

Awareness and Usage of MOOCs: The Underrepresented Experience

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Abstract. MOOC's (Massive Open Online Courses) allow individuals to expand boundaries, enrolling massive numbers of students with potential quality learning materials and resources that may not otherwise exist in underserved communities. The proliferation of MOOCs holds the potential to enhance access to quality learning materials for those who lack these resources, such as young adults in low-income communities; African Americans are overrepresented in these communities. There has been little attention to investigating how African Americans in higher education currently use MOOCs for personal and career development, and even less attention to how these young adults become aware of MOOCs. This empirical study identifies how African Americans from underserved communities in New Jersey became aware of MOOCs and their uses of it. Findings in this research are essential for education providers, economists, educational technology developers, even politicians, for developing strategies to raise awareness of MOOCs in underserved communities. Such strategies could enhance access to potential quality educational resources, which could ultimately decrease education disparities.

Keywords: MOOCs, Educational Advancement, Educational Disparities.

1 Introduction

The rise of technological advancements has made significant impacts on human-computer interactions and behaviors. Facebook connects more than a quarter of the world's population on a single platform. Cable is no longer a household necessity due to streaming services such as Netflix and being taught in a classroom is no longer mandatory for learning due to the rise of massive open online courses (MOOCs). MOOCs are free or low-cost online courses to vast subjects matters with open access and a publicly shared curriculum. They are based on the idea of providing free educational resources, facilitated by a subject matter expert (contracted professor or field professional) and peer to peer learning. Additionally, MOOCs hold the potential to promote equality in educational resources and eliminate boundaries that disadvantage learning and, personal and professional development in underserved communities; where education inequalities

exist. The impact of open online courses is a power shift towards increased equity between educator and learner [21]; which can also be a power shift towards equality between underserved communities and educational resources.

This research learns from individuals who have experience with MOOCs, revealing its usefulness and benefits. Three research questions guide this study:

RQ1: What online learning platforms are individuals of low-income communities aware of?

RQ2: What variables influence awareness or lack of, online learning platforms?

RQ3: How are online learning platforms used by individuals in low-income communities?

2 Existing Literature

This section critically examines the existing literature on MOOCs. The Technology Acceptance Model is included in this section as a theoretical foundation of technology adoption, while the Digital Divide is included as a framework to explain the disparities of technology adoption, use, and skill level.

2.1 Demographics of MOOC Users

Christensen [9], Ho [17], and Zhenghao's [34] research are leading large scale MOOC studies, however, these studies do not identify racial demographics; which is vital for understanding the racial differences among users. From the use of MOOCs, two types of benefits exist, career and educational benefits [9,17,34]. The most common educational benefits are gaining knowledge essential to a field of study (76.6%) and deciding on a field of study (40.3%) [34]. Still, there is no certainty regarding which racial demographics receive such benefits. Without knowing the race of MOOC users, those who are already privileged may be benefiting more than underprivileged groups, increasing educational and career disparities. We can learn from current MOOC literature to include race in demographic data for future research efforts.

2.2 Quantitative and Qualitative Research Approaches

Hakami [15] systematic review of MOOC literature finds a large volume of empirical quantitative studies exist, mostly using the survey method (26 papers), and even less empirical qualitative studies exist (8 papers). More qualitative approaches ought to be performed in MOOC literature. It enables more discovery during investigations and provides deeper insight to context and social interactions. Insight that quantitative methods doesn't necessarily capture.

Quantitative studies favor the survey methods; however, demographic data is mainly retrieved through email-based surveys with low response rates [33]. One of the most frequently cited studies to present demographics of MOOC learners [9] received a response from only 4.3% of the targeted population of learners. Fan and Yan [33] state that the main problem with such low response rates is that they decrease the likelihood

of representative results; which increase risks of misrepresentation. Misrepresentation of MOOC users threatens the integrity of research findings, making the entire literature questionable.

