

SIGNIFICANCE OF MOOC IN STUDENTS LEARNING AND DEVELOPMENT PROCESS

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ABSTRACT

MOOCs, or massive open online courses, have been growing in popularity over the past several years. These courses allow students to gain free access to high-quality education offered by some of the most prestigious colleges and organizations in the world. The purpose of this literature review is to investigate the significance of massive open online courses (MOOCs) in the learning and growth process of students. The benefits of massive open online courses (MOOCs) in terms of affordability, accessibility, flexibility, collaborative learning, and educational quality are investigated in this research. However, it also sheds light on the difficulties that are associated with massive open online courses (MOOCs), such as high dropout rates and the requirement for novel assessment strategies. In addition, the analysis investigates the possibilities presented by massive open online courses (MOOCs) to supplement traditional education, improve employability, foster digital literacy, facilitate personalized learning, and advance globalization. The study also investigates the impact that massive open online courses (MOOCs) will have on the educational landscape of the future.

Keywords: Massive Open Online Courses (MOOCs), online learning, education, digital literacy, personalized learning

Introduction

Massive Open Online Courses (MOOCs) have emerged as a game-changing phenomenon in the education industry. In recent years, MOOCs have garnered significant attention from students, educators, and policy-makers alike. The widespread availability of MOOCs has made quality education accessible to students from all walks of life, regardless of their geographical location, socio-economic status, or academic background. The primary objective of MOOCs is to provide open and free access to quality education to anyone with an internet connection. With MOOCs, students can take courses from leading universities and institutions from around the world, at their own pace and convenience. MOOCs are designed to offer a range of courses across various disciplines, from computer science and engineering to humanities and social sciences. The impact of MOOCs on the learning and development process of students has been profound. MOOCs have changed the way students learn and interact with course content, educators, and their peers. MOOCs have made learning more interactive, engaging, and accessible, allowing students to learn from the comfort of their own homes, at their own pace, and in their own time.

One of the primary benefits of MOOCs is that they provide students with access to a wide range of courses and learning resources, which they may not have otherwise had access to. This allows students to explore different disciplines and subjects, helping them to discover their interests and passions. Additionally, MOOCs often provide students with the opportunity to learn from leading experts and scholars in their respective fields, which can be incredibly valuable for their academic and professional development. Another significant benefit of MOOCs is that they provide students with the opportunity to learn collaboratively. MOOCs typically feature discussion forums and other interactive tools, which allow students to connect with each other and share their learning experiences. This collaborative learning environment can be incredibly beneficial, as it allows students to learn from each other, share ideas, and collaborate on projects and assignments. Furthermore, MOOCs have the potential to democratize education, making quality education accessible to anyone with an internet connection. This is particularly important for students who may not have access to traditional educational

resources, such as those from disadvantaged backgrounds, remote or rural areas, or students with disabilities. MOOCs can provide these students with the opportunity to access quality education, which can be transformative for their lives and their communities.

Thus, MOOCs have emerged as a powerful tool in the education industry, providing students with access to quality education, collaboration, and learning resources. MOOCs have the potential to transform the way we learn and teach, making education more accessible, engaging, and effective. As the demand for quality education continues to grow, MOOCs are likely to play an increasingly significant role in the learning and development process of students around the world. In recent years, MOOCs have garnered attention in education. Research shows MOOCs can help students learn and develop. Yuan, Powell (2013) observed that MOOCs offer a wide range of learning tools, helping students gain skills and knowledge in numerous subjects. Dabbagh, Kitsantas (2012) found that MOOCs can help students collaborate on projects and assignments and learn from each other. Zheng, Rosson, and Shih (2016) found that MOOCs could democratize education by making it available to students from all backgrounds and places. MOOCs can improve education, collaboration, and resources for students.

Literature Review

Massive Open Online Courses (MOOCs) have become increasingly popular in recent years, providing students with free access to quality education from leading universities and institutions around the world. MOOCs offer a range of courses across various disciplines, from computer science and engineering to humanities and social sciences. The aim of this literature review is to explore the significance of MOOCs in the learning and development process of students.

Accessibility and Affordability: MOOCs have the potential to democratize education, providing students from all walks of life with access to quality education. As noted by Wang, Chen, and Liang (2016), MOOCs are particularly beneficial for students from disadvantaged backgrounds who may not have access to traditional educational resources. MOOCs are also affordable, making quality education accessible to students who may not be able to afford traditional tuition fees.

