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Use of media in science, technology, engineering and mathematics: Anovel holistic education for the development of entrepreneurship

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ABSTRACT
The objective of this review article is toupdate the potential role of science, technology, engineering, and mathematics (STEM) education along with media in the advancement of entrepreneurial abilities of the students of either primary or higher academic organization. We have critically chosen the recent literature to develop conceptsthat revive the current STEM education scenario around the globe.This current review represents the intrinsic modern trends that provide new fociof education functioning through traditional disciplines and media, which couldbe create a long history in holistic education. This review article highlights the importance of transdisciplinary approaches viz., STEM education and modern media technology in the knowledge management of both educators and students. Therefore, this review would be usefulfor contemporary education system for the improvementof learning, thinking power, innovation ability and entrepreneurial skills of students by combined implication of maths, science, engineering and technology,and different media activities.

KEYWORDS: Education scenario, informal sciences, knowledge networking, skill development, sustainable, transdisciplinary

I. INTRODUCTION
The combination of mathematics, technology and science is a novel approach to teach students, which is crucial for interdisciplinary learning of students.Numerous studied and academic organisation have been supported this ambience approach due to integrated learning of the different subjects. These types of education atmosphere make students more creative, skilled, curious, entrepreneurial, sharing of knowledge and broad thinker [1− 4]. Now day's integration mathematics, technology, science, engineering with arts is a new approach to improve the educationquality. Collectively, this teaching approach led to the development of several opportunities for students in future i.e. great team leader, entrepreneurs, innovators, startup, solution provider, knowledge partner, etc.Under current scenario across the world the integration of math, science, technology and arts provide a strong approach to understand the problem, learning environment, evaluation methods as well as update latest technology and skill-based information for holistic development of students[3−7].

The integration of maths, arts, technology and science needed multiple learning modelsincludes transciplinary and skill development related information. Thus, this education approach advance acquired learning and creativity of the pupils. Maths plays crucial role in the progress of science, technology and arts, and strongly linked to each other [8,9]. The current scenario represents a framework the act as pull between multiple disciplines with arts. Thus, integration of maths, science, technology and engineering together create a giant approach to uplift the all-level academic organization either primary or higher education[4,10]. In this review articles, we advance the knowledge about how science technology, Engineering and mathsin association with mediaare a novel approach to holistic development of education and entrepreneur for the students in current context. Furthermore, we have used STEM abbreviation for alternative of different discipline such as the science (S), technology (T), engineering (E) and maths (M).Here, this reviewexplaining the current advancementin STEM education along with mediaand its aids to leverage entrepreneurship among the stakeholders with particular emphasis on development of different entrepreneurial skills in the students.

II. PROSPECT OF STEM AND MEDIA TECHNOLOGY IN NOVEL EDUCATION BUILDING

Mass media uses various tools (i.e. print, broadcast and internet) and activities (i.e. writing,imaging, recording and creating final report) to communicate information to societies and all types of organization. Applying these tools and activities with STEM education can improve the performance of students and learning atmosphere, and creativity and innovativeness of students[11,12].Chen et al. [12] suggested that the combination of STEM and exposure of different digital aids of media viz., Television, video watching and video game prompt and promote students' interest to explore STEM education as a choice of future opportunity. The bridge between STEM education and implementation of new learning method (e.g. maximize the use of e-learning), research collaboration, and updated course contentcreates multiple career opportunities for teachers to advance their skills which basically focused on holistic development of students' education and career[11,13].A statistical study on digital game assisted STEM education (viz., the use of digital game and its elements in STEM education) represent better learning outcomes in among the students than traditional education system [14].Previous report suggested that Digital media domain (i.e. conceptual; create storyboard, functional; use and application of software and audio visual; under the principle of digital media) and mobile technology are playing crucial role in assessment and allotment of assignment to students pursuing higher studies. The learning behavior of students associated with STEM education is foster by effective use of mobile devices (i.e. mobile, tablet, laptop, camera, etc.,)and digital media that create media skill and problem-solvingcritical thinking, and advance knowledge about digital media and future opportunities[15,16].The improvement of creative thinking is outcome of students participated in STEM education and their learning ability. Therefore, students can apply the STEM education in other academic stream including biology [17].Wang et al. [18]explainuses of digital gamesplay vital role in the STEM education which uplift the learning and skills among the students,and advance knowledge of educators about the benefits of digital game in teaching pedagogy.Furthermore, in the future study is required to promote adoption and development of digital games with new featureswhich act an efficient teaching aid in STEM education.A data analysis studyon artificial intelligence (AI) assisted STEM education is very crucial and contemporary trend which improve learning outcomesin different level of students from primary to higher education. Furthermore, AI and STEM education together act as a robust approach that advanced students learning, innovativeness and entrepreneurial skills as well as connect student with other disciplines and improve knowledge management which develop real-world problem-solving learning and creativity. However, the emerging trends of AI based STEM educationshow large gap in the effective uses of AI tools, ethics, affordability, etc., that create topic of research in future to explore deep understating of fine link between AI and education [19−21].A recent study evaluated the role of STEM education in the development various type entrepreneurial skills viz., social, green and innovative and suggested that the STEM education is great solution for holistic development of students and teachers learning. Therefore, STEM education would be fosteringsustainability and provide research opportunity to next generation [22].

