2006-1920: TRIANGULATING TC2K ASSESSMENT RESULTS BY USING STUDENT SURVEYS

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Triangulating TC2K Assessment Results by Using Student Surveys

Abstract

This paper describes the use of student surveys to supplement in-course assessment of program outcomes in a EET program for Technology Criteria 2000 (TC2K). It discusses the development of the program outcomes and their assessment within the department courses. It then describes, in detail, the surveys that were developed and concludes with numerical results together with analyses of the results. Examples of how the surveys indicated areas that need attention are included. The opinions expressed in this paper are solely those of the author and should not be considered to represent an official ABET position.

Introduction

With the adoption of TC2K for accreditation the Technology Accreditation Commission (TAC) of ABET requires accredited programs to define objectives and outcomes and to prove to the visitor that they are being met and that the program is being continually improved. The TC2K was reorganized and modified for 2004.[1] The new TC2K includes eight criteria:

1. Program Educational Objectives
2. Program Outcomes
3. Assessment and Evaluation
4. Program Characteristics
5. Faculty
6. Facilities
7. Institutional and External Support
8. Program Criteria

The Self-Study instructions[2] provide guidance as to what must be included in the Self-Study report and the display materials. In particular, the readiness matrix in the Self-Study instructions indicates the necessity of having multiple methods of assessment. This paper will concentrate on the development and assessment of the program outcomes, and specifically the use of student surveys to help identify areas for improvement in the curriculum.

Program Outcome Development

The EET program at Purdue is a 2+2 curriculum; i.e., students spend two years working toward an Associate of Science degree in EET, followed by two more years to obtain a B.S. degree. A unique characteristic of the program is that students are required to take a projects course in each of the first three years and a two-semester senior project sequence in their senior year. At the Purdue West Lafayette campus, very few students stop at the A.S. point. Because of the

relatively few number of A.S. graduates entering the workforce, the faculty decided to pursue accreditation only for the B.S. degree. This was a change from previous visits under the old criteria. One of the first steps in the process of preparing for our TC2K visit was the development of program outcomes.

Program outcomes for the EET program were developed beginning in 1996, when Purdue was preparing for a North Central accreditation visit. As part of its preparations, the University published a statement of outcomes, and shortly thereafter the School (now College) of Technology published its set of outcomes. At about the same time, early draft versions of TC2K became available, so the "a" to "k" requirements were also incorporated. Feedback was solicited from the Industrial Advisory Board at West Lafayette to identify what industry expected from a new EET graduate. A set of EET outcomes was then developed to cover all of the University and School outcomes, the requirements of TC2K Criterion 1, and the requirements of industry.

Developing the outcomes required numerous department meetings, involving the faculty from all of the Department locations. At these meetings, the Assessment Coordinator provided training concerning the assessment process and what outcomes and objectives were. Brainstorming techniques were used to identify what the faculty believed graduates should be able to do, and eventually draft outcomes were developed and refined until a set was agreed upon.

The original set of program outcomes was used for assessment for several years; however, they were eventually criticized as being too generic (i.e., they could apply to any engineering technology program). Thus, in 2002-2003, the faculty revisited the outcomes and refined them; in particular, the sub-outcomes were made much more specific to the EET field. In addition, the IEEE requirements for EET Programs were included in the revised EET Program Outcomes. The Program Outcomes for our program are shown in Appendix A of this paper. The outcomes were divided into sub-outcomes that were more readily assessable.

Assessment of the Program Outcomes

Once the outcomes were defined, we had to determine how to assess the student achievement of the outcomes. Of particular concern were the so-called "soft skills," such as teamwork, communications skills, global perspectives, ethics, life-long learning, and contemporary issues. Assessment of these can be difficult at best, particularly when it comes to triangulating results; i.e., providing more than one method of assessing the outcomes. While some members of the faculty desired to leave the soft skills to the students' humanities and social science courses, that was not a practical solution for our program because there is a wide variety of electives for students in those areas, which might cover some but not all of the ABET outcomes. Thus, it is impossible to guarantee that our students receive exposure to all of the soft skills in their elective courses. In addition, there is virtually no way for the EET faculty to obtain assessment information from courses outside the department. First, our students only comprise a small fraction of the enrollment in any given elective, so it is impractical to ask the instructor to conduct assessment of the entire class in a manner that satisfies our requirements. Second, even if an instructor agreed, there could be restrictions on the transfer of information under the Family Educational Rights and Privacy Act (FERPA).

As a result of these considerations, we incorporated the assessment of all of our outcomes, including the soft skills, in the technical courses offered by the department. All course coordinators were asked to indicate how their courses made a contribution to program outcomes. Some faculty asked me why they should put down that their course contributes to some of the outcomes, because it might mean more work for them. My reply was that any course that doesn't contribute to the program outcomes probably doesn't belong in the curriculum. They saw the logic in that and were willing to fill out the matrix. Generally, we didn't have coverage of much of the soft skills, so some additions had to be made to several courses to emphasize those topics. Examples of how we included soft skill materials into technical courses have been described in a previous paper.[3] As the Department Assessment Coordinator, I worked with the Curriculum Committee and the faculty to identify appropriate places in the curriculum to assess each of the sub-outcomes. In addition to specifying where the items would be evaluated, the faculty specified who would do the evaluation (e.g., lab instructor, course instructor, faculty team), how the item would be assessed, what the standard for success is, and who would compile the data. In some cases, more than one point in the curriculum was used to assess a given sub-outcome; however, that still left the issue of multiple methods of assessment or triangulation.

