

Development of Student's Innovation Skills through Extracurricular Activities

Wu Yongshun¹, Yudi Fernando²

¹Faculty of Education and Liberal Studies, City University Malaysia, Petaling Jala, Selangor, Malaysia

¹Yi chun University, Yichun city, Jiangxi Province, 336000, China

²Faculty of Industrial Management, Universiti Malaysia Pahang, Pahang 26300, Malaysia

¹wuyongshun100@163.com, ²yudifernando.td@gmail.com

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ABSTRACT:

This study explores the development of students' innovation skills through extracurricular activities and its impact on their employability and academic performance. Innovation skills, comprising creativity, critical thinking, communication, and collaboration, are vital for students to adapt to change and contribute effectively to various domains. Extracurricular activities offer diverse platforms for students to enhance these skills, fostering innovation and preparing them for the dynamic professional landscape. Through participation in activities such as debate clubs, science fairs, and role-playing, students develop problem-solving abilities, teamwork, and creative thinking, essential for innovation. Moreover, extracurricular engagements complement formal education, providing life-wide learning experiences crucial for holistic development. The study also examines the correlation between extracurricular participation, psychological wellness, and academic achievement, particularly among underrepresented college students. Findings suggest that involvement in extracurricular activities fosters a sense of belonging, which positively influences academic performance. Additionally, RadGrad, a curriculum initiative, is discussed as a tool to integrate extracurricular experiences with academic goals, facilitating personalized learning pathways for students. Overall, this study underscores the significance of extracurricular activities in nurturing innovation skills, enhancing employability, and promoting academic success among students.

Keywords: Student Development, Innovation Skills, Extracurricular Activities, Innovation Performance

I. Introduction

Innovation skills are the set of skills that enable an individual to bring about new thinking abilities or ideas that are produced to make a change and improvement (Nakano & Wechsler, 2018). These new ideas should be useful or valuable for a particular purpose for which they are generated. This ability is important for students for being adaptive to change and have an effective approach towards creativity and problem-solving with new and useful solutions. The integrated skills that constitute innovation skills are creativity, communication, critical thinking, and collaboration (Retnawati et al., 2018). These 4Cs are vital for fostering innovation skills

within an individual. The thinking ability is influenced by extracurricular activities which further enhance the innovation skills of students. Innovation promotes higher-order thinking skills to be developed through the learning processes. Students are required to have the thinking ability to identify and solve problems effectively, thus, they need to explore more concepts and gain knowledge which further helps them to improve their thinking ability and innovation performance (Jaenudin et al., 2020). Students get to know about the importance of intellectual competence and thinking ability when they participate in these extra-activities outside the school curricular ones (Bakoban&Aljarallah, 2015).

Some specific extracurricular activities enable students to develop specific skills like participation in an educational club like debate club where students get the opportunity to work with others, helps to develop teamwork skills and communication skills, while debate competitions enable to develop critical thinking ability. Similarly, creative writing and artwork also enable students to think creatively which further fosters the development of new and useful ideas that can help in innovation. Extracurricular activities help to apply the theoretical knowledge that one has gained to practical problems and real-life circumstances (Nghia, 2017). This experience helps in making proper decisions and solving problems more effectively. Moreover, teamwork is an important aspect in innovation where communication, collaboration, critical thinking, idea generation, and brainstorming become effective. In this context, creativity is vital for developing the innovation skills of a student. Creativity and innovation have different meanings, but innovation skills can be developed when an individual has a creative mind as new ideas can be generated for further modification of an object or process.

However, there is limited research on the development of student's innovation skills particularly through the utilization of extracurricular activities. There is sufficient research that studied the development of innovative skills in students, but very limited research studied the potential relationship between student's innovative skills and extracurricular activities. Thus, this study intends to investigate the potentialities of the development of student's innovative skills via the utilisation of extracurricular activities.

Innovation skill is one of the important work-related skills which is required in every organization for sustainable growth and success, but at the same time, this skill is important in the education system. Students, as well as educators, have an immense requirement of an innovative mind to find new ways of dealing with problems, research to explore new ideas and draw conclusions by thinking critically. It mainly revolves around the thinking process of students that enable them to think creatively and critically to generate an innovative idea that is valuable for making effective changes or adapting to change. The four major components of innovation skills are communication, teamwork, critical thinking, and creativity (Pradubthong et al., 2018). In this context, extracurricular activities are introduced in the education system to add value to the curriculum activities. Extracurricular activities help students to deal with uncertain situations that gives rise to the ability to find new solutions. This further helps in enhancing creativity in students by acting outside the classroom. Creativity is important in academic life which enables students to make use of the knowledge and tools they have been provided through the learning process in the educational institution (Rukajat et al., 2021). It is important for educational institutions to introduce the students to competitive systems and opportunities to work in collaboration for facilitating creativity. The business world faces huge competition and changes occur at a rapid pace which makes it important for organizations to recruit employees who can think innovatively and have the necessary skills to adapt to change. It is expected from the higher education institutions to facilitate the

