IMPACT OF ONLINE LEARNING ON SKILL DEVELOPMENT AMONG COLLEGE STUDENTS IN HYDERABAD

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Abstract

This study examines how online education affects college students' employability and skill development in Hyderabad, India. The study identifies issues with virtual learning environments and assesses how e-learning platforms help students prepare for careers by fostering the development of digital, technical, and interpersonal skills. 202 students from Hyderabad's private colleges were given a structured questionnaire. In IBM SPSS, one-way ANOVA, correlation, chi-square tests, and descriptive statistics were used to evaluate the data. According to the findings, students believe that online education helps them strengthen their skills in areas like self-control, digital literacy, and flexibility. But issues like a lack of practical experience, irregular internet connection, and little peer contact still exist. Significant correlations between the frequency of online learning engagement and perceived employability were found by statistical research. According to the research, if universities remove current obstacles and adapt their courses to meet market demands, online learning might revolutionize higher education.

Keywords: *Online learning, Skill development, Employability, Higher education, Hyderabad, SPSS analysis*

1. Introduction

One of the main goals of higher education globally in the twenty-first century has been to provide educational opportunities to everyone. Rapid technological advancements have made remote learning easy. "The capability of using a networked computer, which provides the opportunity to learn from anywhere, anytime, in any rhythm, with any means, is what The majority of the terms (such as computer-mediated learning, blended learning, m-learning, online learning, open learning, and web-based learning) have in common" (Cojocariu et al., 2021). Teachers can create training, instructional courses, and skill-building programs with the use of platforms for unified communication and collaboration like Google Classroom, Canvas,

Blackboard, and Microsoft Teams. To maintain classroom productivity and organization, they provide tools including office chat, video conferencing, and file storage (Kaup et al., 2020). Open Online Course: This is a great time to encourage teachers and students to gain new skills or hone their existing onesMOOCs, also known as Massive Open Online Courses, are online courses that allow for flexible learning. These include websites like Future Learn, Swyam, NPTEL, and Coursera. There may be certification fees or no cost for the courses. (Kaup & colleagues, 2020) The Geneva Global EIE Hub initiative was launched by UNESCO and its partners on the International Day of Education. This project's only objective is to give the students a top-notch education. Furthermore, it aims to broaden the political, technical, and financial domains of emergency education.Lin (2021). Around the world, online education is being promoted and is getting good feedback from various nations.Online learning has become a vital component of both the classroom and the home office. Institutions of higher learning have compelling reasons to transition from traditional to online or digital instruction. (Kedia & Mishra, 2023). From its 2022 estimate of USD 399.3 billion, the e-learning market is projected to increase at a compound annual growth rate of 14% between 2023 and 2032. The use of e-learning systems in the healthcare sector is being driven by the growing demand for immersive learning and hands-on training experiences. By raising awareness and understanding of the availability and appropriate use of virtual care services, the e-learning initiative seeks to improve digital health education. People will feel more at ease utilizing digital healthcare technologies and be able to manage their health more skillfully if they receive better education on digital health. (E-Learning et al. 2023 - 2032, Global Report, n.d.)

2. Review of Literature

Emergence and growth of Online Learning Platforms

With its free online courses, massive open online courses, or MOOCs, are a well-known feature of the online learning environment, attracting millions of students. At first, some scholars praised MOOCs as a potential solution to the global demand for higher education (Perna et al., 2014). Although some voices continue to promise disruptive transformation in higher education through online learning, there is growing consensus

