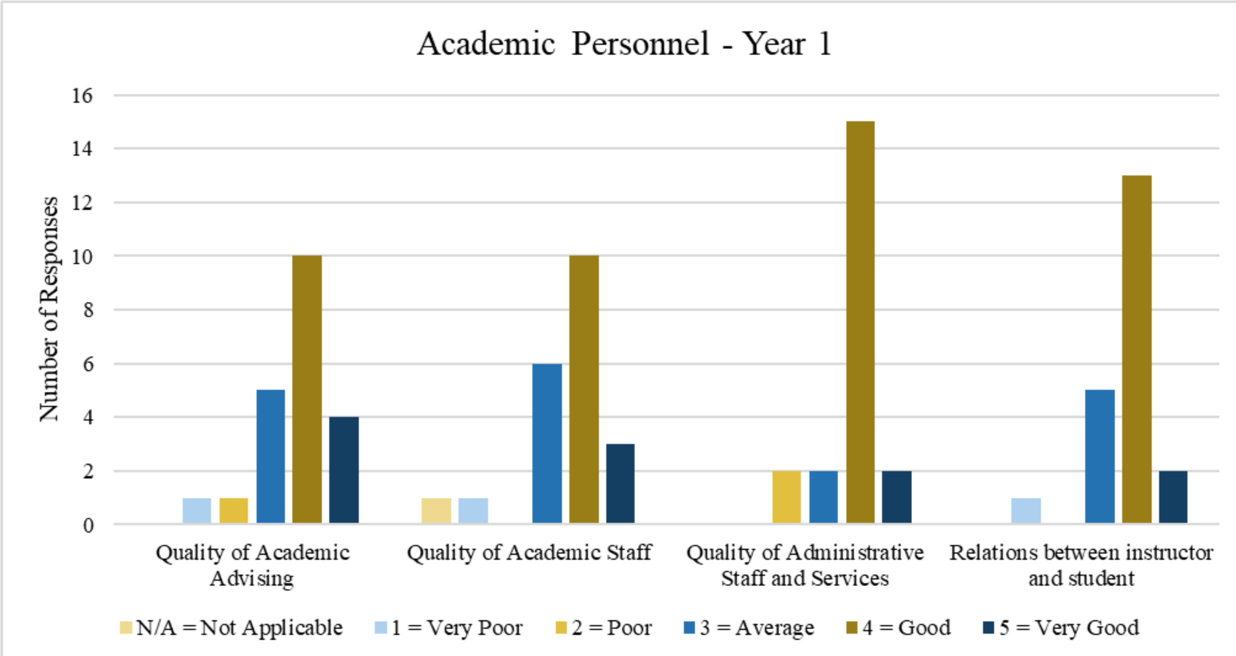


Year 4 Student Rankings of Academic Facilities

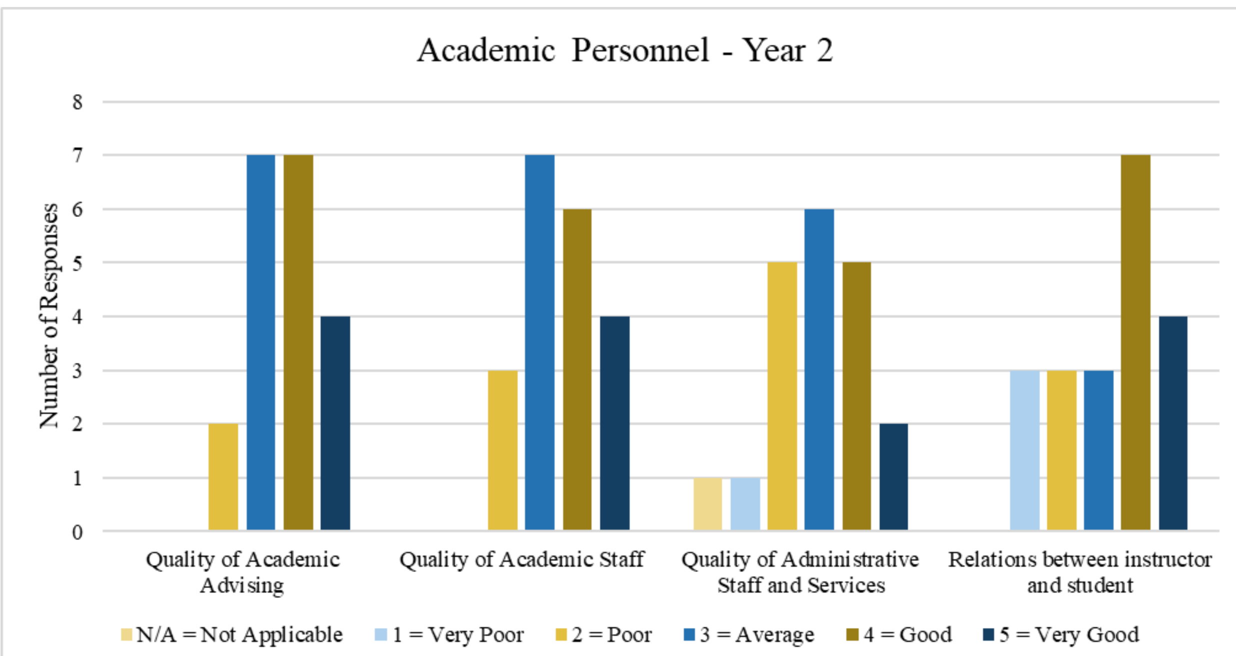
Academic Personnel



Overall Student Rating of Academic Personnel



Year 1 Student Rating of Academic Personnel



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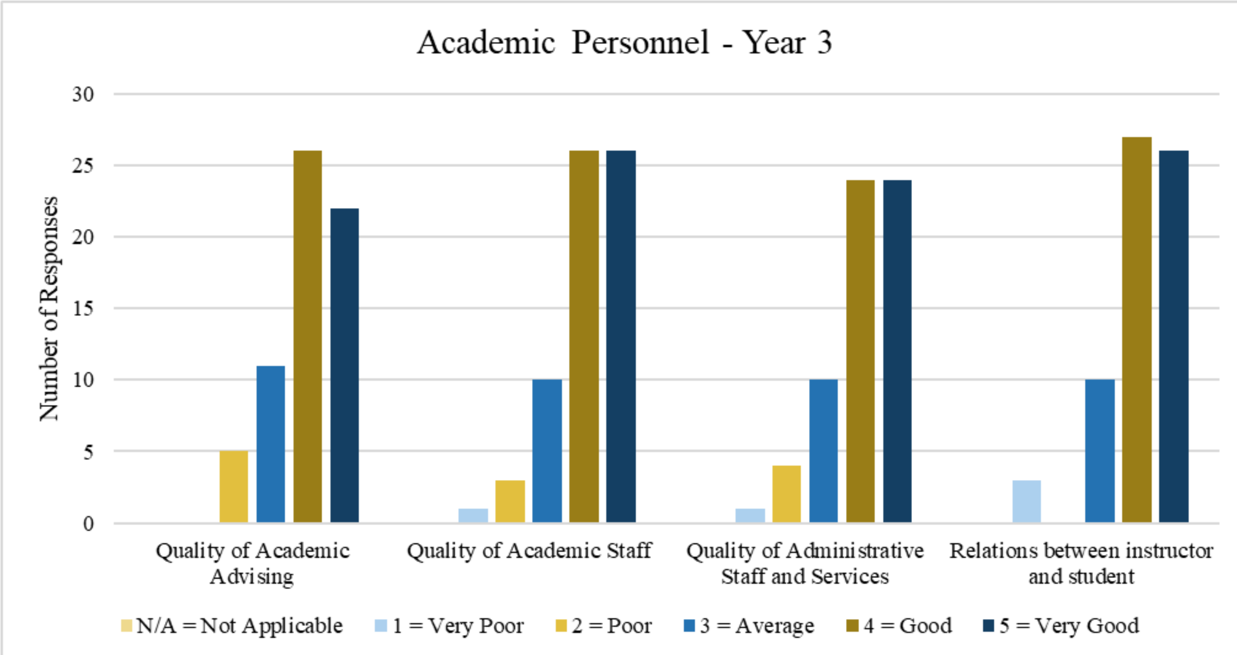
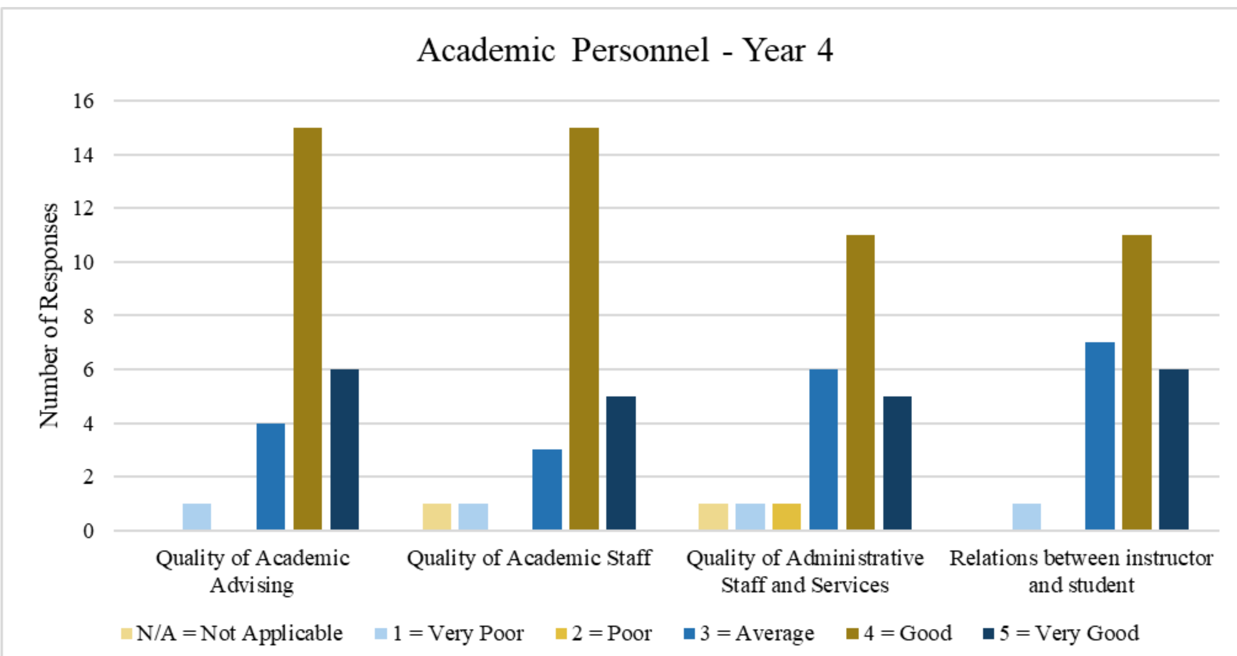
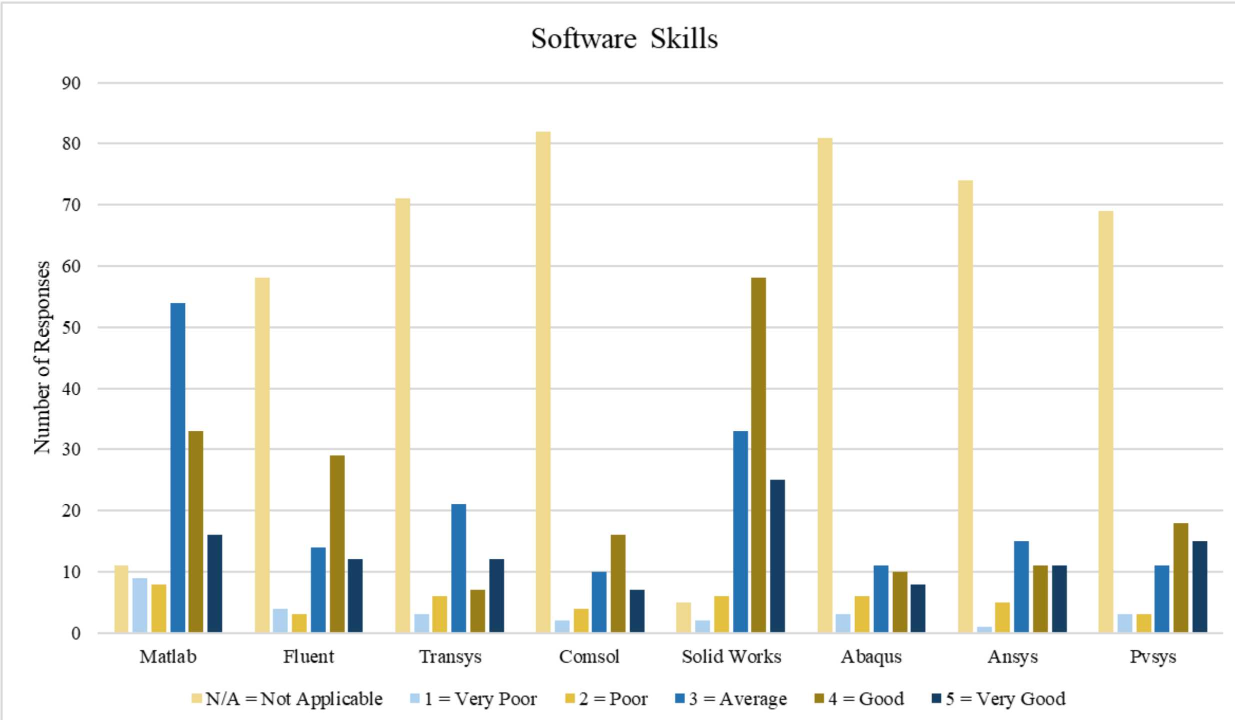


