International Journal of Evaluation and Research in Education (IJERE)
Vol. 14, No. 3, June 2025, pp. 2337~2345
ISSN: 2252-8822, DOI: 10.11591/ijere.v14i3.32178

Best practices of effective classroom management strategies supported by digital ICT in higher education

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Article Info

Article history:

Received Jul 21, 2024
Revised Apr 25, 2025
Accepted Apr 29, 2025

Keywords:

Classroom management
Digital ICT
Higher education
Learning experience
Professional development

ABSTRACT

In the field of higher education, incorporating digital information and communication technology (ICT) into classroom management has gained significant attention due to its potential benefits in enhancing students' engagement and learning. One of the significant challenges in higher education is managing students learning in the classroom effectively. Higher education students cannot gain effectively the targeted learning outcomes by using regular classroom management in teaching higher education subjects away from digital ICT. The purpose of this study is to explore the advantages of using digital ICT tools into classroom management in higher education and to discuss the challenges and considerations that are involved in this process. This study uses the descriptive research methodology that does not include or present students during preparing of the suggested framework, because it suggests a well-designed cohesive framework of preparing steps, best digital ICT software programs, and the most suitable practical techniques for ICT effective classroom management. It describes the best practices of using 10 professional ICT digital software tools for effective integration and provides examples of practical techniques at the higher education level using suggested ways of successful implementation. It finds that using these software programs can lead students to engage in classroom activities actively, increase their academic achievement, and maximize their technology communication skills. It recommends that providing instructors with enough ICT digital professional development programs and the availability of most updated digital infrastructure are crucial factors for effective classroom management.

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1. INTRODUCTION

Classroom management is the method and approaches used by a teacher in controlling student behaviors in a classroom. Classroom management essentially entails skill in relation to methods that include communications, disciplinary measures, relationships between teachers and students, and lesson plans. There are some key aspects of classroom management supported by recent references, such as: establishing clear expectations, consistent discipline, building relationships, engaging instruction, and classroom environment. Establishing clear expectations is about writing down the rule and procedure to be followed and the right and wrong ways of behaving informs the students on what is expected of them. This clears confusion and interruptions [1]. Consistent discipline is important here to note that fairness in the implementation of rules and the consequences that come with it is quite important in as much as order is to be maintained. It is found

out that positive discipline practices in fairness and consistencies impose beneficial impacts towards class climate. Engaging instruction using well-prepared/creative lessons helps in containing cases of disturbance among the leaners since they are fully absorbed. Infusing fun fab and technology enhance student engagement [2]. Classroom environment enables the proper arrangement of a classroom layout and the position of furniture to affect behavioral patterns. An orderly environment enhances learning and behavioral skills as well as organization for children. Digital information and communication technology (ICT) as used in this paper can be defined as the various tools used in processing, storing, retrieving and sharing of information using electronic means. Essential technologies embrace units in hardware (computers, cell phones, and tablets), software (word adept, spread sheet, and media), and communication resources and networking (internet, e-mail, and social sites) [3]. There are some key aspects and developments of digital ICT supported by recent references, such as technological infrastructure, software applications, communication networks, digital literacy and skills, and impacts on society and education. Technological infrastructure of digital ICT refers to the process and apparatus that make up the physical area and network for conveying digital messages and data. This also relates to the improvement of the core features of the gadgets like better processors, more storage space and the ability to connect to other devices [4].

The purpose of this study is to explore the advantages of using digital ICT tools into classroom management in higher education and to discuss the challenges and considerations that are involved in this process. It describes the best practices for effective integration and provides examples of practical techniques at the higher education level using suggested ways of successful implementation. It explores the possible implications for teacher professional development in this regard. It discusses the significance of using digital ICT in classroom management to enhance students' learning experience in their higher education classes. Therefore, this study investigates to introduce answers of the following questions:

i) What are the successful preparing steps of using digital ICT into classroom management?
ii) What are the best digital ICT software programs that can support classroom management in higher education?
iii) What are the most suitable practical techniques of using digital ICT software programs for effective classroom management?