Assessment of the POs can be by a variety of methods, both direct and indirect and these have been described in the literature, as well as at ABET Workshops.[4, 5] In the assessment of the outcomes in the courses we were using direct methods, so we decided to survey the students to learn their opinion of the curriculum and the program. We began with a survey that is related to the program outcomes and asks the students how the program is doing in the various areas. This survey (the Senior Exit Survey) is shown at Appendix B. The survey contains both open-ended questions and multiple-choice responses. Appendix B also shows the results over the past six years for the multiple-choice questions. As we drew closer to our ABET visit, we became concerned that the survey wasn't detailed enough with respect to some of the soft skills. As a result, we borrowed a survey that our MET colleagues had developed and adapted it for our EET program. This second survey (the Senior Attitude Survey) is shown at Appendix C and contains multiple-choice questions that attempt to draw out the students' attitudes toward topics such as life-long learning, diversity, internationalization, and ethics. We have been using the first survey for over six years and the second is now in its second year. The first survey has traditionally been given in our Professional Issues course (ECET 480), which the students take during the semester prior to their final semester. To avoid giving both surveys in the same course, we chose to administer the second survey during the final semester in the Senior Projects laboratory sections (ECET 497). By administering them in class or lab, we insure that virtually all students participate in the surveys and their length is not an issue. The next two sections will discuss the surveys in more detail.

Senior Exit Survey

As mentioned previously, the Senior Exit Survey, with scoring results, is shown at Appendix B. The scoring responses that are shown are weighted averages of the student responses, except for the True-False or Yes-No responses. In this survey "5" is the most desirable score. The survey contains the program outcomes to help the students consider their responses to the questions that are keyed to the outcomes. In the area of communications skills, we were interested in whether the students felt the curriculum was helping them. Thus, we asked questions about what they

believed their written and oral abilities were before they started at Purdue and what they are now. We also asked what courses helped or didn't help them learn communication skills, whether they had adequate opportunities to practice these skills in the curriculum, and whether they received sufficient feedback from their ECET professors.

In looking at the responses to questions 1 and 2 for written communication, in every semester the students indicate they believe their written skills have improved. The change in score ranges from about 0.5 to 0.9, with an average of 0.7, which seems to indicate a significant improvement in the minds of the students. When asked what courses helped and didn't helped, students were almost as likely to indicate their first-year composition course. Many frequently mentioned the ECET courses that have comprehensive lab reports as helping them improve their writing. This seems to be borne out by the response to questions 3 through 5. Question 3 asks whether the English and Comm classes helped and the responses are in the low 3's. Questions 4 and 5, with scores typically above 4, indicate the students believe the curriculum provides sufficient opportunities for them to improve and the ECET professors provide them with feedback   In general, these results seemed to indicate we were doing well in written communications. It is interesting to note that the English department, in response to feedback from several colleges and schools within Purdue, revised the first composition course, increasing it from three to four credit hours including small group work. The results of this change won't be seen in our senior surveys for another year, however.

Questions 6 through10 were essentially the same as questions 1 to 5, except they dealt with oral communication skills. In general, the scores for oral skills were lower in both questions 5 and 6 (i.e., their skills before and after Purdue). There still was a noticeable improvement in the scores from question 5 to 6 in every semester, with an average of 0.75 points improvement. The speaking courses scored somewhat better than the writing courses (question 8 vs. 3) while the EET courses were lower for oral than for written (questions 9 and 10 vs. 4 and 5). This was not unexpected, as the required courses in the curriculum only had a requirement for presentations during senior design (some ECET electives have oral presentation requirements). Partly as a response to this, the Curriculum Committee combined two, 2-hr courses (trouble shooting, ECET 276, and sophomore projects, ECET 296) into a new 4-hr sophomore project course (ECET 297), during the final semester of the A.S. degree program. It was decided that ECET 297 would have an oral communication requirement. The first group students that took 297 will graduate next year, so we hope to see an improvement in the response to questions 9 and 10.

Questions 11 and 12 deal with graphical communications and targeting presentations, respectively. The responses to question 11 show that students very strongly agree that the curriculum has prepared them to develop effective visual presentations. This has been borne out by the faculty assessment of the senior design presentations. The responses to question 12, while not as strong, still indicate that students agree they have been taught to target their presentations to a particular audience.

Outcome 2 for the EET program deals with life-long learning and the implementation of current technology. Questions 13 to 15 were related to this goal. The responses to question 11 show that students believe they have developed information acquisition skills and those to question 13 indicate students will continue their education throughout their career. Students indicated they

believe they can use and implement current technologies in their area of specialization in their responses to question 14. In a survey of graduates, 41 out of 48 respondents indicated they agreed (19) or strongly agreed (22) that they were continuing their education, which indicates that students do follow through on their intent. The area of life-long learning was explored in more depth on the attitude survey that is discussed in the next section of this paper.

Questions 16 to 20 surveyed the students' self-evaluation in the areas of problem solving, critical thinking, and design. Students agreed they could create a project timeline as the responses to question 16 ranged from 4.03 to 4.19 and even more so that they understood the design process as shown by question 17, with scores from 4.12 to 4.37. In general, the faculty viewed these results as validating the junior and senior projects courses in the curriculum. In the junior course they are taken through the steps of a project and then have to propose their senior project. In the senior project they design, construct, and test an electronic-based system of their choosing. Responding to question 18, students indicate they can analyze, design, and implement technology in at least one of the four specialty areas required by the IEEE criteria for a EET program. Students' confidence in their ability to use the advanced math required by the IEEE seems to vary significantly from semester to semester, as shown by the results for question 19, which range from 3.78 to 4.53. Question 20 shows that students agree they can solve problems that haven't directly been covered in class.