2.3 Online Learning Motives

Motives for MOOC engagement can be grouped in four dimensions, 1) learner related factors, 2) institution and instructor-related factors, 3) platform and course-related factors, and 4) perception of external control and facilitating conditions-related factors [15]. Of the learner related factors, the most frequently proposed factors in the study [15] were: perceived usefulness (10 papers), perceived ease of use (10 papers), and perception of external control and facilitating conditions (4 papers); which are consistent with Davis's [12] Technology Acceptance Model. Of the institution and instructor-related factors, the most frequently suggested factors were: extend knowledge and skills (25 papers), curiosity and earn a certificate (16 papers) and interaction with learners (14 papers) [15]. Interestingly, educational challenges were not found as factors for engagement like participants in this study.

2.4 Theory and Framework

One theory that may help understand the motivation of users to engage with MOOCs is the Technology Acceptance Model (TAM) [12]. The goal of TAM is to explain the determinants of computer acceptance that is general, capable of explaining user behavior across a broad range of end-user computing technologies and user populations [13]. It explains the motivation of users in three factors; perceived usefulness, perceived ease of use, and attitude toward use [12], however, TAM has limitations. It ignores the social influence on the adoption of technology and the examination of cultural influences towards technology adoption [31].

The Digital Divide, however, does not ignore cultural factors in technology adoption. It examines the disparities in access and use of digital technologies [8]. The framework of the digital divide promotes scholars to focus on usage rates and skillsets to compare the computing opportunities and abilities for various demographic groups [14]. It explains barriers to MOOC usage by minorities in three dimensions, 1) money, 2) access to the Internet, and 3) socio-cultural awareness [26]. Wealthier individuals have more available resources than underserved individuals [26], which allow higher-income groups to indulge more in active learning. The digital divide framework is well suited to explore the inequalities in technology use, access, skill level, and socio-cultural awareness.

3 Methods

An online survey was created to recruit participants with three or more months of experience with MOOCs [Appendix 1]. A recruitment flyer [Appendix 2] was created and

sent to minority student organizations at Rutgers University. Members within the organizations were invited to complete the online survey through a hyperlink in the recruitment flyer. Those who completed the online survey and met the recruitment criteria were invited for follow-up interviews [Appendix 3]. Data was collected through interviews, which lasted six months. All interviews were transcribed for open coding analysis to find common themes, followed by being synthesized.

3.1 Data Collection

The criteria for targeted participants were African American New Jersey residents between the age of 18 – 24 who have taken at least one MOOC in the last nine months, speaks English, and is from or currently living in an underserved New Jersey community. The recruitment flyer was distributed via email to Presidents of minority student organizations at Rutgers such as NAACP, BSU, and Collegiate 100. Organization emails were retrieved from Rutgers University organization directory. Emails asked each President to distribute the recruitment flyer to all organization members. The flyer consisted of a brief overview of the research objective and a hyperlink to the online survey.

The online survey was created via Google Forms with password encryption for secure data collection. It consisted of 14 questions, collecting email addresses, demographic information, academic status, employment status, and assessed student's history, engagement, and use of MOOCs.

A total of 58 respondents completed the survey. 33 respondents passed the participant criteria, and 10 participants volunteered for interviews (6 females and 4 males). Volunteers were contacted by email to schedule follow-up interviews. Interviews were conducted both in person and remotely through a secure video conference. Each interview lasted 20 - 60 minutes and was audio-recorded using an iPad and microphone for transcriptions.

3.2 Data Analysis

Audio recordings of interviews were transcribed verbatim by the principal investigator with the assistance of a secure external transcription service. The transcriptions were uploaded to a web application, Dedoose, for manual analysis of the raw data and stored with password encryption protection. The 10 interviewees names were changed to pseudonyms during open coding analysis; participant 1 as (S1), participant 2 as (S2) ... through participant 10 as (S10). Data synthesis techniques were used to organize the raw data into themes, concepts, and relationships. The rich qualitative data emerged themes related to motivation of MOOC engagement and use, MOOC experiences, and educational challenges.

