# Papers

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## Promoting Competencies of Engineering Graduates: Role of Internship Programme

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*Abstract**:** This study aimed to reveal that the internship program is important in employability of engineering graduates in Myanmar. In Myanmar, an internship program is the best approach to explore career opportunities in the technological industry but most of engineering students do not have opportunities to take internship program. In our neighboring countries such as Singapore, Malaysia, India, Vietnam, etc., information technology and computer studies are very much in demand among businesses; the internship is likely to be very good compensated. But in our country, Myanmar, we have many challenges for the successful implementation of internship program of engineering institutes as well as other kinds of universities. Moreover, the engineering institutes in Myanmar are reformed their curriculum that internship program is a part of the curriculum. So, the final year engineering students cannot pass their final examination without finishing their internship program successfully. In this study, the major challenges of internship program, especially in engineering institutes, are discussed as well as it proposed the feasible solution for the problem of getting rare opportunities to be the interns.*

*This study also analyzed the employability of engineering graduates of a public university in computer studies and it show that employability is improved for the graduates who have chances of internship program. This study also accessed the performance of interns evaluated by the manager or supervisor of different companies where interns deployed. Qualitative type of research methodology is used to analyze primarily and required data are collected also qualitatively from the University of Computer Studies (Taunggyi), which is one the IT engineering institute in Myanmar. The results proved that the capabilities of IT engineering graduates are drastically improved after attending internship program and the employability of engineering graduates are in progress. This study also showed that the academic performance is moderately related with internship performance.*

**Keywords:** employability, engineering education, competencies, internship

Higher education is the basic need for socio-economic development of a country. It is the main responsibility of higher education institutions to develop the highly qualified human resources needed by the country. Universities graduates need to have the innovative and

creative thinking needed for an economically competitive society. Myanmar higher education institutions (HEIs) need to strengthen their role as a center for creating and disseminating knowledge in the local community. The HEIs need to focus on the development of employability of their graduates by systematic ways.

Employability is the ability to create and sustain work over time (Bennett, 2018). Myanmar HEIs is in weak state for the development of employability of its graduates. There are many complaints from industry site that the HEIs are not preparing their graduates for the workplace. Employability is a set of skills, knowledge and personal attributes that make an individual more employable. Effective Internship program is an efficient way for engaging students to develop their employability skill.

## Literature Review

According to the numerous publications in the academic literature, the employability of Myanmar engineering graduates is not studied with detailed discussion. But there are many research studies on the employability of higher education. (Bennett, 2018) highlighted that the preparation for employment and employability of higher education students is very important and it is at the forefront of higher education. Bennett (2018) described that the employability must focus on ability, must form the center of the curriculum, must embrace diversity, and must integrate the metacognitive capacities with which higher education graduates are not only ready for work, but ready to learn. (Sevillia et.al, 2014) assessed the level of performance of the interns in terms of knowledge, skills, attitude and personality. That study also revealed that there is no significant relationship between the academic performance and the training performance of their students. (Chavez, 2014) studied how to develop the students' competencies and academic performance of engineering students through Academe- Industry Partnership. That study found that Engineering interns have very high competencies in terms of attitude with high performance in personality of their cohort of students. (Miralles-Quirós & Jerez-Barroso, 2018) examined the role of internship for adaptability of higher education to the demand of labor market through the existing evidence published in highly qualified scientific journals. They said that there is a great interest of research in the field of economics and education but poorly addressed, establishing an important field for further research.

## Developing Internship Program

There have been significant changes and improvements in the field of higher education in Myanmar. There are thirty two universities and colleges in 1988 but the number of HEIs is growth up to 171 in 2017 (Haydena & Martin, 2013). The country's universities and colleges are widely dispersed across the regions of the country. Fifteen states and divisions are divided around the country and at least three public universities or colleges are established in each region. Around the country, 28 universities specialized for computer science and technology and 33 technological universities, altogether sixty-one universities of engineering are implemented and accounted for 18% of all higher education enrolments (Kraas. et al, 2017). All engineering universities have dedicated and strictly regulated curriculum. All of engineering universities tried to reform their curriculum, teaching methodology, assessment plan to improve the quality of education and employability of the university. Starting from 2016-2017 academic year, there is a new rule that each and every final year of engineering students must involve in the internship program. In final year subjects, internship is considered as one subject. If the student doesn't join to the internship program, she/he could not pass the final year exam.

**Challenges of internship program development in Myanmar**

The engineering universities are encountered with many challenges to develop successful internship program. The following are some of these challenges to implement internship program.