Ethics and personal discipline are covered by program outcome 5 and were covered by questions 21 through 28. Questions 21 to 23 specifically dealt with ethics. Students generally were not all that familiar with the IEEE code of ethics (question 21), but they do show very strong agreement that business should be conducted ethically (question 22). They also tend to agree that their education will help to identify ethical issues. Ethics was an area that was identified as needing additional emphasis. As a result, an ethics component was added to the new 297 course previously mentioned and a case study on Enron was added to the electrical power course.[3] The responses shown here were from students who were not exposed to this additional material. Questions 25 and 26 were intended to determine if students were voluntarily participating in professional activities. As is clear from question 25, there has been a steady decrease in IEEE membership, probably due in part to a dues increase from $19 to $30 in 2002. Unfortunately, there has been a similar decrease in participation in professional society meetings as shown by question 26. This is an area that the curriculum committee will be exploring. In answering question 27, students agree that the curriculum motivates them to take pride in their work and to put their best effort forward. They also agree, but less strongly, that they can manage their time effectively (question 28).

Questions 29 to 31 covered program outcome 6, which includes diversity, internationalization, and societal concerns. Typically, about half of the students indicate they have participated in a cultural experience outside of their own at Purdue (question 29). These were not defined so it was up to the students to interpret what that would include. Students do agree that diversity is important in business as shown by the positive response to question 30. Students indicate in question 31 strong agreement that they understand legal issues that can arise from harassment or discrimination. This is covered in ECET 480, the Professional Issues Course, which was where the survey was completed. After reviewing the survey, it was noted that we had not covered international concerns. The topics included in outcome 6 are covered in more detail in the

attitude survey, which is described in the next section.

Teamwork is covered by questions 32 through 35. Questions 34 and 35 were not originally in the survey and were added in the fall semester of 2003. Students agree fairly strongly that the curriculum has helped them learn to work in a team (question 32) and that they have an understanding of different personality types (question 33). As shown in question 34, students agree that they enjoy working in teams and show stronger agreement with the statement that teamwork is important in the workplace (question 35). Teamwork is always high on the list of skills required by our Industrial Advisory Board and it occurs informally throughout our curriculum as students are required to work in groups of two or three in labs. Some instructors rotate lab partners several times during the semester to force students to work with different personalities. Formal teamwork occurs in the junior projects course, where students must work in teams of three to five to design and construct a microprocessor controlled system. Typically, these have been micromouses that were required to do autonomous functions and report back to a PC, requiring RF communication, power, micros, software, and other skills for success.

Students are encouraged to write comments at the end of the survey and most do. Those comments are recorded by the department secretaries and are forwarded to the Curriculum Committee for action, as required. Students indicated there were problems with the old 276 and 296 courses that were previously mentioned, and as a result the Department replaced those courses with the new 297 course. Other courses have made changes as well.

The Senior Attitude Survey

As we began final preparations for our ABET visit, we looked at our survey results and thought we could use some additional results. Our MET colleagues shared a survey they had developed and we adapted it for our program. The survey and results are shown at Appendix C. Only two semesters' results were available–for the spring and summer of 2005.

The first five questions dealt with life long learning. The responses to question 5 clearly indicate that students strongly agree there is a need for lifelong learning in the EET profession, which agreed with the results of the first survey instrument. The responses to questions 1 and 2 indicate that most recognize they will be spending a significant amount of time learning new things in the early part of their careers, but the responses to 3 and 4 seem to indicate they believe the requirement for new learning will decrease as they progress further in their careers.

Questions 6 through 16 deal with students attitudes toward each other and how they perceive other students' attitudes toward themselves. Questions 6 and 9 indicate that the overwhelming majority of these students believe that they treat each other with respect and they try not to embarrass other students. Question 10 indicates that most have not been ridiculed for being different; however, 44 of the 52 students were Caucasian males, so the groups were not very diverse to begin with. The same comment holds for question 7; the students indicate they are comfortable working in diverse groups, but the pool isn't very diverse to begin with. Questions 11, 12, 15, and 16 dealt with communications between students and respect for others' opinions. In each case, a large majority scored the question in the 5 or 4 category, indicating that other students respect different opinions and listen respectfully to others. Question 13 indicates that

the overwhelming majority of students believe EET students treat all with respect, regardless of race, gender, age, or sexual orientation; however, in each class one Caucasian male student strongly disagreed with the statement. Question 8 dealt with inappropriate jokes and only three spring and four summer students indicated they had never heard other students tell such jokes. This was identified as an area that the faculty will need to consider. As a result, all faculty were asked to put statements in their syllabus dealing with professional conduct.

Questions 17 and 31 are designed to solicit students' commitment to continuous improvement. In both cases, roughly 90% of the students expressed agreement that they would need to continuously improve products and processes, indicating an awareness of the need for continuous improvement.

Questions 18, 20, 21, 22 and 29 all deal with international considerations. In general, students seem to understand that international considerations will affect their careers. Question 18 had the weakest response as only about 50% agreed or strongly agreed that their career paths may have to move away from manufacturing. However, the response to question 21 indicated agreement that outsourcing would impact their careers, although the summer cohort seemed to be slightly less in agreement with this statement. About three-fourths of the students agreed or strongly agreed that they will need to communicate with colleagues in other countries (question 22). Energy concerns have international implications and, again, over three-fourths of the students realized that they will need to develop energy efficient solutions in the future (question 21). Looking at question 29, twenty (77%) students in both groups indicated it was essential or very important (scores of 5 or 4) to understand other countries and cultures. This compares to 38% of University incoming students in the fall of 2004. This would seem to indicate that the curriculum and University experience is helping students to recognize the importance of understanding other cultures.

Questions 23 through 26 dealt with ethical considerations. These questions were reversed, in that the desired answer would be strongly disagree. Over 70% of students indicated they disagreed that not referencing sources was ethical. This could be attributed to the strong emphasis in the curriculum in lab reports and other written assignments. There were a disturbing number in the spring survey that agreed that it is ok to report selected or incomplete data to satisfy pressure from a supervisor or customer (question 24). This is currently covered by the Enron case study in ECET 231; however, almost all of the spring students took 231 before the case study was included. The response to question 24 was better in the summer cohort; a number of them took ECET 231 after the Enron case study was incorporated into the course.

