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The Role of Certification Courses with Reference to Technical Subjects to Improve the Skill of Undergraduate Students

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Abstract: This study explores the role of online certification courses in enhancing the technical skills of undergraduate students. In an era where industry demands are rapidly evolving, traditional classroom instruction may not always suffice to equip students with the necessary practical skills. This research investigates how online certification programs in technical subjects can bridge this gap by offering flexible, accessible, and specialized learning opportunities. Data was collected through online surveys conducted via Google Forms, filled out by students, educators, and industry professionals, along with case studies and a review of existing literature on the subject. The survey results reveal that online certification courses significantly improve students' technical competencies by providing hands-on learning experiences, fostering self-paced learning, and enhancing employability. By integrating online certifications with traditional academic curricula, institutions can offer a more comprehensive education that prepares students for real-world challenges in their respective fields.

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I. INTRODUCTION

Technical skills are vital for undergraduate students as they prepare for a technology-driven and dynamic workforce. These skills enhance employability by meeting the growing demand for industry-relevant expertise in sectors like IT, healthcare, finance, and manufacturing. In a competitive job market, technical proficiency provides a significant edge, fostering innovation, problem-solving, and the ability to tackle real-world challenges. Additionally, as industries globalize and embrace digitalization, these skills are critical for effective participation in the global economy. Even non-technical fields, such as marketing and design, benefit from the interdisciplinary application of technical tools and data.

Moreover, technical skills promote adaptability, enabling students to keep pace with rapid technological advancements and continuously learn throughout their careers. They also open avenues for entrepreneurship, empowering students to leverage technology for start-ups and innovation. In a tech-driven world, these skills enhance collaboration, communication, and project management on digital platforms. Furthermore, integrating technical skills into education provides hands-on knowledge, enriching the learning experience and equipping students to excel in real-world scenarios.

II. LITERATURE REVIEW

MOOCs have sparked an outstanding interest among the educational technology research community. Acknowledging the number of studies already conducted on MOOCs, many authors have also conducted very interesting literature reviews to map what we already know about MOOCs**.** [1] This study have reviewed 6320 papers on MOOCs, finding a lack of research on teaching methods. Most studies focus on student participation and analysis. [2] This research has explored the effectiveness of MOOCs in enhancing student learning efficiency, with a focus on stakeholder perceptions and their potential. [3] This study investigates the features, functionality, and effectiveness of these platforms. The increasing demand for online education has led to the development of local MOOC platforms, including NPTEL, mooKIT, IITBX, and SWAYAM. [4] This study explores the evolution and impact of MOOCs, examining their definition, history, and global implementation through a comprehensive review of existing literature. [5] This paper shows us that MOOCs initially aimed to revolutionise education but their reach has been limited. Despite of this, top universities continue to offer MOOCs, particularly in health sciences.[6] Through this research paper we examine the historical context of educational technologies, the rise of MOOCs, and their potential impact on higher education, addressing both the hype and the underlying paradoxes.[7] This paper provides us with review of MOOCs, examining their characteristics,

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development, technological implementations etc.[8] This paper provides a systematic review of the early literature on MOOCs categorizing research into key areas and identifying future research directions.[9] This paper reviews the rise and decline of MOOCs, highlighting research trends.[10] This paper reviews and analyses recent research on MOOCs, categorizing it into seven dimensions to provide an overview and highlight future challenges and opportunities.

III. METHODOLOGY

This study employs a quantitative research approach to assess the effectiveness and acceptance of Massive Open Online Courses (MOOCs) in education. The primary objective is to understand student awareness, perceptions, and engagement with MOOCs compared to traditional learning methods. Data collection was conducted using a structured questionnaire designed through Google Forms to ensure wide accessibility and ease of participation. The survey aimed to gather a large volume of responses to uncover trends and insights regarding the adoption and utility of MOOCs.

The participants for this study were primarily students aged 18-40, as this demographic is most likely to engage with and benefit from online learning platforms like MOOCs. The sample included respondents from diverse educational backgrounds, fields of study, and geographic locations. Additionally, educators and professionals were also invited to participate, offering valuable perspectives based on their experiences and observations of integrating MOOCs into education.

- The questionnaire consisted of 18 questions, divided into five distinct sections:

- Personal Information**:** To gather demographic and background details of the respondents.
- Educational Background**:** Questions focusing on participants' current level of education and field of study.
- Experience with MOOCs**:** To identify whether respondents have enrolled in MOOCs and their level of engagement.
- Motivation and Challenges**:** Questions exploring the reasons behind enrolling in MOOCs, such as career growth, skill enhancement, or personal interest, along with challenges faced in completing courses.
- Perceived Effectiveness**:** To assess the impact of MOOCs on learning outcomes and their comparison to traditional classroom education.

Most questions in the questionnaire were Multiple-Choice Questions (MCQs) to facilitate quantitative data collection. Some open-ended questions were included to capture qualitative insights regarding personal motivations and challenges. An interactive element was incorporated within the questionnaire to gauge participant engagement, such as requiring respondents to rank their preferences or evaluate real-world scenarios related to MOOCs.

At the conclusion of the survey, participants were presented with a case study of a practical learning situation through MOOCs, requiring them to critically analyze its effectiveness and suggest improvements. Educators and parents were also invited to provide their perspectives on the role of MOOCs in enhancing academic growth and professional development.
The questionnaire was distributed via social media platforms, ensuring broad accessibility. All responses were collected and stored anonymously to maintain participant privacy and encourage honest feedback.