**(i) Financial status of universities**

All of HEIs in Myanmar are public and government funded university. Each education institution requested to the Ministry of Education for their expenses. The Ministry of Education asked for the budget from government for expenses of all education institutions. The universities are dispersed around the country, so the cost of operating is fairly high and the obtainability of sufficient resources is limited (Kraas. et al, 2017). All of the universities are underfunded. So, the university cannot support to the interns financially.

**(ii) Slow economic development of industries**

The declination of economic in country can reduce the obtainability of employment and supporting for internship. Many employers want to recruit only the experienced employee and they don't want to use time and money for novice employee and intern students. Even though they would like to help to improve the quality of engineering graduates and interested to collaborate with universities, they cannot afford to support

financially. Most of the students from universities in rural area cannot afford to go the far cities away from their hometown for internship program if they don't have financial support.

**(iii) University-Industry collaboration is weak**

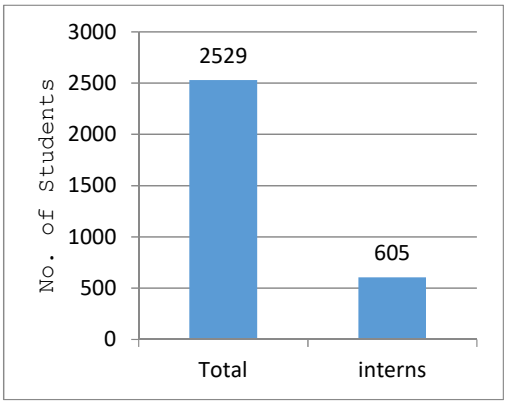


*Figure 1*. The rate of interns for IT engineering graduates

During military regime, the management of HEIs is strictly centralized and restricted to engage with industries. As a consequence, the knowledge of graduates doesn't meet the industry need. The job opportunities for the graduates are very rare and need to join extra training organized by industries and private institutions for readiness to join labor market. The linkage of universities – industries are not good. Most of them have no effective join up policy for collaboration with industries. The industries complained that the graduates are not enough knowledge and skill to meet their need. The numbers of students who want to be intern are very high and on the other hand, the number of interns accepted by industries is so little. In 2016, only 32 % of final year students in engineering universities can join to internship program and the others 68% are doing project in their universities under supervision of faculties. The weakness of doing project at their home university is the graduates don't have working experience and don't in touch with working environment and lack of exploring for career path. Figure 1 shows that the rate of interns for IT engineering graduates around the country in 2016-2017 academic year. There are 2529 IT engineering graduates in 28 Universities of computer studies, and only 605 of graduates can join to the internship program.

In order to solve above challenges and maximize the number of interns, this study proposed the reasonable internship model.

**Proposed internship model**

Because of the intern acceptance rate by the industries are very low, most of engineering students cannot have an opportunity to gain valuable work experience, to explore

career path and other benefit of internship program. There are two parts in this internship model such as in-campus internship program and out-campus internship program.

Out-campus internship program is intended for the minority of students who can financially afford to go to industrial site in urban area. It will take about four months or six months requested by industry. In out-campus internship program, the university needs to strengthen the relationship with industries. For this program, the university request to the industries for recruiting interns or the industries request to university for recruitment. The interns need to record their daily activities on their log books. The industries evaluate to the interns and send their evaluation to the university after internship period. The industries need to facilitate the working space and required equipment for the interns and some industries financially supported to the interns. Only a few of interns could join to out-campus internship program.

In-campus program is intended for majority of IT engineering graduates. In the in-campus internship program, the interns have to do project under guidance of performing industrial professionals. According to survey, there are many industrial professionals who want to support to the universities for generating industries readiness graduates. In this program, the industrial professionals and university faculties are cooperating to implement internship program. The industrial professionals could only join once a week and share industrial knowledge to the interns. In the other days, the university faculty needs to supervise to the interns. The university can request to Myanmar Engineer Council for engineering professionals or Myanmar Computer Federation for computer engineers to assist to in-campus internship program. The university needs to facilitate a space for interns, and other equipment and necessary kit to the interns for doing project. The program will take three or four months. After completion of project, the industrial professional and university faculty can evaluate together their project. Table 1 describe that how internship programs are management. This model can solve the problems that encountered with developing internship program in engineering universities.

Table 1. *Types of internship program and its management*

| Internship Program | Working Places | Supervised By | Evaluated by | Facilitated By |
|---|---|---|---|---|
| Out-campus | Industrial | Manager or Supervisor of industries | Industries | Industries |
| In-campus | University | University Faculties and industrial professionals | Industry and university | Universities |

## Evaluation of Graduates' Competencies

The following section studied to determine whether the graduates' competencies are developed during internship program. Majority of graduates studied in computer studies and technology are females indicated by the average ratio of 71 % against 29 % of males. Figure 2 shows that the distribution of male and female ratio of computer studies students in UCS(Taunggyi).