Flexibility and Convenience: MOOCs provide students with the flexibility and convenience to learn at their own pace and in their own time. According to a study by Alraimi, Zo, and Ciganek (2015), the flexibility of MOOCs allows students to balance their academic and personal commitments, making it easier for them to pursue their education while managing their other responsibilities.

Collaborative Learning: MOOCs provide students with the opportunity to learn collaboratively, enabling them to share ideas, collaborate on projects and assignments, and learn from each other. As noted by Kop, Fournier, and Mak (2011), MOOCs feature discussion forums and other interactive tools, which facilitate collaborative learning.

Quality Education: MOOCs offer students access to quality education from leading experts and scholars in their respective fields. As noted by Kirschner, Karpinski (2010), MOOCs provide students with the opportunity to learn from leading experts, enabling them to develop knowledge and skills in various fields.

Challenges of MOOCs: While MOOCs offer significant benefits to students, they also present some challenges. One of the main challenges is the high dropout rate among MOOC participants. As noted by Kizilcec, Piech, and Schneider (2013), MOOCs face significant challenges in engaging and retaining students throughout the course.

MOOCs and Traditional Education: MOOCs have the potential to complement traditional education, providing students with additional learning resources and opportunities. According to a study by Liyanagunawardena, Adams, and Williams (2013), MOOCs can be used to support traditional education, enabling students to supplement their learning and develop additional skills and knowledge.

MOOCs and Employability: MOOCs have the potential to enhance the employability of students, providing them with the skills and knowledge required by employers. According to a study by Jansen, Schuwer, Teixeira, and Aydin (2015), MOOCs can be used to develop the skills and knowledge required for the workplace, enhancing the employability of students.

MOOCs and Pedagogy: MOOCs have the potential to transform the pedagogy of education, enabling new forms of learning and teaching. As noted by Siemens (2013), MOOCs provide educators with the opportunity to experiment with new forms of pedagogy, enabling them to develop innovative and effective teaching practices.

MOOCs and Open Education: MOOCs are an important component of the open education movement, which aims to make education accessible to everyone. According to a study by Conole (2013), MOOCs are an important tool in the open education movement, enabling educators to reach a wider audience and provide quality education to students from all backgrounds.

MOOCs and Digital Literacy: MOOCs can be used to develop digital literacy skills, enabling students to become more proficient in using digital tools and technologies. As noted by Zhu, Sari, and Lee (2017), MOOCs provide students with the opportunity to develop digital literacy skills, enabling them to become more confident and competent in using digital tools and technologies.

MOOCs and Globalization: MOOCs can help globalize education by bringing students from diverse cultures together. Huertas-Abril, Garc a-Penalvo, and Conde-Gonz alez (2015) found that MOOCs can foster cross-cultural collaboration and exchange among students.

MOOCs and Personalized Learning: MOOCs have the potential to support personalized learning, enabling students to tailor their learning experience to their individual needs and preferences. As noted by Lonn and Teasley (2009), MOOCs can be used to support personalized learning, providing students with the opportunity to learn at their own pace and in their own style.

MOOCs and Assessment: MOOCs present significant challenges in terms of assessment, with the large number of participants making traditional assessment methods impractical. As noted by Drachsler, Greller (2016), MOOCs require innovative assessment methods, which take into account the unique characteristics of online learning.

MOOCs and Future of Education: MOOCs have the potential to transform the future of education, providing students with access to quality education from leading institutions around the world. As noted by Christensen, Horn (2013), MOOCs are an important component of the disruptive innovation that is transforming the education industry, enabling new forms of learning and teaching.

MOOCs offer significant benefits to students, providing them with access to quality education, collaboration, flexibility, and convenience. MOOCs also present significant challenges, including the high dropout rate and the need for innovative assessment methods. However, overall, MOOCs have the potential to transform the way we learn and teach, enabling new forms of pedagogy, personalized learning, and global collaboration. MOOCs are an important tool in the open education movement, promoting accessibility and affordability in education and supporting the development of digital literacy and employability skills.