Questions 19, 27, and 28, dealt with racial diversity. The response to question 19 indicates that most students understand the job place will be more diverse than the EET program at Purdue. Seven spring students and nine summer students disagreed or disagreed strongly with the statement that racial discrimination is no longer a problem in America (question 27). Ten in the spring indicated agreement or strong agreement, but only four indicated these choices in the summer. In a survey of fall 2004 entering Purdue students, 25% agreed with this statement. The faculty may need to consider alternative courses of action, such as a required course for all students either from Humanities/Liberal Arts, the department, or the College of Technology. With respect to question 28, Twenty (spring) and 17 (summer) indicated that racial

understanding is essential or very important. All but one of the remaining were neutral. Only one student, in the summer, indicated that it is not important (scores of 2 or 1).   This compares to 22.7% of the University incoming students in the Fall of 2004. This would seem to indicate that the curriculum is helping students recognize the importance of racial understanding.

Finally question 30 was designed to show the students commitment to timeliness. No student disagreed with this statement and 22 (85%) in each class agreed or strongly agreed with it. This indicates that our graduating students do seem to have an understanding of the importance of timeliness.

Summary

Two surveys of senior EET students were used to determine their attitudes towards their accomplishment of the program outcomes and many of the so-called ABET "soft skills." The surveys were intended to supplement the assessment of student learning based on student accomplishments in required courses The survey results have been used by the Curriculum Committee, which has found them to be useful in determining the accomplishment of the outcomes, as well as indicating where to make improvements in the program. Now that we are past our ABET review, we will likely look at consolidating the two surveys into one, unless that results in an excessively lengthy survey document. In scoring the second survey, it was found that there was more useful information in the distribution of the responses, rather than the averages, so in the future we will tabulate all responses as in the second survey.

Acknowledgement

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APPENDIX A
Purdue EET B.S. Degree Program Objectives

Students graduating with a Bachelor of Science Degree in Electrical Engineering Technology will have:

1   The ability to communicate effectively in oral, written, visual, and graphical modes in both interpersonal and group environments.

   1.1   Students produce effective written documents.
   1.2   Students deliver effective oral presentations.
   1.3   Students develop, prepare, and interpret effective visual and graphical information.

2   The attitudes, abilities, and skills required to adapt to rapidly changing technologies and the ability to pursue life-long learning.

   2.1   Students effectively use Information acquisition tools.
   2.2   Students express a commitment to quality, timeliness, and continuous improvement.

3   The ability to think critically, and to identify, evaluate, and solve complex problems.

   3.1   Students will be proficient in the use of digital-multimeters, oscilloscopes, waveform generators, and power supplies.
   3.2   Students apply circuit analysis/design techniques and analog and digital electronics to the building, testing, and operation of electronic systems.
   3.3   Students apply computer programming and associated software to microcontroller systems.
   3.4   Students apply physics principles to electrical/electronic(s) circuits in a rigorous mathematical environment at or above the level of algebra and trigonomentry.
   3.5   Students can analyze, design, and implement electronic systems using control systems, communications systems, computer systems, or power systems.
   3.6   Students are able to use statistics and/or probability, transform methods, discrete mathematics, or applied differential equations in support of electrical or electronic systems.

4   An understanding of all aspects of the design process and project management including functional and esthetic considerations.

   4.1   Students understand and can apply the stages of the design process.
   4.2   Students are able to evaluate alternative design solutions.
   4.3   Students can develop a project schedule.

5   A well-developed sense of ethics and the personal discipline to succeed in the EET profession.

    5.1   Students are aware of professional Codes of Ethics.
    5.2   Students can identify ethical misbehavior, situations, & issues, and suggest courses of action

6   An awareness of the internationalization of technology and the marketplace and cultural diversity

    6.1   Students are aware of the international nature of large technical companies.
    6.2   Students are aware of cultural diversity in contemporary society
    6.3   Students demonstrate awareness of some international implications of technology
    6.4   Students are aware of legal issues relating to harassment and discrimination.

7   The skills and attitudes necessary to work successfully as a member of a team.

    7.1   Students demonstrate effective teamwork skills.

Appendix B
Department of Electrical & Computer Engineering Technology
Senior Exit Survey

Dear Senior ECET Student:

To assist us in our efforts to continually improve our curriculum and student learning, we would like you to help us by answering the following survey. The expected outcomes for students in our curriculum are as follows:

Our graduates will have:
1. The ability to communicate effectively in oral, written, visual, and graphical modes in both interpersonal and group environments
2. The attitudes, abilities, and skills required to adapt and adjust to rapidly changing technologies and a desire for life-long learning
3. The ability to think critically, and to identify, evaluate, and solve complex technical and non-technical problems
4. An understanding of all aspects of the design process including functional and esthetic considerations
5. A well developed sense of ethics and the personal discipline to succeed in their chosen profession
6. An understanding of the internationalization of technology and the marketplace and the value of cultural and personal diversity
7. The skills and attitudes necessary to work successfully as a member of a team

Considering the above goals, please indicate your responses to the following questions or statements:
1. Goal (1): When I came to Purdue, I believe my writing skills were:
a. very strong (5)   b. strong (4)   c. average (3)   d. weak (2)   e. poor (1)

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04	Sp 05
3.35	3.22	3.00	?	3.41	3.29	3.22	3.36	3.24	3.63	3.34	3.42	3.57

2. Goal (1): At present, I believe my writing skills are
a. very strong (5)   b. strong (4)   c. average (3) d. weak (2)   e. poor (1)