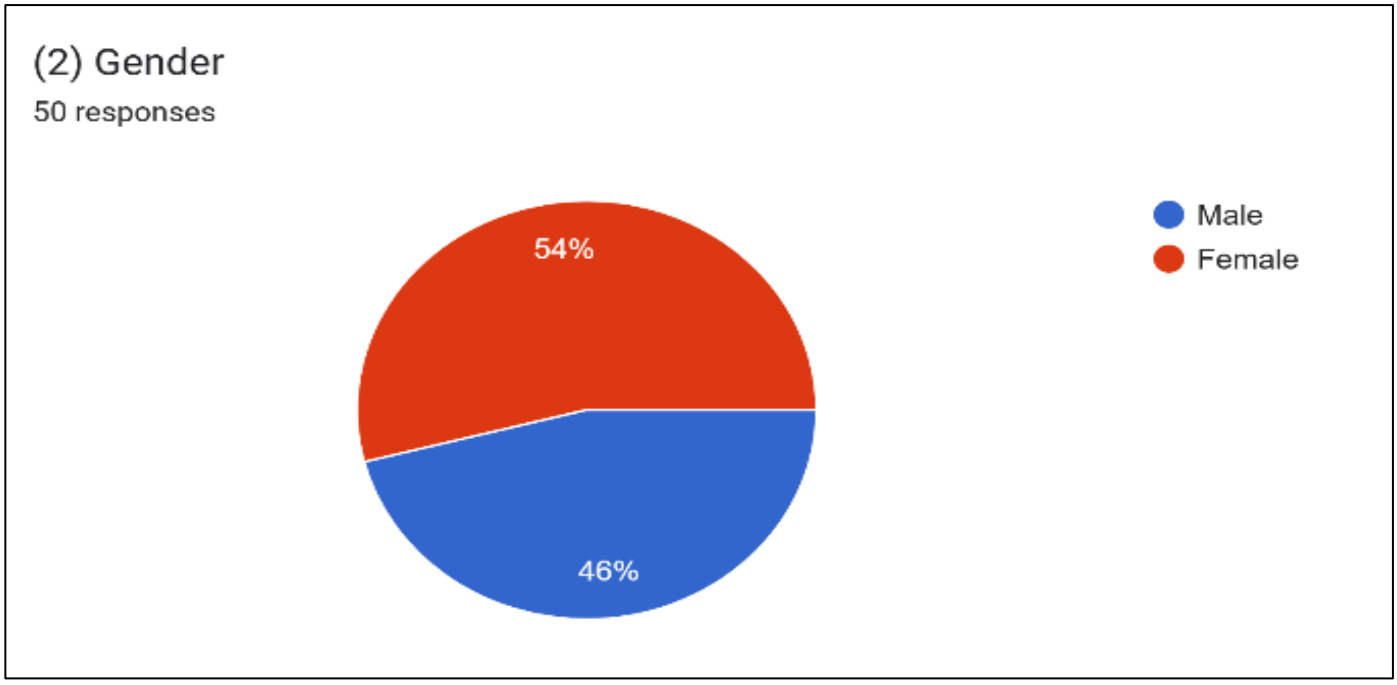

Fig.1 Gender of the Participants

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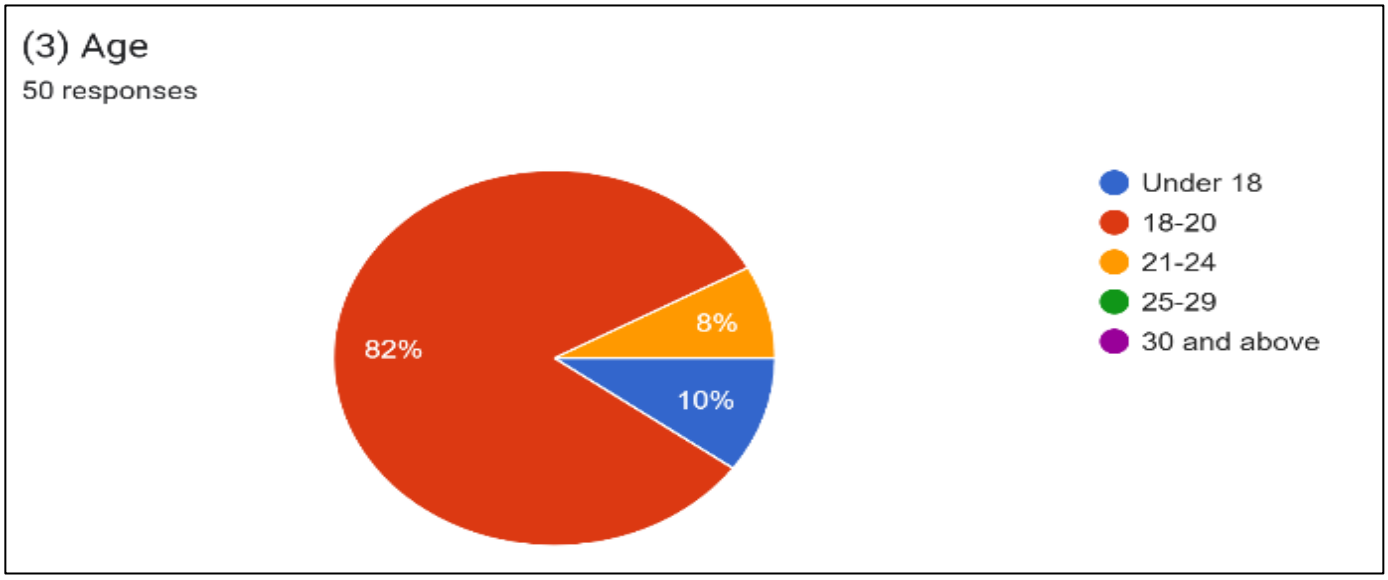

