Employability Skills, Competencies and Relevant Programs in Engineering Technology Graduates: A Case of Mindanao State University System, Philippines

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Abstract  Determining how graduates of Engineering Technology Programs faces the challenges of being part of the workplace and serve as substantial input and basis of policymakers in Mindanao State University System, the Philippines for continuous enhancement and improvement of the services being offered by the Institution to the community and industry within and outside the region. This study evaluates and determines the employability skills of the graduates of Engineering Technology programs of Mindanao State University System as a basis of the curricular review, enhancement, improvement, and sustainability of the Engineering Technology programs. Findings of the study revealed that the majority of the graduates of Engineering Technology programs did not seek employment after their graduation, but enrolled in baccalaureate degrees which are non-allied to their diploma obtained from the University System. Among the competency skills acquired by the graduates of Engineering Technology programs; assessment, inclusion, and diversity student life skill, and outcome-based have found to be a significant influence on alumni or graduates. The employability skills and competencies of the engineering technology graduates in Mindanao State University System do not comply with the skills and competencies required by the local and national industries. Hence, the Engineering Technology curriculum at Mindanao State University System needs adequate funds for operation and maintenance to improve facilities for instruction, research, and extension services that will comply with the academe-industry based curriculum. The admission and retention policies, faculty development programs, testing and evaluation, and management system have to be enhanced and improved. Faculty members teaching Engineering Technology programs in the University System have to undergo short-term technical or vocational training, pre-service training carried out by professionally-trained teachers with industrially and or occupationally-related skills, competencies, and educational qualifications.

Keywords: employability, sustainability, curricular review, graduates, faculty member, supervisor

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1. Introduction

The Engineering Technology program offered in Mindanao State University System (MSUS) provides necessary technical skills, pieces of knowledge, and competencies to shape their characters, attitudes, values, and outcomes needed for job placement by manufacturing industries and construction firms in the region.

Graduates of Engineering Technology programs are now the most in-demand graduates in the 21st-century workplace because of the limited number of students who take this as a profession. It is one of the fields of discipline in which the Philippine government encourages the students to pursue.

However, after having completed engineering diploma courses, the majority of the graduates of the Engineering Technology programs in Mindanao State University System face hard times in seeking possible employment to sustain a living or support the needs of the family as part of the culture of Filipino.

As one of the faculty members teaching in the University System, I have similar experiences with many faculty members in the University that the majority of the graduates of the programs do not seek or apply for employment but rather pursue or enroll in baccalaureate degrees. Such as Social Sciences related studies, Business Administration, Islamic Studies, and other baccalaureate degrees in the University.

2. Methodology

In order to evaluate and comprehensively assess the Engineering Technology programs in Mindanao State
University System as a basis for graduates’ employability and sustainability of the program, survey questionnaires were distributed to the respondents of the study namely; those faculty members teaching the Engineering Technology Programs; Supervisor or Employer of the engineering technology graduates; and those graduates of the Engineering Technology Programs. Deans or Directors of the Unit or College offering the Engineering Technology Programs were notified thru letter about the intent of the study.

2.1. Setting of the Study

The research study was conducted at the three campuses of Mindanao State University System (MSUS), such as the Division of Engineering Technology in Marawi City; Mindanao State University – IIT in Iligan City, and MSU-General Santos in General Santos City, and industries located within Marawi City, Iligan City, General Santos City.

2.2. Sample Size and Sampling

The sample size of the study was estimated using Slovin’s formula presented below:

\[ n = \frac{N}{(1 + Ne^2)} \]

Where: \( n \) = Number of Samples
\( N \) = Total population equal to 510
\( e \) = Error of margin/ margin of error (5% or 0.05)
Computation: \( n = \frac{510}{(1 + 510 (0.05)^2)} \)
\( = 224 \) estimated sample size of the population.

2.3. Data Processing and Data Analysis

Data is collected using survey questionnaires consist of four sections. The first section asked what is the socio-demographic of the faculty member teaching Engineering Technology programs in terms of; Gender, age, marital status, length of service to the campus or University, academic rank, the field of specialization, eligibility, or professional regulation commission license.

The section asked what is the Socio-demographic profile of the supervisor or employer in terms of; Gender, highest educational qualification, and length of service to the company or industry.

The third section asked what is the Socio-demographic profile of the alumnus or graduate of the two or three year’s technology programs in terms of; Name of respondents (optional); gender; age; school of origin, name of the diploma course; year graduated; the number of year of the diploma course; the field of specialization; highest educational attainment; the number of graduates that proceeded, the relatedness of the diploma course to the baccalaureate degrees, and several employed graduates.

The fourth section asked about a significant difference between faculty competency/competencies and Engineering Technology graduates’ employability and a significant difference between graduates’ competency/competencies and employability.

3. Data Collection Data

Deans, Directors, Chairperson, and Registrars of the three campuses that offer Engineering Technology programs in Mindanao State University System were contacted and informed about the intent of the study.

3.1. Statistical Tools

Data collected were converted to numerical codes and entered in a predesigned data entry spreadsheet in SPSS. The descriptive statistics describe data in a manageable form to interpret a summary that enables comparisons across the Engineering Technology Programs of the three campuses of Mindanao State University System (MSUS). The T-test is employed to determine significant differences in the variables at a significant level of 0.05.