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04	Sp 05
4.06	4.03	3.89	?	4.21	3.88	4.08	4.00	4.02	4.14	3.89	4.15	4.12

3. Goal (1): The communications and english courses in the curriculum provided me information that I could apply in my writing assignments throughout the curriculum:
a. strongly agree (5)   b. agree (4)   c. unsure (3)   d. disagree (2)   e. strongly disagree (1)

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
3.19	3.11	3.44	?	3.24	3.44	3.38	3.16	3.41	3.33	3.41	3.33

4. Goal (1): The EET curriculum provided enough opportunities (writing assignments) for me to improve my writing skills
a. strongly agree (5)   b. agree (4)   c. unsure (3)   d. disagree (2) e. strongly disagree (1)

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
4.10	4.36	4.00	?	4.41	4.12	4.20	4.19	4.27	4.04	4.16	4.27

5.   Goal (1): I received feedback from my ECET professors concerning my writing skills on lab reports, papers, and other assignments that enabled me to improve my writing:
a. strongly agree (5)   b. agree (4)   c. unsure (3)   d. disagree (2) e. strongly disagree (1)

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
3.97	4.17	3.89	?	4.14	3.76	4.00	4.11	4.16	4.27	4.06	4.40

Were any courses particularly effective in helping you develop your writing skills (list them here)?

Were there any courses that you believe should have helped in this area, but didn't or that fell short of your expectation (list them here)?

6.   Goal (1): When I came to Purdue, I believe my verbal communication skills were:
a. very strong   b. strong   c. average   d. weak   e. poor

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
3.23	2.81	2.89	?	3.10	3.09	3.08	3.06	3.16	3.42	3.22	3.13

7.   Goal (1): At present, I believe my verbal communication skills are:
a. very strong   b. strong   c. average   d. weak   e. poor

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
4.03	3.86	3.85	?	3.93	3.88	4.04	3.94	3.94	3.84	4.00	3.87

8.   Goal (1): The communications courses in the curriculum provided me information that I could apply in my verbal communication assignments throughout the curriculum:
a. strongly agree (5)   b. agree (4)   c. unsure (3)   d. disagree (2) e. strongly disagree (1)

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
3.90	3.75	3.96	?	3.66	3.50	3.61	3.28	3.90	3.67	3.56	3.71

9.   Goal (1): The EET curriculum provided enough opportunities (oral presentations) for me to improve my verbal communication skills
a. strongly agree (5)   b. agree (4)   c. unsure (3)   d. disagree (2) e. strongly disagree (1)

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
3.71	3.72	4.07	?	3.83	3.47	3.84	3.68	3.96	3.22	3.67	3.67

10.   Goal (1): I received feedback from my ECET professors concerning my verbal communication skills:
a. strongly agree (5)   b. agree (4)   c. unsure (3)   d. disagree (2) e. strongly disagree (1)

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
3.10	2.81	3.37	?	3.10	3.06	2.92	3.28	3.47	2.67	3.23	3.44

Were any courses particularly effective in helping you develop your verbal skills (list them here)?

Were there any courses that you believe should have helped in this area, but didn't or that fell short of your expectation (list them here)?

11.   Goal (1): The curriculum has prepared me to develop effective visual presentations, including graphs, block diagrams, schematics, etc.

a. strongly agree (5)   b. agree (4)   c. unsure (3)   d. disagree (2) e. strongly disagree (1)

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
4.16	4.47	4.37	?	4.59	4.35	4.51	4.34	4.47	4.39	4.52	4.48

Were any courses particularly effective in helping you develop your visual presentation skills (list them here)?

Were there any courses that you believe should have helped in this area, but didn't or that fell short of your expectation (list them here)?

12.   Goal (1): The curriculum has taught me to consider who I wish to communicate with when I prepare a document or presentation

a. strongly agree (5)   b. agree (4)   c. unsure (3)   d. disagree (2) e. strongly disagree (1)

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
3.90	4.11	4.04	?	4.03	3.94	3.80	4.02	4.06	4.02	3.89	4.02

Were any courses particularly effective in helping you to learn how to target your presentation (list them here)?

Were any courses that you believe should have helped in this area, but didn't or that fell short of your expectation (list them here)?

13.   Goal (2): The curriculum has helped me to develop the ability to use information acquisition skills to find the information I need to help solve a problem

a. strongly agree (5)   b. agree (4)   c. unsure (3)   d. disagree (2) e. strongly disagree (1)

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
4.10	4.17	4.15	?	4.21	4.06	4.27	4.02	4.20	4.06	4.11	4.21

Were any courses particularly effective in helping you to learn how to use information acquisition tools (list them here)?

Were there any courses that you believe should have helped in this area, but didn't or that fell short of your expectation (list them here)?

14.   Goal (2): Within the areas that I chose to concentrate in, the curriculum has effectively taught me to use and implement current technology?

a. strongly agree (5)   b. agree (4)   c. unsure (3)   d. disagree (2) e. strongly disagree (1)

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
4.10	3.92	4.37	?	4.34	4.26	4.12	4.06	4.16	4.25	4.27	4.13

Were any courses particularly effective in this respect (list them here)?

Were there any courses that you believe should have helped in this area, but didn't or that fell short of your expectation (list them here)?

