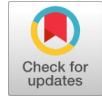


The Impact of Co-curricular Activities Supported by Generic Skills on Students' Performance at University Level



Nahla El_Hagggar, Nesrine Mezhoudi, Fatimah Alrawjih

Abstract: Co-curricular activities refer to the events and learning skills that take place alongside the academic curriculum which offers opportunities for the students to develop specific skills and exhibit their non-academic abilities which are essential for interacting individually or collectively in their work and social life. These activities are considered as gained skills that accomplished out-of-class to complement and extend the formal learning skills of a course or academic program. This work has been conducted along with information technology track, computer science department, Community College, Imam Abdulrahman bin Faisal University, Dammam, Saudi Arabia. In this paper, a new methodology was suggested to improve the students' performance based on modern generic skills by integrating co-curricular activities with curriculum to enhance the achievement of the necessary work requirements. The results showed that co-curricular activities had great effects on students' performance based on these skills.

Keywords : Co-curricular activities, Extra-curricular activities, ICT, 21st century skills, Generic skill.

I. INTRODUCTION

Co-curricular activities denote activities that are undertaken side by side with curricular activities. They considered a supplement and a complement to curricular teaching [1]. Co-curricular activities are defined as learning experiences, events, and/or programs outside the classroom that complement those inside the classroom without having any allowance of grades or specific examinations. Further, these activities enable students to expand their knowledge, skills, values learned in the classroom and demonstrate their non-academic abilities [2, 3]. Co-curricular activities and extracurricular activities are not the same. The Glossary of Education Reform states that "generally speaking, co-curricular activities are an extension of the formal learning skills in a course or academic program, while extracurricular activities may be manageable or coordinated by a school or college, but may not be explicitly connected to academic learning." [4]. For instance, Extracurricular activities involve sports, societies or clubs which give a way

to deal with a subject and culture and the uniform bodies. Also, sports activities like football, rugby, swimming, volleyball, archery, tenpin bowling, golf, etc. [5]. Co-curricular activities include orientation sessions, educational workshops, seminars, simulated experiences, group site visits for hands-on experiences, and service-learning [6, 7]. Generally, co-curricular activities enhance classroom learning and encourage the growth of well-rounded learners. In 21st Century, Information and communication technology (ICT) has a great role to communicate, share information and different resources adapt and innovate in response to create new knowledge [8]. According to this, skills like rote memorization have been reduced and new criteria for what students should be able to do must be changed by gaining additional skills such as critical thinking, problem solving, social collaboration and communication skills [9]. All of these skills can be developed successfully outside of curriculums by depending on co-curricular activities which lead to a great development in students' performance [10, 11, 12]. The main objective of this study is to demonstrate the impact of co-curricular activities on students' performance at the university level based on the 21st century skills specifically generic skills such as critical thinking skills, collaboration skills, oral communication skills, Information communication technology (ICT) and self-efficacy. This paper structured as follows: Section 2 represents the literature review of Co-curricular activities. Section 3 [the link between 21st-Century skills and Bloom's cognitive domain](#) introduces. Section 4, illustrates the role of generic skills in higher education institutions (HEI) in 21st-Century. Section 5 introduces the suggested methodology for integrating co-curricular

activities into the computer science curriculums based on the 21st Century skills to enhance students' quality. Section 6 illustrates the results and discussion. Section 7 conclusions and future work.

II. LITERATURE REVIEW

Co-curricular activities are playing a great role in the development of students' performance since participation in these activities enables students to gain the basic principles of teamwork and individual and group responsibility and several skills which decrease the possibility of failure in their work and social life [10,11]. Bronfenbrenner Ecological Theory (1979, 1989) [12], stated that the intellectual intelligence of students is not enough to excel its gained by social skills that they obtained via co-curricular activities which are essential to build their skills for interacting individually or collectively in their work and social life.