4. Results

This chapter presents the data collected from the survey questionnaires provided to the respondents of the study such as the graduates or alumni to the Engineering Technology programs during the year (2010-2016).

4.1. Descriptive Statistics

This section discusses and interprets individual characteristics or socio-demographic profiles of the faculty members teaching the Two or Three-year Diploma in Engineering Technology programs in Mindanao State University System (MSUS), graduates of the Two or Three-year Engineering Technology programs, and the supervisors or employers of the graduates of the Two or Three-year Engineering Technology programs.

4.1.1. Faculty Respondent’s Socio-Demographic Profile

It shows that the majority of the respondents representing 43 or 78.20% were male faculty respondents, and 12 or 21.8 % of them were female faculty members. These findings of the study presented in Table 1 show that: the majority of the faculty members teaching the Engineering Technology programs in the three (3) campuses of Mindanao State University System (MSUS) was dominated by male faculty members, who were strong, resilient, and capable to spearhead in the undertaking of highly tasking activity such as a heavy piece of training and skills development jobs, can spend more hours and days to supervise students during their laboratory activities, knowledgeable in the dissemination of academic learning modules and competencies needed for employability in the industry.
Many of the Faculty members teaching Engineering Technology in the three campuses of Mindanao State University System were above 58 years old, 6 or 10.1% were ages below 30 years old, 5 or 9.1% were ages between 31-43 years old, 5 or 9.1% were ages between 44-53 years old, and 9 or 16.36% are aged between 54-57 years old.

Table 1 present the findings of the study; it was a shred of evidence that faculty members teaching Engineering Technology programs were tenured faculty members. These faculty members were academically experienced, technically skilled, capable of heavy academic workloads, can provide heavy training and skills development to the students, can supervise students during laboratory activities even in harsh conditions, and can impart, provide and disseminate knowledge and competencies to the Engineering Technology students needed for their employability.

The table shows that 13 or 23.6 % of the respondents were single faculty members, 40 or 72.7 % were married, and 2 or 3.6 % were separated or divorced faculty members.

In terms of marital status, the findings of this study as presented in Table 1 indicate that the faculty members
teaching Engineering Technology programs in the three (3) campuses of Mindanao State University System are mostly married. Being married and having a partner indicates parenthood attributes, authority, and experiences needed in dealing and solving problems that are necessary to effectively and efficiently in the dissemination and imparting competencies to equip graduates for their employability.

Table 1 shows that 12 or 21.82% of the faculty members teaching Engineering Technology Programs in Mindanao State University System (MSUS) have served the campus below 14 years, 18 or 32.72% have served between 15-27 years, 18 or 32.72% have served the campus or campus between 28-33 years, while 7 or 12.72% of the respondents have served between 34-40 years.

These findings of the study support or affirm the notion that the longer the faculty members have served the campus, the more academic experiences and expertise they gained and become technical experts and skilled in their field of discipline. Based on the experiences in the past, that was; the longer a faculty member has served the campus as teachers, the easier it for them to understand, grasp feelings and problems of students; become more patient, become committed and diverse on undertaking and solving problems of students inside the classrooms. These are the characteristics needed to effectively and efficiently disseminate and impart the knowledge and skills needed for their employability.

It shows that the majority of respondents teaching Engineering Technology programs in Mindanao State University System (MSUS) representing 11 or 20.0% are Associate Professors, 19 or 34.5% were Assistant Professors, 14 or 25.45% were Instructors, 1 or 1.8% was Master Teacher, and 10 or 18.2% were Full Professors.

The findings of the study as presented in Table 1 indicate that majority of the faculty members teaching in Engineering Technology programs in the three (3) campuses of Mindanao State University System (MSUS) were dominated by faculty respondents who were Assistant Professors. This only shows that faculty respondents teaching diploma in Engineering Technology in the University System were hired and selected following the mandate prescribed in paragraph 1 of the amended Civil Service Commission (CSC) Memorandum Circular (MC) No, 10, s. 2012 on the Education Requirement for Faculty Positions in State Universities and Colleges and Local Universities and Colleges and MSU-Board of Regent Resolution No.15 s. 2009 ( approval of the policy to require faculty members teaching in college to possess master’s degree as a basic educational requirement).

These findings only support those faculty members teaching Engineering Technology programs in Mindanao State University System are equipped with necessary competencies and technical skills. They were committed, diverse, and academically experienced; they are competencies to the students for their employability.

In terms of field of specialization, the table shows that 17 or 10.91% of the respondents were in the field of Electronics Communication Engineering and Computer Engineering Technology, 6 or 10.91 were in Building and Civil Construction Technology, 6 or 10.91% were in Chemical Analyst Technology, 6 or 7.27% were in Mechanical Technology, 5 or 9.10% were in of Material Analyst, 4 or 7.27 were in the Metallurgy Technology, 3 or 5.45% were in the field of Database and Electronics, 3 or 5.40 % were in Automotive Technology, 2 or 3.63 % is in Ceramics and Metallurgy Technology, 1 or 1.82% was in Drafting Technology, 1 or 1.82% was in of Foundry Technology, 1 or 1.82% was in the field of Industrial and Automation Technology, and. 1 or 1.82% was in Machine Shop and Industrial Education Technology.