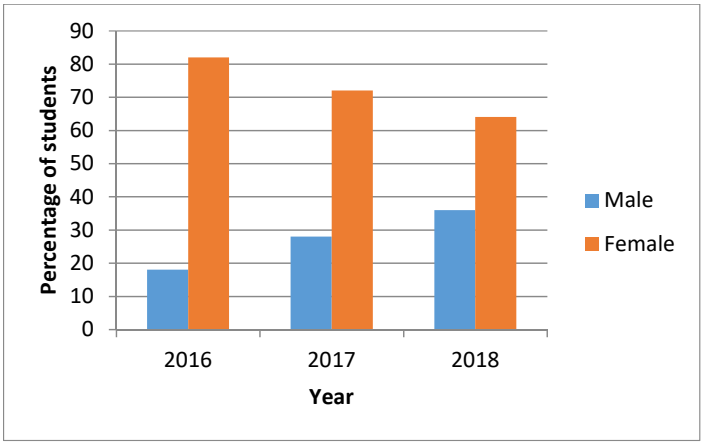


*Figure 2*: Illustration of computer studies students by gender

This study used the performance of interns evaluated by the manager or supervisor of different companies where interns deployed as instruments. The interns' performance is categorized into two types of skills such as soft skill and hard skill, include sixteen competencies in total. Table 2 describes the hard skill and soft skill that we emphasized for IT engineering graduates in Myanmar. There are many kinds of soft and hard skills studied in the literature. In this study, we collect the type of skills needed in Myanmar industries according to the nature of student in Myanmar. Especially, most of these skills are needed to realize for IT graduates of Myanmar.

Table 2. *Graduates competencies categorized in hard skill and soft skill*

| **Soft Skills** | **Hard Skills** |
|---|---|
| 1. Arrived work on time | 1. Effectively performed assignment |
| 2. Behaved in professional manner | 2. Oral communication skill |
| 3. Ability to work with other | 3. Written communication skill |
| 4. Reliability and dependability | 4. Computer skill |
| 5. Attention to accuracy and details | 5. Quality of work |
| 6. Interested and enthusiastic in the internship experience | 6. Demonstrated critical thinking and problem solving skill |
| 7. Willingness to ask for help and guidance | 7. Making and meeting deadline |
| 8. Ability to adapt to a variety tasks | 8. Decision making and setting priorities |

The internship period is four months from May to August. The participants of the study are the 45 interns studied for the Bachelor of computer science and technology program at University of Computer Studies (Taunggyi). They are evaluated by the managers or supervisor of the industry where they are working for internship program. The University of Computer Studies (Taunggyi) is located in Shan State, northeast of the country, Myanmar. Most of Shan State region are mountainous landscapes, height over 3000 feet above sea level. It covers 155,800 km², almost a quarter of the total area of Myanmar. 11.31% of Myanmar population is lived in Shan state and the population density (people per $km^2$) is 37 (Kraas et al , 2017). Most industries that link with University of Computer Studies (Taunggyi) are in Yangon, 453 km far away from Taunggyi.

**Research Method and Data Description**

This study used a standard competencies assessment tool provided by the university to assess the competencies of the interns. The competencies score is divided into five scoring grades 1.00 -1.49 is the lowest and rated as poor (P), 1.5-2.49 is fair (F), 2.5-3.49 is good (G), 3.5-4.49 is very good (VG) and the highest is 4.5-5.00 rated as excellent (E). The interns are enrolled in the Bachelor program of computer science and technology. They have to study four and half year in university and study for 4 months in industry. The interns went to the IT industries such as software development companies, IT solution services, banking services, telecommunicating services, network operation center and data center.