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Haensly, et al. (1985) [13], suggested that the co-curricular activities may be specific additions to academic coursework, or are complementary to it. These activities can be cultivated successfully outside the traditional classroom setting based on the 21st century skills.

Mahoney (2000)[14], detected that students who are participated in several co-curricular activities able to reduce students' involvement in crimes and dropout problems. Also, they are capable to develop their skills such as oral communication, teamwork, and self-confidence.

Ruhaiza (2007) [15], referred to the efforts introduced by governments in supporting the participants where students can achieve balance in both their academic curriculum and personality skills.

Bohnert et al. (2010) [16], defined the co-curricular activities as events proposed for students to enhance their personality skills outside the classroom. Similarly, Henry and Costantino (2015) [17] and Metsäpelto et al. (2012) [18] displayed the co-curricular activities as separated activities that allow the participants to develop their skills and acquire valuable knowledge. Adachi-M et al. (2014) [19], defined co-curricular activities as experiential activities, hands-on, action-oriented and based on skills. Bungay & Vella-Burrows (2013)[20], referred to participate students in co-curricular activities and whether this action inspires participants to gain useful knowledge to help them in their social life. Valerie G. et al. (2010) [21], illustrate that the co-curricular activities have a great significance since it is involved in activities that lead to enhancement of the creativity, productivity, and well-being of students.

III. MAPPING OF 21ST CENTURY SKILLS ONTO TAXONOMY

Recently, the rapid diversification in the economic and social community caused great variations in the needs of the work-field. Hence, universities adjusted their vision to prepare more capable graduates to succeed in their workplace and social life [22].

A. 21st century Learning Skills

21st century skills are considered as common objectives among countries to include these non-cognitive skills beside academic content. 21st century skills such as critical thinking, (ICT) and self-efficacy. They also include social-emotional skills, such as social collaboration and leadership skills, cross-cultural awareness and self-direction [23]. Recently, social-emotional skills have received more attention than 21st-century cognitive skills where OECD research in several countries, as well as US research, has demonstrated that strengthening social-emotional skills has a great impact on teaching and learning. Moreover, these skills can enhance cognitive outcomes to achieve and improve labor market outcomes. As a result, all countries are working to behave the best ways for integrating these skills into teaching and learning in their education systems [24]. According to Silva (2009) [25], it must be emphasized on the essence of 21st-century skills which demonstrates that How can students employ their knowledge, rather than what components of knowledge they have. So, teachers must provide students with carefully planned lessons and assignments, also, to merge social-emotional skills within these subjects [26].

B. The Cognitive Domain

Professor Benjamin Bloom in the University of Chicago in the 50s introduced Bloom taxonomy theory, Taxonomy of Educational Objectives, for classifying and quantifying learning behavior to assist in the development and assessment of learning outcomes (Bloom, 1956). Bloom identified the cognitive domain which involves 'knowledge and the development of intellectual skills' with six learning levels:

recall data, understanding, applying, analyzing, synthesizing, and evaluating.

Anderson and Krathwohl (2001), introduced a revised version of the cognitive domain. This version is ordered hierarchically, three levels in the bottom as and three parallel levels in the top which classified as higher-order thinking skills. These levels are consistent with the modern pedagogical focus on 21st-century skills that enable students up for long term success in their careers.

Currently, (ATC21S™) is considered as the biggest research project in the valuation and education of 21st century skills. Their researchers focused on identifying the nature of these skills and making them more explicit to provide teachers with information that will guide their teaching of them. So, they clustered the 21st century skills into four general categories as shown in table-I [27]:

Table-I: 21st century skills identified by ATC21S

1-Ways of Thinking	<ul style="list-style-type: none"> • Creativity and innovation • Critical thinking, problem solving • decision making, • Learning to learn, metacognition
2-Ways of Working	<ul style="list-style-type: none"> • Communication, • Collaboration (teamwork) .
3-Tools for Working	<ul style="list-style-type: none"> • Information literacy • ICT literacy
4-Living in the World	<ul style="list-style-type: none"> • Citizenship – local and global • Life and career Personal and social responsibility.