15.   Goal (2): I intend to continue my education throughout my future career?
a. strongly agree (5)   b. agree (4)   c. unsure (3)   d. disagree (2) e. strongly disagree (1)

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
4.23	4.08	4.37	?	4.41	4.00	4.00	3.89	3.96	4.57	4.06	4.06

16.   Goal (3, 4): I can create a project timeline and manage a project against it:
a. strongly agree (5)   b. agree (4)   c. unsure (3)   d. disagree (2) e. strongly disagree (1)

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
4.13	4.14	4.19	?	4.24	4.03	4.14	4.11	4.10	4.04	4.03	4.13

17.   Goal (3, 4): I understand the various stages of the design process and can break a project down into
            the various stages.
a. strongly agree (5)   b. agree (4)   c. unsure (3)   d. disagree (2) e. strongly disagree (1)

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
4.16	4.17	4.22	?	4.41	4.15	4.27	4.32	4.25	4.12	4.20	4.37

Were any courses particularly effective in helping you learn the design process and project management (list them here)?

Were there any courses that you believe should have helped in this area, but didn't or that fell short of your expectation (list them here)?

18.   Goal (3, 4): I believe I am able to analyze, design, and implement control systems, communications
            systems, computer systems, or power systems (Note: "or" means any one of the list)
a. strongly agree (5)   b. agree (4)   c. unsure (3)   d. disagree (2) e. strongly disagree (1)

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
4.03	4.17	3.96	?	4.00	4.06	4.14	3.98	4.43	4.73	4.13	4.23

19.   Goal (3, 4): I am able to use advanced math techniques such as statistics/probability, transform
            methods, discrete mathematics, or applied differential equations in support of electrical/electronic(s)
            systems. (Note: "or" means any one of the list)
a. strongly agree (5)   b. agree (4)   c. unsure (3)   d. disagree (2) e. strongly disagree (1)

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
4.19	4.11	4.15	?	4.34	4.06	4.22	4.09	3.88	4.53	3.78	3.88

20.   Goal (3, 4): I am confident in my ability to solve problems that are not directly covered in class
a. strongly agree (5)   b. agree (4)   c. unsure (3)   d. disagree (2) e. strongly disagree (1)

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
4.07	4.08	4.00	?	4.28	4.09	4.02	4.28	4.14	4.18	4.05	3.94

Were any courses particularly effective in developing your problem solving skills (list them here)?

Were there any courses that you believe should have helped in this area, but didn't or that fell short of your expectation (list them here)?

21. Goal (5): I am familiar with the IEEE Code of Ethics.
a. strongly agree (5)   b. agree (4)   c. unsure (3)   d. disagree (2) e. strongly disagree (1)

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
3.84	3.78	3.07	?	3.34	3.65	3.46	3.64	3.49	4.57	3.72	3.62

22. Goal (5): I believe it is always important to conduct ones business in an ethical manner.
a. strongly agree (5)   b. agree (4)   c. unsure (3)   d. disagree (2) e. strongly disagree (1)

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
4.65	4.53	4.52	?	4.79	4.47	4.53	4.45	4.55	3.90	4.52	4.60

23. Goal (5): I believe the education I received here will help me to identify ethical issues associated with different courses of action, during the course of my career.
a. strongly agree (5)   b. agree (4)   c. unsure (3)   d. disagree (2) e. strongly disagree (1)

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
4.23	4.11	3.93	?	4.14	4.21	3.96	3.89	4.16	3.80	4.06	4.21

Were any courses particularly effective in developing your sense of business ethics (list them here)?

Were there any courses that you believe should have helped in this area, but didn't or that fell short of your expectation (list them here)?

24. Goal (5): I am a member of Tau Alpha Pi
     a. True   b. False   `Note % True is show in Table

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
6.45%	2.78%	0.00%	?	3.45%	5.88%	4.08%	2.13%	1.96%	98.04%	6.25%	0.00%

Fall 03 response contains an unknown error. Only 4% can belong to TAP on average

25. Goal (5): I am a member of the IEEE
     a. True   b. False   Note % True is show in Table

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
29.03%	22.22%	25.93%	?	20.69%	32.35%	16.00%	12.77%	17.65%	13.73%	10.94%	9.62%

26. Goal (5): I attended and participated in meetings of professional societies while a student?
     a. True   b. False   Note % True is show in Table

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
64.52%	61.11%	59.26%	?	44.83%	41.18%	30.61%	21.28%	35.29%	27.45%	20.31%	11.54%

27. Goal (5): The curriculum motivated me to take pride in the work I do and strive to present my best work in all assignments
a. strongly agree (5)   b. agree (4)   c. unsure (3)   d. disagree (2) e. strongly disagree (1)

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
3.90	4.22	4.19	?	3.97	4.09	4.14	4.06	4.02	4.37	4.05	4.33

28. Goal (5): I successfully practiced time management skills in accomplishing my school work load
a. strongly agree (5) b. agree (4) c. unsure (3) d. disagree (2) e. strongly disagree (1)

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
3.71	4.14	3.44	?	3.69	4.03	4.02	3.72	3.80	3.96	3.78	3.96

29. Goal (6): I participated in cultural experiences outside of my own culture while at Purdue.
a. True   b. False   Note   % True is show in Table

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
64.52%	66.67%	62.96%	?	75.86%	55.88%	51.02%	55.32%	52.94%	50.98%	65.63%	42.31%

30. Goal (6): I believe that it is important to have diverse backgrounds in a business
a. strongly agree (5) b. agree (4) c. unsure (3) d. disagree (2) e. strongly disagree (1)

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
4.43	4.37	4.15	?	4.48	4.35	4.40	4.13	4.27	4.02	4.30	4.25

31. Goal (6): I am aware of the legal issues that may arise in a corporate setting due to harassment or discrimination
a. strongly agree (5) b. agree (4) c. unsure (3) d. disagree (2) e. strongly disagree (1)

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
4.45	4.36	4.37	?	4.62	4.41	4.56	4.45	4.39	4.37	4.50	4.40

32. Goal (7): The curriculum has enhanced my ability to work effectively as part of a team
a. strongly agree (5) b. agree (4) c. unsure (3) d. disagree (2) e. strongly disagree (1)