Fig.2 Distribution Of Age

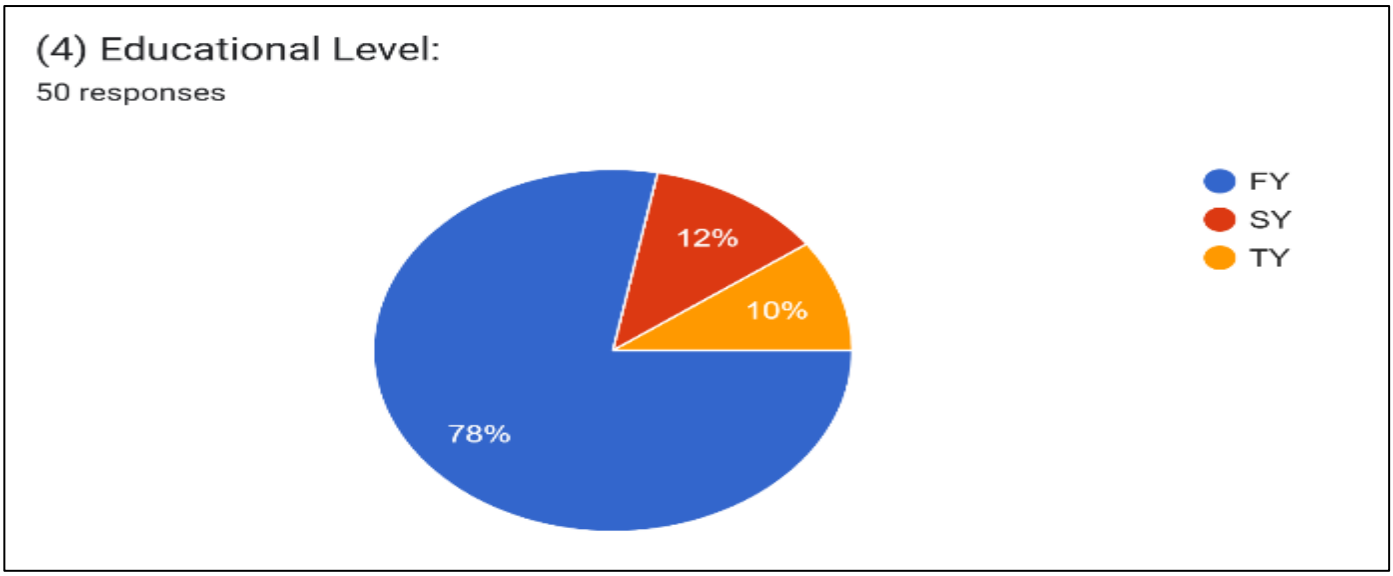

Fig.3 Educational Level of Participants

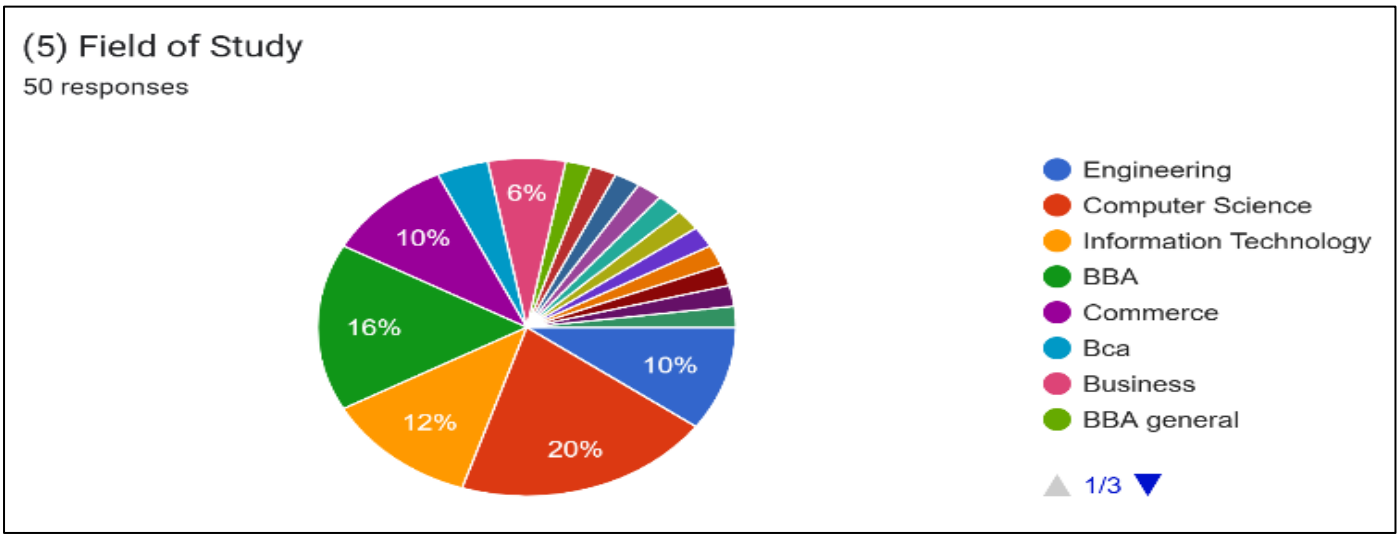

Fig.4 Field of Study of Participants

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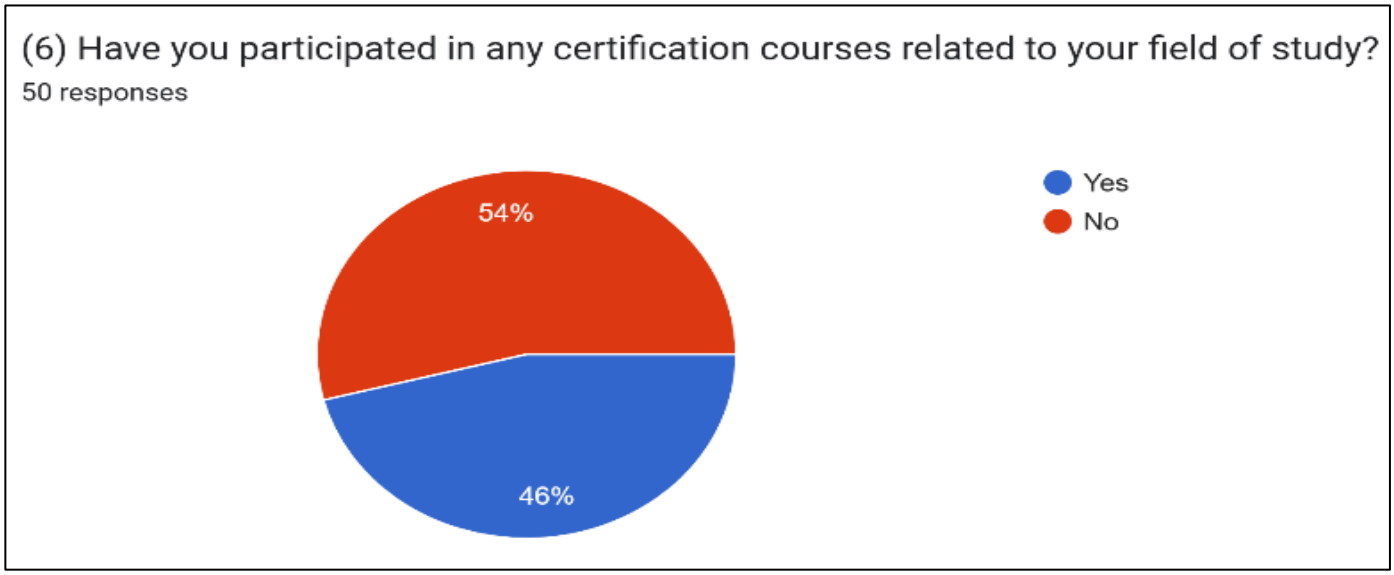