According to these categories, ten skills have been identified to contain all other skills and accommodating all approaches. Fig. 1 illustrates the 21st century skills identified by ATC21S (tableI) that mapping to taxonomy except communication, collaboration, and ICT literacy skills which could not have existed broadly in 1956, but were classified as the basic elements of the effective implementation of other cognitive skills [28].

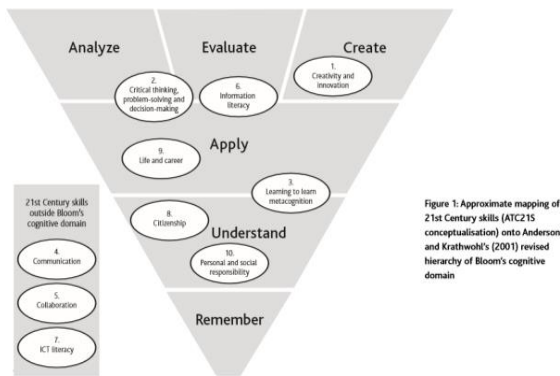


Figure 1: Approximate mapping of 21st Century skills (ATC21S conceptualisation) onto Anderson and Krathwohl's (2001) revised hierarchy of Bloom's cognitive domain

Fig.1 Mapping of 21st century skills onto a revised hierarchy of Taxonomy

IV. THE ROLE OF GENERIC SKILLS IN (HEIS)

Generally, the skills are broken down into two categories: hard and generic skills. Hard skills are technical skills that refer to the more specific, teachable skills like writing skills, programming, system development, entrepreneurship and others [28]. Generic skills are considered as the main components of the 21st century. Also, these skills can be referred to as generic attributes, key skills, core competencies and soft skills [29, 30]. Generally, soft skills include seven clusters that contain communication, leadership, teamwork, decision making, problem solving to self-management skills. For instance, the most important three characteristics of communication cluster are communicating accurately, effective oral communication and employers ranked listening.

Nowadays, (HEIs) have great attention to applying the generic skills alongside technical skills where (HEIs) are considered as the most suitable place for integrating these skills to enable the students facing the difficulties due to a lack of generic skills either inside or outside the work-field where are necessary for the work environment and future career prospects [31].

Cecilia et al. (2017) [32], illustrate the problems in improvement and usage of some generic skills in higher education curriculum. Among these skills, oral communication problem solving, teamwork and social collaboration skills.

V. METHODOLOGY

The main goals of the methodology are to prepare graduates of the Information Technology program for professional careers and improve their education to provide them with the expected real-life professional development. These goals can be accomplished by improving the essential capabilities of the students through the previously mentioned generic skills.

This study has been conducted in the Information Technology Track, Computer Science Department, Community College, Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia. First, a pretest was done by handing out a five-question per topic exam and the exam had four topics in total to ninety students asking them about the modern applications of information technology in the digital age. Fig. 2 shows a sample of the suggested questions. The results were collected and analyzed.

Topics for Information Technology (Seminar Presentation)

1- Topic: Streaming Technology

Student 1: What is Streaming Technology?
 Student 2: Define 3 types of delivery methods of streaming media?
 Student 3: What is the streaming media?
 Student 4: What are Mobile Video Streaming Challenges?
 Student 5: What are the interesting advancements with streaming media?

2- Topic: Wireless Technology

Student 2: How does wireless technology work?
 Student 3: what are the Features Wireless Internet?
 Student 4: What are the types of wireless transmission media?
 Student 5: What are the different wireless technologies?

3- Topic: Wearable Device Technology

Student 1: what is wearable technology?
 Student 2: What are the smart wearable devices?
 Student 3: What are the Wearable applications in clothing?
 Student 4: what are the field uses of wearable technology?
 Student 5: what are the risks and challenges of wearable technology?

Fig. 2 Sample questions about modern applications of information technology in the digital age.

