Eliminating shyness through co-curricular activities towards enhancing the career development of engineering students

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Abstract. The purpose of this study is to find the most effective strategies for eliminating shyness amongst engineering students through co-curricular activities. As shyness causes negative impacts towards students’ development, it becomes a major concern for lecturers and student affairs departments to find strategies that can solve the problem. However, shyness cannot be eliminated solely through the formal classroom learning. Ironically, co-curricular activities provide a good platform to develop students’ potentials, but previous research failed to analyse the specific co-curricular activities that can decrease the impacts of shyness. This paper seeks to address this gap. 102 articles were reviewed and 6 articles were used to suggest co-curricular activities that can reduce the impact of shyness. Finding shows that co-curricular activities such as debate, choir, sports team, physical activities and exercise, career and technical student organizations and entrepreneurship clubs and societies are found to be the core activities that can enhance the social and communication skill, participation in the teaching and learning, self-esteem and career development of shy students. The recommendation activities can be used by the student affairs departments to eliminate shyness amongst engineering students by ensuring their active participation in the respective clubs.

1. Introduction
In developing a career, engineering students need to have a high level of self-confidence and not being shy to communicate. According to [1], communication aspects such as oral presentations represent one of the tasks required in the career development of an engineer. A professional engineer needs to familiarize himself and allocate nearly 60% of their time in oral communication, especially for project presentations where they need to work with various types of agencies [1]. Thus, in building a career, engineering students need to develop good interpersonal communication skills so that they dare to express their ideas effectively. This is because communication is the most anticipated generic skill by many potential employers. According to [2], engineering students have the strength in terms of technical and theoretical skills, but they are lacking in social and communication skills. However, conventional learning methods have little to assist in improving their interpersonal skills and decrease shyness among students [3].
Enhancing shy engineering students’ self-esteem in the classroom setting seems impossible because lecturers need to meet their teaching objectives in a certain period given. Furthermore, [4] pointed out that there are many negative cultures in a classroom that cause negative influences towards shy students. In this sense, out-of-class programs could be the most appropriate solution to be applied for shy engineering student at the universities. Students’ participation in the co-curricular activities able to give positive impacts on academic development and to shape the students' self-esteem towards developing their career [5]. This is important because highly skilled workers with good social and communication skills are the characteristics of graduates required by current employers [6].

1.1 Engineering students and the problem of shyness
Self-confidence is pivotal in everyone’s life. Individuals with a high self-esteem can accomplish their desired goals and not easily give up in achieving their success. However, not all individuals have positive thinking and high self-esteem. There are shy individuals with low self-esteem and always think negative. Most scholars relate shyness with social and communication skills deficiency, in which shy individuals feel discomfort in social communication situations, fear of speaking and tendency to be silent, passive or irresponsible to others [7, 8, 9]. Shyness is a universal problem experienced by all individuals, from children to adults. Shyness among students causes negative impacts towards their career development. Engineering students must fit in the world of work, so, each of the student needs to be prepared with the skills needed to meet the requirements of today’s industrial market. However, previous research found that among the shortcomings of engineering graduates is the lack of social and communication skills as demanded by the employer in addition to the competitive job market [10]. These skills are crucial to ensure that students are able to cope with any problems in their study, especially when they do not understand certain topics, or have something to be argued [11, 12]. Students need to give opinions and ask questions, join the discussions and participate in activities during the learning sessions to develop their generic skills [13, 14]. In order to enhance the generic skills among engineering students, many of them face the difficulties to participate actively in social situations, especially during the classroom learning and also during their practical session due to shy behaviour [13].

Numerous studies have considered co-curricular activities as the holistic approach to develop students’ skills in general, but only limited research looking at the benefits for each type of the co-curricular activities it can offer. Although international studies have emphasized various ways to overcome shyness, they are generally focused on shy children and very few studies conducted to cater shyness among college students. Furthermore, many studies have focused on the benefits of some extra-curricular activities for students who are at the risk of academic failure or dropout [15], emphasizing the program as a possible way to enhance engagement, but ignoring to analyze its impacts towards reducing or eliminating shyness. Thus, there is a vital need to investigate the type of effective co-curricular activities in eliminating shyness among engineering students who play an important role in the development of human capital. This paper seeks to address this gap by reviewing the literature on co-curricular practices to propose specific activities that able to eliminate or reduce shyness among engineering students to achieve the full potential of student development.