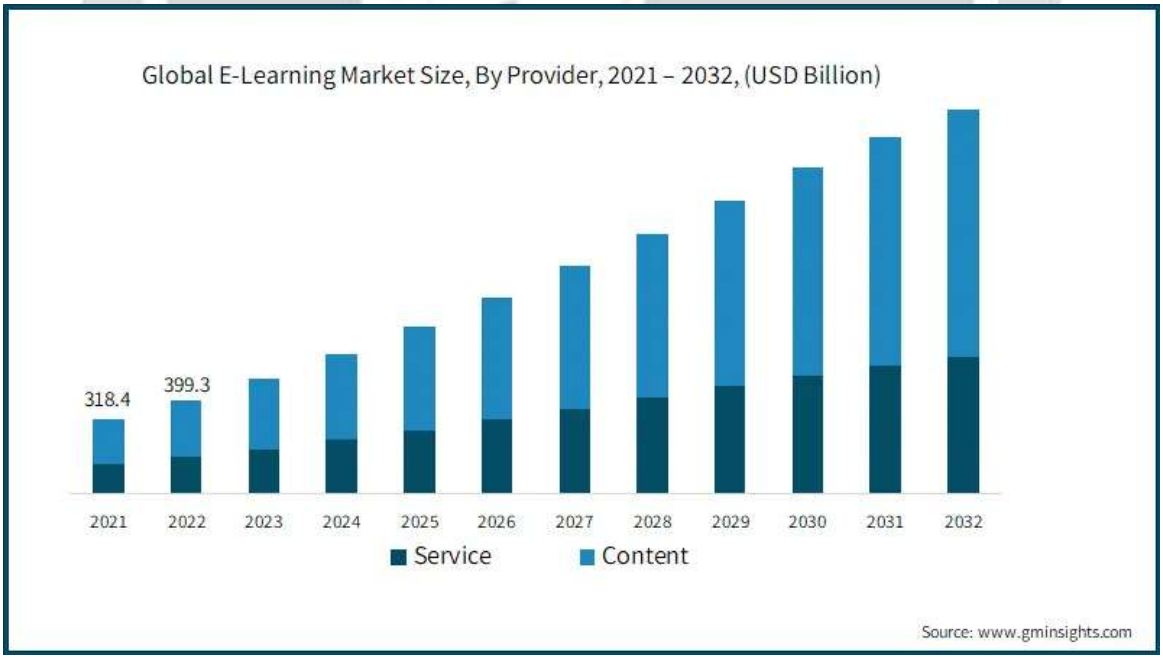

Figure 1 – Global E-Learning Market Size

that MOOCs will be integrated into existing higher education systems rather than totally replacing them. (Littenberg-Tobias & Reich, n.d.). Online learning techniques and procedures are quite effective. These online learning techniques' advantages can help us get through these difficult times. It is focused on the

student and provides a lot of flexibility with regard to time and place. We can adapt our procedures and processes to the needs of the learners thanks to e-learning techniques (Dhawan, 2020). Additionally, educators are searching for creative ways to provide high-quality higher education in light of state and educational budget limits and cuts as well as student growth. Over the past few years, blended learning has become more than just an affordable educational choice, but also as a teaching strategy that is better than the conventional classroom However, growth statistics for Internet penetration indicate that access to the Internet won't be a barrier for very long (Mahrenholz, n.d.). Additionally, educators are searching for creative ways to provide high-quality higher education in light of state and educational budget limits and cuts as well as student growth. Over the past few years, blended learning has become more than just an affordable educational choice, but also as a teaching strategy that is better than the conventional classroom (Soni, n.d.). Given evolving demographics, the explosive proliferation of new technologies and their use, especially by young people, the rapid expansion of Internet connectivity worldwide, and the growing need for high-quality education(Choudhury & Pattnaik, 2020). The widespread use of online learning that is currently occurring may have long-lasting effects on the global educational system even after the pandemic is over, and it may also hasten and broaden the rapidly expanding number of virtual schools worldwide (Saleh et al., 2023). Digital transformation is more than just providing online learning environments and platforms like Moodle or Blackboard; it also includes utilizing emerging learning technologies like 3-D visualization and augmented reality. Additionally, it is a vital component of student-centered, active learning. MOOCs and other online learning are expanding access to fresh information, and this tendency is only going to get strongern (Hadgraft & Kolmos, 2020). In 2013, 11% of undergraduate degree-seeking students in the United States were enrolled in entirely online programs, while 27% were enrolled in at least one online course. Four years later, in 2017, the numbers had increased to 18% enrolled in fully online programs and 33% taking at least one online course, indicating the explosive growth of the online higher education industry over the previous decade (Hadgraft & Kolmos, 2020). Since MOOCs are less priced, provide courses online, and have an admissions process that is reversed from traditional higher education, they may open up opportunities to a wider range of students than traditional higher education. Many students thought that online learning's affordances helped them comprehend the subject matter, and many commended the excellent quality of the courses and how applicable they are to their careers (Radhamani et al., 2021). MOOC providers argue that by offering hybrid and online-only degrees, colleges may reach more potential students, serving a more internationally and socioeconomically diverse student body and meeting the need for qualified professionals everywhere.(Mittal & Raghuvaran, 2021).