Then the students were divided in half into two groups, a group was given a co-curricular sessions and a control group with no co-curricular sessions. For the first group, four sessions were conducted per topic. Each session included one hour dedicated to a theoretical lecture and the other hour to self-directed learning through individual and group presentations, videos, and simulated cases for each topic and including seminar hours every week to improve oral communication skills. The teacher is to guide them only. For each session, the requirements were given. After the sixteen sessions were done the students presented their co-curricular activities in the hall of community college. Students were divided into six groups, each team a research project in which they used internet resources for accomplished the study. Students also used digital tools to communicate and collaborate with other students in their team such as WhatsApp group page was set up to enable teachers and students to participants and collaborate with. They always help each other and learned a lot of things and to share what they had been doing with each other than each one presented his/her showcase about his/her topic.

After the co-curricular activities were concluded, a post-test was conducted by the questions from similar topics. The students had to ensure that every member of the group makes a search about their topic and focuses on answer his question and finally, gives an oral presentation of the main topic. Students collaborate by sharing information about their topic and interact between them over time to improve their skill of communication, as well as planning and team working. The description of the applied method is illustrated in Fig. 3:



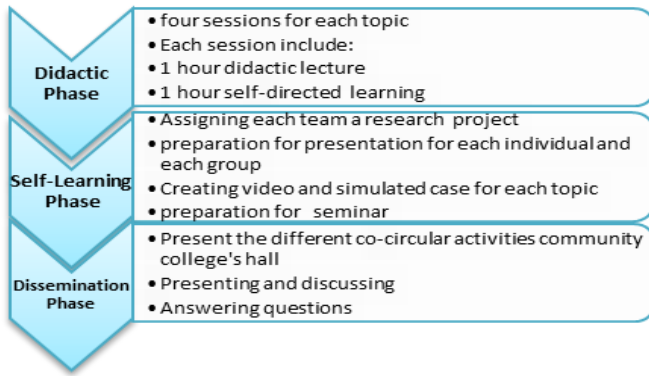


Fig .3 Description of the applied method

VI. RESULTS AND DISCUSSION

Two methods on 21st century generic skills were conducted in assessing this study. The first one, students received pre-test and post-test measures assessing knowledge gain on how to evaluate the material. The pre-test and post-test scores of the experimental assisted as data for this study. The group of students that received the training to participate in this study did better on the post-test after taking the co-curricular sessions with significant improvement in grades compared to their pre-test but for the control group the results of the post-test were similar to the pretest results as shown in table -II:

Table-II: Exam performance

Comparison of the pre and post-test marks			
No. of total students who took the (pre-test)	No. of participants in the control group (Post-test)	No. of participants in co-curricular activity group (Post-test)	Marks %
50	25	1	< 21%
30	9	3	21- 50%
6	5	28	51- 60 %
4	6	15	> 60%

The results in Table-III indicate that there was a statistically significant improvement in oral communication and table-IV shows that the role of different phases of the applied method to enhance specific generic skills for work requirements.

Table-III: improvement in the oral presentation and Communication skills

Statistics indicating improvement in oral communication skills							
Group Marks	S1	S2	S3	S4	S5	S6	
G1	75	6	10	15	8	17	19
G2	84	12	13	16	19	14	10
G3	77	13	9	10	17	16	12
G4	92	15	18	13	15	16	15
G5	91	19	12	17	10	19	14
G6	96	17	19	16	12	19	13

Table-IV: The role of different phases of the applied method to enhance specific generic skills

21st Century Skills	Generic Skills	Phase1	Phase2	Phase3
Ways of Thinking	Critical Thinking	●	○	○
Ways of Working	Communication, Collaboration	○	●	●
Tools for Working	ICT	○	●	●
Living in the World	Self-Efficacy	○	○	●