Year 3 Student Rating of Academic Personnel

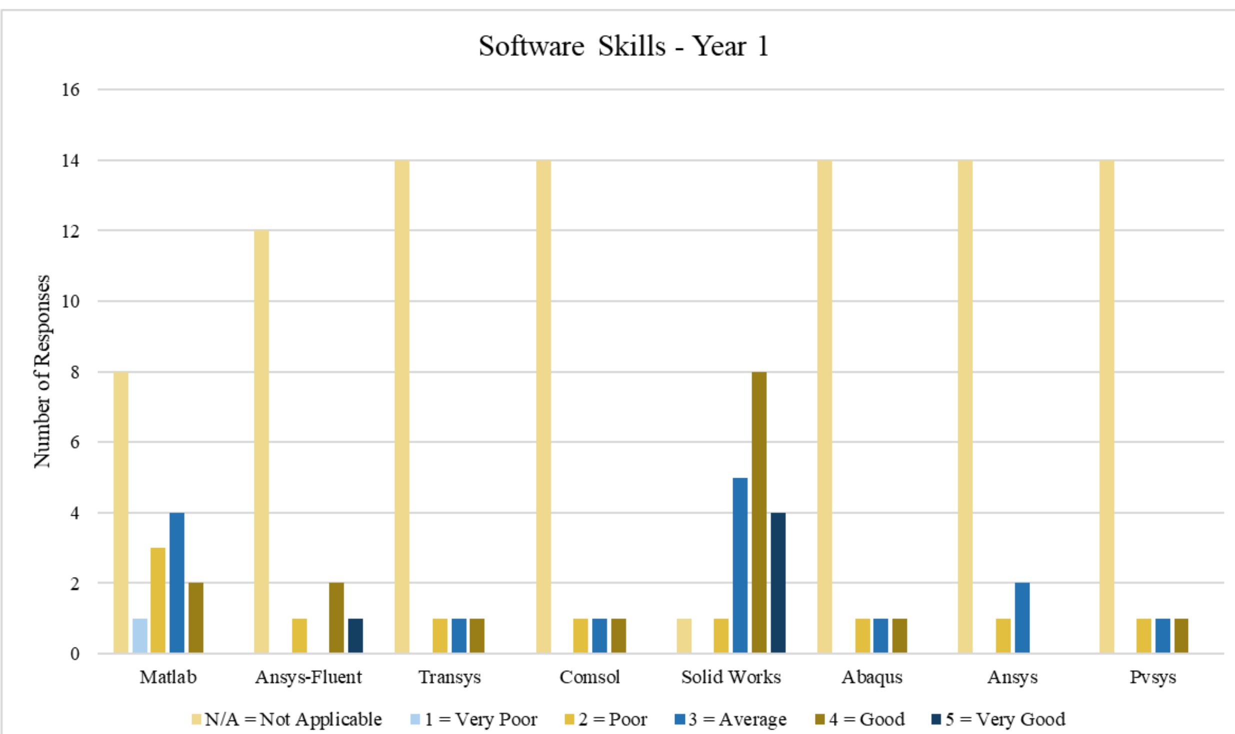


Year 4 Student Rating of Academic Personnel

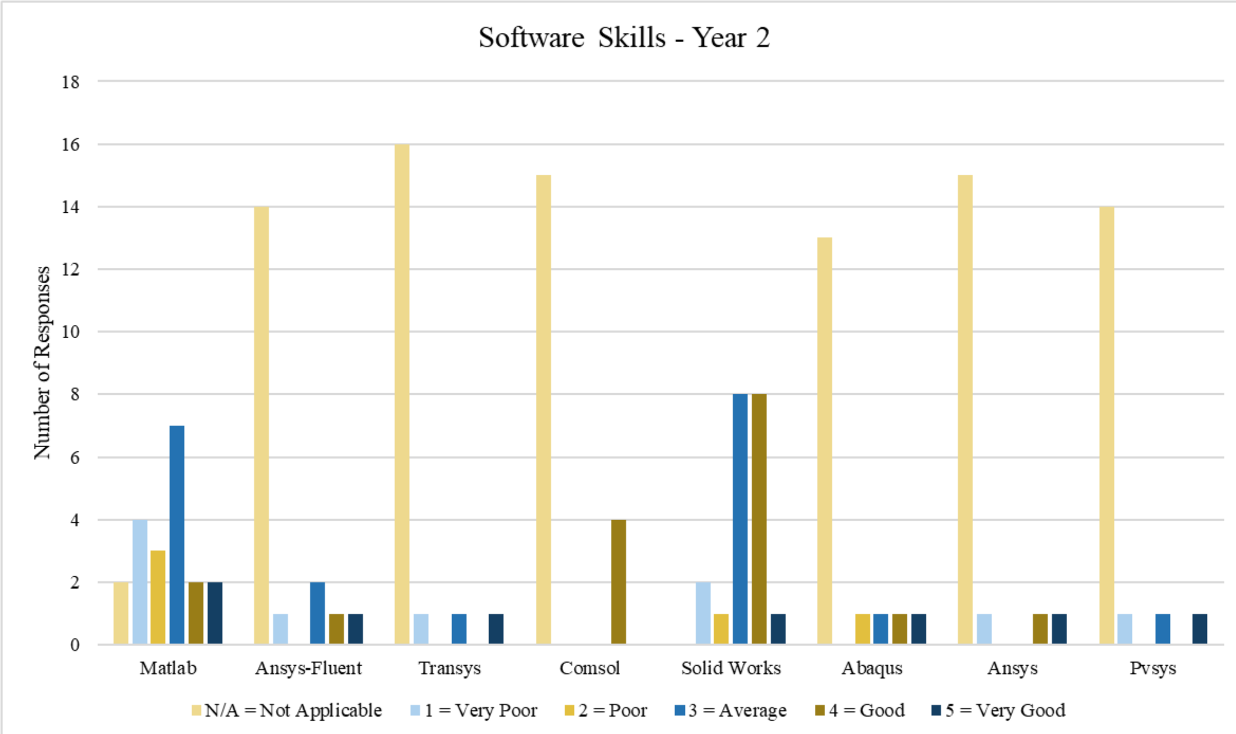
Software Skills



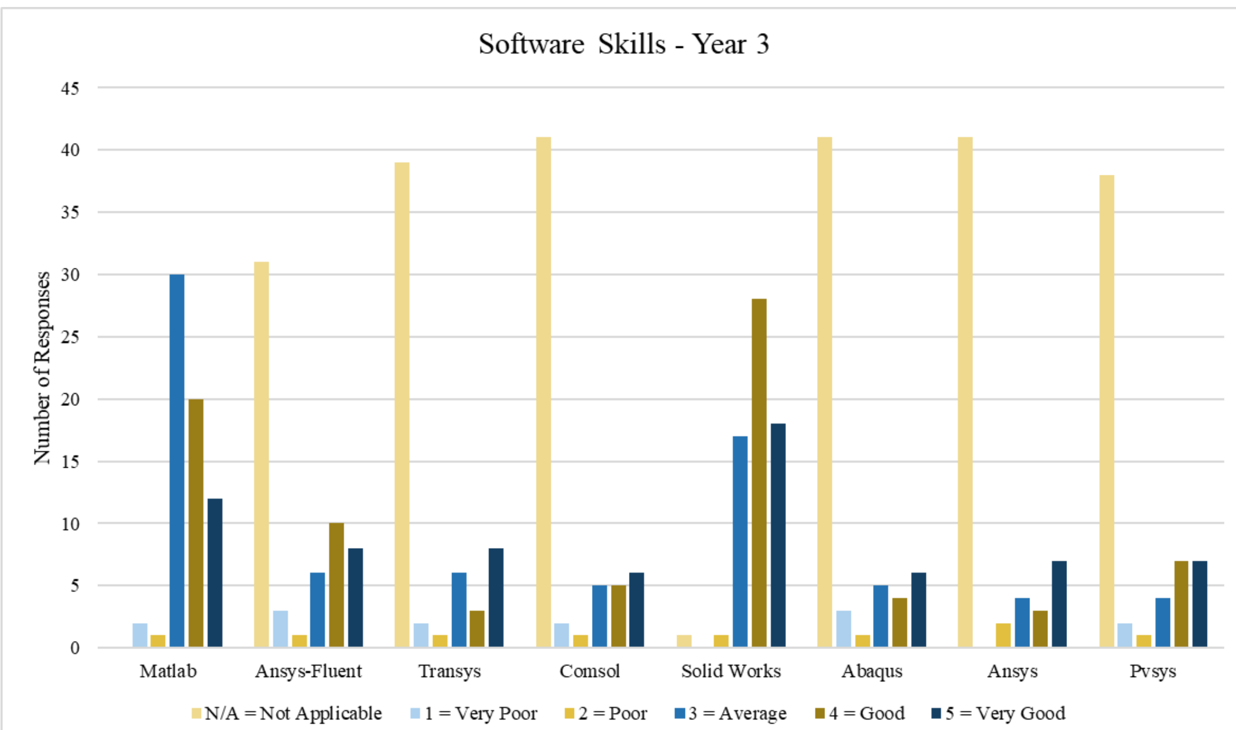
Overall Student Ranking of Software Skills



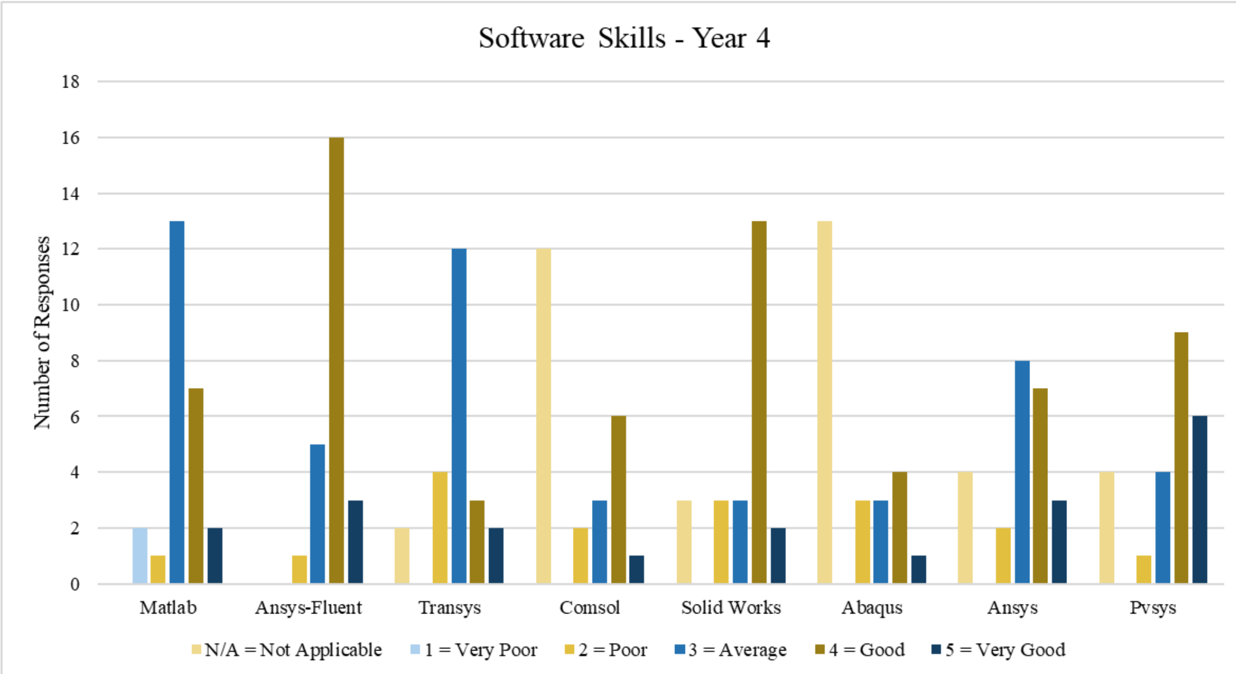
Year 1 Student Ranking of Software Skills