2. LITERATURE REVIEW

2.1. Digital ICT potentials in classroom management

Digital ICT in teaching and learning has the propensity to highly boost the process of classroom management through presenting different tools and techniques that are effective in class management and significantly improvement in learning outcomes. Enhanced communication and collaboration using modern digital ICT tools in form of learning management systems (LMS), video conferences or messaging apps enhance effective interaction between teachers, learners and parents. This enhances the flow of information, feedback processes, and teamwork concerning assignments and projects [3]. Personalized learning experiences by modern tools and applications of learning technologies include what Hamizan and Zaid [4] study, called adaptive learning technologies; educational applications which enhance different learning patterns proper to different students. This differentiation assists in covering all the learning levels within a classroom, as has been discussed by Mahmoud [5]. Data-driven decision making through digital ICT, the trainers are in a position to gather and analyze the performances of the students conveniently. This data can be used to make better instructional strategies, discover the problematic areas and the improvement at the learning process over a certain period of time. Facilitation of active learning using open space, electronic black boards, computers and other technological items enhance classroom exercises and provoke student's activity. These tools enhance the children's involvement and challenge them in problem solving [6]. Inclusive education practices via digital ICT can constructively contribute to the provision of accessibility features, and supports, as well as other differentiated resources to benefit all the learners [7].

2.2. Digital ICT challenges in classroom management

Incorporation of digital ICT in classroom management has several complexities that affect the utilization of the ICT resources in an efficient and effective manner. There are some of the key challenges according to several studies. Digital divide of science student population has called for integration of technology and internet to support learning However, issue of equity reveals technology disparities and reliable internet connectivity among students prolong inequalities chances of learning [8]. Digital distractions like the availability of devices makes it easy for the learners to be distracted and this affects their concentration and how they participate in class activities. Cybersecurity concerns came from the issue of data and student privacy protection from cyber dangers also stays highly relevant while using digital ICT resources and sites [9].

Technical issues as timely access challenges such as technical hitches, compatibility complications of software and programs, and poor networks can interfere with lesson delivery and be a thorn in the neck of both the teachers and students. Digital literacy gaps of limited use of ICT makes students fail, especially because their levels of digital illiteracy are not equal and may not enable them to use the ICTs for learning in the best possible way. Teacher training and support could suffer from the lack or poor professional development resources and assistance with the issue can hinder its effectiveness by failing to offer enough professional development to teachers and how they can use ICT integrally into the classroom. To overcome these issues, one needs to establish a preventive/ameliorative early response policy that would entail acquiring the necessary physical and virtual resources, launching information and computer technology literacy campaigns, enforcing cybersecurity measures, continuously training teachers, and providing guidance to students on how to be responsible users of technology-based tools.

2.3. Practical solutions to overcome the potential challenges of using digital ICT in classroom management

Regarding practical concerns as a result of the effects of digital ICT in classroom management, there are several practical undertakings that are carried out and enhanced with the purpose of increasing effectiveness and controlling and/or eradicating dangers. Promote digital equity as many students especially those from the least privileged background do not own devices or have access to internet, thus, where a student is using a school owned device, that student should be allowed to connect to internet each time he or she is doing homework. Sensitize knowledge with the community organizations and governmental organizations and strategies to eradicate the digital divide [10]. Faloye and Faniran [11] found that digital games dramatically improve the level of students' participation and interest in learning in primary school. The adoption of games in teaching practices is very effective in encouraging activity amongst the learners and interest in learning the particular subject. Digital citizenship education that shows how to use the internet appropriately, safe use of the internet as well as safe-net usage basic good manners should be taught to students. Equip students into being the responsible and safe users of the technologies and smart devices when it comes to ethical usage of the cyberspace [8]. Professional development through professional development programs should availed for the teachers to fully exploit their digital literacy as well as their capabilities in the integration of digital ICT in; training should also be offer to enhance the teachers' digital ICT literacy for lesson delivery [12]. As one of the challenges in the classroom management is to enable students to be able to manage their self-directed learning using the available sequential and needed instructions [13]. Technical support and infrastructure should also have good infrastructural support that addresses any hardness and or software complications as and when they arise. In this context, there is emphasis that Infrastructure should be made sure to be well developed and digital tools being used at classrooms should be compatible and reliable [14]. Balanced technology use to encourage the use of devices during lessons with the help of certain rules and the list of requirements concerning the use of devices. Implement the suggestions to minimize interferences and promote the students' engagement during learning-related activities [15]. Data privacy and security provide the patient's data collection, storage, processing and protection procedures should have robust polices against leakage of patient information and cybercriminal attacks. Explain to students, teachers, and parents. desire for privacy and secure usage of the internet [16]. Application of these realistic strategies enables optimal achievement of the digital ICT within the simultaneous minimization of adverse factors in the learning process for the all students using an effective classroom management.