2. Methodology
The effects of students’ shyness were identified according to analyses of selected publications. Then, a small-scale literature review of published articles was undertaken to identify the most relevant type of co-curricular activities to eliminate shyness. To carry out the search, online literature search engines were used to find academic papers and other resources using few keywords like; co-curricular and self-esteem, co-curricular and communication skill, co-curricular and shyness, co-curricular and career development, and, college students and club. A total of 102 articles were reviewed but only six were relevant and selected as the main references in constructing the suggested co-curricular activities to eliminate shyness and achieve the maximum potential of students’ career development (see Table 1).
This paper first deliberates the effects of shyness towards engineering students. An overview is given to the effects of shyness towards students in terms of communication skill, social skill, participation in the teaching and learning, self-esteem and career development. Then, the most relevant types of co-curricular activities that able to reduce the impacts of shyness were discussed.

| Types of co-curricular activities | Researcher(s) | Findings |
|----------------------------------|---------------|----------|
| Debate club                      | Lawhorn [16]  | Self-confidence, workplace skill, presentation skill, analytical and logical reasoning skills, ability to think and speak spontaneously |
| Choir                            | Jacob, Guptill, & Sumson [17] | Sense of community, social bonding, accomplishment, expressing personality |
| Sports team                      | Edwards, Edwards, & Basson [18] | Enhances mental health, social, psychological well-being, self-esteem |
| Physical activities and Exercise  | Page & Hammermeister [19], Ekeland, Heian, Hagen, & Coren [20] | Lower score of shyness related to longer time doing physical activities, higher self-esteem |
| Career and technical student organizations | Lawhorn [16] | Academic, interpersonal skill, career skill, leadership skill, improve self-esteem, encourage civic involvement |
| Entrepreneurship clubs and societies | Pittaway, Rodriguez-Falcon, Aiyegbayo, & King [21] | Motivation, enhance social, increase self-efficacy, self-esteem, gaining practical experience & networking |

3. The impact of shyness
Shyness affects engineering students in various parts of their development. In this part, first, the impact of shyness towards students’ communication skill were discussed, followed by the impacts on their social skills, participation in the teaching and learning and self-esteem. Finally, the impact of shyness towards students’ career development were discussed.

3.1 The impact on communication skills
Communication is vital for an engineer. However, shyness causes engineering students fail to share ideas and opinions, refuse to ask questions for clarification, inactive in group discussions, ineffective in the classroom, and unable to deliver presentations effectively. Past studies have identified shyness is a strong and stable trait that brings negative impacts to oral communication among students [22, 23], [24, 25]. Shyness inhibits one's interpersonal goals and prevents students to start a friendship because they are not confident to communicate [12]. Shyness makes a student become less talking and feels awkward or behave like completely wrong when interacting [26]. Shy students are associated with the low perception of communication efficiency [27, 28]. Shy students rarely express their ideas or thoughts. They prefer to keep silent when being asked and refuse to be participative in classroom’s activities. These students are unable to talk fluently in front of others like when delivering a presentation due to the lack of self-confidence.
Shyness in students is closely related to the difficulty of communicating because they are too concerned about other person or people’s negative judgments against them [26]. Shy students often considered as unfriendly and unable to communicate effectively [28, 29] also reported that shy students have low communication competence and unable to speak fluently and confidently in a social situation. Students who are shy will have problems in both verbal and non-verbal communication [26]. According to [28], shy students face the difficulties to start a conversation because they find it hard to initiate and structuring the conversation. Because of this, shy students speak less and take more time to give a response [26]. Shy students exhibit poor reciprocity smiling behaviour and lack of verbal competencies [30]. Shy students often considered as having an introverted personality, thus they have a low level of verbal responding [24]. Shy engineering students will have the difficulties to throw their ideas and do presentations in front of others as they have a low level of communication skill.