● = Great Enhancement ○ =Mid ○=Low

The pre-test was done for all the students with 20 mark questions, from the 4 topics. Fig. 4, shows the marks of the students in the form of percentage the graph illustrate that significant improvement occurred in the student's marks in pre-test marks. In Pre-test, out of 90 students, 50 recorded less than 21% marks. 30 students recorded 21 -50% marks and 6 students recorded 51 - 60% marks and 4 students secured more than 60% marks. In post-test, out of 45 students the number of control group (no Participation in co-curricular activities), 25 recorded less than 21% marks, 9 recorded 21 -50% marks, 5 students recorded mark between 51 - 60% and 6 students secured more than 60% marks. Out of 45 students who Participant in co-curricular activities, 1 recorded less than 21% marks, 3 recorded 21 -50% marks, 28 students recorded mark between 51 - 60% and 15 students secured more than 60% marks.

In Fig. 5, the graph shows that they are contributing to the seminar presentation and feel connected to other students encouraging them to interact with other students. The assessment was done twice. Firstly each student was assessed for their presentation. Later 6 members were grouped and were asked to give a group presentation. The below graph in Fig. 5 along with the data indicates the improvement seen in all the 6 teams after the showcase of the co-curricular activities has encouraged and enhanced the collaboration and communication skills.

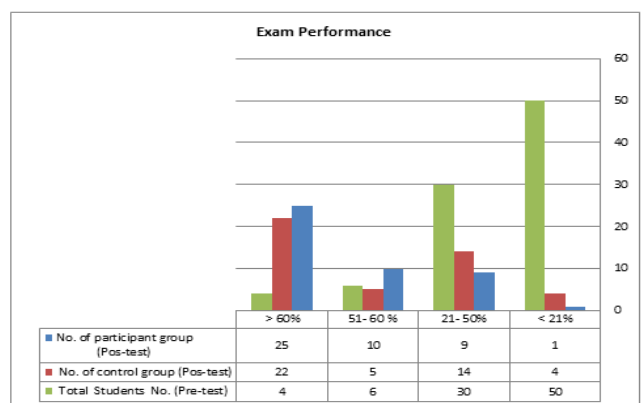


Fig. 4: Statistics of the pre and post-test marks

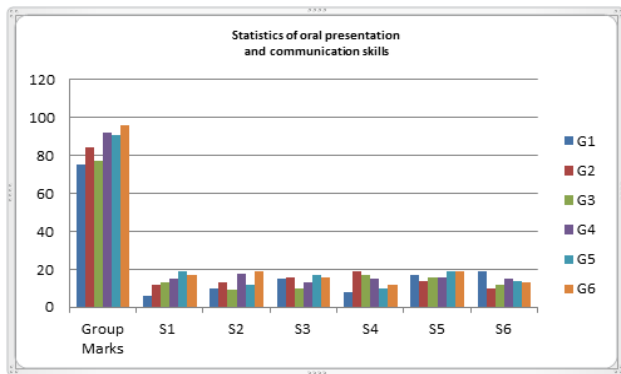


Fig. 5 Oral presentation and communication skills for individuals and groups

The analysis of data revealed that on the whole, experimental groups exhibited better performance after co-curricular activities. The final results of the study demonstrated that co-curricular activities can contribute to enhance the academic achievements of students in (HEIs). The results informed that students can be improving generic skills that have been applied in universities through co-curricular activities.

VII. CONCLUSION

This paper highlighted the role and the impact of co-curricular activities, which become very important and used by many universities to enhance students' outcomes. Further, the great effects of co-curricular activities to improve the students' performance are examined in this paper. Assuming that student development should consider additional resources that the curriculum of academic learning, co-curricular experiences were developed to support them as a whole in the 21st century. Based on the above-mentioned results, it can be obvious that students who are engaged in co-curricular activities achieve a better understanding of acquired knowledge and gain preferable communication skills, than the students who were not involved in any co-curricular activities. Therefore, it can be concluded that co-curricular can enhance the students' performance by integrating co-curricular activities with the curriculum to achieve generic skills among the students for preparing them with the necessary work requirements.

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