Fig.5 Majority of Participants do Certification Courses

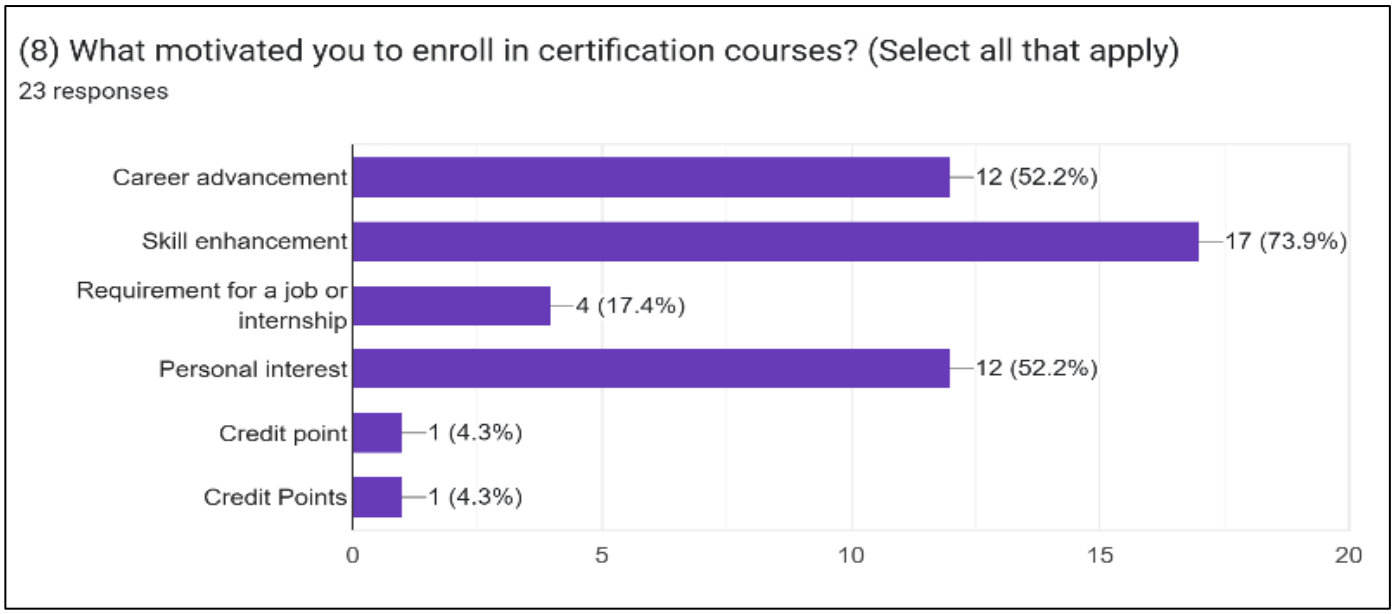

Fig.6 Factors that Motivated Participants to do MOOCs

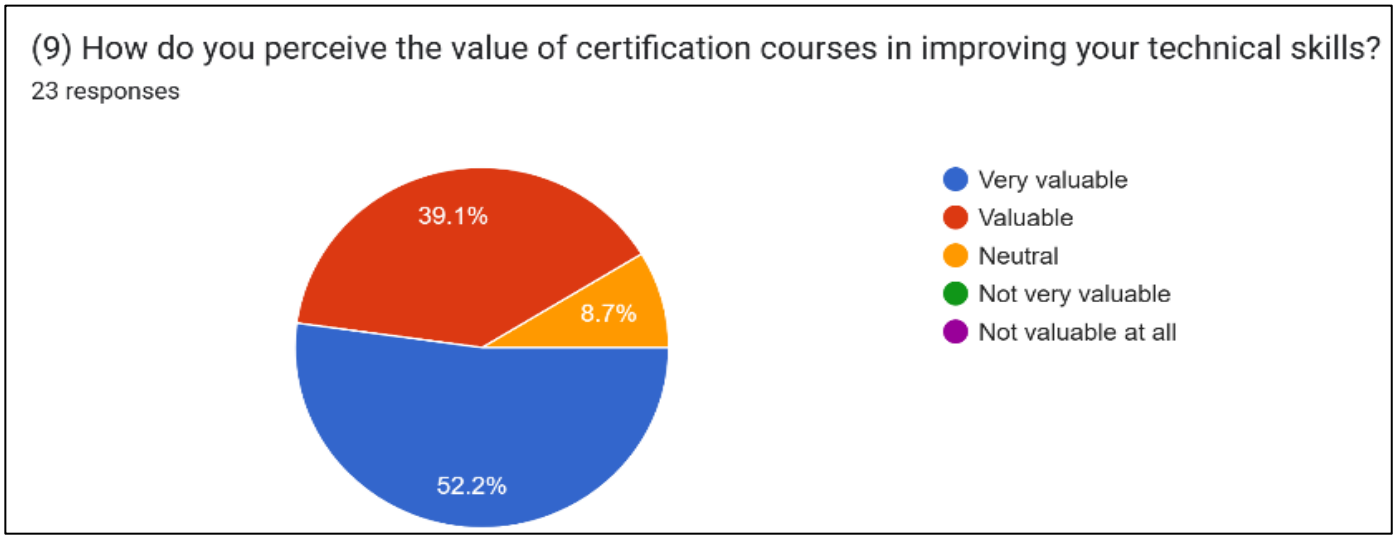