4 Findings

There were three main findings in the research.

- 1) Awareness of MOOCs is generated when individuals face educational challenges in two forms: peer-to-peer networking or online social network engagement.
- 2) MOOCs help individuals overcome educational challenges.
- 3) MOOCs help promote networking, personal and professional development.

4.1 RQ1: What Online Learning Platforms are Individuals of Low-income Communities Aware of?

The following MOOCs were found being used by participants:



Fig. 1. MOOCs used by participants.

4.2 RQ2: What Variables Influence Awareness or Lack of, Online Learning Platforms?

Most participants became aware of MOOCs when faced with educational challenges in two forms: peer-to-peer networking or online social network engagement. Peer-to-Peer networking navigated participants directly to MOOCs. “My younger brother took a course for his IT program at school, and he suggested it to help me, so I Googled it, looked it up and took some course I found interesting” (S8). Social networks, YouTube and Twitter specifically, exposed MOOC platforms to participants but did not directly navigate them to their specific needs as peer-to-peer networking does. “I saw an ad and then somebody that I follow on Twitter was talking about it too. So, I went on there, and they were having one of their discounts where everything is \$10. I bought two or three courses” (S9).

Other participants were exposed to MOOCs from their academic or professional curriculum. Two participants were introduced to MOOCs while in high school; “during high school, every day during homeroom period, which is for about an hour, we would have to use khan academy to study for SATs” (S7). One participant used MOOCs with on-site job training; “I interned over the summer at Varus Analytics, and Lynda was one of the learning platforms that they use for training” (S5).

4.3 RQ3: How are Online Learning Platforms Used by Individuals in Low-income Communities?

Participants engaged with MOOCs for two reasons 1) to overcome educational challenges, or 2) career development. 80% of participants used MOOCs to overcome educational obstacles. As participant 1 states, "I couldn't understand my professors. So, I would use Khan Academy to teach me what I felt my teachers weren't." 20% of participants used MOOCs for career development. Participant 9 states "Codecademy and Khan Academy were for career and personal growth."

5. Discussion

In this section, a demographic analysis of MOOC users from existing literature and participants in this study are performed. It also entails a reflection on the second and third research questions; what variables influence the awareness of MOOCs and how are online learning platforms used by individuals in low-income communities, connecting theoretical frameworks. Lastly, a comparative analysis of the benefits MOOC users experienced from existing literature to the benefits revealed in this research is done.

5.1 Demographic Analysis

Existing research states students engage with MOOCs to advance in a career [9], which implies a career already exists. This study found participants engage with MOOCs to aid in *starting* a career. Christensen [9] found 62.4% of MOOC users being employed full-time or self-employed, while findings from this study reveal that only 30% work full time, 50% work multiple part-time jobs, 20% not employed, and 0% self-employed. With 0% of participants in this study being self-employed, existing literature on MOOC users doesn't appear to be representative of African American student users. The term *users* should not be used generalized and represent all races, as findings in this study show significant differences in use and benefits. Attention to racial demographics of *users* ought to be performed for future MOOC research.

5.2 Reflection of Research Questions 2 and 3

The variables found to influence awareness of MOOCs for students from low-income communities in New Jersey are educational challenges and, academic or professional learning curriculums. Individuals who have prior experience with MOOCs tend to share their experiences, which can be a powerful influence to increase socio-cultural awareness. The nature in which participants learned and became aware of MOOCs is consistent with the social constructivist theory, which focus on the interdependence of social and individual processes in the co-construction of knowledge [27]. The social constructivist theory brings to light that shared experiences can be one of our best teachers, especially for African Americans. Learning from such experiences can be

modeled as an approach to increase awareness of MOOCs for others, as shown in Fig. 2.