2.4. Conceptual framework of integrated technology and mathematics

Several studies have discussed the potentials of using digital ICT into classroom management in higher education and the techniques to be applied when integrating such technology in teaching different subjects. There were some common findings and results that were used to describe these dimensions. However, there were some studies that showed some unique conclusions in this regard. Previous study [17] revealed that self-perceived information technology literacy, previous interaction with technology and perceived usefulness of ICT influences the pre-service teachers' preparedness to incorporate ICT in classroom management. Incorporation of hands-on experience and reflective practices improves their ability to integrate the technology as well. The results indicate that providing opportunities for hands touch that require integration of technology helps to prepare the students in achieving the intended technology integration. Johnsen *et al.* [10] found that promoting digital equality is vital to equal learning in colleges to enable all students to have equal opportunities when it comes to quality education. Policies regarding students should address the issue of differential access to technology in order to improve learners' achievement. Dinc [12] implemented their study and shed the light on the conclusion that it was ascertained that extensive teacher training has a major impact on the effective implementation of digitized tools in the management of classroom environment. Sustaining and enhancing the use of ICT in teachers' practice require ongoing backing and personnel development.

3. PROBLEM STATEMENT

Effective classroom management in higher education became a challenging factor that interrupts instructors and learners in higher education. Technology became part of all human activities in this era. Hence, it is crucial to any educator to involve in classroom management new digital ICT tools and discover new management techniques and use new digital management strategies, in order to increase educator's professional development. It is challenging to understate the role of technology in classroom management because it provides different tools and materials that are useful for establishing effective learning-teaching process and increasing learners' interest and achievements. There are some reasons why technology is important for classroom management, supported by recent literature. Enhanced communication and collaboration as synchronized tools like LMS and communication apps enhance timely communication between the learning actors, that is teacher, child, and parent [3]. Personalized learning opportunities as it assists in the delivery of learning activities in a manner that cater for the uniqueness of each student and the learning gaps that are distinctive to each learner that is in the classroom [5]. Data-driven decision making as open facilitates an end-to-end reporting system for educators that gives real-time data concerning learners' performance and needed interventions in learning processes.

According to the previous presentation and explained conceptual frameworks and results of the previous conducted relevant studies, there is a crucial, important demand and significant scarcity to suggest and implement more consistent and practical conceptual framework of digital ICT and classroom management. It is clear that there is a lack in analyzing the challenges of such integration in higher education level. Based on the reviewed studies and researches, it is obvious that there is a huge gap between the available reviewed frameworks and the used digital classroom management techniques. Particularly, there are several of the investigated studies that neglected the specific digital ICT tools that need to be applied to have an effective classroom management without any explanation or even focused discussion. It is important to provide the practitioner and educator a clear digital ICT guidance of integrating digital ICT tools into classroom management, particularly in higher education. Therefore, this study has the significant potential to overcome the highlighted limitations and to be successful in helping educators in maximizing their skills of implementing digital ICT tools in increasing their classroom management efficacy by suggesting unique software programs and in-classroom management techniques incorporated with the suitable higher education learning environment.

4. METHOD

4.1. Context of the using digital ICT in classroom management in higher education

This study focuses on the best practices of using digital ICT into effective classroom management in higher education in Bahrain. It suggests a cohesive framework of preparing steps, best digital ICT software programs, and the most suitable practical techniques of using digital ICT software programs for effective classroom management techniques that the researcher is professional in terms of majors and experience. Hence, this study uses the descriptive research methodology that does not include or present students during preparing of the suggested framework, because it suggests to the readers and educator with a well-prepared cohesive framework of preparing steps, best digital ICT software programs, and the most suitable practical techniques of using digital ICT software programs for effective classroom management techniques. This suggested practical framework has high and important potentials when it is used for classroom management in higher education learning environment by instructors, practitioners, and researchers.

However, the outcomes of applying this framework may not be the same when used by different instructors and different higher education level students and subjects. This divergence in outcomes can be interpreted by the differences among instructor's capabilities and skills, and learner's characteristics. The higher education curriculum of different subjects can be used when applying the framework of this study. This higher education curriculum of different subjects can be selected due to its nature and the types of topics, including: timeframe, topics, knowledge, concepts, attitudes, values, and skills, and behaviors. To have a deeper view on the structure of this study, it suggests a cohesive framework of preparing steps, best digital ICT software programs, and the most suitable practical techniques of using digital ICT software programs for effective classroom management strategies.