Fig.7 Improvement of Technical Skills through MOOCs

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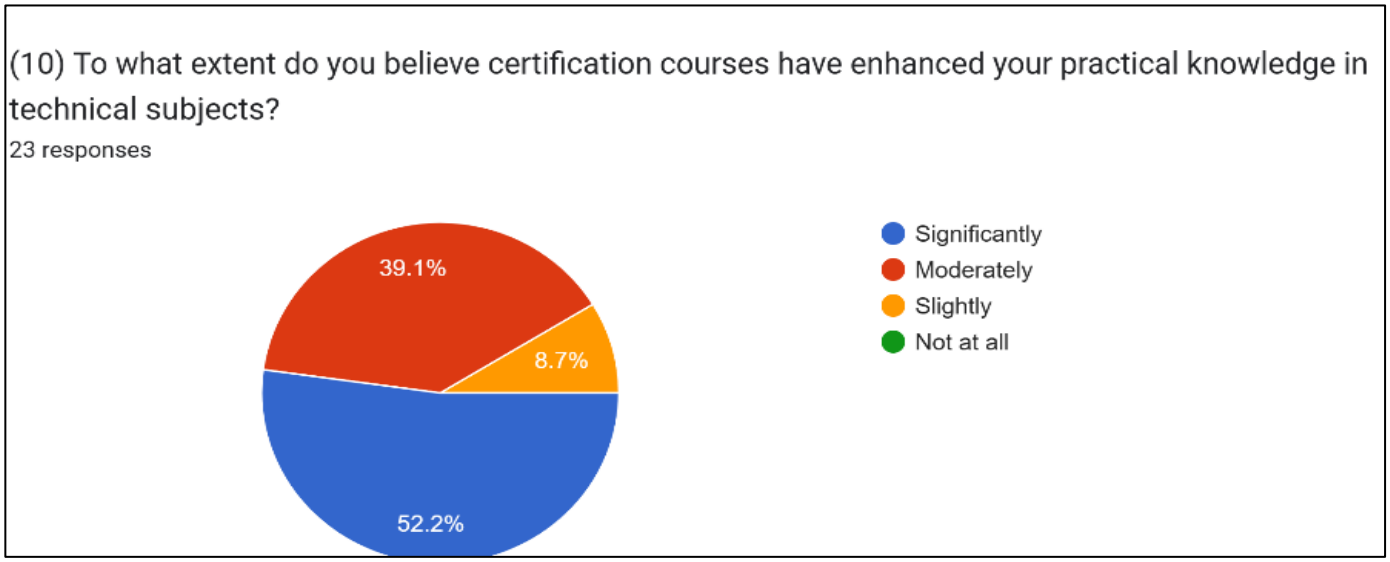

Fig.8 Enhancement of Technical knowledge through MOOCs.