The findings of the study as shown in Table 1 indicate that faculty respondents teaching Diploma in Engineering Technology programs in the three (3) campuses of Mindanao State University System were composed of faculty respondents with balance baccalaureate degrees needed in the diploma in Engineering Technology. It shows that faculty members teaching Engineering Technology programs in the three (3) campuses of Mindanao State University System (MSUS) are technical skills and trained, knowledgeable, and competent needed for graduate’s employability.

The findings also indicate that the respondents possess the field of disciplines required by the industry. Hence, they were capable and able to teach and impart technical skills, and they can provide more training to the Engineering Technology students needed for employability.

The respondent’s professional eligibility from the Professional Regulation Commission (PRC). The table shows that the majority of the respondents, 46 or 83.6% of have professional eligibility, 8 or 14.6% neither have professional eligibility, and 1 or 1.82 % with no professional eligibility.

The findings of this study as presented in Table 1 indicate that faculty respondents teaching diplomas in Engineering Technology programs in Mindanao State University System were faculty members with the necessary competencies needed for graduate employability. This finding of the study supports the notion that these faculty members can disseminate and impart the knowledge and skills required for graduate employability. This only shows that faculty respondents teaching diploma in Engineering Technology in the University System were hired and selected following the mandate prescribed in section 2.1.1.4 of CHED Memo No. 86, s, of 2017 that faculty members teaching in Engineering Technology must be registered Engineers with a valid license or certified engineers.

4.2. Employer’s or Supervisor’s Socio-Demographic Profile

Table 2 presents the frequency and percentage distribution of supervisor’s Socio-Demographic Profile, it revealed that out of the 24 respondents, the majority of them, 17 or 70.8% were males and 7 or 29.2% were female supervisors. These findings of this study indicate that male supervisors dominated female faculty respondents in the workplace because of the nature of the working environment in industries that require male employees who can sustain or carry and exert efforts for the heavy workloads. This finding supports or affirm the results of the study of [9] in which female workers were rated acceptable, and their male counterparts were rated proficient.
In terms of the respondent's highest educational attainment, it shows that out of 24 respondents, the majority of them 12 or 50.0% have only baccalaureate degrees, 10 or 41.7% have only diploma, 1 or 4.2% have master's degrees, and 1 or 4.2% have a doctoral degree.

These findings of the study indicate that graduates of the Diploma in Engineering Technology have the knowledge, skills, training, and competencies needed for their employability.

In terms of the supervisor's length of service to the industry or company; out of 24 respondents, 12 or 50.0% were employed below 4 years, 3 or 12.50% were employed between 5 to 14 years, 4 or 16.67% were employed between 15 to 18 years, and 5 or 20.83% were employed more than 19 years. This finding of the study revealed that these supervisors were newly hired to work in the industry or company.

4.3. Graduates of the Diploma in Engineering Technology Socio-Demographic Profile

The Table 3 shows that out of 227 respondents, the majority of them 157 or 69.2% were male respondents, while 70 or 30.8% were female respondents.
### Highest Educational Attainment

| Level       | Graduates | Percentage |
|-------------|-----------|------------|
| Diploma     | 89        | 39.2       |
| Certificate | 1         | 0.4        |
| Degree      | 136       | 59.9       |
| Master      | 1         | 0.4        |
| **Total**   | **227**   | **100.00** |

### Graduates’ Field of Specialization

| Field of Specialization                                         | Graduates | Percentage |
|---------------------------------------------------------------|-----------|------------|
| Electrical Technology (ET)                                    | 74        | 32.6       |
| Building Construction Technology (BCT)                        | 54        | 23.8       |
| Machine Shop Technology (MST)                                 | 48        | 21.1       |
| Automotive Technology (AT)                                    | 25        | 11.01      |
| Material Science Engineering Technology (MSET)                | 11        | 4.8        |
| Furniture & Cabinet Making Technology (FCMT)                  | 6         | 2.6        |
| Mechanical Engineering Technology (MET)                       | 4         | 1.8        |
| Heat, Ventilation, Air-Condition Engineering Technology (HVAC)| 3         | 1.3        |
| Industrial, Automation Control Engineering Technology (IACET) | 2         | 0.9        |
| **Total**                                                     | **227**   | **100.00** |

### The Respondent (Graduates) Who Proceeded to Baccalaureate Degree

| Proceeded                      | Graduates | Percentage |
|--------------------------------|-----------|------------|
| Yes                            | 173       | 76.2       |
| No                             | 54        | 23.8       |
| **Total**                      | **227**   | **100.00** |

### Allied Baccalaureate Degree

| Degree                                                         | Graduates | Percentage |
|---------------------------------------------------------------|-----------|------------|
| Bachelor of Science in Agricultural % Bio-System Engineering   | 1         | 0.4        |
| Bachelor of Science in Civil Engineering                      | 5         | 2.2        |
| Bachelor of Science in Electronics & Communication Engineering | 2         | 0.9        |
| Bachelor of Science in Engineering Technology                 | 2         | 0.9        |
| Bachelor of Science in Engineering Technology management      | 8         | 3.5        |
| Bachelor of Science in Mechanical Engineering                 | 20        | 8.8        |
| Bachelor of Science in Electrical Engineering                 | 1         | 0.4        |
| Bachelor of Science in Engineering Technology-Construction Engineering Management | 9       | 4.0        |
| Bachelor of Science in Engineering Technology Electrical and Renewable Energy | 6       | 2.6        |
| Bachelor of Science in Engineering Technology Machine and Fabrication | 2       | 0.9        |
| None                                                          | 171       | 75.3       |
| **Total**                                                     | **227**   | **100.00** |