Year 2 Student Ranking of Software Skills

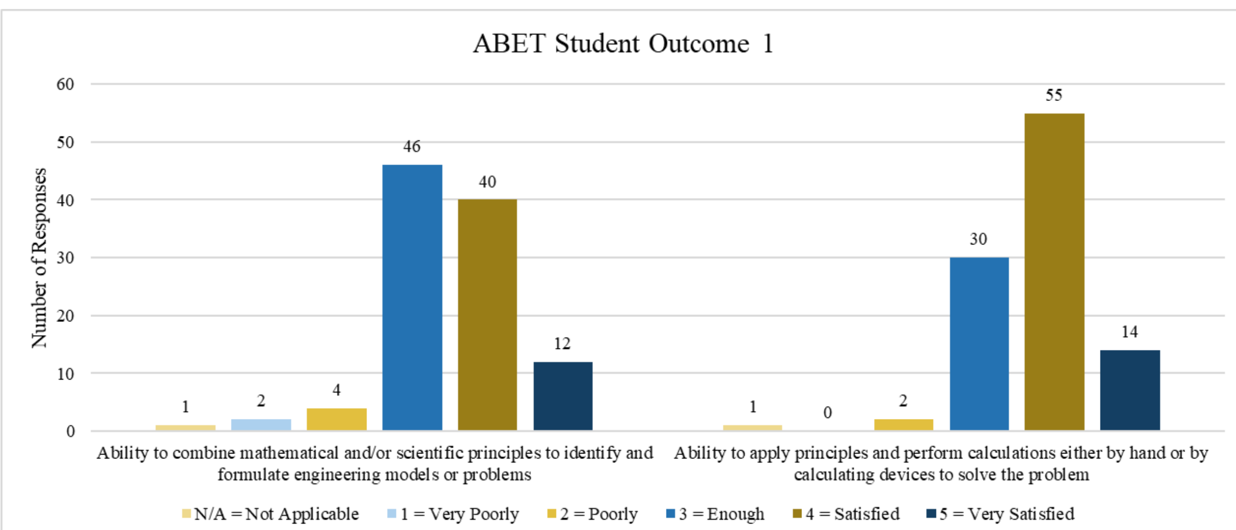


Year 3 Student Ranking of Software Skills

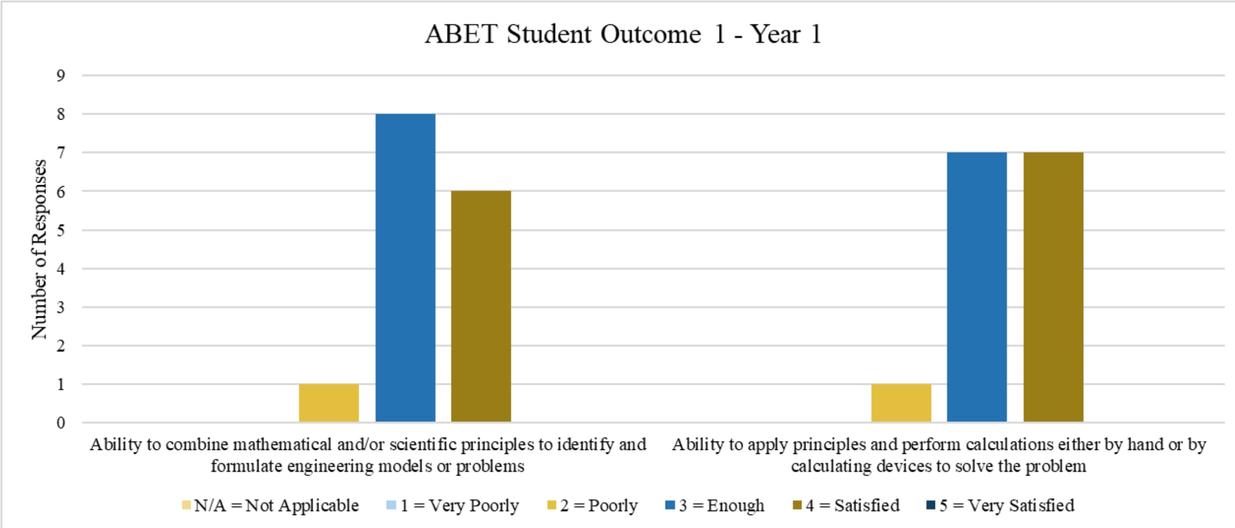


Year 4 Student Ranking of Software Skills

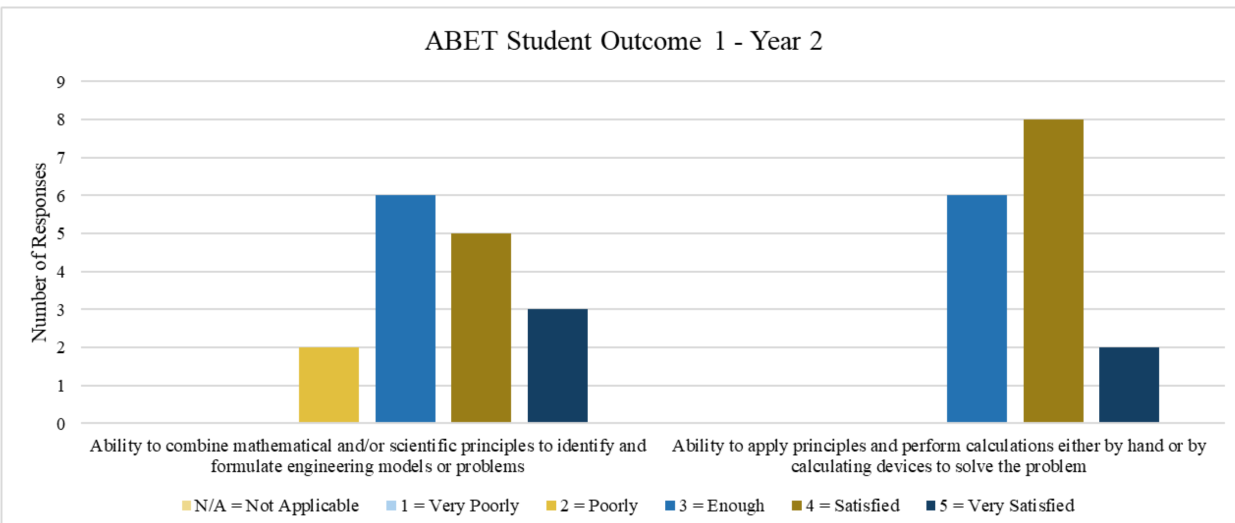
Student Outcome #1



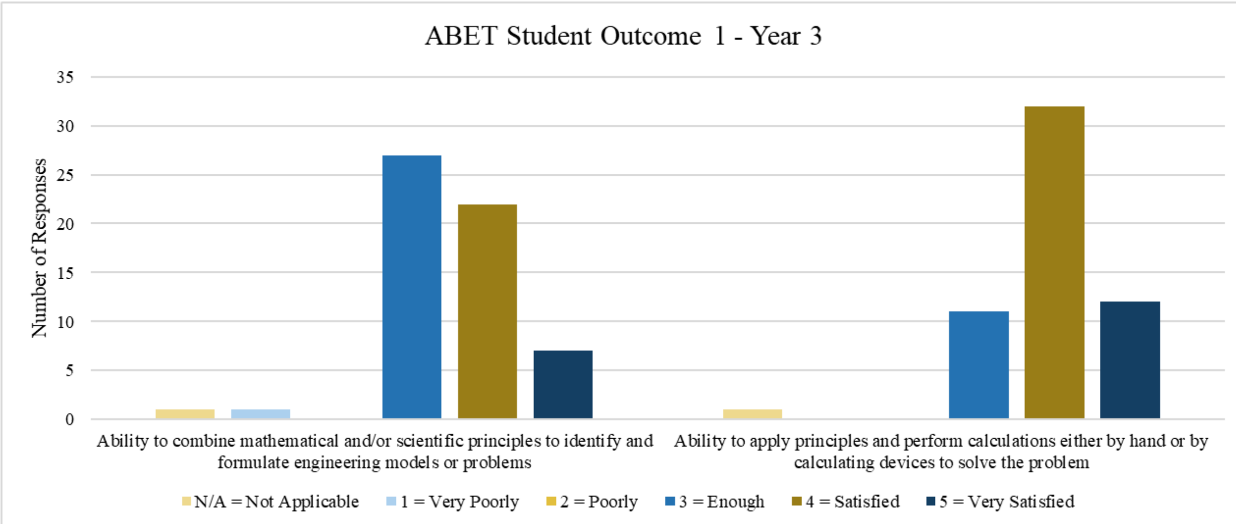
Overall Rating of Abilities in ABET Student Outcome 1



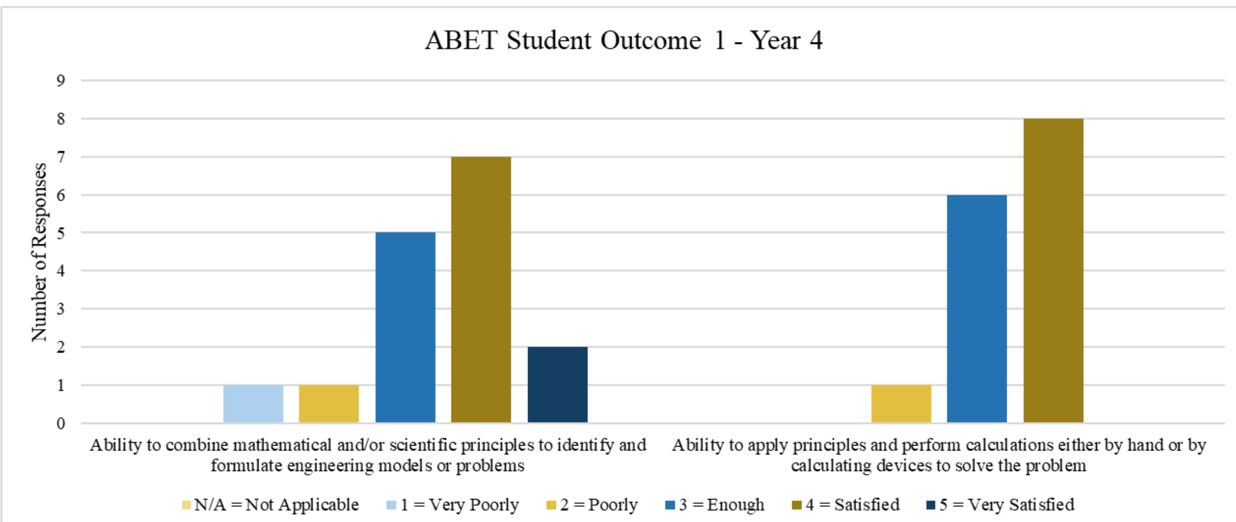
Year 1 Rating of Abilities in ABET Student Outcome 1



