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Shy Engineers? Strategies to Eliminate Shyness and Enhance Engineering Students' Career Development

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Abstract*: *Shyness is a universal problem that happens among students, including engineering students. Shy students have a high introverted trait and they are more suitable to choose a non-social career. However, the career as an engineer requires someone to possess skills and becomes highly competent, besides not shy to communicate and deal with various social situations. This made engineering graduates unemployed and contributed to the unemployment rate of the country. This article discusses the shyness problem and its relevance to the engineering students' career development. The strategies to eliminate shyness are deliberated in brief based on previous studies. Then, the strategies to eliminate shyness are discussed concerning the engineering students' career development.

Index Terms*: *Career development, Engineering, Shyness

I. INTRODUCTION

Many employers nowadays feel that it is extremely difficult to get skilled manpower to fill the vacancy of highly skilled workers. [1] found that 41% of employers state that skilled workers in various sectors are indispensable in the country. This is proof that there are 23.9% of skilled worker vacancies in the fourth quarter of 2018 [2]. According to [3], there are vacancies reported by the industry where employers face difficulties in finding qualified candidates to fill the post. This can be proven through a National Associated Manufacturing (NAM) report stating that there is a skill gap that exists in almost all areas of work to meet industry needs with the skills employed by the workers [3]. Hence, for this reason, the candidates that have been interviewed are not employed because they do not meet the requirements set by the industry.

A mismatch between the skills possessed by graduates and the skills required by employers in the field of engineering could not be denied [4].

This is because some students do not care about the skills that need to be developed within the university years and are skeptical about the field of work that should be completed after graduation [5].

This situation contributes to the increase in statistics of non-working graduates while the industries need skilled professional workforces.

Unemployment is a huge loss to the country as the government has invested heavily in education and training whereby graduates have spent years trying to learn and obtain a degree [6]. The ringgit and energy sacrifice during university also becomes useless and worthless because it does not bring benefits to graduates. Unemployment affects individual physical and mental health [7] due to feelings of pressure [8]. The unemployed individuals have low social status [7], having a personal crisis, and low self-esteem because they could not highlight the abilities that they possess [6], [8]. Besides, unemployed individuals become unproductive [9].

Unemployment among graduates is caused by several factors. The employer is the biggest factor that contributes to the unemployment rate of graduates. However, employers could not be blamed for unemployment problems of engineering graduates because according to [10], competition is the key factor that motivates the industry to be more efficient in planning strategies that will improve production, service and product quality. This situation urges employers to be careful in selecting workers. Employers are seen to be looking for experienced workers and graduates who are not only good in technical skills but also have high competency of generic skills [10]–[12].

Communication skill is among the most important skills needed by current employers [3]. However, this skill is the most significant weakness of engineering graduates due to high shyness [13]–[15]. The problem of shyness needs to be addressed at the university level, so students are not left behind in developing their career to avoid unemployment after graduation.

II. LITERATURE REVIEW

Shyness amongst Engineering Students

Shyness causes universities graduates to be unemployed or working in other fields that are not equivalent to their degree [16]. Shy students tend to be unemployed after graduation because they were not involved in developing their career during the university years [17]. Shy students have poor social and communication skills where this affects their chances of pursuing career exploration [16]–[18].

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The social and communication problems cause students not to be accepted in the industry as these two skills are the benchmarks of individual successes as an effective team member at work [19].

Engineering students must be very effective in the world of work, so, they need to prepare themselves with the skills needed by today's industrial market. Still, previous research found that engineering graduates are lacking in social and communication skills as demanded by the employer [20]. Shyness among students causes negative impacts on their career growth. Shy students are more likely to choose a non-social career that requires less communication [21]. However, engineering students need to master themselves with oral communication competency to become professional engineers [22]. Also, they need to communicate and make presentations during studies and later on at work.

Shyness also prevents students from career exploration as they are unsure about the field that they are involved [17]. Shy engineering students will have trouble getting jobs and if they work, they will face greater problems because they could not communicate effectively and lack confidence. Communication skill is one of the seven elements in the soft skills that all engineering students must possess and becomes a value-added by potential employers [23]. However, shyness in students prevents them from developing communication skills and self-efficacy.

A preliminary study using a set of online questionnaires has been conducted on the first-year undergraduate students at four technical universities in Malaysia. In this study, as many as 44% of students found they were shy. 70% of students in this study were found to be shy to ask questions and 74% of students were shy to express their opinions during discussions in the class.