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
4.16	4.39	4.44	?	4.59	4.47	4.34	4.28	4.38	4.39	4.23	4.35

33. Goal (7): I understand the different types of personalities that may be in a group and am aware of methods for working with other personality types to accomplish team goals
a. strongly agree (5) b. agree (4) c. unsure (3) d. disagree (2) e. strongly disagree (1)

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
4.32	4.31	4.26	?	4.34	4.32	4.39	4.36	4.30	4.24	4.23	4.33

34. Goal (7): I enjoy working in teams.
a. strongly agree (5) b. agree (4) c. unsure (3) d. disagree (2) e. strongly disagree (1)

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
NA	NA	NA	NA	NA	NA	NA	NA	NA	4.12	3.73	4.00

35. Goal (7): I believe that team skills are important to my future success in the workplace.
a. strongly agree (5) b. agree (4) c. unsure (3) d. disagree (2) e. strongly disagree (1)

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
NA	NA	NA	NA	NA	NA	NA	NA	NA	4.43	4.48	4.48

Which courses were most effective in developing your teaming skills (list them here)?

Were any courses that you believe should have helped in this area, but didn't or that fell short of your expectation (list them here)?

Please provide your opinion of the remaining statements, which concern aspects other than the curriculum goals. Please answer using the following scale:

a. strongly agree (5)   b. agree (4)   c. unsure (3)   d. disagree (2) e. strongly disagree (1)

36.   The ECET laboratories are a strength of the program

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
4.65	4.78	4.81	?	4.97	4.74	4.46	4.51	4.28	4.75	4.44	4.48

37.   The faculty are a strength of the program.

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
4.27	4.39	4.11	?	4.28	4.18	4.02	4.26	4.47	4.55	4.28	4.56

38.   The program teaches current technology.

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
4.10	4.28	4.15	?	4.17	4.29	4.04	4.06	3.90	4.33	3.89	4.25

39.   The senior design sequence is an important component of the curriculum.

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
3.34	3.86	3.96	?	4.03	4.09	4.20	3.94	4.12	4.02	3.81	3.96

40.   The faculty are knowledgeable in their areas of expertise.

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
4.16	4.50	4.26	?	4.28	4.32	4.33	4.36	4.43	4.61	4.50	4.63

41.   The faculty are helpful to students.

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
4.13	4.50	4.30	?	4.34	4.29	4.29	4.38	4.25	4.43	4.33	4.44

42.   There was sufficient lab open time.

Sp 99	Fa 99	Sp 00	Fa 00	Sp 01	Fa 01	Sp 02	Fa 02	Sp 03	Fa 03	Sp 04	Fa 04
2.81	3.47	3.30	?	3.66	3.24	3.26	2.98	2.88	3.39	2.69	2.73

Please feel free to put <u>ANY</u> additional comments concerning the EET program, courses, faculty, or staff here (continue on the back if necessary). Thank you and good luck in your future endeavors.:

Total Completed Surveys: spring '05: 26; summer '05: 26
Gender: Spring: 25 Male, 1 Female; summer: 24 male, 2 female
Age: 21-22 (6, 4); 23-24 (19, 15); 25-29 (1, 7)
Race/Ethnicity: spring: 1 Asian American, 25 Caucasian; summer: 2 African American, 24 caucasian
Nationality: spring 25 US, 1 no response; summer 26 USA

In the table below, the questions and possible responses are shown. For questions 6 through 31, the point value of each response is also shown. In the row below the question, the number of responses to each choice is shown.

Please answer questions 1-5 with your future employment in mind. For questions 1-4, what percentage of your time on the job do you expect to spend on learning new things? (for each question circle the answer that best represents your expectation)					
1	1 year after your graduation	0%	1 - 5%	6 - 15%	16 – 25%	26% or more
Sp		**0**	**1**	**2**	**7**	**16**
Su		**0**	**1**	**0**	**4**	**21**
2	10 years after your graduation	0%	1 - 5%	6 - 15%	16 – 25%	26% or more
Sp		**0**	**2**	**11**	**8**	**5**
Su		**0**	**0**	**11**	**9**	**6**
3	20 years after your graduation	0%	1 - 5%	6 - 15%	16 – 25%	26% or more
Sp		**0**	**6**	**11**	**4**	**5**
Su		**0**	**4**	**11**	**6**	**5**
4	1 year before you retire	0%	1 - 5%	6 - 15%	16 – 25%	26% or more
Sp		**3**	**15**	**3**	**3**	**2**
Su		**3**	**9**	**6**	**2**	**6**
5	It will be necessary for me to engage in lifelong learning in my profession.	Strongly agree 1	2	3	4	Strongly disagree 5
Sp		**19**	**4**	**1**	**1**	**1**
Su		**17**	**6**	**2**	**1**	**0**
Please answer questions 6-16 based on your experience in the EET program.					
6	In general EET students treat each other with respect.	Strongly agree 5	4	3	2	Strongly disagree 1
Sp		**11**	**12**	**3**	**0**	**0**
Su		**13**	**12**	**0**	**1**	**0**