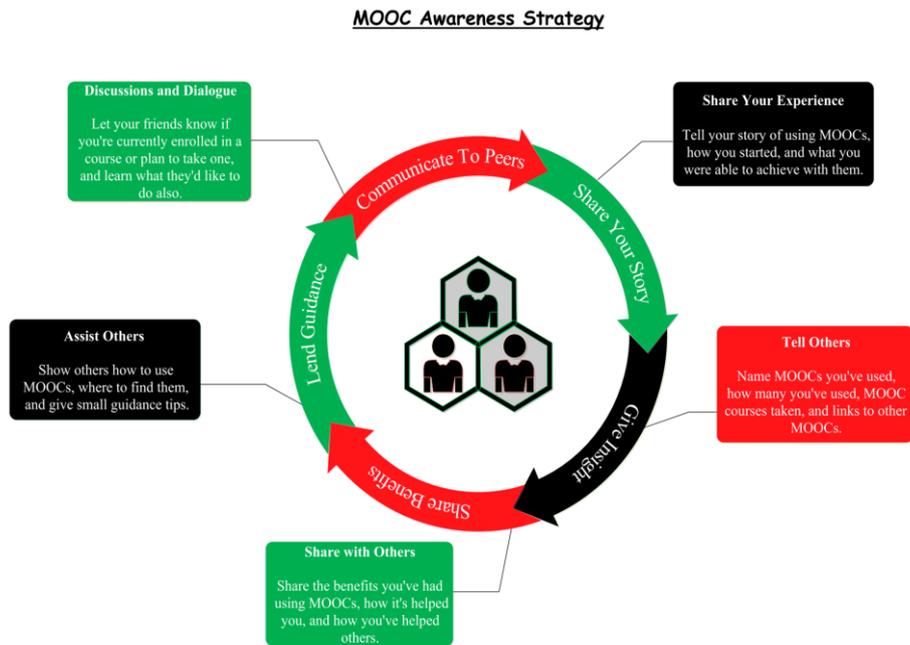


Fig. 2. Overview of proposed strategy to generate awareness of MOOCs.

The usage of MOOCs by participants in this study is significantly different from usage identified in the existing literature. Current literature found student's engage with MOOCs primarily to advance in a career or curiosity [9]. Participants in this study engage with MOOCs to overcome educational challenges or professional development. Students in this study use MOOCs as a vehicle of aid rather than a vehicle of luxury as other researchers suggest [8]. It appears that MOOCs, unintentionally, benefit more privileged individuals than less privileged ones, perpetuating disparities in both education and career advancement.

The perceived usefulness of MOOCs influenced engagement for all participants in this study, which can be explained by Davis's [12] Technology Acceptance Model. Once engaged, the perceived ease of use and attitude towards use was a positive experience. As participant 10 states, "I did a Khan Academy course, and I found out that the person who was teaching it was more proficient teaching Algebra than my actual teacher. So, I enjoyed that course." These experiences highlight benefits other underrepresented individuals could receive from MOOCs for educational advancement. Although MOOC adoption in this study is explained by Davis's [12] Technology Acceptance Model, it doesn't explain the difference in how participants in this study use MOOCs compared to users in existing literature. The Digital Divide is a framework

that can explain the difference in MOOC use by demographics and race. Wealthy white males, college-educated people under the age of 55 and those living in urban communities are more likely to be users of new technologies [14], such as MOOCs. These disparities are unjust given the benefits technology provided participants in this study. Equal distribution of educational resources and technology ought to be more than a research topic, it must become a reality to close the digital divide.

5.3 Comparative Analysis

Both tangible and intangible benefits were found from the use of MOOCs. Intangible benefits found in this study were consistent with existing research [3, 34], however, disparities with tangible benefits were found. Existing literature found five tangible benefits 1) gained credit towards an academic degree, 2) 87% of respondents report a new job found, 3) started a business, 4) received a pay increase, or 5) received a promotion [34]. This study found two tangible benefits 1) 100% of participants gained credit toward an academic degree, and 2) 10% received certifications. When race is considered, disparities are revealed. When the race is excluded, misrepresentation is heightened, and the validity of research findings are threatened. Race ought to be included in all MOOC research so that unseen disparities, as identified in this study, can be exposed and investigated. To close the digital divide, and truly understand the representative population of MOOCs users, race needs to be incorporated in all research efforts.