Year 2 Rating of Abilities in ABET Student Outcome 1

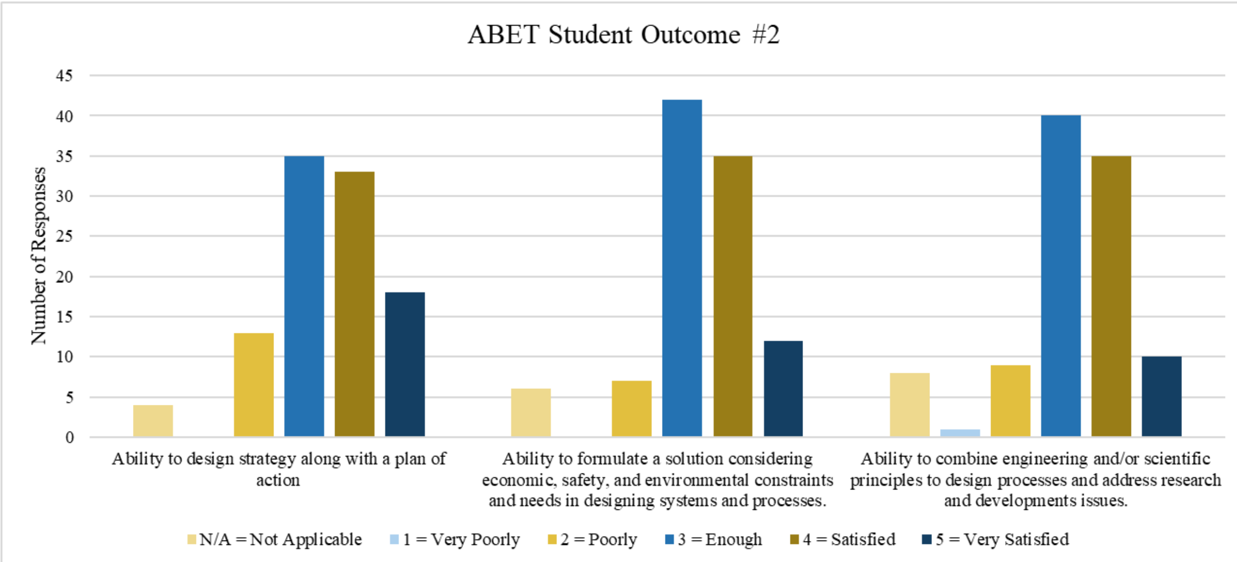


Year 3 Rating of Abilities in ABET Student Outcome 1

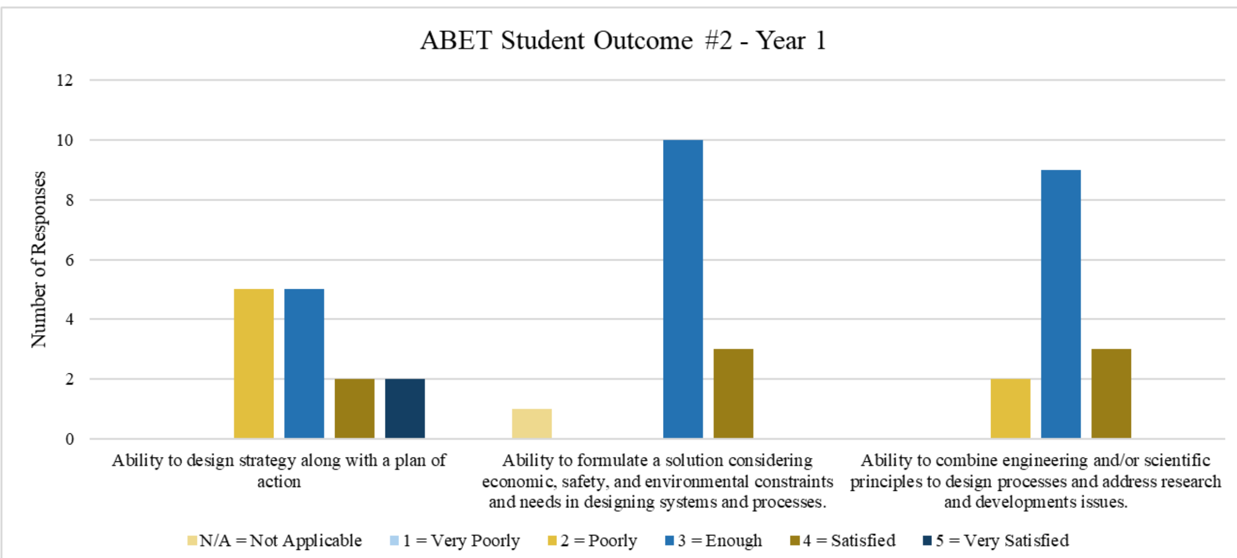


Year 4 Rating of Abilities in ABET Student Outcome 1

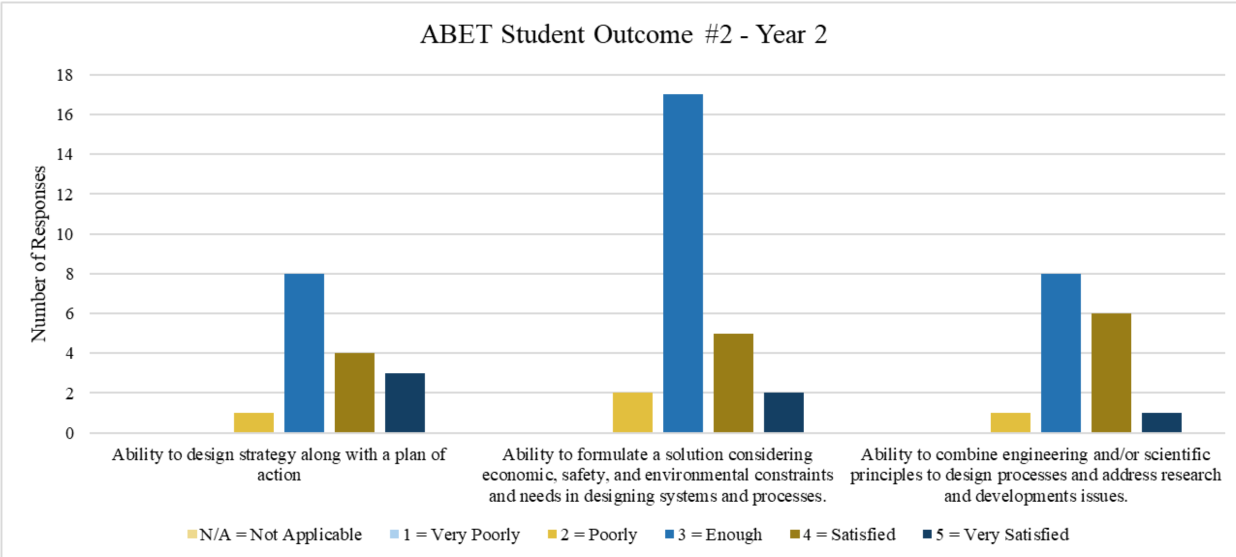
Student Outcome #2



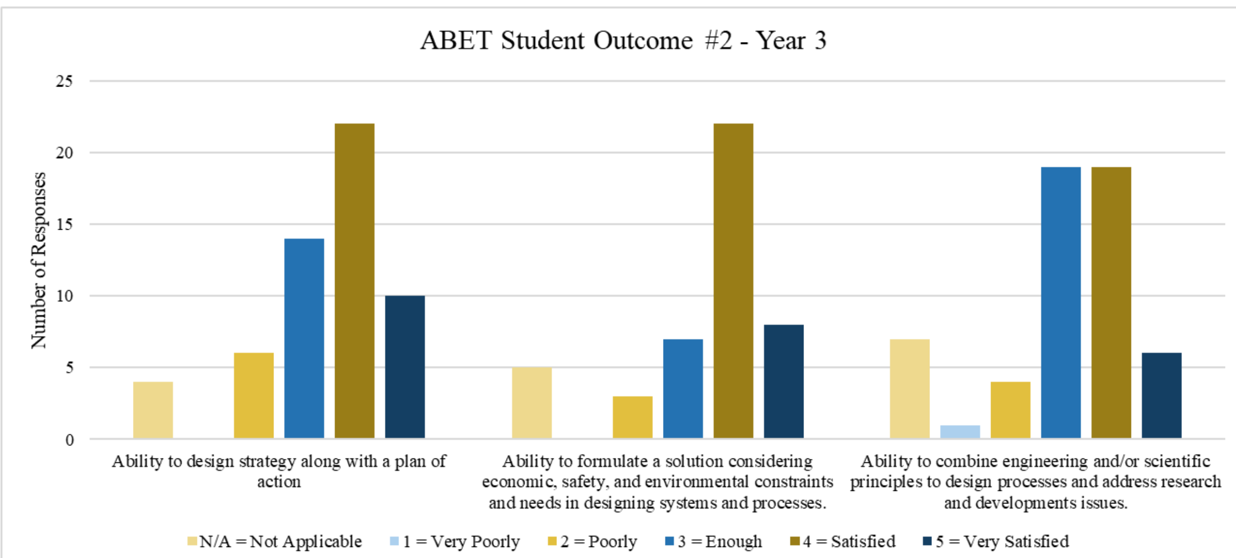
Overall Rating of Abilities in ABET Student Outcome 2



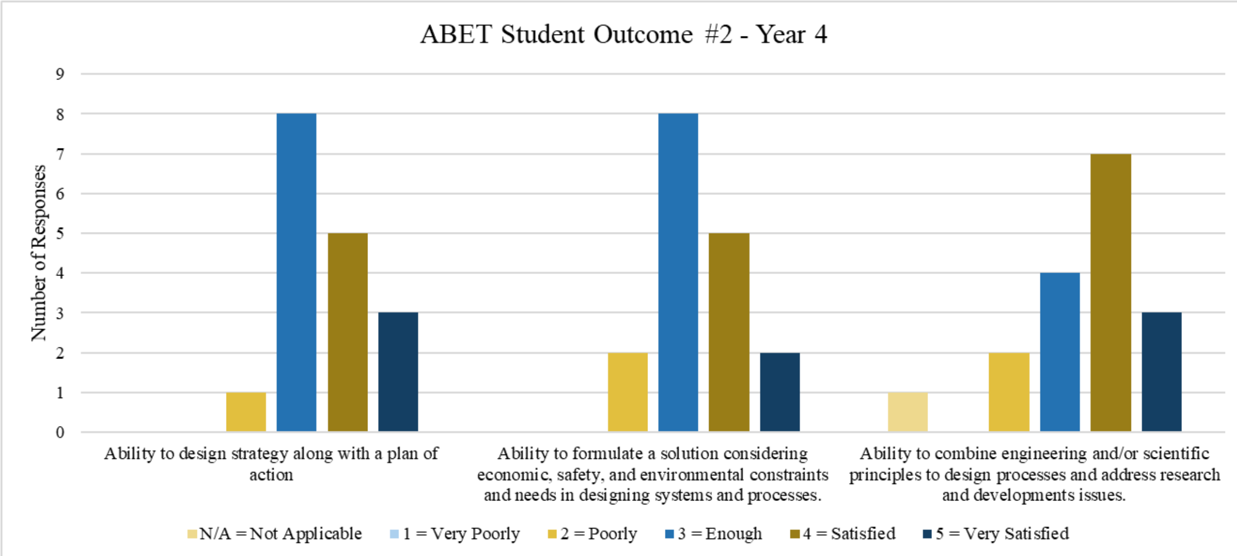
Year 1 Rating of Abilities in ABET Student Outcome 2