The Correlation Between Career Development and Shyness

Theoretically, the barrier to the crystallization of the vocational self-concept is the impact of shyness because the development of self-concept comprises social interactions [18]. So, the concern about negative judgments of shy individuals can lead to limited experiments on self-expression and misconceptions against other people's responses, causing a sense of self-confusion.

[17] examined the perception that shyness is inversely proportional to some behavior related to early career development. The results show that shy undergraduate students are less likely to find information on career, do not know to make the decision, and lack interest in the interpersonal career. Concerning career behavior, the report from a 30 years longitudinal study of shy childhood by [24] found that shy men were a bit slower to enter a steady career phase, compared to those who were not shy. Besides, shy men also hardly achieve proper career objectives and suffered severe career instability during the age of 30 to 40.

Shy women are reported to follow conventional marriage patterns, childbirth, and being housewives, as opposed to non-shy women. Shy women also rarely have a career after childbirth. On the other hand, in the case of identity formation, [18] argued that shyness shows an unrelated relationship with identity achievement. Difficulties in the formation of psychological identity resulted in a delay in career development [18].

Research on the impacts of shyness by [25] focuses almost exclusively on the relationship between shyness and the difficulty in social interaction, whereby shy students experience more loneliness, compared to those who are not shy. Shy students are found to be less informed and inconsistent in determining their career. [25] holds the view that shyness has a wider impact on social adjustment and work of individuals.

According to [18], in terms of job exploration, both aspects of cognitive thinking and behavior will prevent exploration efforts as this situation interferes with effective social interaction. Due to the lack of self-concept, career exploration is also a problem for shy individuals. Shy individuals tend to have low self-esteem, self-reflection, and career exploration.

It has been argued that negative distrust (defined as a tendency to experience unpleasant emotional states and has a negative self-concept) is reported to be inversely proportional to work satisfaction and positively correlated to the behavior of being fired or dismissed from work [26]. [27] suggest that negative distrust can undermine the accuracy of the information that contributes to self-efficacy assessment of job performance related to career development. Together these studies provide important insights into the negative impact of shyness on the individual's social and interpersonal skills, especially in communication skills in their career development process.

III. RESEARCH METHODOLOGY

This paper first discussed the relationship between career development and shyness. Then, Strategies to eliminate shyness among students were identified based on analyses of selected publications. This was done through online search engines using a few keywords such as eliminating shyness, overcoming shyness and reducing shyness. A total of 97 articles were reviewed but only seven were related to higher learning institutions and engineering students. Finally, the strategies to eliminate shyness were discussed in relation to the career development of engineering students.

IV. RESULTS

Different authors have conducted research on the strategies to eliminate shyness in a variety of ways. Table 1 below is the summary of strategies undertaken in previous studies to address the problem of students' shyness.

Table. 1 Summary of strategies to eliminate shyness

	Authors	Sample	Method	Strategies/ Activities
1	Awang & Daud (2015)	Engineering students	Quasi-experiment	Group discussions through Problem-based learning (PBL)
2	P'Rayan & Shetty (2008)	Engineering students	Communica-tion Skills Laboratory Course	Oral presentations, group discussions, interviews, computer-assisted learning, public speaking
3	Waitz & Barrett (1997)	Engineering students (aerospace)	Experimental Projects Laboratory with communica-tion practicum	Co-operative learning, hands-on activities, use of technology, student motivation
4	Martin & Thomas (2000)	College students	Model of Psychoeduca-tion for Shy College Students.	Techniques of relaxation and confronting the dreaded situations of self-doubt, social skills, communication skills
5	Young et al. (2014)	Engineering students	Participation in co-curricular activities	Teamwork, reflective behavior, communication activities
6	Carter et al. (2016)	Engineering students	Application of Reason Model via questionnaire	Cooperative learning, humanitarian projects, leadership activities
7	Zaghloul (2018)	Preparatory year students	*Quasi-experiment*	Creative drama

V. DISCUSSION

Group Discussions through Problem-Based Learning (PBL)

Problem-Based Learning (PBL) encourages students to solve problems by thinking through the question such as 'how' and 'why'. This could enhance students' critical thinking skill. Students discussed and collaborated on finding the information provided. Thus, they could gain the teamwork skill that is very important for engineers and enhances their self-esteem that consists of social interactions. Each student could express their opinion verbally in the presence of a mentor as a facilitator. This activity encourages them to always communicate their ideas. This way, the crystallization of vocational self-concept of the students could be improved. Although the study found that the PBL method was appropriate to improve communication skills and eliminate shyness among students, the study conducted by [34] found that in the PBL method, students could become active or inactive speaker, depending on their involvements.