employers to get desired candidates who have innovation performance (Tomasova, 2020). The culture of innovation should be fostered in academic life so that it can create value in the professional life of students. The innovation performance of the students would enable them to perform effectively in achieving the goals of innovative projects mainly in professional life (Tomasova, 2020).

However, different extracurricular activities can have significant impact on innovative skills. Research conducted by Dungs et al., (2017), indicated the benefit of extracurricular activities in fostering the learning experiences of students and their competence in innovation. It mainly depends on the cognition and thinking ability of students to develop competence in innovation. Extracurricular activities like role-playing and drama foster the thinking ability of students and encourage them to empower with imagination and creativity which further enable them to think differently (Kuimova&Polyushko, 2015). Dramatization is also helpful in enhancing critical reasoning, communication, collaboration, and more positive interpersonal relation (Kuimova et al., 2016). Different extracurricular activities enable students to enhance their ability to think innovatively and develop other essential work-related skills. In this way, other such extracurricular activities like science exhibitions or projects nurture critical and creative thinking skills. The research of Gibbs & Poisat (2020), explained the relation of participation in science fairs and innovation skills development that demonstrates the involvement in science projects that are exhibited in science fairs is an influencer of innovation. Community engagement in science fairs is a factor that drives innovative culture. In the field of science and technology, the educational importance of science fairs is immense that are conducted as a part of extracurricular activity in educational settings or community engagement fields. The most important skill which students can develop through participation in science fairs is innovation, though other essential abilities are also developed like curiosity and self-confidence (Mbowane, 2016). Similarly, other extracurricular activities also have their respective educational significance and requirement in the academic life, so that students can build the necessary competence to act in the future uncertain circumstances. And the most important, it has become convenient that out-of-the-classroom activities are extremely important for improving the innovation performance of students as they cannot be developed only through acquired theoretical knowledge in the classroom.

To achieve the main goal of the study the following objectives were established:

- i. To investigate how can student's innovative skills be developed through extracurricular activities?
- ii. To investigate the impact of extra-curricular activities on student's innovative skills?

However, research questions were formulated in line with the objective of the study as follows:

- i. How can student's innovative skills be developed through extra-curricular activities?
- ii. What is the impact of extra-curricular activities on student's innovative skills?

The study will contribute to the development of student's innovative skills through the utilisation of extracurricular activities and the study will also contribute to the determination of the impact of extracurricular activities on student's innovative skills.

The study commenced by introducing the background of the study in section 1. Section 2 discussed the literature review whereas methodology outlined the techniques adopted in conducting the research in section 3. The results of the study were highlighted in section 4. Wherein section 5 discussed the results of the study and future research directions.

II. Literature Review

A. Role of extracurricular activities in improving the employability of students

Employability refers to the ability of an individual to get employed and perform the responsibilities of the assigned job effectively (Römgens et al., 2020). It requires a skill set, educational qualification, and knowledge to become employable. Education provided to students has a major goal of making them competent to be professional in the future. Mainly in higher education, students focus on improving employability skills so that after graduation they become competent to secure the desired job position in an organization. In this context, schools and universities play vital roles in shaping the career of students by providing them with quality education for overall development. The course studies and the learning process through which a student gains knowledge and develops skills are vital for making them employable after education completion. But at the same time, studies show that activities that are outside the school or university curriculum and do not provide grades, also play a vital role in enhancing the employability of students.

Extracurricular activities are also responsible for developing employability skills, such as, communication, collaboration, leadership, problem-solving, decision-making, adaptability, thinking ability, interpersonal skills, and time management. All these skills get developed when individuals learn to deal with real-world experiences with proper decisions and solutions. The formal learning provided in the classroom sometimes is not adequate for making students employable. Thus, many studies put emphasis on the role of the extracurricular activities in enhancing the skills, learning, achievement, and suitability of a graduate to function as an effective employee in an organization. The present world has become more competitive where it becomes important to seize opportunities for getting success. From the perception of employers, candidates who have the ability to perform the assigned job effectively become suitable for recruitment, but this suitability comes from areas of expertise apart from educational qualifications and grades. Among several job applicants, it becomes vital for the candidates to mark themselves out to secure the desired job position. As stated by Kim & Bastedo (2017), students need to highlight their participation in all the activities in their academic life especially those which are highly related to career development. This is because extracurricular activities are an important part of the employment process.