### Number of Respondents’ (Graduates) Being Employed

| Employed                      | Graduates | Percentage |
|-------------------------------|-----------|------------|
| Yes                           | 25        | 11.0       |
| No                            | 202       | 89.0       |
| **Total**                     | **227**   | **100.00** |

### Place of Employment

| Employment        | Graduates | Percentage |
|-------------------|-----------|------------|
| None              | 204       | 89.9       |
| National          | 19        | 8.4        |
| Abroad            | 4         | 1.8        |
| **Total**         | **227**   | **100.00** |

These findings of the study presented in Table 3 indicate that graduates of the two or three years Diploma in Engineering Technology programs in Mindanao State University System during the year 2010-2016 were dominated by male respondents and implication that many male students prepared to enroll in the Engineering Technology programs compared to female respondents, which is also an indication that these male graduates in the Diploma in Engineering Technology program have the great chances and opportunities to be hired as employees in the industry or company.

The table above shows that out of 227 respondents, the majority of them representing 96 or 42.29% were below 23 years old, 86 or 37.89% were between 24-26 years old, while 45 or 19.83% of them were above 27 years old.

These findings of the study as presented in Table 3 indicate that the respondent’s age is the ages considered as matured age or the most ideal accepted age for employment. This is an indication that the number of years, that is, two- or three-year's Diploma in Engineering Technology is the most ideal number of years for the Diploma in Engineering Technology.

In terms of respondents’ school of origin where they graduated the diploma in Engineering Technology, the table above shows that out of the 227 respondents, 157 or 69.2% of them graduated from Mindanao State University in Marawi City, 49 or 21.6% of them graduated from Mindanao State University in General Santos City, and 21 or 9.3% of the respondents graduated at Mindanao State University-Iligan Institute of Technology in Iligan City.

The findings of this study as presented in Table 3, indicate that graduates of the Diploma in Engineering Technology during the year 2010- 2016 were dominated by the graduates of Mindanao State University main campus in Marawi City, this is because of the number of years which is two years Diploma in Engineering Technology in Mindanao State University main campus,
and three years in MSU General Santos City and at MSU-Iligan Institute of Technology.

The table above shows that out of 227 respondents, majority of them 74 or 32.6% graduated in Electrical Technology (ET), 26 or 11.5% graduated in Automotive Technology (AT), 54 or 23.8% graduated in Building Construction Technology (BCT), 5 or 2.2% graduated in Furniture and Cabinet Making Technology (FCMT), 3 or 1.3 graduated in Heat, Ventilating, Air-Conditioning, and Refrigeration Engineering Technology (HVAC), 2 or 0.9% graduated in Industrial, Automation, Electronics and Communication Engineering Technology (IAECT), 4 or 1.8% graduated in Mechanical Engineering Technology (MET), 11 or 4.8 graduated in Machine Shop Technology (MSET), and 48 or 21.1% graduated in Machine Shop Technology (MST).

The findings of this study as presented in Table 3 indicate that graduates of the Diploma in Engineering Technology during the year 2010-2016 are dominated by those graduates whose diploma in Electrical Technology. Many of the students enrolling in Engineering Technology programs in Mindanao State University System enrolled in Electrical Technology due to the opportunity of having many National Certificates and competencies they will have from the Technical Educational and School Development Authority (TESDA) upon graduation from the Engineering Technology program.

The frequency and percentage distribution of the year the respondents graduated from the diploma in engineering technology is presented in Table 3.

The table shows that out of 227 respondents, the majority of them representing 48 or 21.1% graduated the Diploma in Engineering Technology during the year 2016, 15 or 6.6% graduated in 2010, 45 or 18.9% graduated in 2011, 8 or 3.5% graduated in 2012, 45 or 19.8% graduated in 2013, 42 or 18.5% graduated in 2014, and 26 or 11.5% graduated in the year 2015.

Findings of this study as presented in Table 3, revealed that graduates of the diploma in Engineering Technology during the year 2010-2016 were almost distributed among the year this is a strong indication that many among students enrolled in the University System prepared to enroll in the Diploma in Engineering Technology. It is observed that many students enrolled in Engineering Technology programs due to the opportunity of having many National Certificates and competencies they will have from the Technical Educational and School Development Authority (TESDA) upon graduation from the Engineering Technology program.

The respondents (graduates) who proceeded to baccalaureate degree shown in Table 3 revealed that out of 227 respondents; 74 or 32.6% were in the Electrical Technology (ET), 54 or 23.8% were in Building Construction Technology (BCT), 48 or 21.1% were in Machine Shop Technology (MST), 25 or 11.01% were in Automotive Technology (AT), 11 or 4.8% were in Material Science in Engineering Technology (MSET), 4 or 1.8% were in Mechanical Engineering Technology (MET), 5 or 2.2% were in Furniture and Cabinet Making Technology (FCMT), 3 or 1.3% were in Heat, Ventilating, Air-Conditioning, and Refrigeration Engineering Technology (HVAC), and 2 or 0.9% were Industrial, Automation, Electronics and Communication Engineering Technology (IAECT). It also shows that many of the graduates of Engineering Technology to be hired as an employee in the industry or company.