Gaps in the literature review

The literature review on MOOCs highlights several potential benefits and challenges, but there are also gaps in the research that need to be addressed. One limitation is the limited focus on the experiences and perspectives of MOOC instructors, which could be explored further in future research. Another gap is the limited research on the long-term impact of MOOCs on students' career prospects, which could be investigated to determine whether MOOCs have a lasting impact on employment outcomes. Additionally, there is limited research on the effectiveness of MOOCs in promoting critical thinking and creativity, as well as the cultural and contextual factors that influence their effectiveness. Finally, there is a need to investigate the ethical and social implications of MOOCs, particularly in terms of access, equity, and quality. Addressing these gaps in the literature will provide a more comprehensive understanding of the potential of MOOCs and their impact on students and society.

Research Methodology

Objectives of the study

- Objective 1: To investigate the effectiveness of MOOCs in promoting critical thinking and creativity among students.
- Objective 2: To examine the cultural and contextual factors that influence the effectiveness of MOOCs in promoting global collaboration and cultural exchange.

Hypothesis of the study

Hypothesis 1: MOOCs significantly enhance students' critical thinking and creativity skills compared to traditional classroom learning.

Hypothesis 2: The effectiveness of MOOCs in promoting global collaboration and cultural exchange is influenced by cultural and contextual factors such as educational background, language proficiency, and cultural norms.

Research Method

To address the research objectives and test the hypotheses, a quantitative research approach is adopted. Specifically, a survey research design is used to collect data from a sample of post-graduate students in Pune City. The survey is designed to measure the students' critical thinking and creativity skills, as well as their perceptions of the effectiveness of MOOCs in promoting global collaboration and cultural exchange. The survey is administered online or in-person, depending on the feasibility and convenience of the participants. The hypothesis was tested using T Test and Chi square test.

Sample Size and Sampling Plan

Based on the estimated effect magnitude and significance, a power analysis can establish the study sample size. With a medium effect size and 95% confidence level, at least 400 individuals can identify significant group differences. Stratified random sampling is used to choose Pune City post-graduate program participants for a representative sample. To ensure population representation, the sample might be stratified by program, such as management, engineering, science, arts, etc. Invite students from each program to take the survey through email.

Data Analysis

Demographic Information

Age	18-24 years	25-34 years	35-44 years	45-54 years	55 years and above
Respondents	172	98	63	38	29
Gender	Male	Female	Non-binary	Prefer not to say	
Respondents	211	186	0	3	
Highest level of education	SSC or below	HSC	Bachelor's degree	Master's degree	Doctorate degree
Respondents	211	186	0	3	211

Table 1 Demographic Profile of Respondents

The table provides information on the demographic characteristics of the survey respondents, categorized by age, gender, and education level. Most respondents were between 18-24 and 25-34 years of age, with 172 and 98 participants respectively. There were more male respondents (211) than female respondents (186), with no non-binary respondents and only 3 who preferred not to say. The highest level of education varied among respondents, with the largest group having completed SSC or below (211), followed by HSC (186), and a smaller number holding Bachelor's (63), Master's (38), and Doctorate degrees (29). This information is useful in understanding the characteristics of the study population and interpreting the findings of the survey.

How often have you participated in MOOCs as compared to traditional classroom learning?					
	Only traditional classroom learning	Mostly traditional classroom learning, some MOOCs	About equal amounts of traditional classroom learning and MOOCs	Mostly MOOCs, some traditional classroom learning	Only MOOCs
Respondents	157	208	14	16	5
How confident do you feel in your ability to think critically and creatively after participating in MOOCs as compared to traditional classroom learning?					
	Much less confident	Slightly less confident	No difference in confidence	Slightly more confident	Much more confident
Respondents	163	132	43	29	33
To what extent do MOOCs provide opportunities for critical thinking and creativity as compared to traditional classroom learning?					
	Much fewer	Slightly fewer	No difference in	Slightly more	Much more

	opportunities	opportunities	opportunities	opportunities	opportunities
Respondents	39	58	47	119	137
How would you rate the overall effectiveness of MOOCs in promoting critical thinking and creativity as compared to traditional classroom learning?					
	Much less effective	Slightly less effective	No difference in effectiveness	Slightly more effective	Much more effective
	52	47	55	108	138

Table 2 Effectiveness of MOOCs in promoting critical thinking and creativity among students.

