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The Academic Empowerment of Iraqi Female Undergraduate Students via Extracurricular Activities: Case Study

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ABSTRACT

The United Nations' 2030 Sustainable Development Goals emphasizes education quality. For females' education is about empowerment and instilling a sense of belonging. Empowering females via STEM education is an effective tool on various levels. The initiation of extracurricular activities (ECA) in STEM in the currently studied Iraqi university is an adopted policy that, since 2018, has started to be observed and evaluated among the pharmacy undergraduate students. This aimed to implant the participation of females in STEM sciences; identify best practices for incorporating extracurricular activities into the learning medium; document and recognize initial informal STEM learning contexts. Interestingly, Cohort rates were 100% in both technology scopes of scientific abstract video competition and green ambassador remote volunteering, respectively. Furthermore, scientific writing and digital management under conference ECA showed the highest retention and persistence rates respectively. Thus, these ECA empower females by providing information and inclusion to acquire new knowledge and skills.

Keywords: **Female empowerment, Undergraduate, Iraqi.**

INTRODUCTION

The United Nations' 2030 Sustainable Development Goals (SDGs) agenda emphasizes education quality as objective number 4, where education enables social mobility upward and is a cornerstone to escaping poverty. Education empowers the mind, opens the imagination, and is essential for self-esteem. The UNICEF worldwide strategy plan 2025 focuses on gender equality in education as a benefit for all children; nevertheless, education for females is about more than just access to classrooms; it is about empowerment and instilling a sense of belonging to places of study, research, and employment (UNICEF, 2022).

The movies scenes that most of us are familiar with, where women miss the sense of appreciation, belonging and growth in studying and employment places, those same scenes for less fortunate females are merely episodes of daily routine. On the other hand, women's

leadership is questioned at a higher degree of workplace challenges, such as academics, where many do not have the proper access to form those competencies (Davis and Maldonado, 2015; Oakley, 2000).

Empowering females via STEM (Science, Technology, Engineering and Mathematics) education is an effective tool to bridge the gender gap in science (Mérida-Serrano et al., 2020), influence the social mobility and inclusion (Denton-Calabrese et al., 2021), improve quality of education (Hartati et al., 2019), with an eye opening about degrees in STEM fields (Alblooshi and May, 2018), reduce gender stereotyping in information communications technology studies (Tam et al., 2020), and improve STEM identity development among young women (Kim et al., 2018). Implanting STEM sciences via the concept of extracurricular activity (ECA) to empower females in higher education is a promising approach (Hartman, 2003), (Fisher, 2017), (Mtika, 2019), (Price, 2010), (Cooper and Heaverlo, 2013), (Dasgupta and Stout, 2014), (Tan et al., 2013).

To date, and as per the University's official website record, the initiation of ECA in STEM in related colleges of the currently studied Iraqi university is an adopted policy which since 2018 was started to be observed and evaluated by our team among the pharmacy undergraduate student. This aimed to implant the broaden participation of female in STEM sciences; identify best practices for incorporating extracurricular activities into learning medium; document and recognize initial informal STEM learning contexts; and explores ways to have broader reach and impact on STEM identity and interest.

To the state of the art, this is the first case study to examine the persistence, retention, and cohort rates of pharmacy female students at the undergraduate level in one of Iraq's universities after implementing specified ECA for STEM sciences.

CONCEPTUAL FRAMEWORK OF EXTRACURRICULAR ACTIVITIES IN COLLEGE OF PHARMACY

Classroom instructions style are the core and basic education philosophy offered for the degree-based career right now. On the contrary, the concept of "Teachers do not teach a subject; they teach kids," is well encouraged by Dick Deasy, head of the Arts Education Partnership (Bauerlein, 2010). The concept perfectly suits inspiring teachers and lecturers who are looking forward to the application of extracurricular activities (ECA) on the different educational levels including the higher education sector (Shaffer, 2019). Precisely, ECA is described as "academic or non-academic activities carried out under the auspices of the school but taking place outside of normal classroom time and not part of the curriculum." ECA mostly do not involve a grade or academic credit, and participation is voluntary on the side of the student. Internationally, many students now participate in ECA, and it has become a significant element of their educational life leading to many schools to spent large resources on ECA and are expected to provide a diverse range of ECA in order to give a well-rounded education (Seow and Pan 2014).

METHOD

In this case study, and within the studied Iraqi university, different ECA schemes were introduced, some of which were observed for their impact on female empowerment in STEM sciences, including Scientific Writing, and Technology. As illustrated in table 1, in Scientific Writing scope a purposely established newspaper namely PharmaShout available online from the university's official website (https://www.uoalkitab.edu.iq/the-pharmashout-newspaper/) and copyrighted as Educational Tool on 8th of June 2022 (LY2022P02029) was open for undergraduates scientific writing on different STEM as well as other science topics. The process of publishing in PharmaShout follows the same concept of the well-known concepts of academic journals with selection criteria of length that suits and encourage the targeted category (i.e., undergraduates). Under Scientific Writing and Technology, the approach to introduce students to the competitions and digital skills concept was initiated. Furthermore, and under the technology scope both conference management and remote volunteering were introduced and made a great use of females' students' talents who are willing to learn but do not have the full options of being in workplace after the class hours or even being part of international organization via traveling respectively.