The respondents’ (graduates) field of specialization in Table 3 revealed that out of 227 respondents: 74 or 32.6% were in Electrical Technology, 54 or 23.8% were in Building Construction Technology, 48 or 21.1% were in Machine Shop Technology, 25 or 11.01% were in Automotive Technology, 11 or 4.8% were in Material Science in Engineering Technology, 4 or 1.8% were in Mechanical Engineering Technology, 5 or 2.2% were in Furniture and Cabinet Making Technology, 3 or 1.3% were in Heat, Ventilating, Air-Conditioning, and Refrigeration Engineering Technology, and 2 or 0.9% were Industrial, Automation, Electronics and Communication Engineering Technology.

The respondent (Graduates) who proceeded to baccalaureate degree shown in Table 3 revealed that out of 227 respondents; 173 or 76.2% of the graduates proceeded to Baccalaureate degrees after they graduated in Engineering Technology programs. 54 or 23.8% of the graduates do not proceed to any Baccalaureate degrees after completing the Diploma in Engineering Technology. It also noticed in Table 3 that many of the graduates in Engineering Technology programs did not seek their employment after obtaining Engineering Technology programs. It is an indication that they did not utilize or use the technical skill and training, knowledge, and competencies they acquired from the Engineering Technology programs for their employability.

The respondents’ (graduates) who take allied baccalaureate degree is shown in Table 3 above shows that out of the 227 respondents, the majority of them or 20 (8.8%) proceeded to Bachelor of Science in Mechanical Engineering, 1 or 0.4% proceeded to Bachelor of Science in Agricultural & Biosystem Engineering, 5 or 2.2% proceeded to Bachelor of Science in Civil Engineering, 2 or 0.9% proceeded to Bachelor of Science in Electrical and Communication Engineering.

It is observed in Table 3 that respondents have pursued the following baccalaureate degrees after graduation; Two (2) or 0.9% have proceeded to Bachelor in Science in
Engineering Technology, 8 or 3.5% have proceeded to Bachelor in Engineering Technology Management, 1 or 0.4% have proceeded to Bachelor of Science in Electrical Engineering, 9 or 4% have proceeded to Bachelor of Science in Engineering Technology major in Construction Engineering Management, 6 or 2.6% have proceeded to Bachelor of Science in Engineering Technology major in Electrical and Renewable Energy, 2 or 0.9% have proceeded to Bachelor of Science in Engineering Technology major in Machining and Fabrication, while 171 or 73.3% have proceeded to Baccalaureate degrees.

These findings of the study revealed that despite the skills, pieces of training, knowledge, and competencies possessed by the graduates of the Engineering Technology program they do not seek employment. The findings of this study as presented in Table 3 revealed that after graduating from Engineering Technology programs, the graduates did not take the advantages of using their skills, pieces of training, knowledge, and competencies they possessed for employment opportunities. Instead, they enrolled in Baccalaureate degrees allied to their Diploma in Engineering Technology instead of seeking employment in the industry or company, this is a strong indication that graduates of the two- or three-years Engineering Technology programs do not prioritize employment but rather proceeding to any baccalaureate degrees.

The number of respondents (graduates) being employed is presented Table 3 shows that out of 227 respondents, 202 or 89.0% are never employed, while 25 or 11.0% are employed. The global unemployment rate rose sharply between 2008 and 2009, from 11.8% to 12.7%, reversing the pre-crisis trend of declining youth unemployment rates since 2002. By 2011, 74.8 million young people were unemployed.

These findings of the study presented in Table 3 indicate that graduates in Engineering Technology programs have never been employed in the industry or company despite the skills and training, knowledge, and competencies inherited from the Engineering Technology programs, this non-employment of the graduates in the industry or company was a strong indication that the Engineering Technology curriculum needs to be assessed and enhanced for the graduates’ employability. The place or area where the respondents are employed is presented in Table 3 revealed that of the 227 respondents, 19 or 8.4% have been working in the Philippines, while 4 or 1.8% were currently working abroad, and 204 or 89.9% have never been employed.

The findings of the study as presented in Table 3 revealed that very few of the graduates in the Diploma in Engineering Technology during the year 2010-2016 sought employment in the Philippines and abroad. This statistical result presented in Table 3 was a strong indication that the Diploma in Engineering Technology programs at Mindanao State University System needs to be assessed and enhanced for the graduates’ employability. Despite the skills and training, knowledge, and competencies inherited from the Engineering Technology programs, many of the respondents are not employed to earn a living.

4.4. Analysis of Means

4.4.1. Significance difference between Faculty competency/Competencies and Engineering Technology Graduates’ when grouped according to Employability

To explore if there is a significant difference between faculty competency/competencies and the diploma in Engineering Technology graduate’s when grouped according to employability during the year 2010-2016, a paired T-test was used at a 0.05 level of significance.

Table 4 present the result of the T-test or paired sample statistics using a two-tail at a 0.05 level of significance. It revealed from the data that there is a significant difference between faculty competency or competencies (assessment) and Engineering Technology graduates when grouped according to employability (Learning-Centered Teaching Strategies), t = 2.588, p = 0.012<0.05. This finding of the study does not support the stated hypothesis, and that an alternative hypothesis is suggested. The plausible insight for the result indicates that faculty members teaching engineering technology are competent and technically skilled. This finding of the study support or affirm the results of the study of [7] in which faculty member's knowledge and skills are factors needed to assess in designing feedback to help learn environments as a priority need.