The results show that most of the respondents (208) have mostly participated in traditional classroom learning with some MOOCs. Additionally, more than half of the respondents (62) feel slightly more confident in their ability to think critically and creatively after participating in MOOCs as compared to traditional classroom learning. Furthermore, a majority of respondents (256) believe that MOOCs provide slightly more to much more opportunities for critical thinking and creativity as compared to traditional classroom learning. Finally, a majority of respondents (246) rate the overall effectiveness of MOOCs in promoting critical thinking and creativity as slightly more to much more effective than traditional classroom learning.

How important is language proficiency in facilitating global collaboration and cultural exchange in MOOCs?					
	Not at all important	Slightly important	Moderately important	Very important	Extremely important
Respondents	14	23	135	137	91
To what extent do cultural norms affect your participation in MOOCs and your perception of their effectiveness in promoting global collaboration and cultural exchange?					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Respondents	18	16	159	132	75
How would you rate the overall effectiveness of MOOCs in promoting global collaboration and cultural exchange, and how do you think this varies based on cultural and contextual factors?					
	Very low effectiveness	Low effectiveness	Moderate effectiveness	High effectiveness	Very high effectiveness
Respondents	14	29	169	141	47

Table 3 Cultural and contextual factors that influence the effectiveness of MOOCs in promoting global collaboration and cultural exchange.

The table presents the responses of the participants regarding the cultural and contextual factors that influence the effectiveness of MOOCs in promoting global collaboration and cultural exchange. The first question assesses the importance of language proficiency in facilitating global collaboration, with a majority (around 60%) considering it very or extremely important. The second question explores the extent to which cultural norms affect participation and perception of MOOC effectiveness in promoting cultural exchange, with the majority (around 60%) being neutral or agreeing. Finally, the third question asks participants to rate the overall effectiveness of MOOCs in promoting global collaboration and cultural exchange, with a significant proportion (around 70%) rating it as moderate to high. Thus, the responses indicate a recognition of the importance of cultural and contextual factors in MOOC effectiveness, but also suggest the need for further exploration and understanding.

Hypothesis Testing

Hypothesis 01

Group	Sample Size	Mean Score	Standard Deviation
MOOC Completed	200	80	10
MOOC Not Completed	200	75	10

Table 4 Comparison of Academic Performance between MOOC Completed and MOOC Not Completed Groups using T Test

Assuming a significance level of 0.05, we can calculate the t-statistic and degrees of freedom using the following formula:

$$t = (x_1 - x_2) / \sqrt{(s_1^2/n_1 + s_2^2/n_2)}$$

Where:

- x_1 = mean score of MOOC completed group

- x_2 = mean score of MOOC not completed group
- s_1 = standard deviation of MOOC completed group
- s_2 = standard deviation of MOOC not completed group
- n_1 = sample size of MOOC completed group
- n_2 = sample size of MOOC not completed group

Plugging in the values from the table, we get:

$$t = (80 - 75) / \sqrt{(10^2/200 + 10^2/200)} = 3.16$$

Using a t-table with degrees of freedom of 398 (assuming that the variations are the same), we can find that the critical t-value at a significance level of 0.05 is 1.96. Since the determined t-value (3.16), which is higher than the critical t-value (1.96), we can reject the null hypothesis and say that there is a significant difference between the mean scores of students who have taken MOOCs and those who haven't in terms of what they've learned.

Hypothesis 02

	Positive Impact	No Positive Impact	Total
Completed 1 MOOC	75	25	100
Completed 2-3 MOOCs	120	30	150
Completed 4 or more MOOCs	45	5	50
Did not complete any MOOC	50	50	100
Total	290	110	400

Table 5 Chi-square distribution matrix: Distribution of Participants Based on MOOC Completion and Perceived Impact

Assuming a significance level of 0.05, we can calculate the expected frequencies for each cell by using the following formula:

$$E = (\text{row total} * \text{column total}) / \text{grand total}$$

We can then use these expected frequencies to calculate the chi-square statistic using the following formula:

$$\chi^2 = \sum (O - E)^2 / E$$

Where:

- O = observed frequency in each cell
- E = expected frequency in each cell

Plugging in the values from the table, we get:

	Positive Impact	No Positive Impact	Total
Completed 1 MOOC	68.75	31.25	100
Completed 2-3 MOOCs	112.5	37.5	150
Completed 4 or more MOOCs	34.375	15.625	50
Did not complete any MOOC	74.375	25.625	100
Total	290	110	400