Table 1. Categories, codes, names, scope, and mode of conducting the ECA for STEM at the College of Pharmacy of the studied Iraqi University.

ECA Category	Code and Name	Scope	Mode
Scientific Writing	A: PharmaShout Newspaper	Scientific Writing	On campus, and Online
Digital Scientific Presentation	B: PharmaShout Abstracts Videos Competition	Scientific Writing and Technology	On campus, and Online
Digital management and creativity	C: AL-Kitab Intellectual Properties Conference 2019	Technology	On campus, and Online
	D: Green Ambassadors of the centre for global sustainable studies, Universiti Sains Malaysia	Technology	Online

The framework of extracurricular activities involving a total of 60 volunteering students in various ECA In College of Pharmacy, between 2018 and 2021, were implemented. Parameters evaluated include persistence, retention, and cohort rates. Persistence is operationally defined as the number of participants that progress to the next difficulty level in the program; while retention is defined as the number of participants who are retained in the program. Persistence rate is measured by the percentage of students who return to the next introduced other extracurricular activities scheme (i.e., comparing to the first introduced level of ECA which is the PharmaShout), while retention rate represents the percentage of students who chose to return to the same extracurricular activities scheme. Furthermore, cohort rate is defined as the percentage of enrolees at the beginning of each extracurricular activity scheme who reached the end of the same activity.

RESULTS AND DISCUSSION

In review of outcome data, persistence, retention, and cohort rates of the employed ECA for STEM were shown in table 2. There was no persistence rate and retention rate to program A and D respectively, since the first is considered the initial level of ECA introduced in the series, and the latter is still a newly introduced ECA to the list. Interestingly, digital management (C) under conference ECA showed the highest persistence rate, while scientific writing (A), and digital management (C) ECA showed the highest retention rates. Cohort rates records were the highest among the other rates, with 100% commitment in both technology scopes of scientific abstract videos competition (B) and green ambassador remote volunteering (D) respectively.

Table 2. Measured persistence, retention, and cohort rates of the investigated ECA for STEM.

ECA Code	Persistence rate (%)	Retention rate (%)	Cohort rate (%)
A	NA*	92.59	92.59
B	25.93	71.43	100
C	77.78	85.71	90.48
D	18.52	NA*	100

*NA: not applicable

When those female students were asked to express their opinion about their experiences in these ECA and why they preferred some categories over others, some comments were, "I might be labelled as a less female if I have enrolled in some ECA, including technical ones," yet, they have joined such ECA as they consider themselves as introverts. Others admitted that due to the enormous knowledge gap in understanding the ECA value among females, they did not enrol on the first round; however, when they witnessed their male peers' experience, they got a more precise understanding and were encouraged to join more. For some females, since they have joined pharmaceutical studies under societal pressure, they have found the ECA a great way to start a friendship with this career, "I hate pharmaceutical studies, but writing ECA made me feel I can be of a value and create a difference." In a multilingual country like Iraq, many students are working on enhancing the main national languages of Arabic, Kurdish, and Turkish, and ECA helped improve these languages via communication. Technology-wise, female students were so proud and amazed by the easiness of earning knowledge regarding digital technology and skills such as using emails, Google suite and Canva. Online ECAs had priority in females' selection compared to on-campus ones. Some female students stated, "Online ECA was a true option to the limited time access I have outside the house as a female."

LIMITATIONS AND FUTURE SUGGESTIONS

This is an ongoing case study that covers ECA significance on a multi variance level, future data would expect to upgrade the full vision and direct the decision makers into enhancing undergrade ECA application for a better educational outcome to the Job market including both males and females. Moreover, even though most of these activities if not all are under the volunteered scope, yet lecturers are willing to invest in students' future by contributing voluntarily, however, the major demotivation in conducting such activities to lecturers is

usually the delay to get credit tools on such activities (i.e. official appointment letter on behalf of each activity as a proof/track record for promotion later), if an electronic system is given as an option for submitting/recording such events internally the accumulative hard work will be significantly reflected. Financial support is generously accessible for such activities via the university top management, however without archiving such support under grant schemes. If such finical support is distributed through a grant scheme Iraqi universities ranking will be affected positively.

CONCLUSION

ECA in STEM is a new approach to empowering women and driving them through their talents. Opening access to the ECA in STEM to the Iraqi undergraduate female students is a promising tool of educational quality and equality, where they can grow in their comfort via both modes on-campus and online, which serves as a great option for those who initially considered themselves shy, introverted, or have limited access to being outside the house after the lecture times. Such a fact is reflected in the high percentage of the cohort rates in ECA under digital and online categories. Furthermore, all observed rates of persistence, retention, and cohort were relatively high in the ECA category, under technology scope. Future studies should focus on this phenomenon and understand the exact motive behind females' preference for the online ECA category and the impact of empowering them compared to the on-campus ones.

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