Accessibility and Adoption Among College Students

As technology has advanced, the global learning market has emerged quickly in the last ten years. The market for mobile learning, or mlearning, caters to potential customers in both the business and academic sectors. Rapid technology development has changed how Indian students consume educational content. This significant change has made dependable apps and new learning platforms possible to bring back the two-way communication model, greatly benefiting teachers and students. (Shukla, 2021). One of the main factors that determines how someone uses technology is their attitude, which is defined as "the extent to which a person has a favorable or unfavorable evaluation or appraisal of the (usage) behavior." It claims that if a technology is viewed as both practical and user-friendly, a positive attitude toward it may develop.(Chahal & Rani, 2022). Social influence, backed by prior studies on technology adoption, is the process by which people tweak or alter their behavior to fit in with social standards. It affects how each person uses technology. According to studies, when related to digital learning, the younger generation depends on the opinions of their peers, family, and friends. (Meet et al., 2022). ODL is now more practical because to the abundance of platforms and technologies accessible for conducting the teaching-learning processes and delivering course materials. ODL is recognized to be facilitated primarily by communication, teamwork, and information sharing. Online resources in the classroom have proliferated as a result of the adaptability of mobile devices and the advancement of telecommunications services. These tools include video conferencing, online forums and chats, online tests, remote labs, and online teamwork (Saidi et al., 2021)An individual's attitude, defined as "the extent to which a person has a favorable or unfavorable evaluation or appraisal of the (usage) behavior," is one of the main factors that determines how they utilize technology. It says that people can develop a positive attitude toward a technology if they believe it to be both practical and user-friendly.(Gupta & Maurya, 2022). Students need to feel dependent on online learning platforms, according to a positive and important relationship that has been proposed between these platforms and students' autonomy. Students who

are in an atmosphere that values their independence are more likely to set and achieve more goals (Abuhassna et al., 2020). Innovation is viewed as anything that is simple to use or control and requires little work. Researchers have highlighted the beneficial effects of effort anticipation on BI adoption of new technology as well as the favorable implications of perceived ease of use, a variable of effort expectation, on users' BI toward MOOC. It is believed that Gen Z finds MOOCs easy to utilize because they are naturally accustomed to digital devices and the internet (Kaushik & Agrawal, 2021). The way that consumers assess the availability of the tools and surroundings they require to finish a task is known as "facilitating conditions" (FC). Researchers show that FC encourages learners' BI and usage patterns. Because of this, it is expected that FC will have an effect on the BI with regard to MOOC. (Al-Adwan et al., 2023). The assessment of one's degree of confidence in another's ability to do tasks and reach goals is known as self-efficacy. How confident and excited students are about using online learning is linked to its adoption success self-efficacy as well as hence have a substantial correlation with the success of online learning. The significance of education The impact of self-efficacy has been demonstrated in involvement in technology-mediated education. on the conduct of students during online class participation.(Ahmad et al., 2023). The feasibility of MOOCs in overcoming these barriers and limitations can be examined for blended learning. Numerous initiatives have been launched to support Indian universities' creation and utilization of MOOCs and to increase their accessibility, even to far-flung places. WizIQ from IIT Delhi and NPTEL from Indian Institutes of Technology (IITs) and Indian Institute of Science (IISc.) are two examples of this..(Virani et al., 2023).

Role of Online Platforms in Skill Development :