Table 3. *Performance of interns in terms of soft skill*

| No | Soft Skills | Mean | Score | Rank |
|---|---|---|---|---|
| 1 | Arrived to work on-time | 3.9 | Very Good | 1 |
| 2 | Behaved in professional manner | 3.3 | Good | 6.5 |
| 3 | Ability to work with others | 3.5 | Very Good | 4.5 |
| 4 | Ability to adapt to a variety of tasks | 3.5 | Very Good | 4.5 |
| 5 | reliability and dependability | 3.3 | Good | 6.5 |
| 6 | attention to accuracy and details | 3.2 | Good | 8 |
| 7 | Willingness to ask for help and guidance | 3.6 | Very Good | 3 |
| 8 | Interested and in an enthusiastic about the internship experience | 3.8 | Very Good | 2 |

**Analysis of Interns Competencies**

In terms of soft skill, the data show that interns' competencies are very good with the combined mean of 3.51. The interns are very interested in internship program and eager to learn from the industries. Most of these students are come to class late during learning in university, but they tried to be on time during internship program. The ability of work with others and the ability to adapt to a variety tasks are also very good with mean value 3.5. They are less attention to accuracy and details of working assignment. The interns' reliability and dependability for their assignments are also high.

Table 4. *Performance of interns in terms of hard skill*

| No | Hard Skills | Mean | Score | Rank |
|---|---|---|---|---|
| 1 | Effectively performed assignments | 3.4 | Good | 1.5 |
| 2 | Oral Communication skills | 3.2 | Good | 5.5 |
| 3 | Written communication skills | 3.1 | Good | 7.5 |
| 4 | Computer skills | 3.4 | Good | 1.5 |
| 5 | Quality of work | 3.3 | Good | 3.5 |
| 6 | Demonstrated critical thinking and problem solving skills | 3.2 | Good | 5.5 |
| 7 | Making and meeting deadline | 3.3 | Good | 3.5 |
| 8 | Decision making, setting priorities | 3.0 | Good | 7.5 |

In terms of hard skill, the interns' competencies are good but the score are not so high. The score of written communication skill and oral communication skill are less than other skills. The university needs to train more to the students for communication skills. The interns are weak in decision making and setting tasks priorities. This study also shows that the graduates from University of Computer Studies (Taunggyi) have more emotional quotient than intelligent quotient by showing average score of soft skill is more than average score of hard skill. The academic performance is partially related with internship performance. Most of the students who have good grade in academic can show good performance in internship program. They also got job offer by industries after internship program. The following section describes the employment of interns after internship program.

**Analysis of Employment of IT engineering graduates**

The education system in Myanmar is in weakest state because of the effect of 60 years of dictatorship. The higher education system is not bringing in line with the needs of industries. The rate of unemployment is high and the industries informed that the graduates are lacking adequate soft-skills and also not qualified in hard skill.

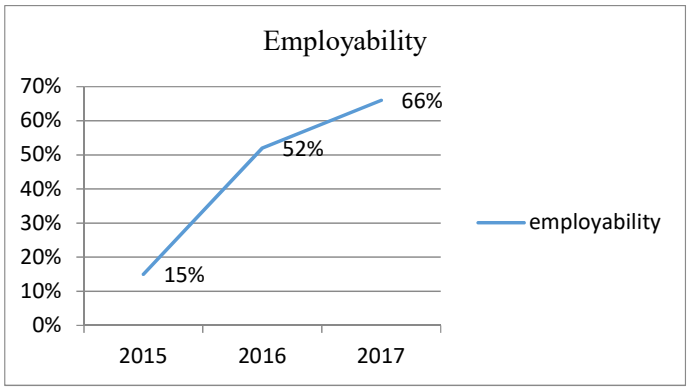


*Figure 3*. Employment of interns after internship program

After transformation from military dictatorship to civil society, the government of Myanmar intended to reform the entire education sector with a new National Education Strategic Plan (NESP) 2016-2021. HEIs also reform aligned with NESP. Figure 3 shows that the level of employability is sharply high after the universities is implemented the internship program. Only 15 % of IT engineering graduates from UCS (Taunggyi) is employed in 2015. The internship program is started in 2016 in university and the employability is higher in each and every year. UCS (Taunggyi) tried hard to collaborate with industries to successfully implement internship program. But as mentioned above, there

are many challenges to develop internship program for IT engineering graduates around Myanmar. Only 32 % of IT graduate can join internship program in 2016.

## Conclusions

Producing highly skilled and career readiness graduates for the modern workforce is the essential task of the HEIs. This study highlighted that the importance of internship program for employability of graduates of HEIs. It also found that the student competencies are improved after successfully develop the internship program. But only a few students can only go for internship program because of lack of internship opportunities provided by the industries. The graduates who went to the internship program have more confident to join the industries and are more readiness to go for joining industries. In this paper, we also proposed the practical internship model for ICT engineering graduates in the country. The proposed in-campus internship program is now using in some universities for computer studies and found that the graduates' competencies is improved. Out-campus internship program is more efficient and effective for employability expansion. But at current situation, Myanmar engineering universities have rare opportunities to implement out-campus internship program and still need to use in-campus internship program.

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