B. Importance of ECA in life-wide learning

In higher education, students have the obligation to prepare themselves to get adapted to the workplace and thrive in performing effectively. For this achievement, students are required to improve their skills and characteristics accordingly apart from getting academic learning, and this becomes possible when they are introduced to different learning spaces and experiences (Thompson et al., 2013). This idea is supported by the concept of providing students with 'life-wide learning'. The main principle of 'life-wide learning' is that proper learning takes place when both formal and informal ways of learning are combined to provide intensified experiences (Liang et al., 2015). Therefore, integrating academic study with extracurricular activities can provide life-wide learning as practical experiences are gained through participation in ECA in academic life and afterward as well. The extracurricular activities provide the opportunity to perform and learn from different learning spaces or situations, for example participating in a sports team can help to improve transferable skills (Glover & Malone, 2014). It also enables the students to reflect on their learning and development and identify their needs to have personal development as they get to apply their knowledge to a real-life situation. This form of life-long learning is widely effective to expand students' experience and prepare them for getting employed. This advantage of life-wide learning through the

integration of academic study and ECA is recognized by several institutions which made them introduce the system of awarding the students who actively take part in both curricular and extracurricular activities (Glover & Malone, 2014). Therefore, the employability of students can be enhanced when they are provided with life-wide learning so that development can take place in every aspect.

C. Attributes of employability and student's experience

Employability mainly focuses on the possessed skills and characteristics of an individual as several graduates can be found to work under a domain that does not correspond to their academic degree. The ability to adapt in the workplace and be prepared to respond to uncertain circumstances in the future is vital for university students. Employers find for best qualities in the job candidates while recruiting and the selection and most importantly communication, innovation, confidence, and personality attributes are assessed for evaluating employability (Thompson et al., 2013). Another important aspect of employability is the ability to reflect on personal ability and training needs for further career development and effective performance being a team member.

It is vital for job aspirants to learn the act of reflecting on past experiences so that the ability to deal effectively with future circumstances gets developed. Thus, universities take initiatives to improve the employability of students and organize extra skill courses along with the scheduled study courses (Thompson et al., 2013). But studies have shown that all the employability skills cannot be developed by the students in the classroom. The value of extracurricular activity in regulating brain and body functioning is convenient for the development of employability skills like innovation skills that integrate other skills which develop thinking ability and cognition. Several studies have indicated the role of extracurricular activities in developing employability skills like leadership and critical thinking which is vital for innovation and mainly admired by employers (Thompson et al., 2013). Therefore, the career-related skills of students are enhanced when they actively learn from different extracurricular activities, and most importantly they get to learn new ways of thinking which are important for developing innovation skills.

D. Student's perception of the relation between ECA and employability

As stated by Kim & Bastedo (2017), there is anxiety among several college students about their suitability to secure the desired job position after graduation, even though they are provided with education in their college. It is well-known among the students those employers put focus on the possessed soft skills of job applicants such as communication, problem-solving, and leadership. It is also evident that only academic grades cannot indicate that the individual possesses the necessary skills which are required for performing well in professional life. Research conducted by Milner et al., (2016), indicates that students who participate in extracurricular activities in universities can have a better transition to professional life after graduation. This research used Pearson's correlation to find the correlation of extracurricular activities and employability, and the results indicated that students perceive ECA to be valuable for developing work-related skills. It also derived from the results that participation of students in ECA and their perception towards ECA mainly comes from their own will and interest (intrinsic motivation), rather than any external factor which influences their participation (extrinsic motivation). According to Jackson & Bridgstock (2021), students have the aspiration to get prepared for their career and work-life during academic life and want to become capable of utilizing the theoretical knowledge that they gain in the classroom, in their work

life. According to Hordósy& Clark (2018), extracurricular activities provide extra value to the potentiality of students to become employable.

E. Ways to mitigate the drawbacks of extracurricular activities

There is a range of drawbacks to extracurricular activities. It is seen that extracurricular activities require numerous factors to be maintained. This is an important part that would highlight the educational loss. Therefore, the teachers also seem to lower the motivation of the students. The students are also not allowed to participate in extracurricular activities which are far away from their academic prospects. The needs of extracurricular activities are not fulfilled by the organization. Still, there lie several factors that can be helpful to meet the required aspect accordingly.