R7 states that "In addition to assisting the student, educational technology (EdTech) expands the possibilities for tailored learning according to the student's abilities, interests, and strengths." According to Modgil et al. (2022), EdTech is a platform that gives educators access to state-of-the-art materials to improve student learning styles and increase the effectiveness of the teaching and learning process. In addition to massive open online courses (MOOCs) and open educational resources (OERs), other digital learning platforms, like online meeting apps like Zoom, Google Meet, Cisco WebEx, etc., have given students a variety of learning opportunities by broadening their horizons and assisting them in acquiring the knowledge and skills necessary for a healthy lifestyle in society.(Bordoloi et al., 2021). Computer skills are now only a small fraction of what students need to acquire in the age of Industrial Revolution 4.0. As a result of digital-based industrialization, both the younger and older generations are under more pressure to adjust to the technology they use (Sriliasta Bangun et al., 2022). Companies look for applicants with new abilities and a strong work ethic, and these courses can enhance a student's resume. Nonetheless, the online platforms that provide a vast range of MOOCs have been working with the best universities in the world, which improves the course's reputation (Anand Shankar Raja & Kallarakal, 2021). Those that sign up for MOOCs study with discipline and have improved self-regulation skills. MOOCs are designed to provide people the chance to improve intellectually and personally (D. Davis et al., 2018). However, because MOOCs mainly rely on self-discipline to learn and achieve and demand technological skills, they are only suitable for individuals who are pursuing higher education. By promoting the publicly available MOOCs, a number of private groups, bloggers, and vloggers are providing free services and ensuring that everyone who views the content will benefit. (Darius et al., 2021). Valuable online certificates (MOOCs), which are widely available from leading universities worldwide, provide the practical skills required for the profession, including psychological, interpersonal, communication, and behavioural ethics (A. Singh et al., 2020). The younger generation will benefit from the skills and knowledge acquired through these online courses, which will enhance their resumes and help them land decent jobs. At this point, educators, learners, and educational institutions should recognize the value of online learning and its benefits (Cohen & Porter, n.d.). Online resources that provide skill certification programs to assist individuals in meeting the demands of the digital labor market. Benefits of skill certificates to society include improving the knowledge and abilities of minority groups, immigrants, and the elderly (Guerrero et al., 2021). Leading online platforms like Udemy, Coursera, Pluralsight, InStride, Degreed, and Guild Education have developed in recent years to address these demands, in addition to earlier producers of short form films like Skillsoft and LinkedIn Learning. Prior suppliers of short films for these uses include LinkedIn Learning and Skillsoft (Levin, 2024). MOOC-based blended professional degree programs have enabled the emergence of professional MOOC-based degree and credential programs, a new online learning innovation, and the methods by which MOOC-based programs manage admissions, instruct students, and ultimately credential them.(Kundu & Bej, 2020).

Impact on Employability and Career Preparedness :

Online instruction and assessment will improve teachers' and students' digital literacy, increasing their exposure to and knowledge of the digital world and boosting their employability, all of which will support social sustainability. It will also reduce paper use and promote environmental sustainability. By lowering unemployment and promoting economic growth and development, all of these initiatives will support economic sustainability (Joshi and others, 2020). Another recommendation for educational institutions is to divide courses into traditional and online training. This will facilitate the integration of technology into educational settings. By reducing unemployment and fostering economic growth and development, all of these programs will contribute to economic sustainability. Online learning will help teachers and students become more digitally literate, which will make them more employable in the digital age and promote social sustainability (An Analysis of COVID-19 Impacts On Indian Education System ABSTRACT Mukesh Rawal, n.d.). ICT use is increasing in the current educational system, and most students do not find using real books or other study materials to be engaging (Sood & Saini, 2020). Additional e-learning programs used in the field include the National Repository of Open Educational Resources (NROER), Swayam Prabha TV Channels, On Air, For the Disabled, E-textbooks, and Open Schools and Pre-Service Education. (M. Singh et al., 2021). Technology enhances the learning environment with features like TEDX seminars, apps for deeper learning, and VR-AI technologies that let students express their opinions and thoughts and better understand subjects. Generally speaking, technology helps students acquire the technical, social, and critical thinking skills necessary for well-paying jobs in the twenty-first century. In addition to other benefits, technology gives educators access to research-backed resources (such as assessments and modules) that let them evaluate student performance and adjust the curriculum as needed (Alenezi 2023). Rao and Patel's (2020) study, "Impact of E-Learning on the Skill Development of Education Sector Employees," focused on 80 employees in the education sector. According to the study's findings, e-learning enhances performance, adaptability, and creativity in learning environments by encouraging self-directed skill development and continuous learning Along with the importance of e-learning in ensuring that workers' skill sets are in step with the demands of the digital age, emphasis was placed on the development of crucial talents, such as communication, technological competence, and instructional design. (V & R, 2024). Digital Learning style growth is facilitated by networks, which give students access to strong tools that enable them to obtain material more quickly and easily. Additionally, digital systems help students enhance their capacity to integrate information technology skills with conventional topic core competencies and to better capture and analyze information from today's rich online knowledge base (Xu et al., 2022). E-training is a considerably shorter learning time that is typically created especially to attain a certain learning goal or skill, even if e-learning and e-training share many similarities, particularly in terms of technology and delivery techniques (WOLOR et al., 2020). Since the COVID-19 pandemic, online education has become increasingly popular and is here to stay. Our research indicates that online learning is supported by a range of technological tools and platforms. Examples include web-based learning platforms, educational apps, streaming conferences, video conferencing systems, instant messaging, and Massive Open Online Courses (MOOCs) (García-Morales et al., 2021). Increased government involvement, the use of digital payment methods, improved Internet connectivity, and a rise in smartphone users have all significantly aided the expansion of online education in India. Companies, instructors, and students all benefit from Indian educational institutions' usage of the newest e-learning technologies. E-learning allows students to learn at their own pace, go back and read, skip, or speed through sections they prefer, saving 40–60% of the time needed to learn in traditional classroom settings, according to a World Economic Forum research.(Rizvi & Nabi, 2021).