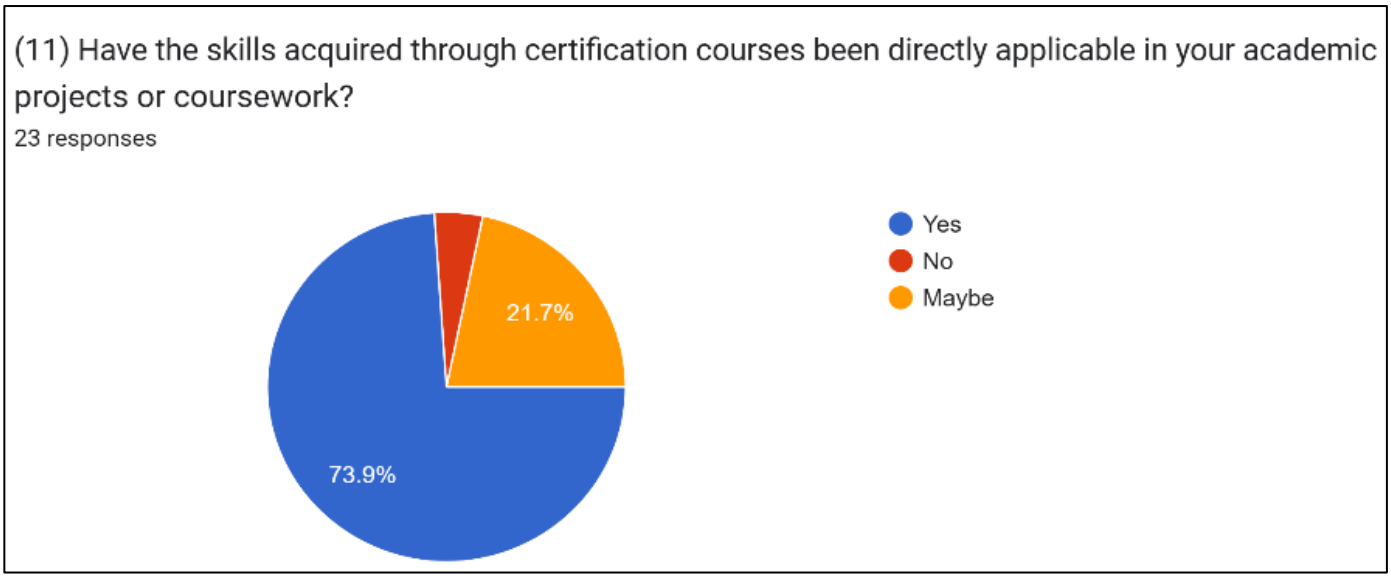

Fig.9 Application of Certification Courses in Academic Course

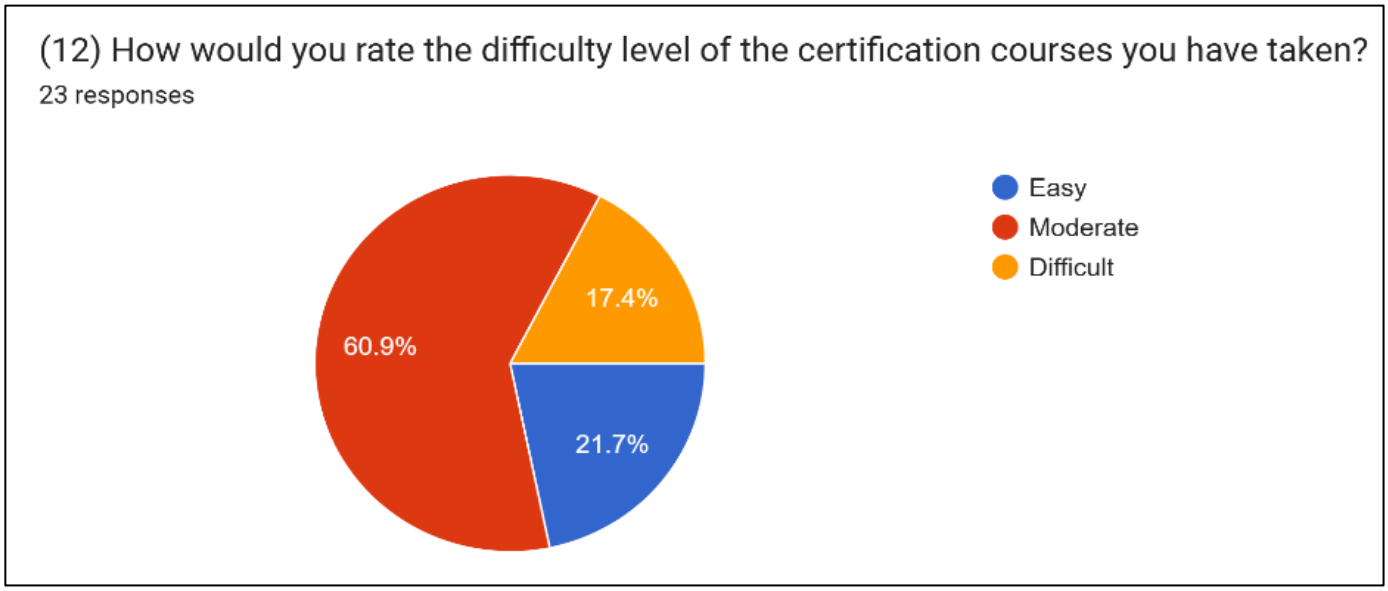

Fig.10 Difficulty Level of Certification Courses

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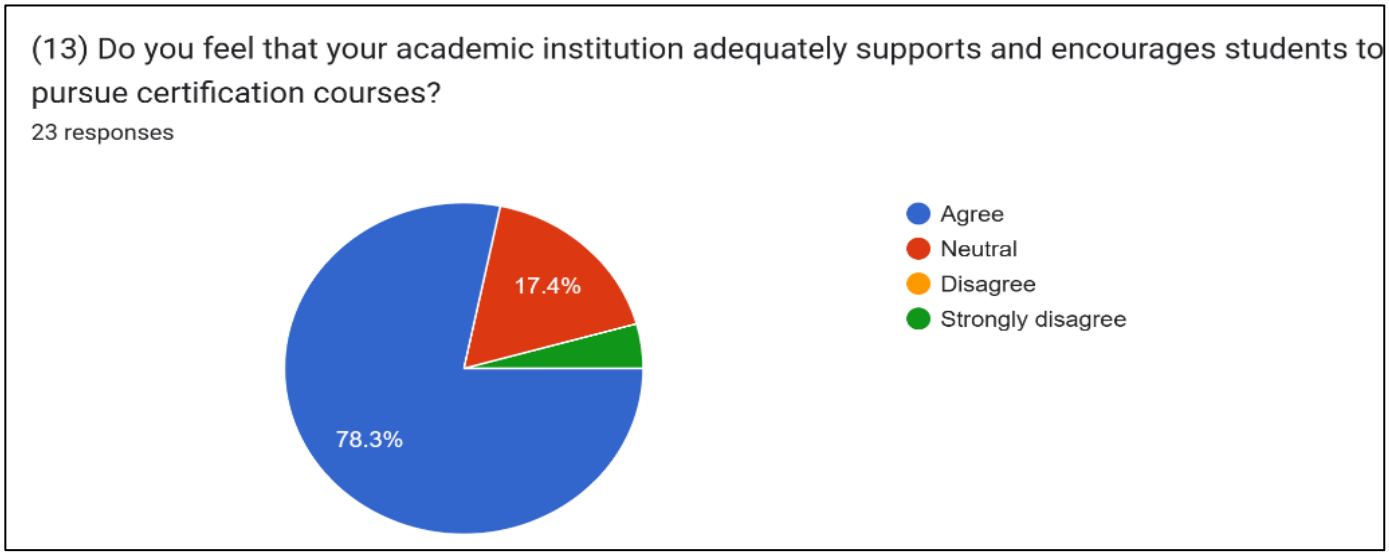