7	I am comfortable working in groups with students different from myself.	Strongly agree 5	4	3	2	Strongly disagree 1
Sp		**13**	**12**	**1**	**0**	**0**
Su		**15**	**10**	**0**	**1**	**0**
8	I have heard EET students tell racial, ethnic, or gender related jokes.	Never 5	4	3	2	Frequently 1
Sp		**3**	**10**	**8**	**3**	**2**
Su		**4**	**9**	**4**	**7**	**2**
9	I try to not embarrass other students.	Strongly agree 5	4	3	2	Strongly disagree 1
Sp		**18**	**4**	**3**	**1**	**0**
Su		**15**	**7**	**2**	**1**	**1**
10	I have been ridiculed by EET students because I am different.	Never 5	4	3	2	Frequently 1
Sp		**17**	**5**	**2**	**1**	**1**
Su		**16**	**5**	**3**	**1**	**1**
11	I find it easy to listen to people whose ideas differ from mine.	Strongly agree 5	4	3	2	Strongly disagree 1
Sp		**9**	**15**	**1**	**1**	**0**
Su		**9**	**12**	**5**	**0**	**0**
12	Other EET students interrupt me when I am talking to them.	Never 5	4	3	2	Frequently 1
Sp		**5**	**15**	**4**	**2**	**0**
Su		**6**	**10**	**7**	**2**	**1**
13	EET students treat each other equally, regardless of race, gender, age, religion, or sexual orientation.	Strongly agree 5	4	3	2	Strongly disagree 1
Sp		**13**	**10**	**2**	**0**	**1**
Su		**13**	**8**	**4**	**0**	**1**
14	I have heard EET students be disrespectful to their professors and/or graduate teaching assistants.	Never 5	4	3	2	Frequently 1
Sp		**7**	**11**	**3**	**5**	**0**
Su		**5**	**12**	**9**	**0**	**0**
15	Other EET students ignore my questions or comments when I work in groups with them.	Never 5	4	3	2	Frequently 1
Sp		**8**	**12**	**5**	**1**	**0**
Su		**11**	**9**	**3**	**3**	**0**
16	EET students show respect for thinking that differs from their own.	Strongly agree 5	4	3	2	Strongly disagree 1
Sp		**5**	**18**	**3**	**0**	**0**
Su		**11**	**9**	**3**	**1**	**1**

Please answer questions 17-31 according to what you think the best response is. An "ET professional" is a person working in the field of engineering technology.						
17	As an ET professional, I will have to apply my knowledge and skills to improving existing products and systems	Strongly agree 5	4	3	2	Strongly disagree 1
Sp		**14**	**9**	**2**	**1**	**0**
Su		**10**	**15**	**0**	**1**	**0**
18	Due to outsourcing of manufacturing, it is likely that, as an ET, I will have to work more in process and equipment development than production control or maintenance.	Strongly agree 5	4	3	2	Strongly disagree 1
Sp		**2**	**11**	**12**	**1**	**0**
Su		**6**	**8**	**11**	**1**	**0**
19	As an ET professional, I expect I will have to work with people who are much more ethnically and gender diverse than the people in the EET program here at Purdue.	Strongly agree 5	4	3	2	Strongly disagree 1
Sp		**9**	**12**	**3**	**2**	**0**
Su		**12**	**5**	**6**	**2**	**1**
20	Limitations on available energy resources are likely to create more and more pressure to develop energy efficient solutions to existing electrical and electronic devices or systems.	Strongly agree 5	4	3	2	Strongly disagree 1
Sp		**10**	**11**	**5**	**0**	**0**
Su		**10**	**12**	**3**	**1**	**0**
21	I expect that my job as an ET professional will be impacted in one way or another by outsourcing.	Strongly agree 5	4	3	2	Strongly disagree 1
Sp		**6**	**16**	**4**	**0**	**0**
Su		**10**	**5**	**10**	**0**	**1**
22	As an ET professional, I will need to communicate with colleagues from other countries.	Strongly agree 5	4	3	2	Strongly disagree 1
Sp		**5**	**14**	**6**	**1**	**0**
Su		**9**	**10**	**5**	**1**	**0**
23	It is ethical to dismiss new cost-saving solutions because they require learning new methods on the part of an employee.	Strongly agree 5	4	3	2	Strongly disagree 1
Sp		**2**	**6**	**2**	**8**	**8**
Su		**0**	**2**	**5**	**5**	**14**

24	It is ethical to report incomplete or selected data because of feeling pressured to give a supervisor or customer "what they want to see".	Strongly agree 5	4	3	2	Strongly disagree 1
Sp		**4**	**6**	**2**	**4**	**10**
Su		**0**	**1**	**4**	**9**	**12**
25	It is ethical to omit citations for referenced materials, thereby implying "original" effort.	Strongly agree 5	4	3	2	Strongly disagree 1
Sp		**1**	**5**	**1**	**2**	**17**
Su		**0**	**1**	**3**	**2**	**20**
26	It is ethical to use my employer's email system for sending personal emails to friends during work time.	Strongly agree 5	4	3	2	Strongly disagree 1
Sp		**3**	**2**	**7**	**7**	**7**
Su		**0**	**2**	**9**	**9**	**6**
27	I believe that racial discrimination is no longer a problem in America (USA).	Strongly agree 5	4	3	2	Strongly disagree 1
Sp		**1**	**9**	**9**	**4**	**3**
Su		**0**	**4**	**13**	**7**	**2**
28	I believe that promoting racial understanding is _____	Essential 5	4	3	2	Of no importance 1
Sp		**10**	**10**	**6**	**0**	**0**
Su		**8**	**9**	**8**	**1**	**0**
29	I believe that having an understanding of other countries and cultures will be _____ to my future success in the workplace	Essential 5	4	3	2	Of no importance 1
Sp		**8**	**12**	**5**	**1**	**0**
Su		**11**	**9**	**5**	**1**	**0**
30	As an ET professional, my failure to accomplish part of a project on time could have serious financial consequences for my employer	Strongly agree 5	4	3	2	Strongly disagree 1
Sp		**13**	**9**	**4**	**0**	**0**
Su		**12**	**10**	**4**	**0**	**0**
31	As an ET professional, I should always seek to improve the process, project, device, etc. that I am working on	Strongly agree 5	4	3	2	Strongly disagree 1
Sp		**16**	**9**	**1**	**0**	**0**
Su		**15**	**7**	**4**	**0**	**0**