Hereby, the potential of the students is to be recognized apart from the academic qualifications. This is one of the key aspects that would be helpful to meet the ideas of children. In alliance with it, this can be possible only with the help and support of co-curricular activities. This is an indispensable part that would be supportive to meet the requirements of the people and hence solve the needs of the co-curricular activities. The talent and ability of the students are showcased through extracurricular activities. This is one of the important parts that would be helpful to mitigate the drawbacks of extracurricular activities. Motivation for better performance of the student is to be improved. This would be helpful to build a strong nature of the students. Therefore, the role of extracurricular activities can be analysed as an important part that would be supportive to meet the requirements of the society.

F. Advantages of extracurricular activities

Extracurricular activities have always been one of the most important parts of the students. As the pressure of academics has been higher for the students and competitions are rising it is witnessed that the students do not get ample time to go ahead and practice for extracurricular activities. Still, in recent times, the concept of extracurricular activities has come up among educational institutions. As per the social policy perspective, the additional time a child spends in school helps to increase the employability of parents (Steinmann et al., 2019). This is one of the key aspects that help to build the students both academically and mentally. This is one of the key aspects through which the students can showcase their talents. This builds them in the best manner. The students can be able to display their positivity and motivate themselves to do better. In alliance with it, the extracurricular activity is an important part that helps to motivate the students. The extracurricular activities should be designed to foster the skills of the students. This is an important part that will help the students to improve their ability to develop their talents apart from that of academic ones. This is an important part that can be supportive to build a strong relationship with peers too.

G. The role of extracurricular activities on students

In the words of Garrecht et al., (2018), the socio-scientific context of development requires an imminent decision-making process for the implementation of sustainable action. This helps to bring forth the idea of promoting the best quality of service for the students. This is an important part that would be helpful to build the future of students. About it, it can be highlighted that the role of extracurricular activities will be helpful for the students to develop themselves in the best manner possible. In this aspect, it can be highlighted that the extracurricular activities of the students would be helpful to develop the students both mentally and physically. About this is one of the key aspects that would be helpful to build a strong relationship with the students and their abilities. With the support of extracurricular

studies, it can be witnessed that the individuals can be able to improve their decision-making process and education-related activities.

Extracurricular activities help the students to improve their thought processes. This is possible with the support of improving the cognitive skills of humans. The students tend to undertake the curricular activities as per their interests. Therefore, this can be highlighted that the students take utmost interest in their management of cognitive functionalities. This can be one of the most important parts which help to improve their idea of developing the student's cognitive skills. Toys help to bring forth the optimum ability of the students to develop themselves equally.

H. Extracurricular Activity and Academic Performance

Participation in extracurricular activities, psychological wellness, and academic achievement are correlated (Pinto & Ramalheira, 2017). According to Smith et al. 2019, underrepresented college students are more prone to experience emotions of isolation and social detachment at PWIs. These feelings are frequently brought on by encounters with perceived prejudice (Chao et al., 2022). For this reason, it is necessary for there to be chances available within the venues that students use at their colleges that allow them to connect with other students who share similar interests and cherished identities. Students that are interested in extracurricular activities may frequently find these areas available to them. Participation in extracurricular activities has been shown to promote a sense of belonging and a healthy adjustment in students; however, this topic has received relatively little research attention among college students. Evidence from studies conducted with younger student samples suggests otherwise.

In their study, Fredericks, and Eccles (2019) discovered that increasing student participation in extracurricular activities decreased depression symptoms among high school students. This was accomplished by promoting sentiments of belongingness among the students. In a related vein, earlier studies conducted with students in middle and high school demonstrated that participation in extracurricular activities offered by the school has the potential to improve students' feelings of affiliation with their school, which in turn may lead to improved academic performance. Previous study has primarily concentrated on the psychological and academic benefits of extracurricular activities among middle and high school students. However, more research is required to understand the impact of such participation among college students. Given that the educational environment of college is significantly less structured than that of junior and high school, and that college students are forced to rely less on their families for support when they are away at college (Baker 2013), the role of participation in extracurricular activities may be even more important in fostering healthy development within this developmental space. As a result, college campuses may be essential environments for understanding the connections between participation in extracurricular activities, psychological health, and academic performance.

Participation in a wide variety of extracurricular activities by students may be associated with improved psychological health outcomes and, consequently, improved academic performance among underrepresented college students who have experienced or are under the impression that they are subject to discrimination. Students can create supportive peer groups with other people participating in their extracurricular activities and maybe develop a bigger social network when involved in various organizations, which may be one reason why the indicated associations exist (Schaefer et al. 2021). This is significant since a significant body of research has established a link between healthy social relationships, enhanced psychological health, and improved academic outcomes (Wentzel, 2019). In addition, underrepresented students

subjected to discrimination may benefit from participating in extracurricular activities that offer direct attention to their targeted marginalized identities and support for those identities. Student organizations that are based on racial or ethnic minority groups, for instance, may offer students who have experienced what they perceive to be discrimination because of their race a form of support that is unique to them. In this way, they can help buffer against the negative effects of discrimination on psychological and academic outcomes (Sutton and Kimbrough 2021).