3.2 The impacts on social skills
Shy students feel more comfortable with computer-mediated communication, compared with the face to face communication, especially when it involves interaction with the opposite gender [31]. [28] listed down some of the consequences of shyness among students, which are they tend to have negative emotions such as loneliness, stress, and isolation because they face the difficulty to find new friends. According to [29], shyness was correlated to social competencies of a student whereby he or she will avoid the social situations and demonstrate awkwardness during social interaction.

Shy students have a lower social acceptance [32] and do not dare to start a conversation in a group setting or doing any social action in group activities [31]. The study on the effects of shyness by [33] focused almost the exclusive correlation between shyness and the difficulties in social interactions. The researcher found that shy students experienced more loneliness and have a smaller support network compared to the non-shy students. Shy students have lack interaction with others and would demonstrate low social skill, speak less, lack eye-contact, sit far from others, less calm and less friendly than non-shy students [29]. Shy engineering students will try to avoid meeting other people, not active in the organization and avoid going to conferences. Thus, they have lack of networking and experiences that are important for their future career.

3.3 Participation in the teaching and learning
According to [34], university lecturers have identified that there is a decrease of student involvement in the classroom. Shyness leads to an increase of unasked questions where students feel afraid to ask for clarifying things they are not sure. Students are shy to speak and ask questions during lectures due to fears of being ridiculed or underestimated by others. Shy students are also difficult to express opinions and ideas [28]. The same situation occurs in the study conducted by [11]. The psychologist found that most students refused to talk and did not participate actively in the class due to shyness.

Among the effects of shyness in the classroom are that students rarely start discussions, they avoid to raise new topics, do not challenge lecturers, rarely ask for clarification and do not respond voluntarily [11]. The researcher argued that due to the lack of interaction in the classroom, the passive learning atmosphere has been unnoticed. In the study of [35], he found that among the consequences of shyness are students afraid to grab the opportunity to stand out like competing to answer questions. The researcher added that in group activities, especially during discussions, shy students do not give many contributions, and just giving irrelevant comments if requested. Shy students are afraid to ask questions because they have a low self-esteem and rarely communicate or interact with lecturers, especially if they were asked to answer the questions or being asked to present their work individually or in groups [36]. Shy students are introverted and have a high level of communication apprehension. This makes them become unnoticed by the lecturers and friends due to the lack of participation in the classroom [37]. Shy engineering students are not active in the classroom, do not dare to speak up and get less attention from lecturers. These affect their academic achievements and the shortcoming limits their chance to improve their interpersonal skill.
3.4 The impacts on self-esteem

Individuals with a high level of self-esteem will also have a high level of self-confidence and could achieve their career goals. However, shy students do not have positive thinking and high self-esteem. Shyness causes students to have negative thoughts and negative self-belief [38, 29]. Shyness has a significant and negative correlation towards students’ self-esteem [23]. Shyness causes students to have lack self-esteem, hence, they feel tense when interacting with others. This makes them feel isolated and uncomfortable in any social situation [27]. According to [39], shy students have a low self-esteem and they tend to blame themselves for their social failure that causes them to feel lonely. The inability of a student to contribute to their social and the expectation that they will be looked down by others can contribute to shyness, thus lowering the self-esteem and decrease in self-confidence [12]. Shy students believe that they are less competent than their peers, thus this belief lowers down their self-esteem [26]. Shy students with low self-esteem will have lack of confidence in social situations [37] and this makes them become inactive in the classroom. Shyness causes engineering students to have a low level of self-esteem that they always think they are incapable of doing challenging tasks. This limits their chances to improve their skills.

3.5 The impacts on career developments

Shyness causes negative impacts towards career development in which shy students fail to grab the opportunities available to them because they have lack of self-confidence and not active in the effort to prepare themselves for the career challenges [40]. Additionally, shyness causes students to achieve lower employment status and delay in the career stability [41]. According to [42], conceptually, shyness creates the barrier in clarifying vocational self-concept because the development of self-concept involves social interaction. [40] examine the notion that shyness is inversely related to some behavior of early career development. The researchers reported that shy undergraduate students are less likely to find information about career, do not know to make career decisions, and lack of interest in the field of interpersonal careers. This agreed by [43] who argued that the personality of shyness affects the career choices of the students in which they tend to involve less in the social career. Shy students are less involved in the career exploration because shyness prevent social interactions that make it difficult for them to get information as they need to interact with people [44, 39].