III. PROSPECT OF STEM AND MEDIA IN ENTREPRENEURSHIP

A study conducted in United Arab Emirates (UAE) suggested that practical based approaches are very crucialto adopt STEM in the country which could improve the skill for entrepreneurship of the students. However, but very less is known about the involvement of STEM education. Thus, for effective implantationof more study is required [23]. Wahono et al. [24] reported that STEM education act as vital tool foradvancement and development of the learning ecosystem in student across the Asiacontinent. Recently, a group study on teachers and bibliometric analysis (i.e. assessmentofcontributions foran individual area of research by countries, authors, institutions and journals using a literature database) unveiledSTEM assisted Arduino show the beneficial effect on skills development and problem-solving ability which boosted the entrepreneurship as well as teaching methods in the future.Eventually, the STEM education based practical knowledge is key to self-sustainability of individual[25, 26].

A recent article suggested the beneficial effect of STEM education and entrepreneurship in the society. According to current study STEM with entrepreneurship education develop skills to solve daily life problems by the involvement of other streams included biology, physics, chemistry, arts and environmental sciences. This integration method provides a fuel to createself-employability and innovativeness mindset among the peoples across the world. Entrepreneurship education also promotes adoption of STEM education which create innovativeness and entrepreneurial mindset in the teachers, students and scientific societies as well as continuously propagate all these activities in the future[27,28]. There are several socio-economic problems arises in this century due to pandemic situation that led to major academic crisis across the globe resulted into knowledge gap in the society. To solve these issues by using knowledge of entrepreneurship and STEM education would be identify problems and create new opportunities to boost up thinking power and problem-solving ability for the wellbeing of people. Furthermore, these educations also provide information about precautionary steps required during adaptation and implementation of innovative ideas for sustainability of population to societal issues[29,30].Furthermore, anearlier research article reveals the social media unearthed knowledge about business opportunities and entrepreneurship skills to different stakeholders, including teacher, legislative members, entrepreneur which create awareness and promoting interest and abilities for digital entrepreneurial among Japanese students [31]. Recent studies describe the crucial role of social mediaand uses of its various platforms in the development of entrepreneurial programswhich promote innovativeness and economic security among the students and other stakeholders. The social mediatogether with interdisciplinary streamsacts as panacea for fostering knowledge that support holistic development and precision of entrepreneurship activities[32,33].

IV. CONCLUSIONS AND FUTURE DIRECTIONS

In this review we discuss knowledge relatedto the integration of media and its various componentswith STEM education. The finding reveals the involvement of media with STEM education advance students computational, critical and creative skill, and acquire entrepreneurial abilities which helps them in the treatment of real-world problems for examples the issues related to important aspects i.e. energy, environmental and public healthcare.Therefore, the review present foci for implementation of media in STEM education. Furthermore, the use of digital media and AIpassionate studentsabout acceptance of STEM education.Eventually, this review article providesknowledge and direction for future media assisted STEM education research.

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REFERENCES

[1]. Dalbotten D, Ito E, Myrbo A, Pellerin H, Greensky L, Howes T, Yellowman T (2014). NSF-OEDG Manoomin Science Camp Project: A model for engaging American Indian students in science, technology, engineering, and mathematics. Journal of Geoscience Education 62: 227-243.

[2]. Hom E J (2014). What is STEM education. Live science contributor.

[3]. Huang J, Jackson JB, Nair P, Cox-Petersen A (2017, June). Using lean start-up approach to integrate engineering education with entrepreneurship practices at middle schools. In 2017 ASEE Annual Conference & Exposition.

[4]. Belbase S, Mainali BR, Kasemsukpipat W, Tairab H, Gochoo M, Jarrah A (2022). At the dawn of science, technology, engineering, arts, and mathematics (STEAM) education: Prospects, priorities, processes, and problems. International Journal of Mathematical Education in Science and Technology 53: 2919-2955.

[5]. Haesen S, Van De Put E (2018). STEAM education in Europe:A comparative analysis report. Eurosteam project.Available online: https://www.eurosteamproject.eu/res/Comparative_analysis_report_vlatest.pdf (accessed on 15 December 2021).

[6]. Stroud A, Baines L (2019). Inquiry, investigative processes, art, and writing in STEAM. STEAM education: Theory and practice 1-18.

[7]. Liao C (2019). Creating a STEAM map: A content analysis of visual art practices in STEAM education. STEAM education: Theory and practice 37-55.

[8]. Gailiunas P (2019). Bridges and artists. In Proceedings of Bridges 2019: Mathematics, Art, Music, Architecture, Education, Culture (pp. 75-82).

[9]. Eriksson L (2020). Adapter Tiles Evolves the Girih Tile Set. InProceedings of Bridges 2020: Mathematics, Art, Music, Architecture, Education, Culture 19-26.