5. FRAMEWORK OF PREPARING STEPS OF USING DIGITAL ICT INTO EFFECTIVE CLASSROOM MANAGEMENT

In the current digital generation, it is crucial for educators to embrace digital ICT as a tool for enhancing classroom management to maximize teaching and learning experiences. Through the systematic application of digital ICT into classroom management steps, educators can successfully integrate digital ICT

into their classroom management and create meaningful educational opportunities that prepare students for better learning and achievement. This study proposes a model (ASPSDEIM) consist of eight steps, including: i) assess current infrastructure and resources; ii) set clear educational goals and objectives; iii) provide professional development for educators; iv) select appropriate digital tools and platforms; v) design engaging and interactive learning experiences; vi) ensure accessibility and equity; vii) implement effective classroom management strategies; and viii) monitor and evaluate implementation, as shown in Figure 1. It shows a systematic design of the suggested framework connecting all steps together. Each step has a role to be done and needs a series of steps based on the reviewed theoretical and practical backgrounds.

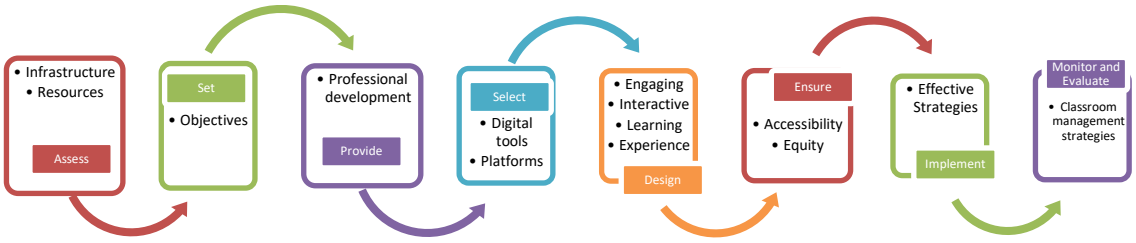

Figure 1. Suggested framework of preparing steps of using digital ICT into effective classroom management

Based on the current practice in the classroom, this study provides the specific steps of the process based on the modern trends and the generally considered best practice for using digital ICT in the classroom management. These steps are informed by ongoing advancements in educational technology and effective implementation strategies. Assess current infrastructure and resources by assessing the general ICT platforms and equipment such as computers, printers, telephones, networks, and the internet to identify if they are suitable for implementing teaching learning technologies [12]. Set clear educational goals and objectives by describing measurable goals and targets to which elements of digital ICT incorporation are expected to contribute, and correlate them with curriculum and academic expectations [18]. Provide professional development for educators by providing massive staff development sessions that will improve the teachers' understanding of ICT, their competence in using technologies, and their ability to incorporate ICT in their teaching [11]. Select appropriate digital tools and platforms by selecting appropriate technologies, LMS, interactive tools, and media in view of targeted instructional objectives and clients' learning profiles [19].

Furthermore, it is important to design engaging and interactive learning experiences by creating multi-media and interactive types of lessons that engages students and create groupwork and differentiated instruction that integrate critical thinking skills among students. Ensure accessibility and equity by meeting digital equity and making it possible for students to have equal opportunities in terms of use of devices and other things in terms of socioeconomic status and other disabilities [12]. Implement effective classroom management strategies by setting up specific rules on how technology is to be used during lessons or in general school setting, and expectations that concern appropriate use of the internet, positive digital citizenship as well as ways and means of dealing with distractions occasioned by technological tools [20]. Monitor and evaluate implementation by monitoring the extent of digital ICT adoption often through formative and summative assessments of student and teacher experiences to facilitate improvement [18]. This suggested framework emphasizes the systematic way of incorporating the digital ICT to classroom management to improve the learning process and students' results in nowadays higher education.