Vocational self-concept is the level of self-clarity pertaining to the career in terms of attitudes, values, interests, needs, and abilities [45]. Shy students always face problems in the development of self-concept and matching it to the appropriate career [42]. Thus, shy students are sceptical in determining career options [46, 43], assuming they have no talent and have a potential job that only fits their shy ability [40]. Shy students have no career maturity, less exploring and planning, and are not sure to be in the world of work [42]. Shy students have a weak vocational self-concept, so if they are employed they are less likely to be a leader, have lack of promotion opportunities and often feel dissatisfied with various aspects of their work [40]. In developing the career, students need to build career management competencies that include generic skills [47]. However, shyness affects the generic skills of the students. [48] reported that 62.3% of the technical graduates are unemployed due to lack of generic skills. [6] found that communication skills are the most important generic skills in the working industry, but are least mastered by the engineering graduates. The study was supported by [49], who reported that the most significant weakness of engineering students when they are in the industry was the lack of communication skills, especially during oral presentations, due to the high level of shyness. Thus, it is clear that shyness prevent engineering students to develop their career as they are lacking in social and communication skill, vocational self-concept and generic skills.

4. Discussion

Shy engineering students are less confident to talk and often not contributive in discussions. Shy students can be helped to reduce their shyness by providing them the platform to enhance their self-
esteem and self-confidence through their involvement in specific co-curricular activities. Such activities will not only develop their social and communication skill but help them in enhancing their vocational self-concept and generic skills towards positive career development.

4.1 Debate club

[50] suggested that the theme-based approach in drama and debate could integrate various skills like listening and speaking skill, reading and writing skill, and thinking skill. This would progressively help students to further develop their self-confidence. As engineering students, it is crucial for students to learn how to speak up in front of people to throw their comments or thoughts. Ironically, the public speaking skills can only be learned through a lot of practices during debate clubs. Thus, students who join debate clubs will get used to participate actively during the teaching and learning sessions in their classroom. The support and cooperation from group members provide debate activity a positive atmosphere that motivates shy students to speak confidently, besides improving their social and communication skills. Through practices in debates, students become brave and confident to talk, able to deliver their ideas confidently and reduce communication apprehension. Debate enables students to improve their oral communication, teamwork and critical thinking skill [51, 52] besides developing their confidence to fight their stage fright [52]. This skill is very much required for engineering students to improve their interpersonal skill and enhance their self-esteem to make them able to speak confidently. Participation in a debate club also enhances shy students’ workplace skill, especially the presentation skill, in which engineering students will be needed to present their works in front of their superiors and co-workers. Besides that, engineering students may develop their analytical and logical reasoning skills, together with the ability to think and speak spontaneously. According to [16], these skills benefit students in college and will be looked by future employers. For engineering students, they can have the engineering related themes for the debate activities, such as sustainable development and engineer-entrepreneur.

4.2 Choir

The choir is another type of communication activities that could decrease shyness in students by enhancing their self-esteem and increasing their confidence level because it encourages both oral and non-oral expressions in front of audiences. Choir and orchestra could enhance shy students’ self-esteem. Although students felt nervous to perform on the stage, the good thing is they gain a lot of benefits like cooperative and teamwork skills, social skill, new friendship, and increase their self-esteem [15]. These enhance their self-confidence and interpersonal skill, yet able to eliminate shyness. By participating in the choir club, social anxiety among engineering students could be decreased gradually as they will be interacting in social interactions. The challenges students face in the choir club act as the platform to motivate them. Students could feel the sense of belonging, yet decrease their shyness because they feel related to others, and experienced a sense of camaraderie. These enhance their teamwork skill and benefit their career development.