Year 2 Rating of Abilities in ABET Student Outcome 2

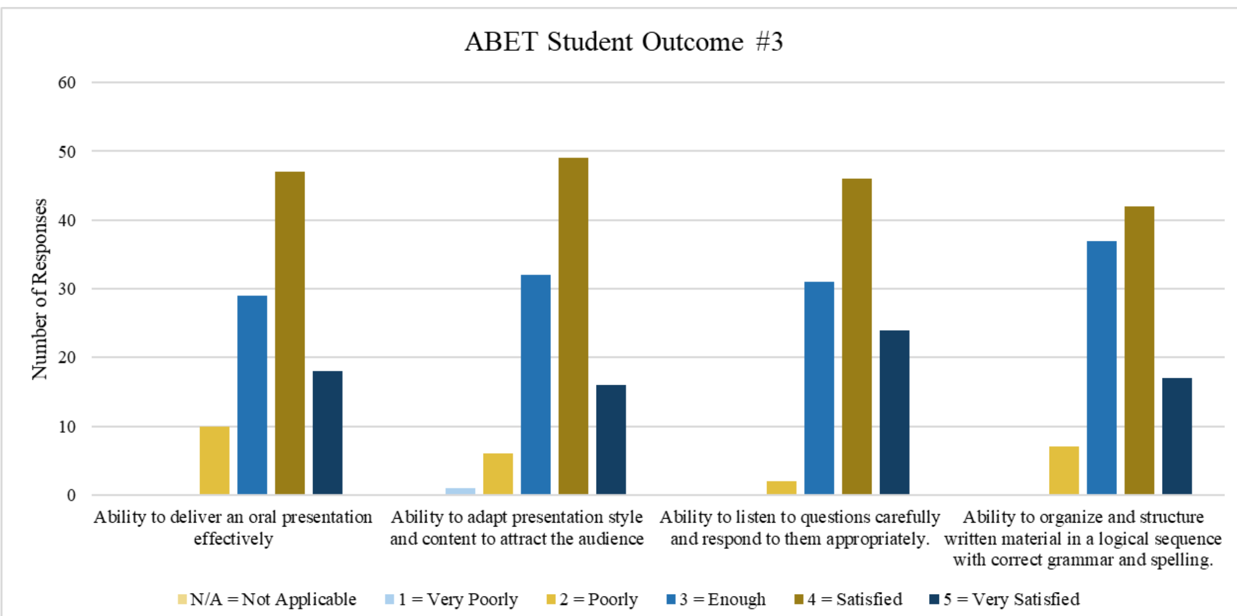


Year 3 Rating of Abilities in ABET Student Outcome 2

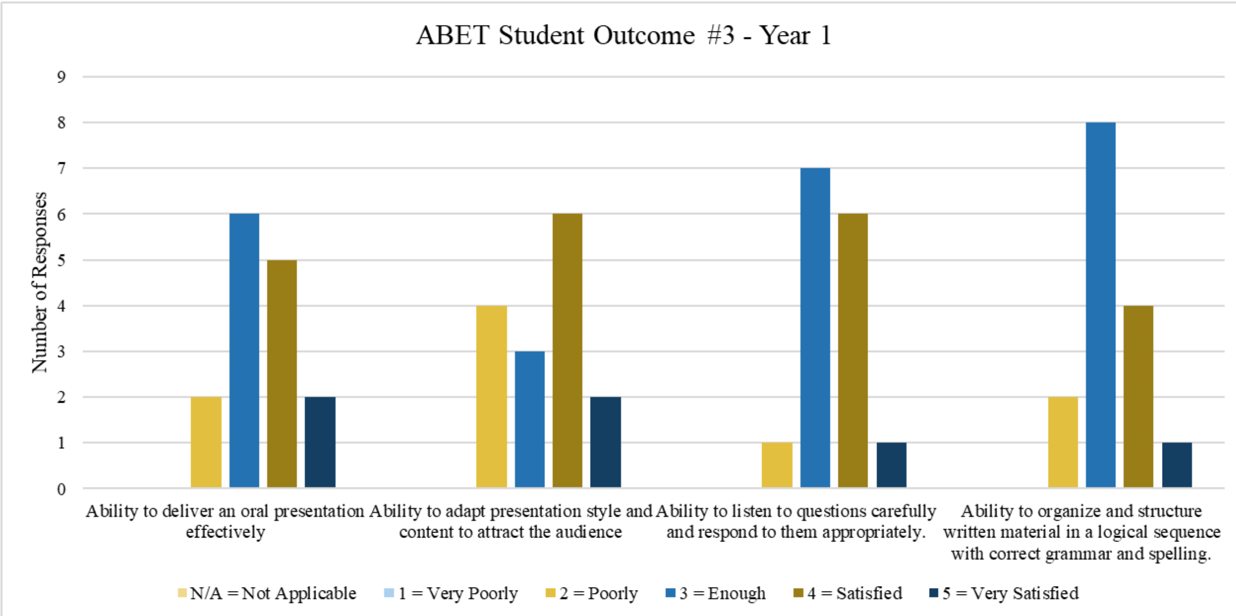


Year 4 Rating of Abilities in ABET Student Outcome 2

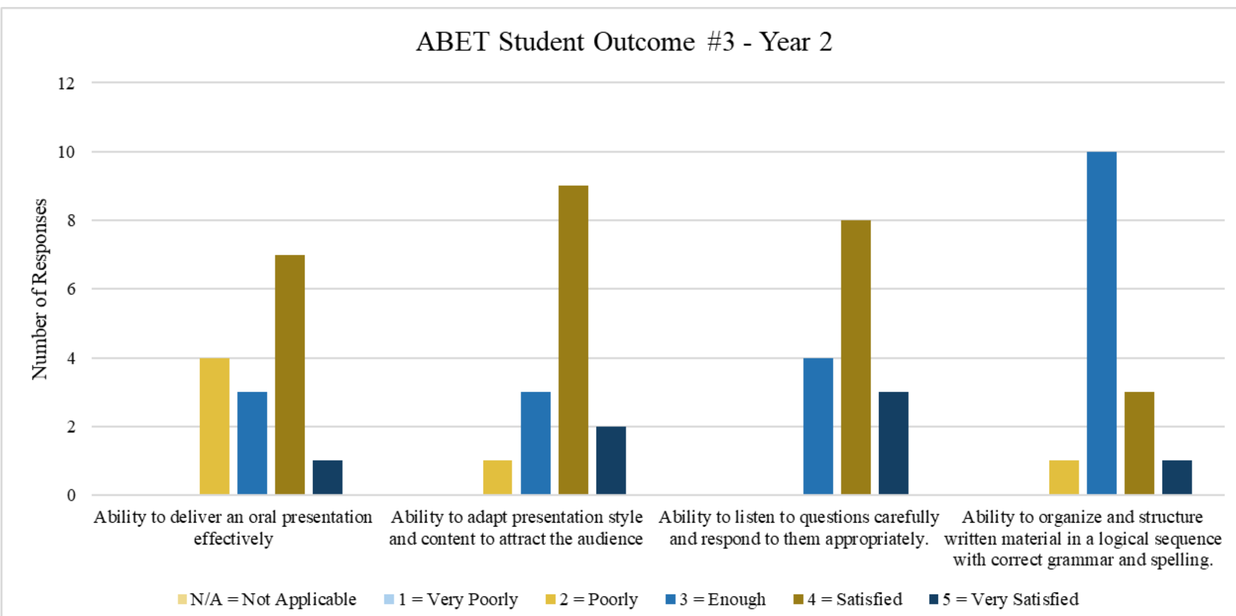
Student Outcome #3



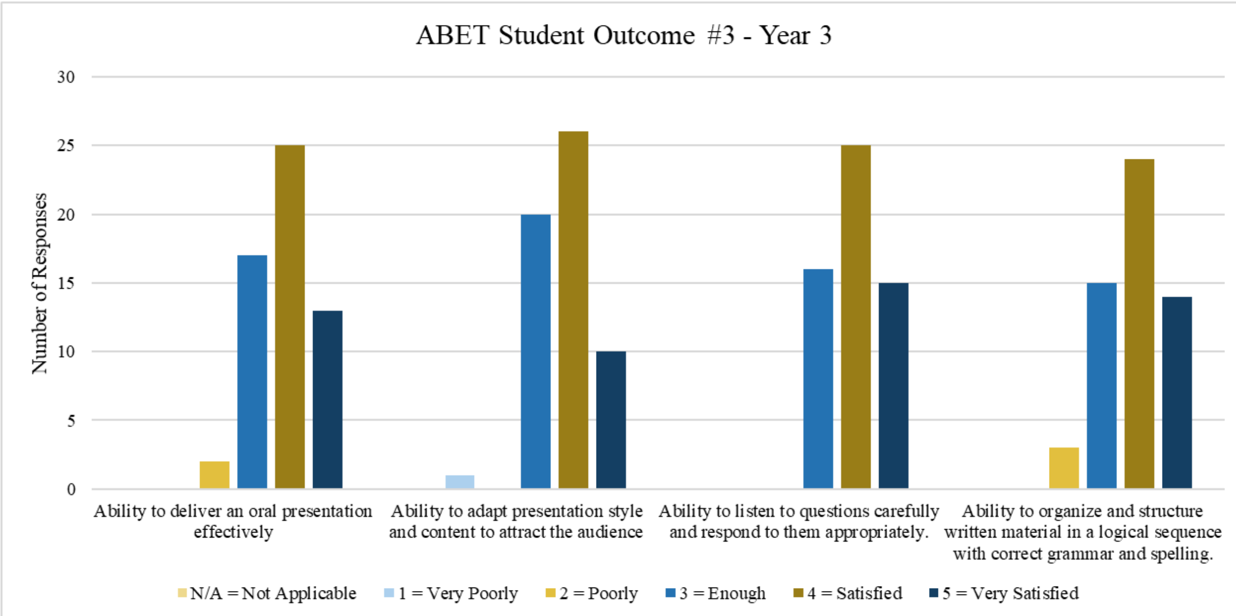
Overall Rating of Abilities in ABET Student Outcome 3



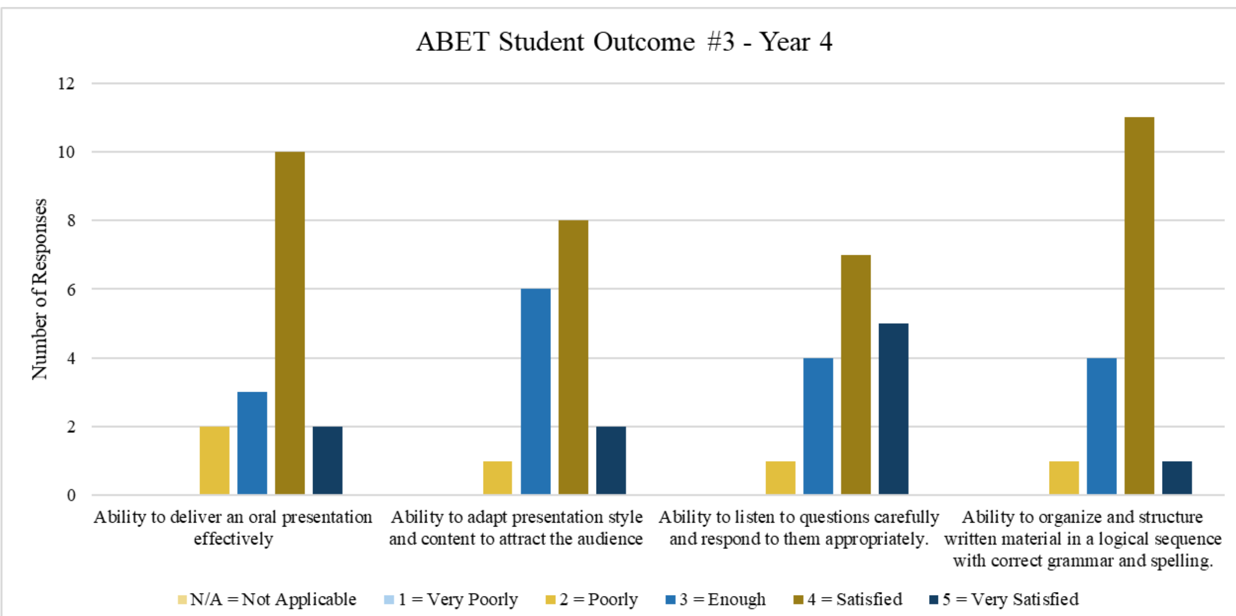
Year 1 Rating of Abilities in ABET Student Outcome 3