Fig.11Support of Academic Institution to do MOOCs

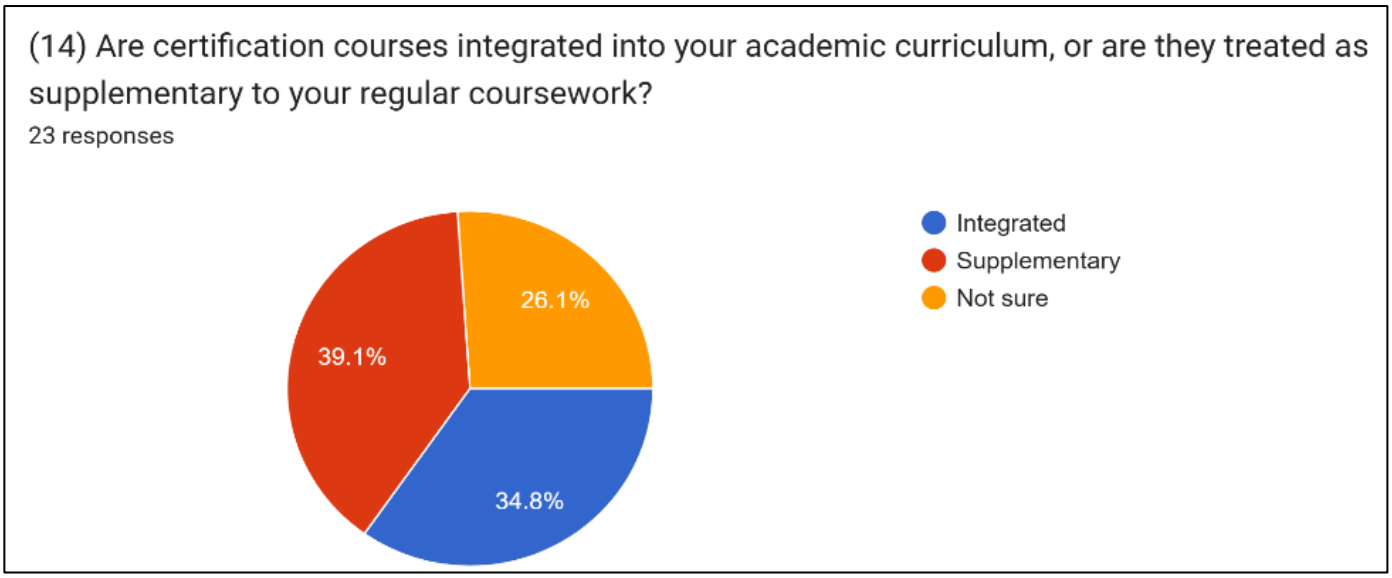

Fig.12 Integration oF MOOCs with Academic Curriculum

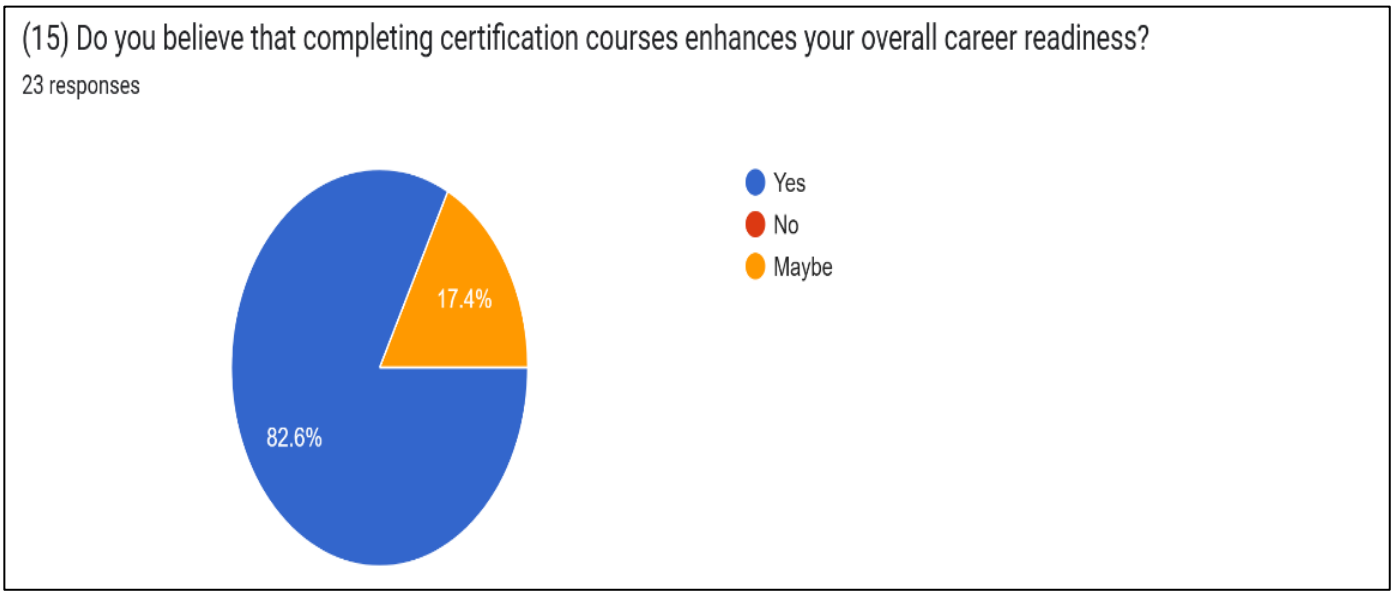

Fig.13 Completion of MOOCs leads to Career Readiness

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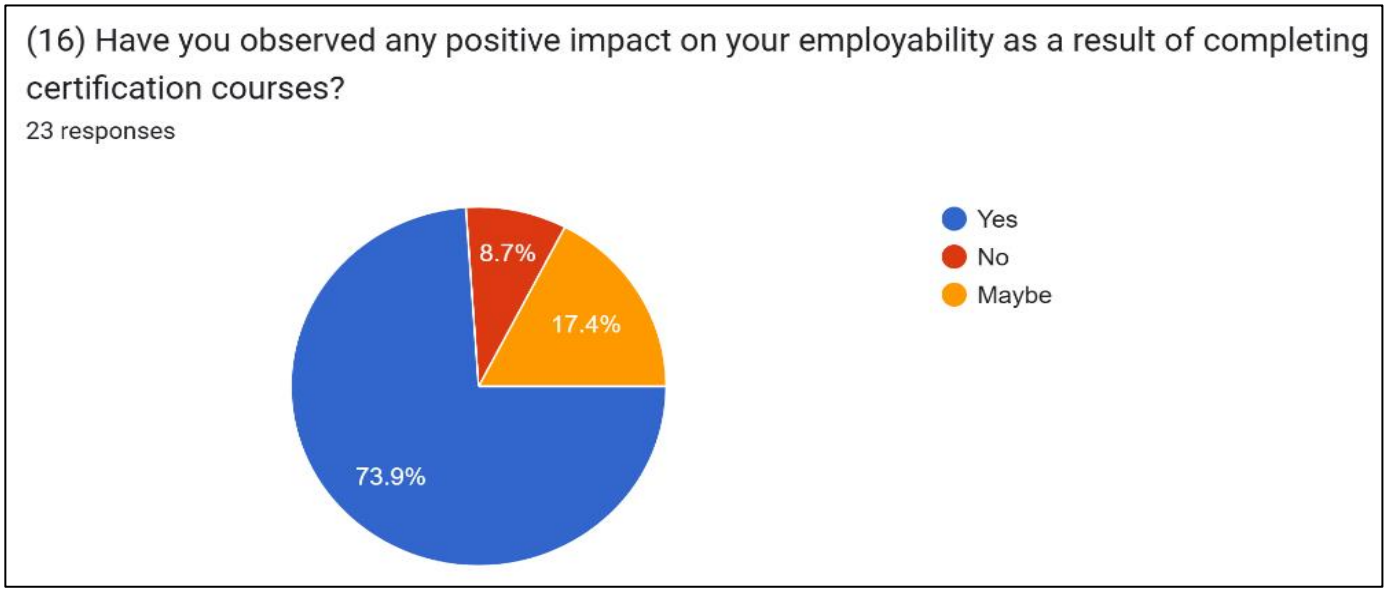

Fig.14 Positive Impact on Employability on Completion of MOOCs

IV. CONCLUSION

This research highlights that MOOCs (Massive Open Online Courses) offer significant advantages for individuals aged between 18-40, including increased access to diverse learning resources, platforms, flexibility in schedule, and the ability to pursue personalized learning paths. These benefits align well with the needs and preferences of this age group, particularly in terms of professional development and lifelong learning. However, the study also identifies certain barriers, such as technological limitations, lack of personalized support, and perceived credibility of certifications, that currently hinder the full potential of MOOCs. Despite these challenges, the findings suggest that with continued technological advancements, improved course design, and broader recognition of online credentials, MOOCs will become an even more valuable educational tool in the future. As these barriers are addressed, MOOCs are likely to play an increasingly prominent role in shaping the future of learning for this demographic.

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