Future Trends in Online Learning for Technical Education

"Education 4.0" describes how learning will be designed and envisioned in the future. It seeks to make optimal use of digital technologies, open-source information, individualized data, and connection. In light of the sustainability of life, it guarantees that society and the individual have improved living conditions and opportunities. The goal of Education 4.0 is to foster people's creativity and innovation (Mukul & Büyüközkan, 2023). In eLearning, artificial intelligence has found applications beyond basic smartphone commands. Supporting the ideas of adaptive learning, AI can assist with learning predictions and real-time personalization in addition to supporting students as they progress through assignments. Given that artificial intelligence is now used in several sectors outside of education, the potential uses for this seem endless

(Gligorea et al., 2023). However, a growing level of sophistication is to be expected within, with greater flexibility allowing for different learning requirements and styles (Davis, n.d.). Massive online open courses (MOOCs) and other AI-driven learning environments use machine learning algorithms (ML) to monitor student behavior and improve performance. Processing enormous amounts of learning data with machine learning algorithms can help to clarify the connection between efficacy and learning behavior. Furthermore, in online learning, a recommender system can be utilized to create effective learning pathways and help students make decisions (Dogan et al., 2023). Virtual reality (VR) and augmented reality (AR) have become increasingly popular in the field of education in recent years. (6,7) The Metaverse offers an engaging and dynamic learning environment. The universe of virtual worlds connected by the internet is referred to as the "Metaverse" (Sun et al., 2022). One of the primary advantages of the Metaverse is its capacity to support active learning, an instructional approach that necessitates active participation and engagement with the content. While students are often passive recipients of knowledge in traditional teaching methods, they can actively engage with the content and participate in role-playing games and simulations in the Metaverse (Treve, 2021). Students' engagement and retention of the material can be enhanced because they are more likely to recall information they have actively engaged with.(Prakash et al., 2023) .

3. Objectives of the Study

1. To assess the effectiveness of online learning in enhancing job-related skills and competencies among private college students in Hyderabad.
2. To identify the challenges and advantages of online learning that influence students' career readiness.
3. To analyze the statistical relationship between online learning engagement and employability outcomes.

4. Hypotheses

H_0 (Null Hypothesis): Online learning has no significant impact on the employability of private college students in Hyderabad.
H_1 (Alternative Hypothesis): Online learning has a significant impact on the employability of private college students in Hyderabad.

5. Research Methodology

5.1 Research Design

This study focuses on students' views of online learning and its effects on skill development. It uses a descriptive and analytical cross-sectional approach. A quantitative method was chosen to test hypotheses through statistical analysis.

5.2 Population and Sample

The target population consists of students attending private colleges in Hyderabad, Telangana. A sample of 202 respondents was selected using convenience sampling, ensuring diversity in age, gender, and educational background.

5.3 Instrument and Measures

The structured questionnaire had four sections: (A) Job readiness; (B) Online learning behavior; (C) Perceptions of skill improvement, measured using a 5-point Likert scale; and (D) Demographic profile. Questions covered topics like communication skills, computer literacy, adaptability, and challenges faced during online learning.

5.4 Data Collection Procedure

Data was collected online to reach a larger audience. Ethical considerations included ensuring data anonymity, informed consent, and voluntary participation.

5.5 Data Analysis

Data was coded and analyzed using IBM SPSS. Descriptive statistics summarized perceptual and demographic data. Chi-square tests examined the relationships between job readiness and online learning engagement. One-way ANOVA assessed the differences in job readiness based on levels of participation in online learning, while correlation analysis explored links between skill-related variables.

6. Results

6.1 Sample Profile

Of the 202 respondents, 46% were female and 54% were male. 35% were doctoral students, while about 65% were undergraduates. Most (58%) reported using online learning platforms daily, 28% once a week, and 14% occasionally.

6.2 Descriptive Findings

68% of respondents felt more adaptable to new learning environments, while about 72% believed that online learning improved their digital skills. However, 36% reported internet access as a major challenge, and 41% expressed dissatisfaction with the lack of face-to-face interaction.

6.3 Chi-Square Test Results

Chi-Square Tests of Association.

The relationship between students' perceived job preparedness and various factors was analyzed using chi-square tests.