6. RESULTS AND DISCUSSION

This study investigates in more detail the practical techniques that can be used in classroom management using top ten digital ICT software programs, including: Google Classroom, Microsoft Teams, Canvas LMS, Schoology, Edmodo, Nearpod, Kahoot!, ClassDojo, Flipgrid, and Seesaw. Google Classroom has slowly but systematically entered the sphere of higher learning institutions and is widely used to organize assignments, as well as improve the interaction between the faculty and students. This study found that instructors need to master using Google Classroom as it is employed in effective high learning attainment. They need to know that Google Classroom is used in the context of higher learning institutions and course management and organization. Instructors and learners can use it for assignment distribution that can be done as instructors can easily share all the assignments, quizzes, and other course materials with the learners and, the same; they can receive assignments from the learners. Introducing Microsoft Teams in the management of college classes for collaborative purposes in higher learning institutions entails the many practical

strategies. Effective utilization of Microsoft Teams in the institutions of higher learning is facilitating communication and collaboration as other features of the software include use of chat, video conferencing, and files that create viable platforms for communications and sharing of works among the instructors and students since the system is enabled with Microsoft Teams [21]. Instructors who demonstrate care and respect for the learners are likely to mute the rate of undesirable behaviors among their students [22].

This study focuses on Canvas LMS, as it is used in most universities because of its enhanced functionality in enabling tutors and coordinators and other members to manage courses, communication, and students. There are some recommendations on the usage of Canvas LMS for higher education as a course management and organization [23]. It offers structured learning hierarchy in that it allows the instructor to organize course in a way that the different components of the course include modules, discussions, quizzes and assignments that will meet the course goals and objectives. This study found that Canvas LMS supports collaboration since work can be done in groups, files can be shared for review, and feedback options. This is real-time response which could be in the form of feedback from work shared by other group collaborators [21]. Schoology is an LMS that has particular options to help with the course management, communication, collaboration, and individual learning in the context of higher education. As applied to the higher education settings, the following is a good and effective utilization of Schoology. Using visual attractive objects can easy the students' navigation that optimizes the accessibility through Moodle and maximizes their learning outcomes [24].

As for the last parameter, it is desired to underline that Moodle was effectively used as a course management and organization. It integrates with Google Drive, Microsoft OneDrive and many other tools that allow for the easy sharing as well as collaboration of course contents. This study found that bridging formality through voiding the formalities of the class as the platform provides for messaging, announcement, and discussions to enable interaction between the tutors and students. This study investigated the capability of Edmodo as it enables the instructors to post and arrange course content, share assignment instructions as well as track and assign scores on a single site. It assists in creating quiz, poll and discussion forums and endorses the use of create and share janitor that makes learning more fun. Out of these four attributes, the role is course management and organization as it is facilitating communication and collaboration. A direct improvement is observed through Edmodo in the way that it facilitates comments and feedback that teachers provide to students along with the ways that students engage in discussions and participate in online assessments [21].

The current study found that Nearpod for the most part, is considered to have tools that make it easy to engage students and ease bureaucratic chores in the college classroom. Effective use of Nearpod in higher education as interactive presentations and Nearpod enables instructors to create the presentations, virtual field trips, quizzes, polls, and collaborative activities that make the students participate actively in the lessons. Such elements as open questions and asynchronous discussions encourage students' learning and teamwork since they engage critical thinking skills [25]. Kahoot! is a live online game played in higher learning institutions to provide a formative assessment to learners, and also offers interactive sessions during learning. Effective use of Kahoot! in higher education as interactive learning activities that Kahoot! enables the instructors to set up and execute engaging quizzes, surveys, and discussions where students are likely to participate actively and with much interest. ClassDojo is in most times recognized for its software program in K-12 training settings rather than better schooling. It is often used to enhance great behaviors, talk with mother and father, and tune pupil improvement. However, its application in higher schooling may also moreover range. Potential use of ClassDojo in higher education as behavior tracking and remarkable reinforcement that ClassDojo can be tailored in higher education to song attendance, participation, and academic behaviors among college university and college students. Flipgrid is a video speak platform that has acquired reputation in each K-12 and higher training settings for promoting engagement, collaboration, and interactive analyzing critiques.