Year 2 Rating of Abilities in ABET Student Outcome 3

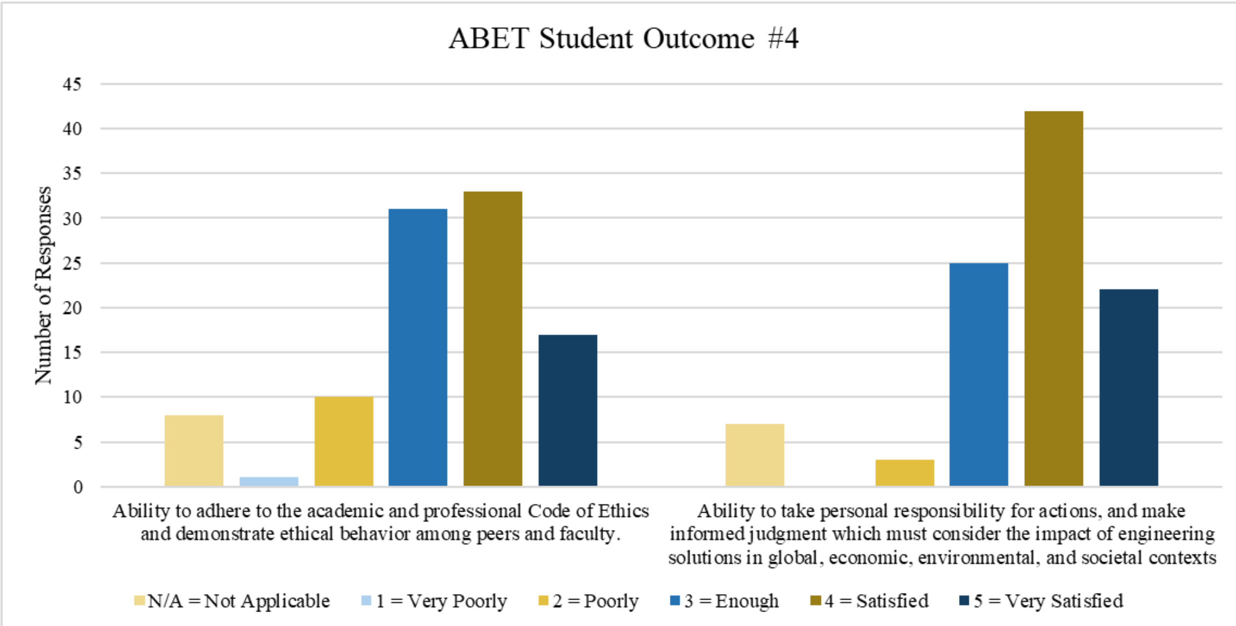


Year 3 Rating of Abilities in ABET Student Outcome 3

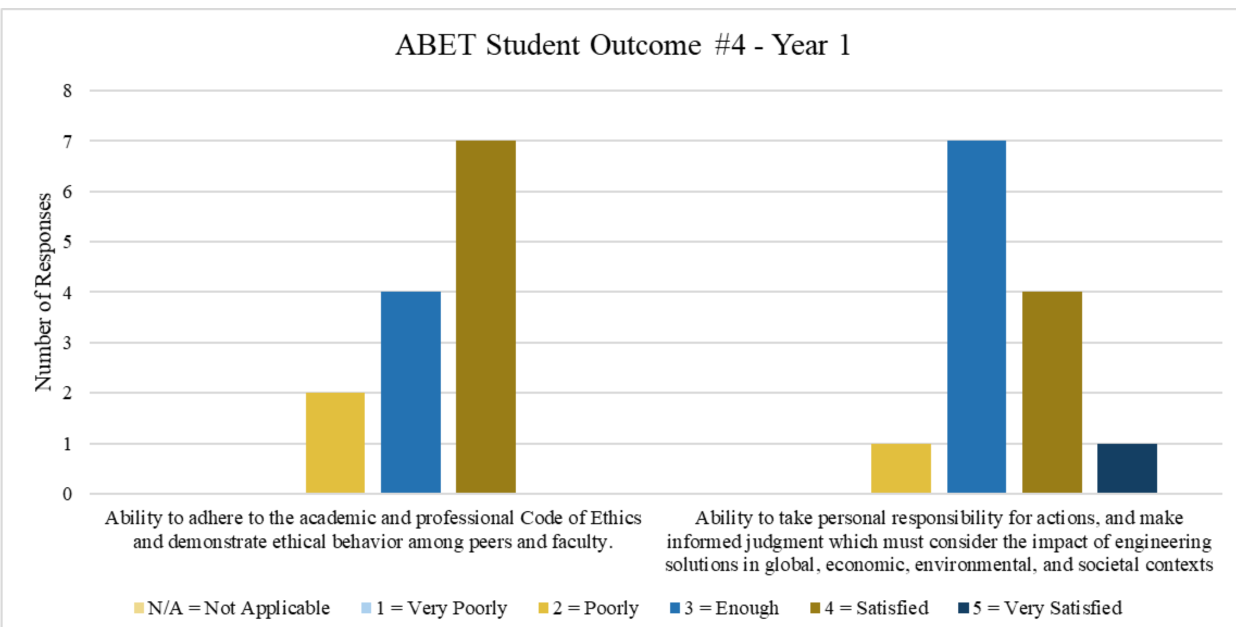


Year 4 Rating of Abilities in ABET Student Outcome 3

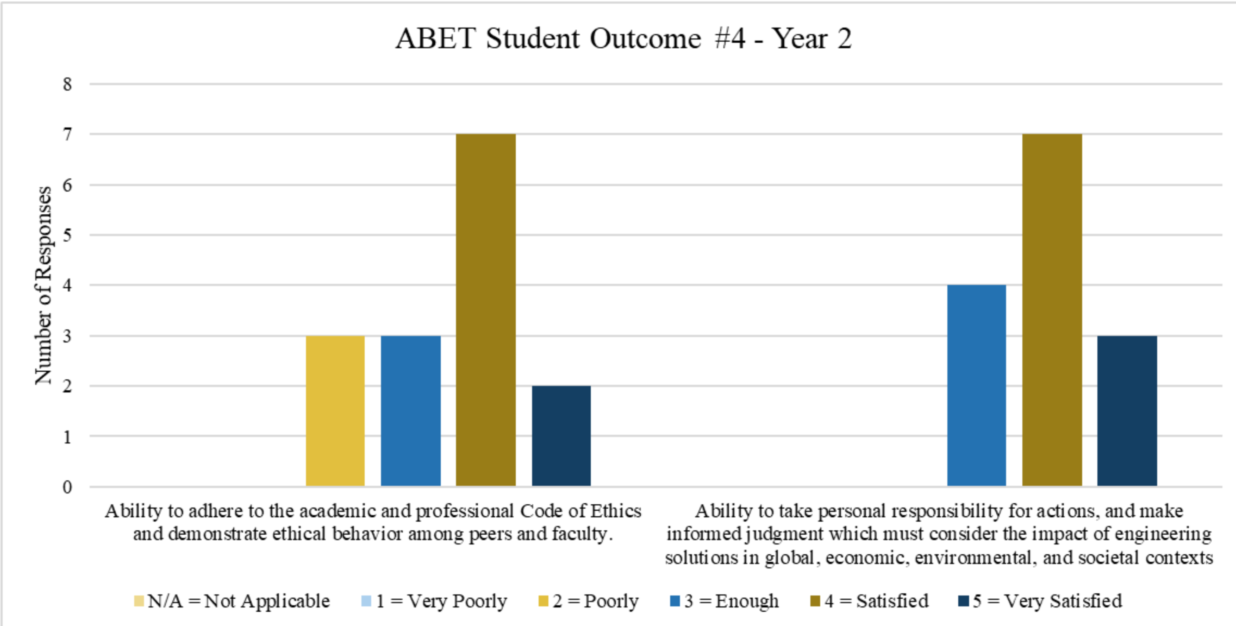
Student Outcome #4



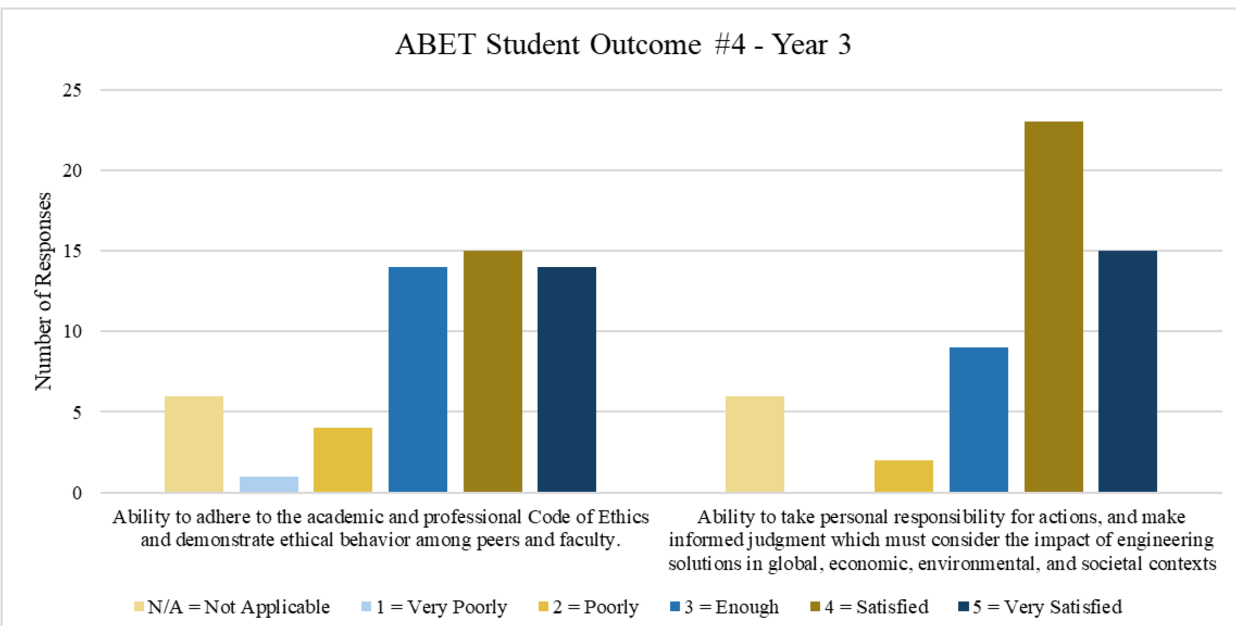
Overall Rating of Abilities in ABET Student Outcome 4



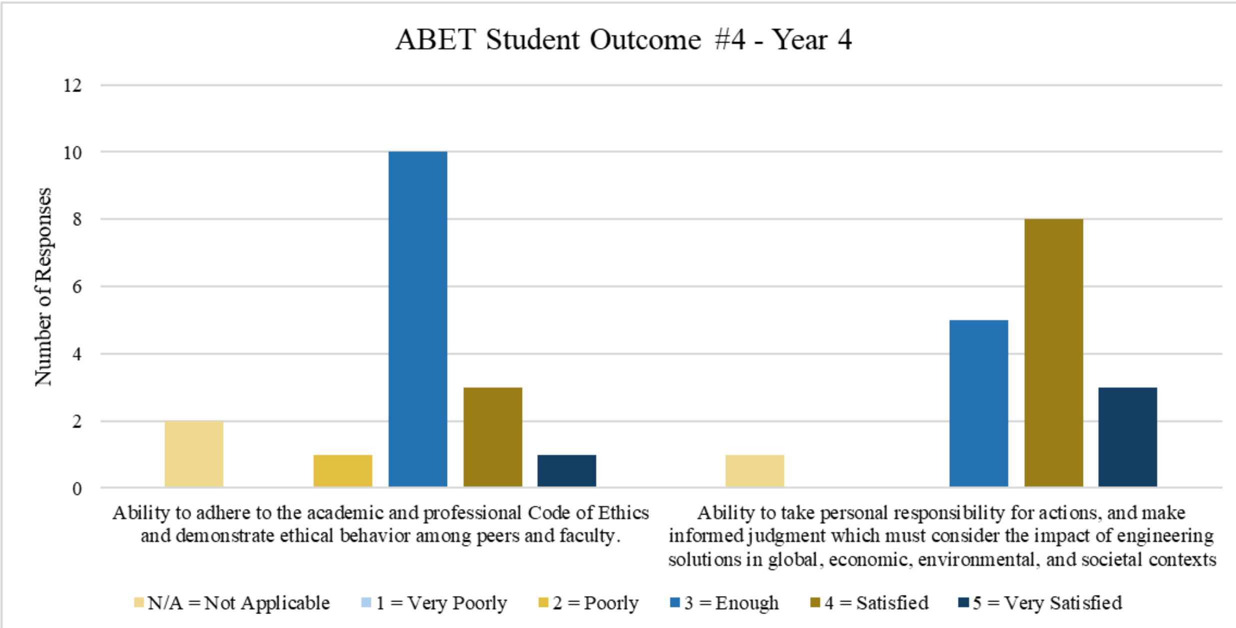
Year 1 Rating of Abilities in ABET Student Outcome 4



Year 2 Rating of Abilities in ABET Student Outcome 4

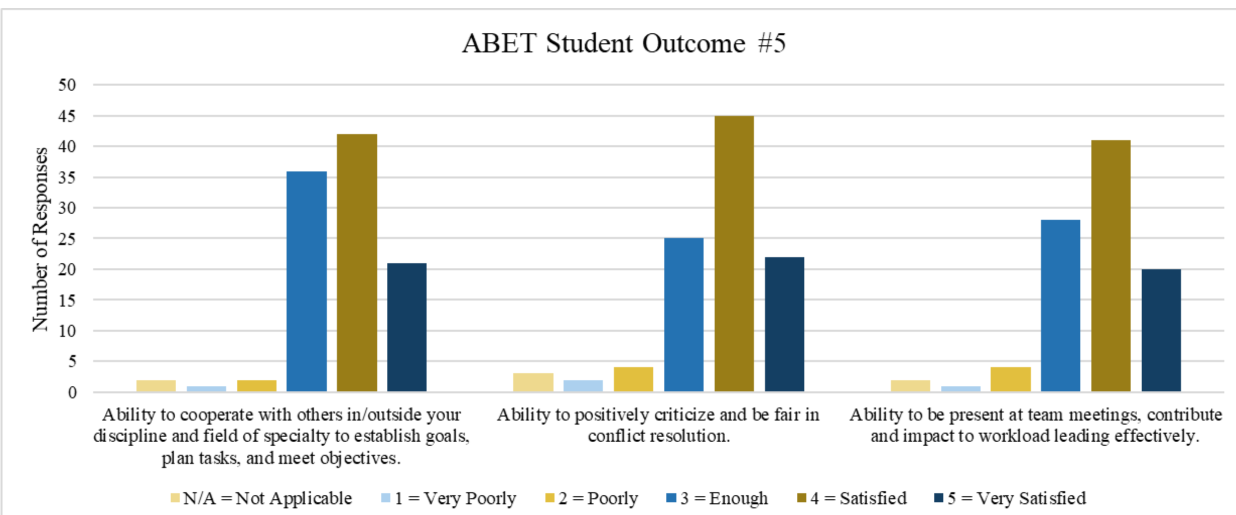


Year 3 Rating of Abilities in ABET Student Outcome 4

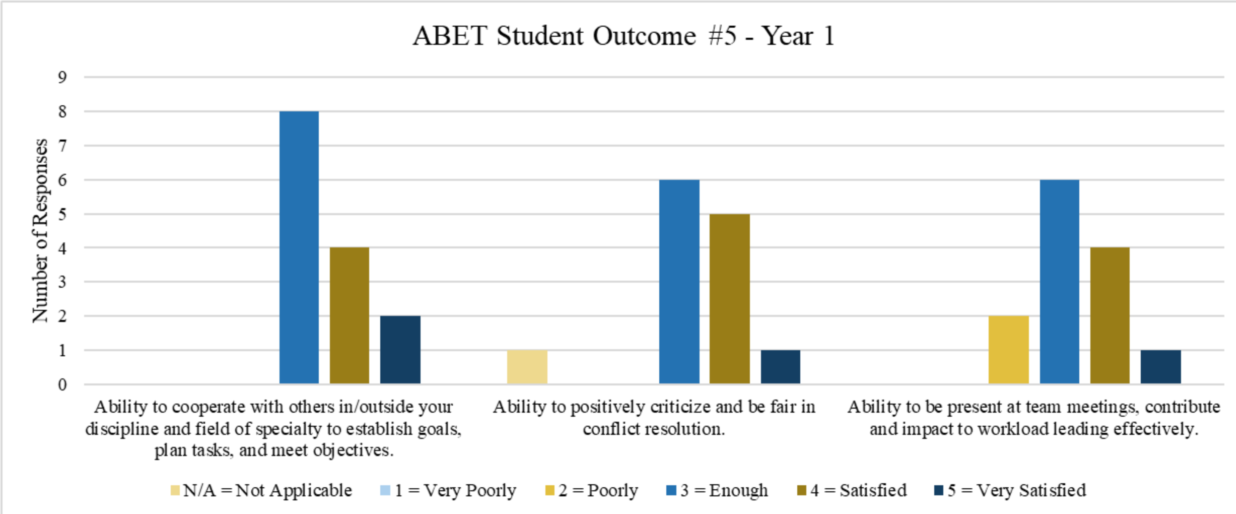


Year 4 Rating of Abilities in ABET Student Outcome 4

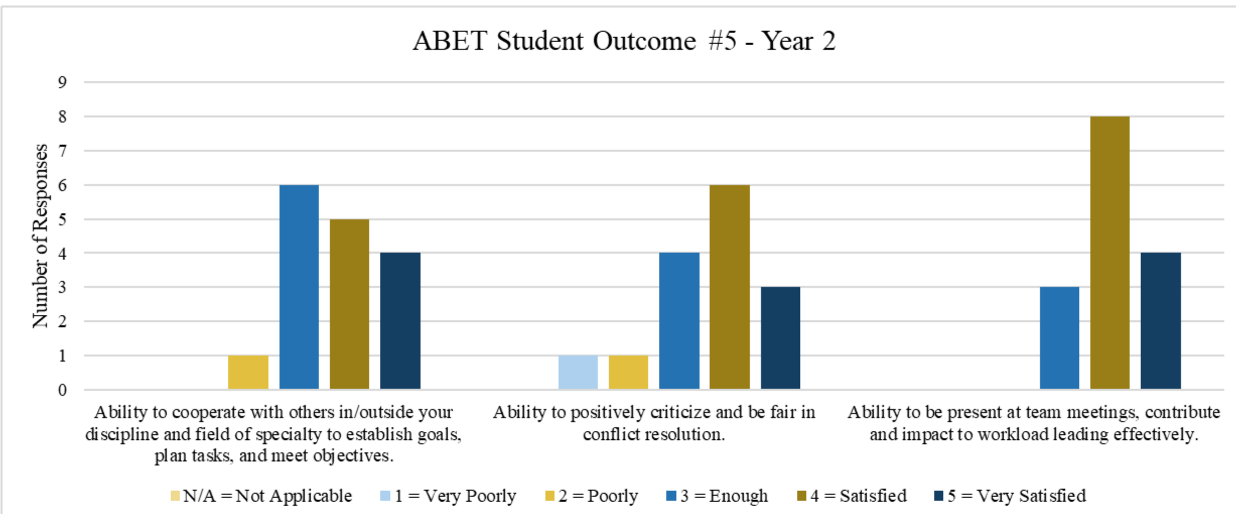
Student Outcome #5



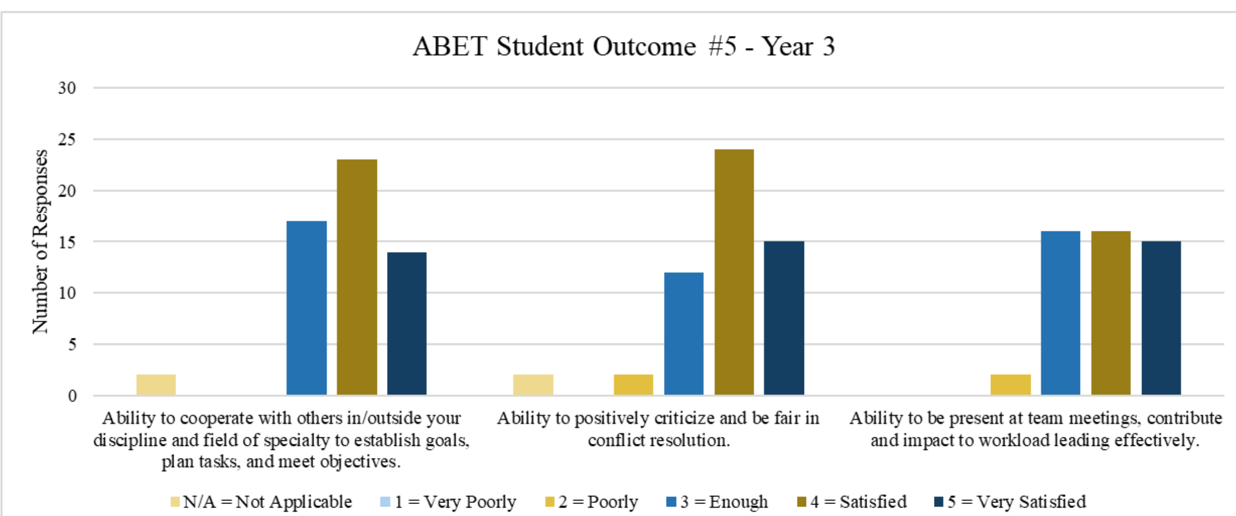
Overall Rating of Abilities in ABET Student Outcome 5