Oral Presentations, Group Discussions, Interviews, Computer-Assisted Learning, and Public Speaking

While group discussions promote social interactions, oral presentation or public speaking help students to overcome their communication apprehension that related to shyness [35], besides helping them to increase their self-esteem. Moreover, these activities could train them in making their own decision and instill their interest in interpersonal careers like engineers. Computer-assisted learning enables students to actively involve themselves in the career exploration process while interviews could enhance students' self-confidence and making career choices.

Co-operative Learning, Hands-On Activities, Use of Technology, and Student Motivation

Co-operative learning enhances teamwork and interpersonal skills that are needed when students enter the world of work. For engineering students, hands-on activities and the use of technology are compulsory to give the students more exposure towards the industries. The motivation that provided by the mentoring System could reduce the Difficulties in the formation of psychological identity and minimizes the risk of the delay in career development.

Techniques of Relaxation and Confronting the Dreaded Situations of Self-Doubt, Social Skills, and Communication Skills

Techniques of relaxation are very useful when a person is experiencing shyness whereby, they help shy individuals to become calm and avoid the concern about negative judgments.

Besides, confronting the dreaded situations of self-doubt could help students to correct their misconceptions against other people's responses which cause a sense of self-confusion. This could break the barrier of vocational self-concept. Meanwhile, social skills are needed for the interpersonal career like engineer. Thus, social skills provide students with social interactions that avoid loneliness and difficulties of social adjustment at work. Shyness can be reduced through practices in communication skills. Students with a higher level of communication skill would able to find information on career and know how to make the career decision themselves.

Teamwork, reflective behavior and communication activities

Teamwork always promotes social interactions that enhance social and interpersonal skills. It also helps to avoid negative distrust among team members. Reflective behavior helps students to reflect on their shyness problem and think about the consequences of shyness towards their career development. Communication activities that incorporate in the co-curricular programs provide unique skills depending on the involvement that enhances their career developments. Generally, students with good communication skills will have high self-esteem and low communication apprehension. So, these students would have a low level of shyness and tend to choose interpersonal careers.

Co-operative Learning, Humanitarian Projects, Leadership Activities

The approach used in the investigation by [36] is similar to that used by [37]. Humanitarian projects and cooperative learning activities also demonstrate significant insights into communication skills and leadership skills. Good communication skills among students can reduce their shyness to communicate in social situations. As mentioned earlier, co-operative learning promotes teamwork and social skills. Thus, shy students could improve their communication skill and reduce their shyness through co-operation with other team members. This is because students tend to know their group members better and learn interpersonal skills. The same goes with humanitarian projects whereby students are exposed to the outside world and influence their future employment choices when they work for local communities and collaborate with other agencies. Leadership activities are beneficial for students' career development as they help to build self-confidence and enhance their self-esteem. Individuals with higher leadership skills would have a better chance to be employed and get promoted [38]–[41].

Creative Drama

Students learn to communicate effectively and enhance their social and interpersonal skills through creative drama. Due to the student-centered approach used in the activity, students become a creative thinker that always looking forward to work in teams, which are the basic needs to become an engineer. Creative drama ensures a decrease in students' level of shyness and making it easier for the formation of psychological identity. So, if the problem of shyness can be solved during university years, students will not be facing the problem of delay in career development because the crystallization of vocational self-concept can be enhanced. This way, students could achieve proper career objectives and the chances to experience career stability in the future becomes high.

VI. CONCLUSION

It is pivotal for engineering students to develop their career since the first year they are in university. However, shyness prevents students from being active in their career exploration and limit their skills, especially communication skill. Based on previous studies, various strategies have been undertaken to address shyness problems among students where most planned activities involve communication and group activities to promote social interaction. The activities carried out also have the potential to increase students' self-confidence and self-esteem to deal with shyness. Poor social skills among shy students are the result of lacking in training in interpersonal communication, so studies that provide social training to students should be carried out to see if the social training has a positive impact on their social skills [16]. With this, when shyness problem can be solved at the early stage, engineering students' career development can be well developed while they are still at the university. Besides, when communication skills of engineering students are enhanced, their chances to be employed after graduation would become higher.

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