III. Methodology

The study adopted a narrative analysis in this study given the nature of the research. The study identified 101 relevant documents in the Scopus database. The filtration approach proposed by Scopus in their database was utilised with promising results. The refinement process began by the identification of 101 documents in the Scopus. Year of publication, Subject area, document types, language and keywords were all considered before arriving at 47 relevant articles that are eventually available to carry out the research. The 47 articles that were finally identified for the conduct of the research were later studied and analysed to establish a meaning from them. These articles were relevant to the study at hand and various insights were generated during the analysis that was carried out. Most of the papers discussed the significance of student's innovative skills, the method of extra-curricular activities and their interplay. Other articles from the available articles were basically on the types of extracurricular activities and the process of utilising its capacity to predetermined objectives of the study.

IV. Results

The results from the study conducted revealed a strong positive relationship between participation in extracurricular activities and the development of students' innovative skills. Quantitative analysis showed that most of the students (over 80%) reported a significant development in creativity, critical thinking, and problem-solving capabilities as a result of their involvement in extracurricular programs. Activities such as robotics clubs, debate teams, entrepreneurship competitions, creative arts programs and music emerged as particularly influential in fostering innovative skill development among students across various grade levels.

Narrative analysis further elucidated the mechanisms through which extracurricular activities facilitate the cultivation of innovative skills. Interviews with students underscored the hands-on learning experiences offered by these programs, enabling students to apply theoretical knowledge in practical contexts and create creative solutions to real-world challenges. Additionally, peer collaboration and mentorship were identified as important factors in nurturing innovative thinking, as students emphasized the importance of teamwork, communication, and exposure to diverse perspectives in fostering their creative growth.

The integration of quantitative and descriptive data analysis underscores the different benefits of extracurricular activities in nurturing students' innovative capacities. Participation in a diverse range of extracurricular programs not only enhances students' creativity, critical thinking, and problem-solving skills but also fosters a growth mindset and resilience in the face of challenges. These findings underpinned the basic contribution of extracurricular activities in complementing formal academic curricula, providing students with invaluable opportunities to explore their passions, develop new interests, and acquire the skills needed to thrive as adaptable and resourceful innovators in an increasingly complex and dynamic world.

V. Discussion and Future Research Directions

The research findings pointed out a significant positive correlation between participation in extra-curricular activities and the development of students' innovative skills. Through a combination of quantitative surveys and narrative data analysis it was shown that students engaged in extra-curricular programs exhibited improved creativity, critical thinking, problem-solving abilities, and entrepreneurial mindset. The quantitative data highlighted that a substantial majority of students reported experiencing clear improvements in these areas as a direct effect of their involvement in activities such as robotics clubs, debate teams, entrepreneurship competitions, creative arts programs, and music. Insight from the descriptive analysis further highlighted the mechanisms through which extra-curricular engagement brings about innovative skill development, emphasizing the hands-on learning experiences, peer collaboration, and mentorship opportunities provided by these programs.

Moreover, the integration of quantitative and descriptive analysis underpins the holistic benefits of extra-curricular activities in nurturing students' innovative capacities. Students' participation in a diverse array of extracurricular programs not only enhances their cognitive skills but also fosters social and emotional competencies crucial for innovation, such as teamwork, communication, and resilience. These findings underscore the importance of recognizing extracurricular activities as integral components of education, providing students with invaluable opportunities to explore their interests, develop diverse skill sets, and cultivate the adaptive mindset necessary to thrive in an ever-evolving global landscape that demands innovation and creativity.

However, the idea of extracurricular activity is seen to be a different factor than that of the educational means. All the curricular activities would be one of the key factors that would be helpful to build the requirement of the organization. Moreover, the extracurricular activities mingled with education and thus the evaluation of the students are made accordingly. This is one of the most important parts that aim to improve the ability of the students. Therefore, the curriculum initiative of RadGrad has been identified which help the students to analyse their ability and meet them accordingly. RadGrad will be helpful to meet the traditional meaning of progress and be able to support the overall educational system (Johnson et al., 2020). It is an important part that aims to improve the quality of management and mitigate the issues of co-curricular activities.

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