There was a significant difference between faculty competency/competencies (Inclusion and diversity)) and Engineering Technology graduates when grouped according to employability (Learning-Centered Teaching Strategies), t = 3.767, p=0.000<0.05. The statistical results do not support the hypothesis of the study and an alternative hypothesis is suggested. The plausible insight for this result indicates that faculty members teaching engineering technology are competent and technically skilled. The findings of the study support or affirm the results of the study of [7] in which faculty member's knowledge and skills are factors needed to assess in designing feedback to help learn environments as a priority need.

| Table 4. Significance Difference Between Faculty Competency/Competencies and Engineering Technology Graduates' when grouped according to Employability |
|-------------------------------------------------|-----------------|-----------------|-----------------|
| Mean Difference | t-Test | p-value | Remarks |
| Assessment | 2.588 | 0.012* | Significant |
| Inclusion and Diversity | 3.767 | 0.000* | Significant |
| Student Life Skills Development | Learning-Centered Teaching Strategies (Engineering technology graduates' employability) | 2.974 | 0.004* | Significant |
| Outcome Based Practices | 5.284 | 0.000* | Significant |
| Professional Commitment | 6.195 | 0.000* | Significant |

*significant at 0.05 level of significance.
There was a significant difference between faculty competency/competencies (Student life skills and development) and Engineering Technology graduate’s when grouped according to employability (Learning-Centered Teaching Strategies), $t = 2.974$, $p = 0.004$. The statistical results do not support the hypothesis of the study and an alternative hypothesis is suggested. The plausible insight for the result indicates that faculty members teaching engineering technology are competent and technically skilled. These findings of the study support or affirm the results of that study of [7] in which knowledge and skills of faculty member are factors needed to assess in designing feedback to help learn environments as a priority need.

There was a significant difference between faculty competency/competencies (Outcome based practices) and Engineering Technology graduate’s when grouped according to employability (Learning-Centered Teaching Strategies), $t = 5.284$, $p = 0.000$. The statistical results do not support the hypothesis of the study and an alternative hypothesis is suggested. The plausible insight for this result indicates that many of the faculty members teaching engineering technology are competent and technically skilled. These findings of the study support or affirm the results of the study of [7] in which knowledge and skills of faculty members are factors needed to assess in the designing feedback to help learn environments as a priority need.

There was a significant difference between faculty competency/competencies (Professional commitment) and Engineering Technology graduate’s when grouped according to employability (Learning-Centered Teaching Strategies), $t = 6.195$, $p = 0.000$. The statistical results do not support the hypothesis of the study and an alternative hypothesis is suggested. The plausible insight for the result indicates that faculty members teaching engineering technology are competent and technically skilled. The findings of the study support or affirm the results of that study of [1] in which faculty members who can evaluate and monitor one’s performance, articulate their knowledge and ideas, demonstrate a sense of responsibility, work ethically even under pressure, and exhibit resiliency are the most important competencies for faculty member needed by the graduates for employability.

4.4.2. Significance Difference between Graduates’ Competency/Competencies and Employability

Statistical results presented in Table 5 shows that the results of T-test (paired sample statistics) at a 0.05 level of significance on the significant difference between faculty competency/competencies and Engineering Technology graduate’s employability, revealed that:

There is a significant difference between graduate’s employability (assessment) and employability (Competency skills of the graduates), $t = 3.664$, $p = 0.000$. The statistical results do not support the tested hypothesis and an alternative hypothesis is suggested. The plausible insight for this result indicates that engineering technology programs in Mindanao State University System are not competent and technically skilled. Findings of the study support or affirm the results of the study of [6] in which employers strongly preferred employees who are loyal and committed to their works and functions, responsible team members, able to assess with strong moral values and a high sense of professionalism.

There was no significant difference between graduates’ employability (Learning-centered teaching strategies) and employability (Competency skills of the graduates), $t = 0.528$, $p = 0.796$. The statistical results support the tested hypothesis. There was a significant difference between graduates’ employability (Inclusion and diversity) and employability (Competency skills of the graduates), $t = 2.368$, $p = 0.019$. The statistical results do not support the tested hypothesis and an alternative hypothesis is suggested. The plausible insight for this result indicates that engineering technology graduates in Mindanao State University System are not competent and technically skilled. The findings of the study support or affirm the results of that study like [8] in which they stated that fundamental skills, teamwork, and the characteristics of graduates are some of the most skills the employers want.