Effective use of Flipgrid in higher training as facilitating video discussions that Flipgrid permits instructors to create video-primarily based definitely speak turns on wherein college students respond with quick video recordings, fostering energetic participation and communication. Enhancing student contemplated picture and presentation competencies as college students can use Flipgrid to expose off their knowledge of route requirements, replicate on studying opinions, and gift undertaking findings thru video displays [20]. Seesaw is commonly acknowledged for its software in K-12 education rather than better schooling. Its competencies as a virtual portfolio platform that lets in college students to report their studying, show off their paintings, and collaborate with buddies and instructors [26]. Potential use of Seesaw in higher education as digital portfolio and reflection has been increased because Seesaw lets in students to curate a virtual portfolio of their academic paintings, together with assignments, tasks, and reflections [27]. This can facilitate self-evaluation, motive-setting, and tracking of progress over time, promoting metacognitive capabilities among college students [28]. This study found that improving balanced classroom management

in a university setting can be conducted via ICT that can enhance the learning, streamline administrative obligations, and foster extra effective teaching and studying environments. It is highly recommended to utilize LMS such as Canvas, Blackboard, or Moodle to arrange course substances, tune student progress, and facilitate communication [29]. These structures provide gear for grading, dialogue boards, and assignment submissions, making it simpler for teachers to manipulate their courses and engage college students [30]. Instructors and learners are encouraged to use classroom response systems to incorporate learners' engagement and participation [31].

This study shows that these systems allow college students to answer questions in real-time, offering instantaneous feedback and permitting teachers to gauge understanding speedy. This study suggests that the use of virtual attendance structures that utilize biometric scanners or cell apps to tune attendance is very important in developing a positive students' attitude towards learning the subject. These structures lessen the time spent on administrative responsibilities and provide accurate records of pupil attendance. It is recommended to integrate on-line collaboration gear like Google Workspace or Microsoft Teams to facilitate group paintings and communication out of doors of class.

7. CONCLUSION

In conclusion, this study has provided an overview of the results and findings of many studies in regards of using digital ICT software programs into effective classroom management. The reviewed studies have demonstrated that digital ICT tools positively impact students' engagement, participation, organization, and communication skills development. It is essential for educators and instructors to take into account the suggested ASPSDEIM framework, digital ICT software programs, and effective classroom management techniques when applying such integration. In current years, the combination of digital ICT into study room management has transformed instructional practices, imparting revolutionary answers to beautify teaching and gaining knowledge of studies. Digital ICT tools along with LMS enable verbal exchange structures and collaborative engagement in classrooms. This transformation is particularly obvious inside the potential of ICT to streamline administrative duties, personalize studying reports, and foster greater engagement among students. One significant benefit of incorporating virtual ICT in the learning classroom management is the enhancement of communication skills and collaboration among students. Platforms like Google Classroom, Microsoft Teams, and Schoology allow educators to talk seamlessly with college students, proportion resources, and offer timely feedback. These tools sell active participation and interaction, thereby growing a more inclusive and scholar-centered studying environment. Moreover, digital ICT enhances academic techniques through presenting diverse multimedia sources and interactive content. Digital ICT tools which include Nearpod and Kahoot enable educators to create dynamic visual structures, manage questions, and gamify achieving new knowledge and skills.

In conclusion, thus study is recommending that integrating digital ICT in classroom management strategies through study classroom control represents an enormous jump ahead in contemporary schooling. It suggests that providing instructors with the necessary digital professional development programs enables them to use these technologies professionally as they can set up environments for mastering which can be all inclusive, interactive and personalized for that reason encouraging collaboration, involvement and educational overall performance of learners. This study opens the door for further continuous research to investigate the most suitable digital ICT tools for class management based on different context subjects. It suggests conducting more specialized studies in terms of the adopting new digital ICT software programs as we move into a brand-new technology of schooling globally. In light of these findings and recommendations, further research should shed the light on addressing gaps and future explores strategies to enhance technology integration in classroom management in higher education. This accumulative knowledge provides a huge forward leap of improving higher educational outcomes and helping students to achieve the intended learning outcomes throughout their learning journey.

FUNDING INFORMATION

The author states no funding involved.

AUTHOR CONTRIBUTIONS STATEMENT

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
Enaz Mahmoud	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓	
Ali Khaled Bawaneh	✓	✓			✓	✓			✓	✓		✓		

C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
Fo : **Fo**rmal analysis
I : **I**nvestigation
R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

CONFLICT OF INTEREST STATEMENT

The author states no conflict of interest.

INFORMED CONSENT

This study does not involve any individuals, so there is no need to obtain any informed consent.

ETHICAL APPROVAL

This study does not use people or animal at any stage of its preparation.

DATA AVAILABILITY

Data availability is not applicable to this paper as no new data were created or analyzed in this study.

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