A shy student would have an introverted personality [53]. According to [54], an introverted person would choose a career that does not involve too many social interactions so that he or she does not need to speak too often due to the communication apprehension. However, an engineering student should not avoid social interactions due to the nature of the work that needed them to communicate with clients and team members [1]. The interactions between shy students and their team members in the choir club, also the interactions between them with the audiences and the communities help to decrease their communication apprehension. These would enhance their social and communication skills and develop their career as engineers.

4.3 Sports team

Besides the oral performance-based clubs, shyness can also be reduced through sports-based co-curricular. Previous studies proved that sports can improve social skills and enhance the self-esteem of
shy students [55, 18, 56]. The involvement in sports would gradually reduce social anxiety among shy students because they interact with group members and with the spectators. Sports team like hockey promotes mental health and psychological well-being that also provide social interactions for students in a meaningful way which can eliminate their shyness. Sports team fosters co-operation between team members. This could enhances their teamwork and leadership skills that automatically improve the communication skill in which these are the generic skills required by the employers [47].

4.4 Physical activities and exercise
There is evidence that higher rate of shyness and loneliness is associated with not exercising frequently [19]. Shy students avoided physical activity due to social anxiety. However, through the involvement in physical education, students can be avoided from being humiliated and enhance their self-esteem [20]. According to [19], students who exercise 7 times a week earn shyness and loneliness scores that are much lower than other groups due to the increased of heartbeat and interpersonal factors during exercise with their friends. Rugged physical activity and involvement in sports teams decrease shyness in students [56]. When students involve themselves in physical activities, this makes them become fit and helps them to become active during the classroom interactions. Furthermore, by exercising or doing physical activities, students would automatically involve themselves in social interaction in a leisure setting and this would slowly decrease their social anxiety that increases their social skill. When involved in physical activities, engineering students practice their motor skills and this helps them improve their technical skill. [57] argued that engineering graduates should master both technical and generic skill so that they can fit in the working industries.

4.5 Career and technical student organizations
In career and technical student organizations, there are many specific categories of vocational education that is not only developing shy students’ technical skills but also enhance their communication skills in the informal setting [58]. This is due to the goals of the organization to improve students’ self-esteem and civic development [16]. Students could develop their social and communication skill and explore their career opportunities when they are participating actively in the community. These will increase shy students’ self-esteem and when they involve in the activities organized by the organization during the co-curricular program, they will also increase their competencies in both technical and generic skills. When self-esteem is enhanced, students will become more confident and would involve actively in the discussions and activities during formal classroom learning [37]. Besides enhancing interpersonal communication, career and technical student organizations provide students a platform to practice their public speaking skill that develops their self-confidence to eliminate shyness, while developing most workplace skills needed for their career development.

4.6 Entrepreneurship clubs and societies
Activities conducted in entrepreneurial clubs help to reduce shyness and increase students’ self-esteem to face and communicate with others. Students are also able to build and operate their own company, as well as not fear to participate in any competition because their self-confidence is built during the entrepreneurship activities. The challenges that students face during joining the club increase their motivation level and self-efficacy that enhance their social skill. Students found that this club changed their personal behaviour, like from introverted towards more extroverted students [21]. Besides gaining practical experiences, students also learn communication skill, team-work skill and gain networking that benefits their career development. [21] also reported that students could enhance their self-esteem and the activities conducted had improved their public speaking skill.

5. Conclusion
Shyness causes negative impacts towards engineering students’ development in terms of their social and communication skill, participation during the teaching and learning session, self-esteem and their
career development. These impacts of shyness can be decreased through the involvement of engineering students in one of the specific co-curricular activities which are; debate, choir clubs, sports team, physical activities and exercise, career and technical student organizations and entrepreneurship clubs and societies. These co-curricular activities are believed as the platform to boost engineering students’ confidence level, lower down their communication apprehension and decrease the social anxiety that eliminates shyness and enhance the self-esteem of engineering students towards a positive career development. When students’ communication skill is improved, it will help them in the career exploration because they will be able to get into social interactions and get information regarding their career path. Thus, it is pivotal for student affairs divisions to provide support, opportunities, and encouragement for engineering students to achieve the maximum potential of development.

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