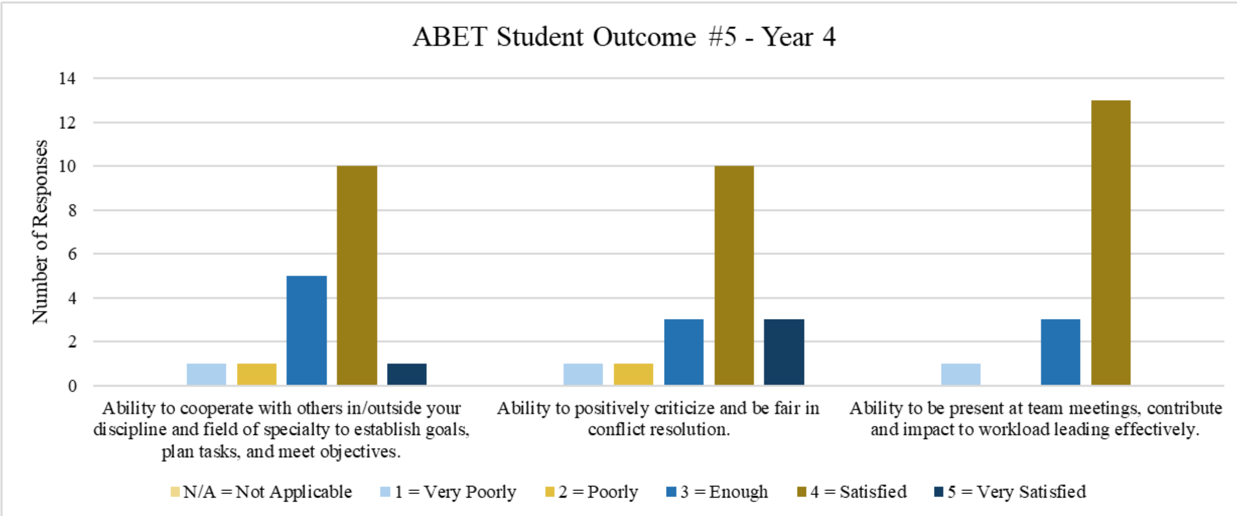
Year 1 Rating of Abilities in ABET Student Outcome 5



Year 2 Rating of Abilities in ABET Student Outcome 5

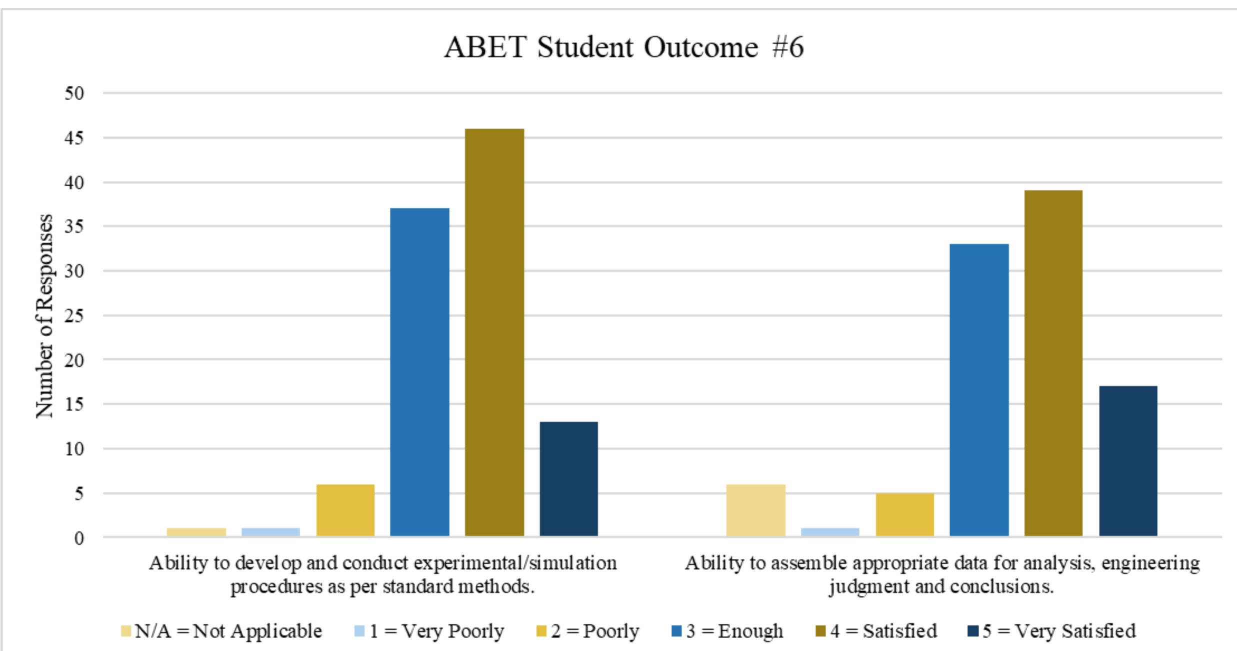


Year 3 Rating of Abilities in ABET Student Outcome 5

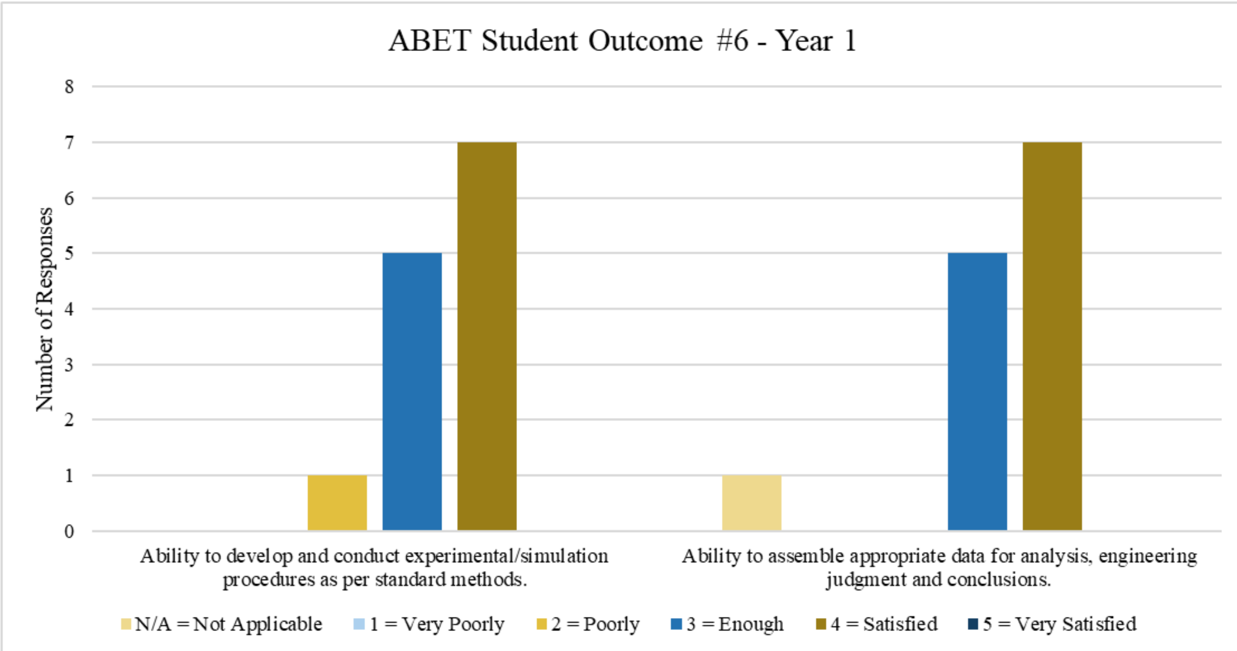


Year 4 Rating of Abilities in ABET Student Outcome 5

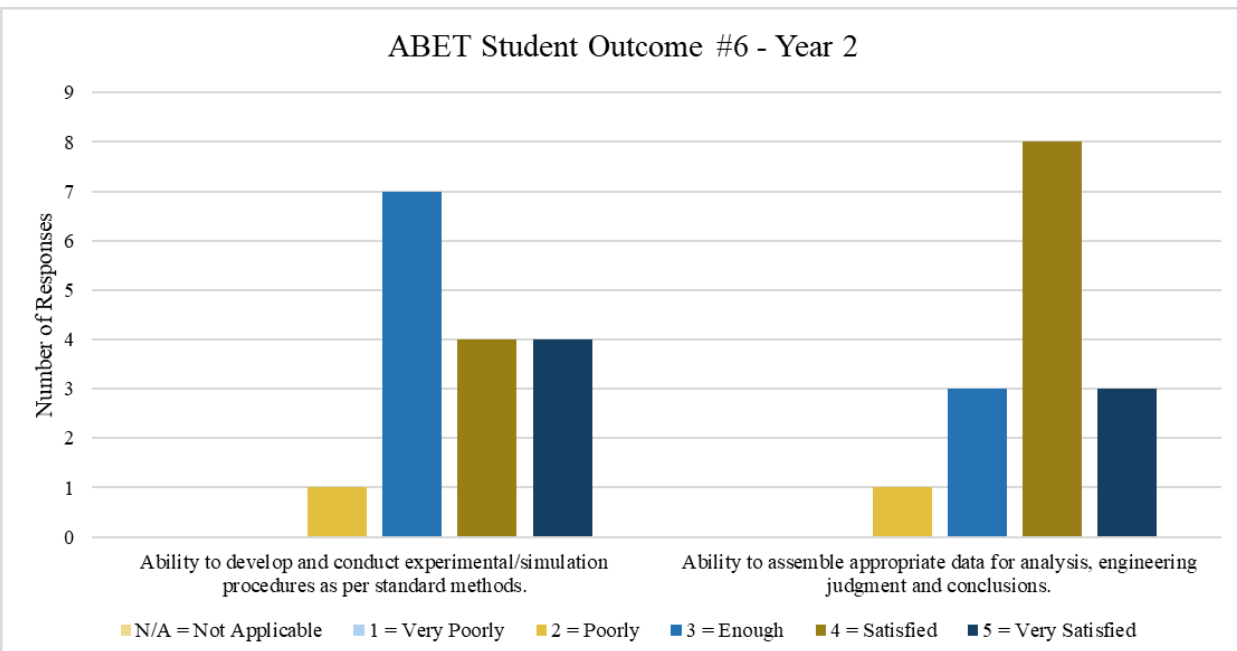
Student Outcome #6



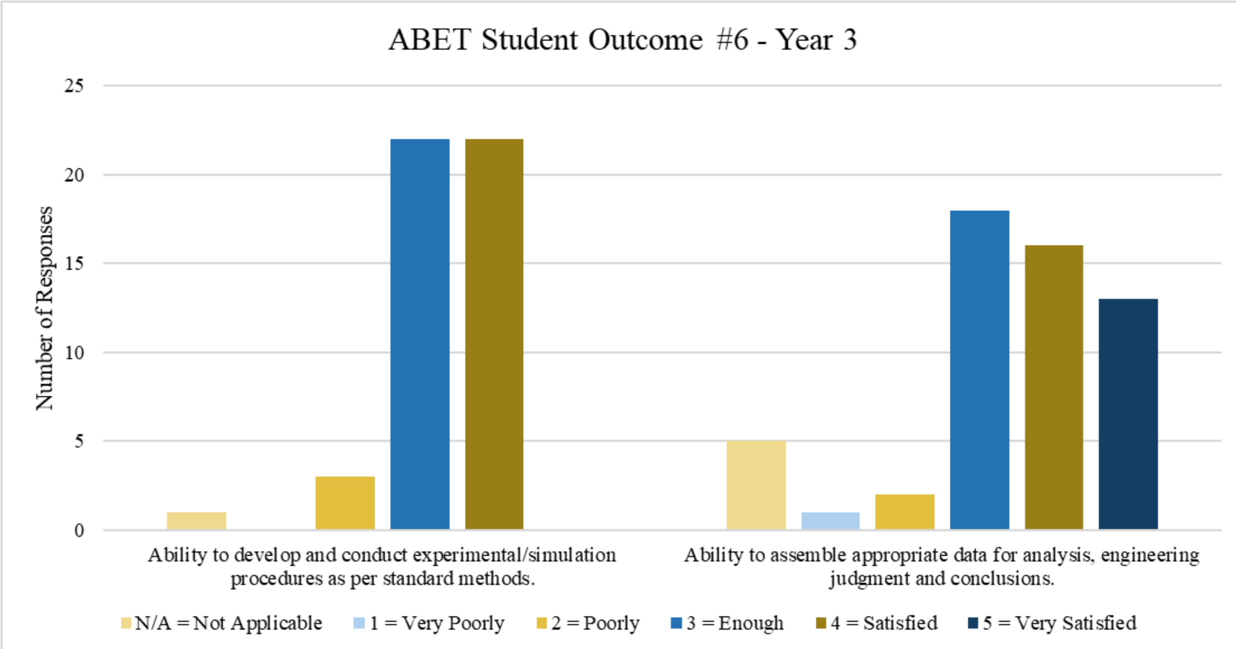
Overall Rating of Abilities in ABET Student Outcome 6