There was no significant difference between graduates’ employability (Student life skills development) and employability (Competency skills of the graduates), $t = 0.999$, $p = 0.323 >0.05$. The statistical results support the tested hypothesis. Engineering technology graduates in Mindanao State University System are not competent and technically skilled. The findings of the study support or affirm the results of that study like [8] in which they stated that fundamental skills, teamwork, and the characteristics of graduates are some of the most skills the employers want.

| Competency/Competencies | Mean Difference | T-Test | Remarks |
|-------------------------|-----------------|--------|---------|
| Assessment              | 3.664           | 0.000* | Significant |
| Learning-Centered Teaching Strategies | 0.528 | 0.796 | Not Significant |
| Inclusion and Diversity | 2.368           | 0.019* | Significant |
| Student Life Skills Development | 0.990 | 0.323 | Not Significant |
| Outcome Based Practices | 2.453           | 0.015* | Significant |
| Professional Commitment | .189            | .236   | Not Significant |

*significant at 0.05 level of significance.
There was a significant difference between graduates’ employability (Outcome-based practices) and employability (Competency skills of the graduates), t = 2.453, p = 0.015 < 0.05. The statistical results do not support the tested hypothesis and an alternative hypothesis is suggested. engineering technology graduates in Mindanao State University System are not competent and technically skilled. The findings of the study support or affirm the results of that study [11] which stated that fundamental skills, teamwork, and the characteristics of graduates are one of the most skills the employers want.

There was no significant difference between academe-industry base curriculum (Teamwork) and graduates’ employability (Technology), t = 0.232, p = 0.819 > 0.05. The statistical results support the tested hypothesis. The plausible insight for this result indicates that engineering technology graduates in Mindanao State University System are not competent and technically skilled. The findings of the study support or affirm the results of that study like [8] in which they stated that fundamental skills, teamwork, and the characteristics of graduates are one of the most skills the employers want.

There was no significant difference between the Academe-Industry-based curriculum (Initiative and enterprise) and graduates’ employability (Technology), t = 0.456, p = 0.625 > 0.05. The statistical results support the tested hypothesis. The plausible insight for this result indicates that engineering technology graduates in Mindanao State University System are not competent and technically skilled. The findings of the study support or affirm the results of that study like [8] in which they stated that fundamental skills, teamwork, and the characteristics of graduates are one of the most skills the employers want.

There was no significant difference between Academe-Industry based curriculum (Initiative and enterprise) and graduates’ employability (Technology), t = 0.456, p = 0.625 > 0.05. The statistical results support the tested hypothesis. There was no significant difference between the Academe-Industry-based curriculum (Learning) and graduates’ employability (Technology), t = 0.169, p = 0.169 > 0.05. The statistical results support the tested hypothesis. The plausible insight for this result indicates that engineering technology graduates in Mindanao State University System are not competent and technically skilled. The findings of the study support or affirm the results of that study like [8] in which they stated that fundamental skills, teamwork, and the characteristics of graduates are one of the most skills the employers want.

There was no significant difference between the Academe-Industry-based curriculum (Learning) and graduates’ employability (Technology), t = 0.169, p = 0.169 > 0.05. The statistical results support the tested hypothesis. The plausible insight for this result indicates that engineering technology graduates in Mindanao State University System are not competent and technically skilled. The findings of the study support or affirm the results of that study like [8] in which they stated that fundamental skills, teamwork, and the characteristics of graduates are one of the most skills the employers want.

4.4.3. Significance Difference between Academe-Industry Based Curriculum and Graduate’s Employability

The statistical result presented in Table 6 below shows the results of t-test (paired sample statistics) at a 0.05 level of the significant difference of Academe-Industry curriculum and graduates employability revealed that:

There was a significant difference between academe-industry based curriculum (communication) and graduate’s employability (Technology), t = 2.133, p = 0.044 < 0.05. The statistical results do not support the tested hypothesis and an alternative hypothesis is suggested. The plausible insight for this result indicates that engineering technology graduates in Mindanao State University System are not competent and technically skilled. The findings of the study support or affirm the results of that study like [8] in which they stated that fundamental skills, teamwork, and the characteristics of graduates are one of the most skills the employers want. This Finding of the study support or affirm the results of those studies like [3] and [1] in which they stated that oral and written communication skills are one of the most important skills for graduates’ employability.

There was no significant difference between academe-industry based curriculum (Problem-solving) and graduates’ employability (Technology), t = 1.421, p = 0.169 > 0.05. The statistical results support the tested hypothesis. The plausible insight for this result indicates that engineering technology graduates in Mindanao State University System are not competent and technically skilled. The findings of the study support or affirm the results of that study like [8] in which they stated that fundamental skills, teamwork, and the characteristics of graduates are one of the most skills the employers want.

Table 6. Significance Differences between Academe-Industry Based curriculum and Graduates’ Employability

| Mean Difference | t-Test | Remarks |
|----------------|--------|---------|
|                | t-value | p-value |
| Communication  | 2.133   | 0.044*  | Significant |
| Problem Solving| 1.421   | 0.169   | Not Significant |
| Team Work      | 0.232   | 0.819   | Not Significant |
| Initiative and Enterprise Technology (graduates’ employability) | 0.496 | 0.625 | Not Significant |
| Self-Management| 0.456   | 0.653   | Not Significant |
| Planning and Organizing | 0.144 | 0.887 | Not Significant |
| Learning       | 0.684   | 0.501   | Not Significant |

*significant at 0.05 level of significance.
5. Discussion

5.1. Faculty Member Teaching Diploma in Engineering Technology

Based on the statistical results, it was found out that respondents (faculty members) teaching two-three years Diploma in Engineering Technology during the year 2010-2016 in the three campuses of Mindanao State University System was dominated by male faculty members outnumbering the female respondents of which mostly among them were a senior faculty member and married.