MOOC Enrollment vs. Job-Readiness:

The chi-square test revealed no significant correlation between students' job readiness and their enrollment in MOOCs ($\chi^2 = 1.43$, $p = 0.49$). 58.3% of those who felt prepared for work and 56.5% of those enrolled in MOOCs did not show a statistically significant difference.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1.425[a]	2	.491
Likelihood Ratio	1.418	2	.492
N of Valid Cases	207		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 25.22.

Figure 2 – Chi-square test result

Skills Developed vs. Job-Readiness:

There was also no significant correlation between job readiness and the types of skills gained (communication, technical, and problem-solving) ($\chi^2 = 11.64$, $p = 0.17$). Students who felt job-ready commonly reported having technical and communication skills, but these trends did not achieve statistical

significance.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	11.638[a]	8	.168
Likelihood Ratio	11.865	8	.157
N of Valid Cases	200		

a. 3 cells (20.0%) have expected count less than 5. The minimum expected count is .28.

Figure 3 – Chi-square test 2 result

6.4 Correlation Analysis

Students' perceived job preparedness and their self-reported skill scores showed a weak correlation of r = 0.062 (p = 0.387). This indicates a negligible association. The link was not statistically significant, as the p-value exceeded the typical significance threshold of 0.05. In other words, there was no strong relationship between higher skill ratings and a greater sense of job readiness in this group. A simple linear regression was conducted with job preparedness as the dependent variable and two predictors: academic stream (science, commerce, arts, or other) and MOOC enrollment status (enrolled vs. not enrolled). The model explained only 3.8% of the variance in job readiness ($R^2 = 0.038$). After controlling for each other, neither predictor was statistically significant at $\alpha = 0.05$, indicating they did not meaningfully predict students' job readiness scores.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	1.611	.303		5.325	<.001		
	stream	-.050	.054	-.067	-.926	.356	.966	1.035
	Mooc_Enrolled	-.044	.126	-.025	-.346	.729	.942	1.061
	skills_developed	.056	.057	.070	.982	.327	.983	1.017
	cert_resume	.124	.129	.072	.963	.337	.911	1.098
	employ_value	.163	.073	.161	2.227	.027	.964	1.037

a. Dependent Variable: job_ready

Figure 4 – Correlation Analysis result

6.5 ANOVA Results

Skill Type vs. Job-Readiness Score:

A one-way ANOVA tested whether different types of skills gained from online learning (e.g., technical, communication, problem-solving) impacted students' job readiness scores. The analysis found no statistically significant differences ($F = 0.54$, $p = 0.66$). With a small effect size ($\eta^2 = 0.008$), skill type explained less than 1% of the variance in job readiness scores.

ANOVA

job_ready

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.178	3	.393	.538	.657
Within Groups	142.320	195	.730		
Total	143.497	198			

Figure 5 – ANOVA result

7.Discussion

The results indicate that MOOC enrollment, skill type, or self-reported skill scores did not significantly influence students' perceived job readiness. The weak correlations and tests suggest that online learning alone may not enhance employability perceptions. This highlights the potential role of other factors like real-world experience, institutional support, and industry exposure in job preparation. While online courses and MOOCs offer benefits, they may not sufficiently foster a strong sense of readiness for the job market. Future research should explore additional factors like employer perspectives and practical training to understand what affects job readiness.

8.Conclusion

The study found that while online education helps Hyderabadi private college students develop their skills, it does not have a meaningful statistical effect on their employability. Tests indicated that factors such as MOOC participation, academic stream, and skill type only partially explained the differences in perceived job readiness. Students reported improvements in technical, communication, and problem-solving skills, but their confidence in workplace preparedness did not show significant growth. Overall, these findings suggest that although online learning offers exposure and flexibility, it should be combined with real-world experience, institutional backing, and opportunities that align with industry standards to improve employability outcomes effectively.

9. Limitations and Future Research

One limitation of the study is its reliance on convenience sampling, which impacts generalizability. Self-reported perceptions may also introduce bias. Future research should consider larger sample sizes, cross-regional comparisons, and longitudinal designs. The effects of emerging technologies like AI, AR/VR, and the Metaverse on skill development through online learning warrant further investigation.

10. Practical Implications

For educational institutions: Develop blended learning approaches that mix classroom participation with online options. For policymakers: Invest in digital infrastructure and equitable access to ensure inclusivity. Employers should support ongoing projects to enhance digital skills and recognize online qualifications.

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