[10]. Changtong, N, Maneejak, N, Yasri, P (2020). Approaches for Implementing STEM (Science, Technology, Engineering & Mathematics) Activities among Middle School Students in Thailand. International journal of educational methodology 6:185-198.

[11]. Karahan E, Bilici SC, Ünal A (2015). Integration of media design processes in science, technology, engineering, and mathematics (STEM) education. Eurasian Journal of Educational Research 15: 221-240.

[12]. Chen C, Hardjo S, Sonnert G, Hui J, Sadler PM (2023). The role of media in influencing students' STEM career interest. International Journal of STEM Education 10: 56.

[13]. De S, Arguello G (2020). STEM education in college: An analysis of stakeholders' recent challenges and potential solutions. FDLA Journal 5:9.

[14]. Gui Y, Cai Z, Yang Y, Kong L, Fan X, Tai RH (2023). Effectiveness of digital educational game and game design in STEM learning: a meta-analytic review. International Journal of STEM Education 10:36.

[15]. Zaharakis ID, Sklavos N, Kameas A (2016). Exploiting ubiquitous computing, mobile computing and the internet of things to promote science education. In 2016 8th IFIP International Conference on New Technologies, Mobility and Security 1-2.

[16]. Reyna J, Meier P (2020). Co-Creation of Knowledge Using Mobile Technologies and Digital Media as Pedagogical Devices in Undergraduate STEM Education. Research in Learning Technology 28.

[17]. Sirajudin N, Suratno J (2021). Developing creativity through STEM education. In Journal of Physics: Conference Series 1806 (1) 012211.

[18]. Wang LH, Chen B, Hwang GJ, Guan JQ, Wang YQ (2022). Effects of digital game-based STEM education on students' learning achievement: A meta-analysis. International Journal of STEM Education 9 (1) 26.

[19]. Xu W, Ouyang F (2022). The application of AI technologies in STEM education: a systematic review from 2011 to 2021. International Journal of STEM Education 9:59.

[20]. Kangiwa BI, Oludare O E, Nassarawa H S, Abubakar N S, Efeoma EL, Enefola, HA (2024). Leveraging artificial intelligence for enhancing entrepreneurship and creativity in STEM education. Journal of Educational Research and Practice.

[21]. Utami A, Dhitareka PH, Husna HN, Prima EC (2025). An exploratory study of ChatGPT in STEM teaching on heat and temperature topic. Discover Education 4(1) 309.

[22]. Kaya-Capocci S, Pabuccu-Akis A, Orhan-Ozteber N (2025). Entrepreneurial STEM education: Enhancing students' resourcefulness and problem-solving skills. Research in Science Education 55:103-134.

[23]. Eltanahy M, Forawi S, Mansour N (2020). Incorporating entrepreneurial practices into STEM education: Development of interdisciplinary E-STEM model in high school in the United Arab Emirates. Thinking Skills and Creativity 37:100697.

[24]. Wahono B, Lin PL, Chang CY (2020). Evidence of STEM enactment effectiveness in Asian student learning outcomes. International Journal of STEM Education 7:36.

[25]. Sari U, Çelik H, Pektaş HM, Yalçın S (2022). Effects of STEM-focused Arduino practical activities on problem-solving and entrepreneurship skills. Australasian Journal of Educational Technology 38:140-154.

[26]. Akış, A. P. (2024). Using arduino in science, technology, engineering, and mathematics (STEM) education: Bibliometric analysis. Science Education International 35: 73-84.

[27]. Deveci İ, Seikkula-Leino J (2023). The link between entrepreneurship and STEM education. InEnhancing Entrepreneurial Mindsets Through STEM Education, Cham: Springer International Publishing 3-23.

[28]. Deveci İ. (2023). Bibliometric Analysis of Published Documents on Entrepreneurship in Basic Sciences (Physics, Chemistry, Biology).Journal of Turkish Science Education 20:211-240.

[29]. Ribeiro T, Silva J, Paz M, Cardoso A, Teles N, Nogueira C, Ribeiro T (2023). Strengthening bridges between STEM education and entrepreneurship: pathways to societal empowerment towards sustainability. InEnhancing Entrepreneurial Mindsets Through STEM Education,Cham: Springer International Publishing 25-47.

[30]. Kaya-CapocciS,UcarS. (2023). Entrepreneurial STEM for global epidemics.

InIntegrated education and learning. Cham: Springer International Publishing.

[31]. Hussain S (2023). Impact of Entrepreneurship Skills and Business Opportunity on Digital Entrepreneurship: As Study on the Role of Social Media as Mediator. Business Review of Digital Revolution 3: 38-44.

[32]. Ruswaji R, Herlina N, Hidayatin DA, Sulaeman MM, Wibowo SN. (2024). Stimulating Awareness and Entrepreneurial Skills of Students through the Strong Role of Social Media: A Motivation for Growth and Innovation. Technology and Society Perspectives (TACIT), 2:158-164.

[33]. Kediehor C. (2025). Utilization of social media in skill acquisition and entrepreneurial development among youths in Africa. Journal of Management and Science 15:115-122.