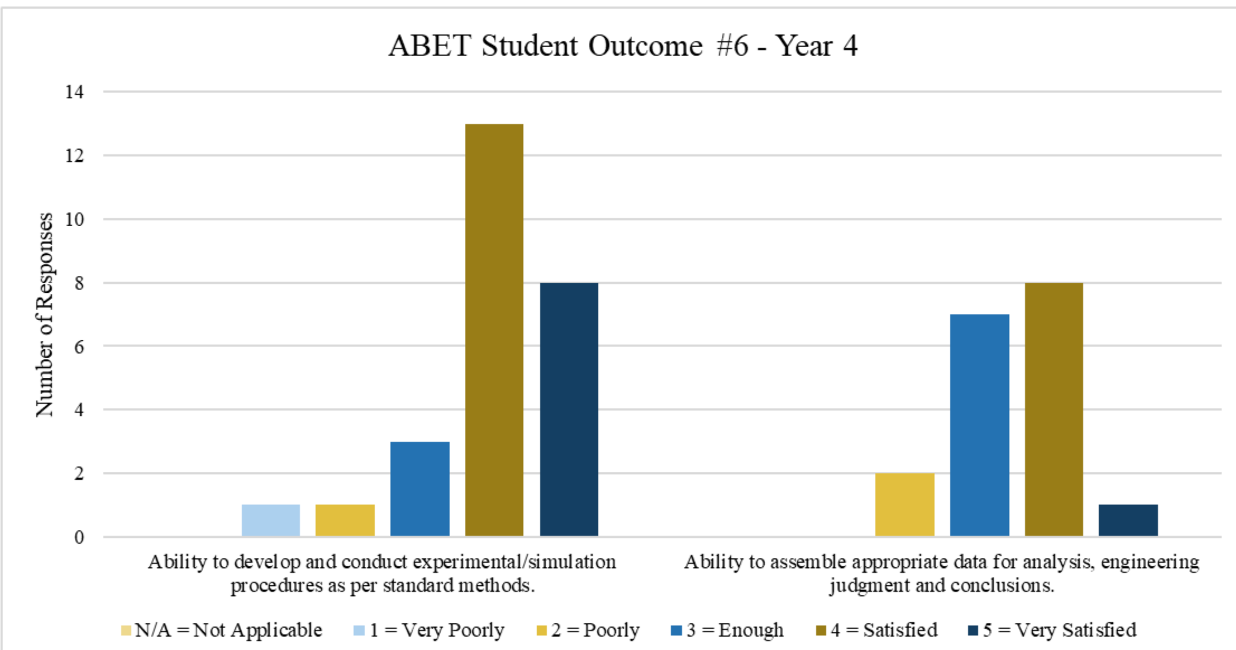
Year 1 Rating of Abilities in ABET Student Outcome 6



Year 2 Rating of Abilities in ABET Student Outcome 6

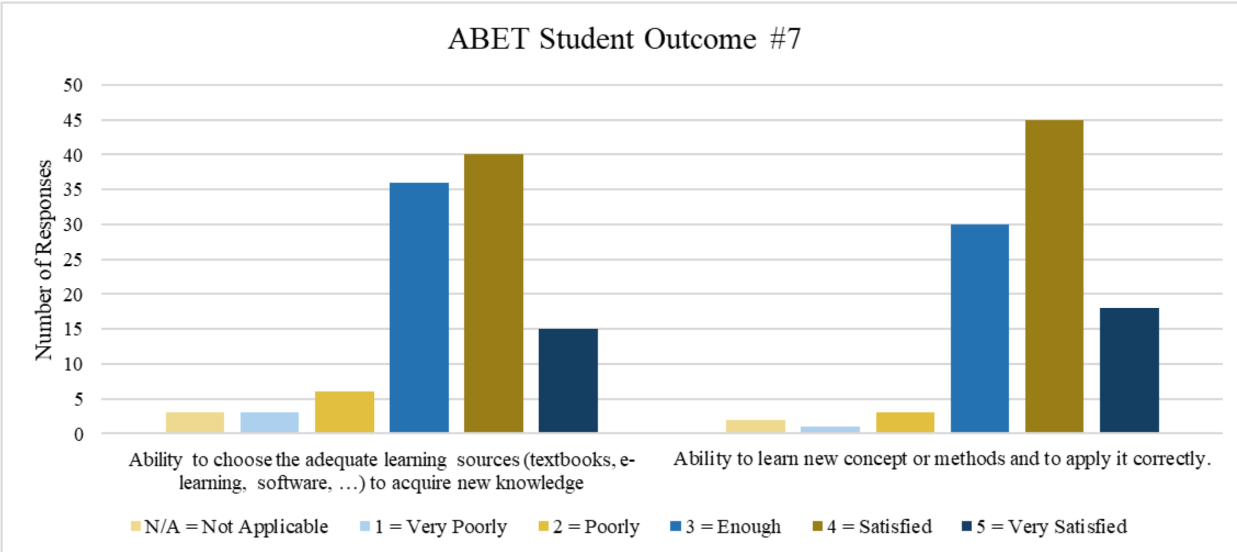


Year 3 Rating of Abilities in ABET Student Outcome 6

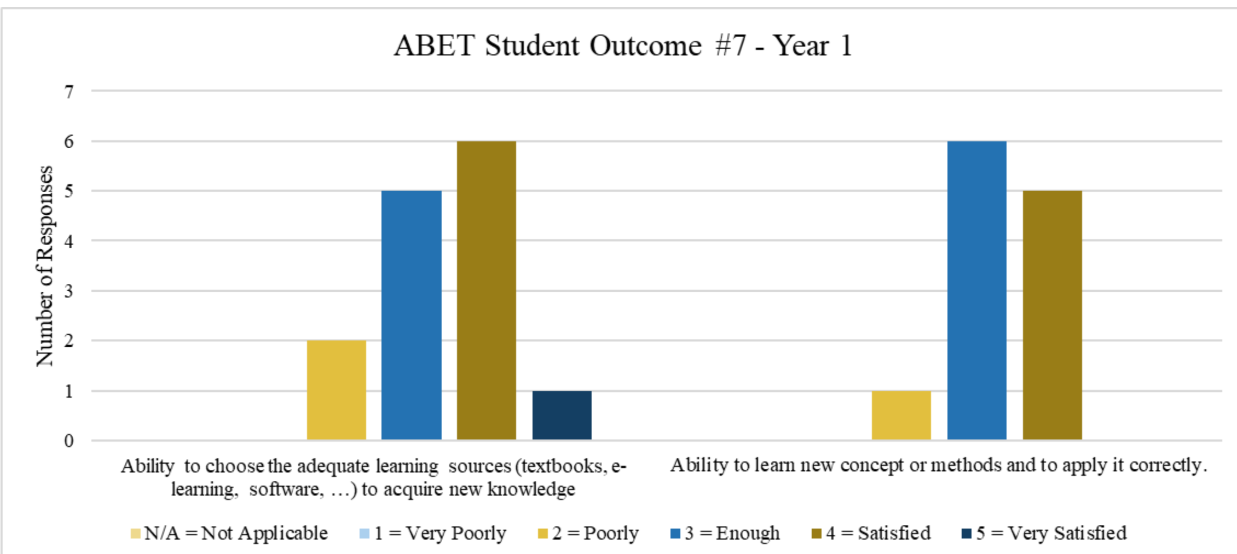


Year 4 Rating of Abilities in ABET Student Outcome 6

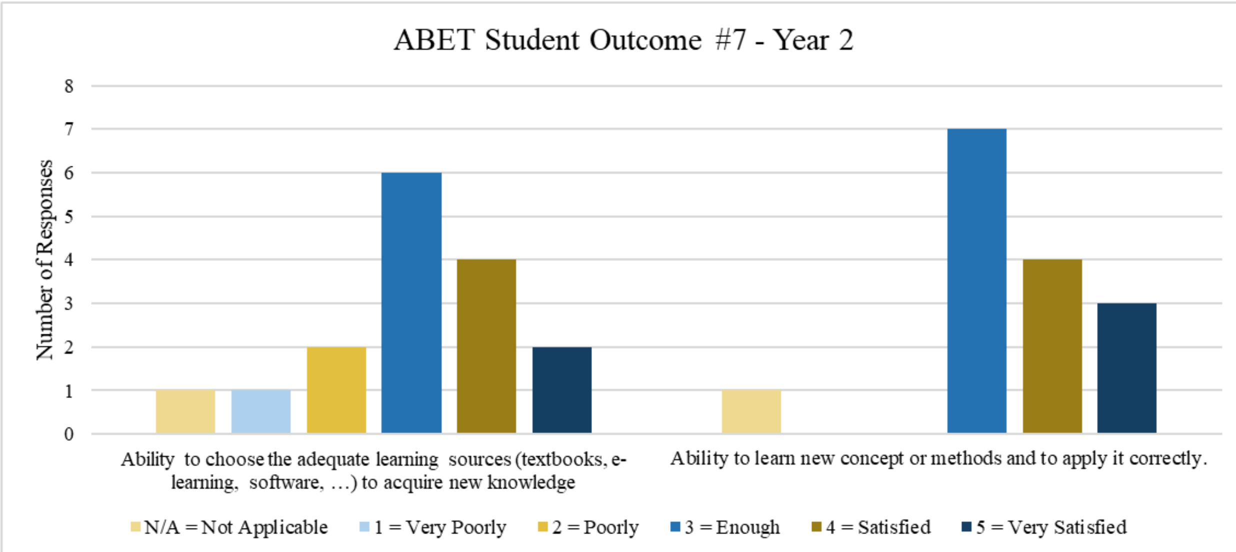
Student Outcome #7



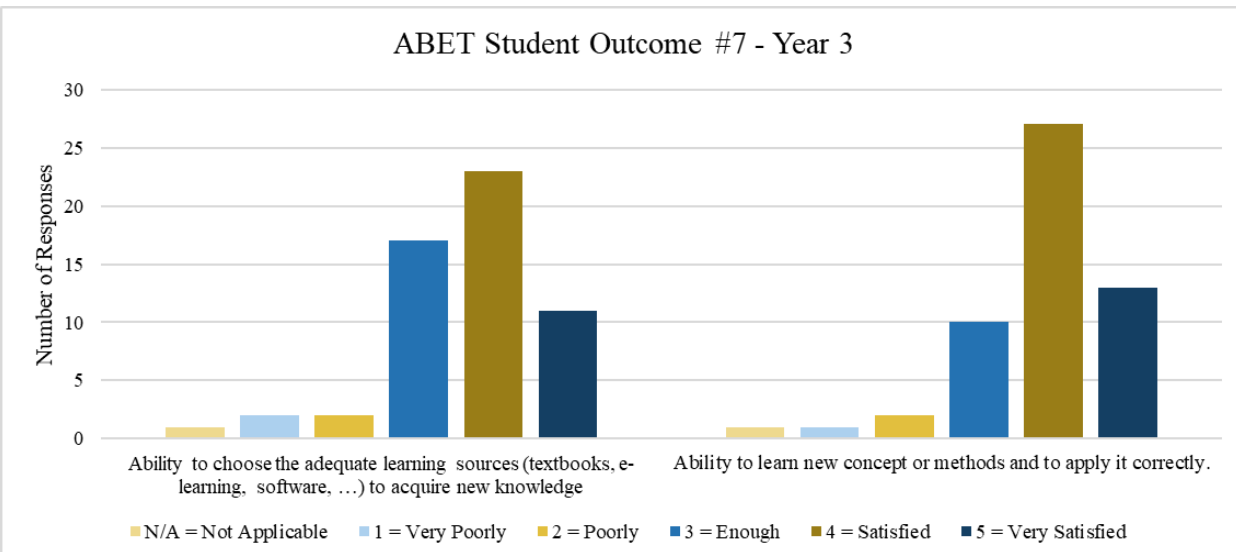
Overall Rating of Abilities in ABET Student Outcome 7



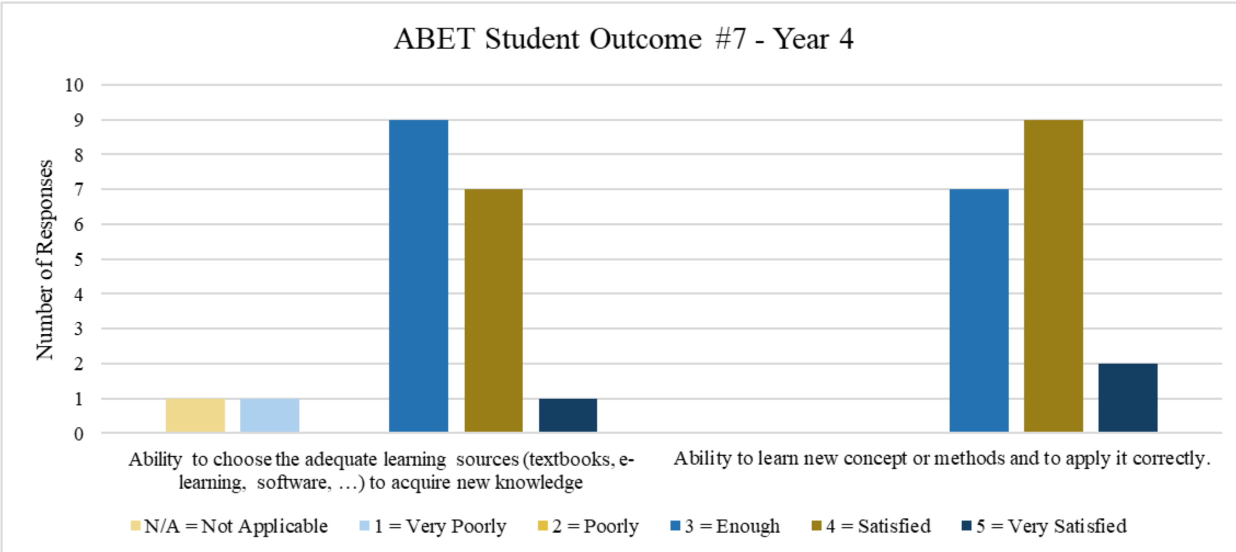
Year 1 Rating of Abilities in ABET Student Outcome 7



Year 2 Rating of Abilities in ABET Student Outcome 7



Year 3 Rating of Abilities in ABET Student Outcome 7



Year 4 Rating of Abilities in ABET Student Outcome 7