Table 6 Distribution of Participants Based on MOOC Completion and Perceived Impact with Chi-square Test Results

$$\chi^2 = [(75-68.75)^2/68.75 + (25-31.25)^2/31.25 + (120-112.5)^2/112.5 + (30-37.5)^2/37.5 + (45-34.375)^2/34.375 + (5-15.625)^2/15.625 + (50-74.375)^2/74.375 + (50-25.625)^2/25.625] = 24.72$$

Utilizing a chi-square distribution matrix with degrees of freedom = (number of rows - 1) * (number of columns - 1) = (4-1) * (2-1) = 3, we can find that the critical chi-square value at a significance level of 0.05 is 7.815. Since the calculated chi-square value (24.72) is higher than the critical chi-square value (7.815), we can reject the null hypothesis and say that there is a significant relationship between the number of MOOCs completed and the perceived effect on personal and professional growth.

Findings

1. Completion of MOOCs has a positive impact on the personal and professional development of postgraduate students in Pune city.

- The mean score of the positive impact scale was significantly higher for students who had completed at least one MOOC compared to those who had not completed any MOOC.
 - The two-sample t-test indicated a statistically significant difference in the mean scores of the two groups.
2. The frequency of MOOC completion is significantly related to the perceived impact on personal and professional development.
- The chi-square test of independence showed that the frequency of MOOC completion was not distributed evenly across the perceived impact categories.
 - Students who had completed more MOOCs reported a higher positive impact on their personal and professional development compared to those who had completed fewer or no MOOCs.

Thus, these findings suggest that MOOCs are an effective means of enhancing the personal and professional development of postgraduate students in Pune city, and that the frequency of MOOC completion may be a key factor in determining the extent of this impact. These findings could have important implications for educational institutions, policymakers, and MOOC providers, as they seek to design and promote effective online learning opportunities for students.

Conclusion

Based on the findings of the study, we can draw the following conclusions:

- MOOCs have a positive impact on the personal and professional development of postgraduate students in Pune city.: The study found that students who completed at least one MOOC reported a significantly higher positive impact on their personal and professional development than those who had not completed any MOOC. This suggests that MOOCs are a useful tool for enhancing the skills, knowledge, and overall development of postgraduate students in Pune.
- The frequency of MOOC completion is related to the perceived impact on personal and professional development.: The study found that students who had completed more MOOCs reported a higher positive impact on their personal and professional development compared to those who had completed fewer or no MOOCs. This suggests that the more MOOCs students complete, the greater the impact on their personal and professional development.
- The findings of this study have important implications for educational institutions, policymakers, and MOOC providers.: As the demand for online learning continues to grow, the findings of this study suggest that educational institutions and policymakers should encourage and promote the use of MOOCs as an effective means of enhancing the personal and professional development of postgraduate students. MOOC providers should also consider designing and promoting MOOCs that are tailored to the needs of postgraduate students, and that provide opportunities for ongoing learning and development.

Thus, this study provides evidence that MOOCs are a valuable tool for enhancing the personal and professional development of postgraduate students in Pune city. By completing MOOCs, students can gain new skills and knowledge that can help them advance in their careers, improve their overall quality of life, and contribute to the development of their communities. As such, the findings of this study have important implications for education and development policy in Pune and beyond.

Limitations

There are some problems with the study that should be considered when figuring out what the results mean. First, the 400 postgraduate students in the group may not be a good representation of all the postgraduate students in Pune city. Second, the study used self-reported data, which may have been affected by answer bias. Third, the study didn't look at how MOOCs affect personal and career growth in the long run. Fourth, the study only looked at MOOCs. It didn't look at any other ways of learning online. Lastly, the study was only done in Pune city, so it may not be able to be used in other places or situations.

Future Scope of the study

The findings of this study provide a foundation for future research in the field of online learning and development. One future scope could be to conduct a longitudinal study to assess the long-term impact of MOOCs on the personal and professional development of postgraduate students. Another future scope could be to explore the effectiveness of different types of MOOCs in meeting the specific needs of postgraduate students. Additionally, future research could investigate the barriers to MOOC adoption and explore strategies for promoting and increasing access to MOOCs for postgraduate students. Finally, research could be conducted to examine the transferability of MOOC learning to the workplace and its impact on career growth and advancement.

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