The Baccalaureate degrees of faculty members teaching Diploma in Engineering Technology were mostly in Bachelor of Science in Engineering and not in Bachelor of Engineering Technology which is the most appropriate for teaching technology programs, their field of specialization was in line on the subject taught in technology programs. However, many of these respondents were teaching more than the prescribed number of students which 20 students per classroom.

It was revealed from the study that the majority of the respondents have professional eligibility obtained from the Professional Regulation Commission (PRC), said eligibility is related to the subjects they are teaching in the Division of Engineering Technology. In terms of the enhancement of knowledge and skills to cope with modern technology, the majority of the respondents have never attended technical skills and training development sponsored by local, regional, national, and international training authorities. Many of these respondents have no national and international certificates certifying their competencies in their field of discipline.

5.2. Supervisor of the Graduates in the Diploma in Engineering Technology Profile

The Statistical findings of this study revealed that male respondents (supervisor) dominated female respondents in the industry’s workplace, of which most of them have baccalaureate degrees but very few among having master’s degrees, these employers mostly have served the industry for less than 19 years. Many of these respondents were assigned to a job that is very much related to their field of discipline.

5.3. Graduates in the Diploma in Engineering Technology

The average age of the graduates of the diploma in Engineering Technology during the year 2010-2016 were between 23-26 years old, which dominated by male graduates whose religion or religious affiliation is Roman Catholic. The majority of these graduates were graduated with the two years Diploma in Engineering Technology at Mindanao State University in Marawi City. In terms of the field of discipline, these graduates took a course in Electrical Engineering Technology.

In terms of respondent’s highest educational attainment, the majority of these graduates in the Diploma in Engineering Technology proceeded to a non-allied baccalaureate degree after a year of graduation, and very few among them sought employment locally and abroad; they pursued a baccalaureate degree just to earn a degree.

6. Analysis of Means

6.1. Faculty competency/Competencies and Graduates’ Employability

Statistical findings of this study revealed faculty competencies such as assessment, inclusion, and diversity; students’ life skills development; outcome-based practices; and professional commitment have a significant relationship on learning-centered teaching strategies for graduates’ employability.

6.2. Graduates’ Competency/Competencies and Employability

Statistical findings of this study revealed that among the graduates’ competencies such as assessments; inclusion, and diversity, the outcome-based practice was found to have a significant influence on competency skills of the graduates’ employability. However, learning-centered teaching strategies; student life skills development, and professional development are not significant to the graduates’ employability.

6.3. Academe-Industry based Curriculum and Graduate’s Employability

Statistical findings of this study revealed that among the graduates’ competencies such as assessment; inclusion and diversity, the outcome-based practice was found to have a significant difference with competency skills of the graduates’ employability. However, learning-centered teaching strategies; student life skills development, and professional development are not significant to the graduates’ employability.

7. Conclusions of the Study

Based on the summary of the findings, the following conclusion is made:

- The majority of the faculty members teaching two or three-year technology programs of the three campuses of Mindanao State University System offering Diploma courses in Engineering Technology were aged (58 years old) with an average of 30 students per semester which are more than the required number of students prescribed by the Commission on Higher Education (CHED Memo Number 25 S. of 2005) for technical courses which not more than 5 students working on the same laboratory equipment on the same time.
- The majority of the alumni or graduates of the two or three-year Engineering Technology programs of the University Systems did not seek employment after their graduation, but immediately proceeded
and enrolled baccalaureate degrees which are non-allied to their diploma or course obtained from the University System, their diploma courses became as a tool-documents for them to proceed to a higher degree in the university.

- Faculty respondent’s competencies (learning-centered teaching strategies, outcome-based practices, development of student’s life skills, professional commitment, assessment, and inclusion, and diversity) are significant influences on alumni or graduates’ employability.
- The academe-industry-based curriculum (communication, problem-solving, teamwork, initiative and enterprise, self-management planning and organizing, and learning) only communication has been found to be a significant influence on alumni or graduates’ employability.
- Among the competency skills acquired by the alumni or graduates of the two or three-year Engineering Technology programs in the three campuses of the University System (communication, assessment, learning-centered teaching strategies, inclusion and diversity, student life skills development, outcome-based practices, and professional commitment) only assessment have found to be a significant influence on alumni or graduates.

8. Recommendations

Based on the summary of findings and the conclusion of the study, the following are recommended:

- Administrators of campuses offering a Diploma in Engineering Technology shall encourage faculty development programs through the academic planning and development program (APDP) to obtain their master’s and doctoral degrees in a relevant field of disciplines meeting both governmental and institutional standards.
- The maximum number of academic preparations for faculty member shall preferably be no more than four (4) different regular course offerings per academic term/semester; the semester academic workload of the faculty members shall be defined by the Mindanao State University System, preferably with a maximum academic workload of 24 units per semester. The academic workload shall include teaching, research, and extension work; a full-time faculty member shall devote time for community and other extension services.
- The School of Engineering Technology shall make available its facilities for continuing education development programs for practicing technologists on current technologies for which it is authorized to operate.
- The future research study is suggested to conduct a collaborative research study between the university and industry to provide findings on a best suited outcome-based curriculum needed for graduate’s employability; and
- Engineering Technology students in the three campuses of Mindanao State University System offering technology diploma courses must be given curricular activities focusing on the enhancement of oral communication. Seminars must be conducted by the Division of Engineering Technology focusing on the total quality management or any quality assurance mechanism as a common area of concern for the University System and industries.

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