6. Limitations

The findings in this research raise many questions that should be investigated. Questions such as, what are the racial demographics of participants in citation leading MOOC literature? What variables influenced awareness of MOOCs for participants in existing MOOC research? What online learning platforms are individuals of high-income communities aware of? What variables influence awareness or lack of, online learning platforms for high-income individuals? How are online learning platforms used by individuals in high-income communities? These questions, which are planned to be investigated, could strengthen and further extend the findings of this research.

The sample size of participants recruited for this qualitative study is relatively small in comparison to existing quantitative MOOC literature. Additional participants for this research could strengthen the findings and central argument of the study. Furthermore, there's a relatively small number of qualitative MOOC studies to support this research, even less examine racial demographics. More qualitative approaches in MOOC literature would add strength and perspectives to this study.

7. Conclusion

This research has shown that educational achievement is 100% effective for African Americans that have used MOOCs. All participants achieved academic credit towards degrees, advanced in education, and enhanced skill development with MOOCs. Some

even achieved a professional certification. MOOCs proved to be extremely useful for all participants when they became aware of the technology.

The results from this research highlight important recommendations for education providers, economists, educational technology developers, even politicians, to equally distribute educational and technology resources, especially in low-income communities. Early exposure to MOOCs in such areas could promote educational advancement while raising socio-cultural awareness of educational technologies in the African American community, which could ultimately decrease disparities in both education and technology. With further investigation, these findings could offer MOOCs as a change agent towards increased equality and opportunities in both the educational and career landscape for African Americans.

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Appendix 1

Online Survey Questions

1) Have you ever enrolled in or participated in an online course, whether it is for credit or not?

Yes

No

IF YES, move on to the next section

IF NO, skip to end survey

2) What is your age?

17 or below

18 – 20

21 – 22

23 – 24

25 or older

IF between 18 - 24, move on to the next section

IF NO, skip to end survey

3) How important, if at all, is it to make an effort to learn new things in some different areas of life?

	Very Important	Somewhat Important	Not Too Important	Not Important At All
Their jobs				
Their hobbies or interests				
Things happening in society, such as developments in science, technology, entertainment, or culture				
Their local community				

4) Have you used any of the following online learning platforms? Check all that apply.

Udemy
Udacity
Khan Academy
Lynda
MOOC
Codecademy
Coursera

Other (Please Specify)

5) How long have you used any of the following online learning platforms? Check all that apply.

	Up to 3 months	3 - 6 months	6 - 9 months	9 months or more
Udemy				
Udacity				
Khan Academy				
Lynda				
MOOC				
Codecademy				
Coursera				
Other (Please Specify)				

6) How many online courses have you taken from the mentioned platform?

- 1 - 2
- 3 - 4
- 5 - 6
- 6 or more

7) What is the annual household income of your family?

- Less than \$10,000
- \$10,000 to \$19,000
- \$20,000 to \$29,000
- \$30,000 to \$39,000
- \$40,000 to \$49,000
- \$50,000 to \$59,000
- \$60,000 to \$69,000
- \$70,000 to \$79,000
- \$80,000 to \$89,000
- \$90,000 to \$99,000
- \$100,000 to \$149,000
- \$150,000 or more

8) How many people live in your household?

- 1 or less
- 2 - 3
- 4 - 5
- 6 or more

- 9) What is your ethnicity?
White/Caucasian
Black/African American
Asian/Pacific Islander
Hispanic/Non-White
Native
Other
- 10) Where are you from (City, State)?
Open Text
- 11) Where are you currently living (City, State)?
Open Text
- 12) What is your current academic status?
An undergraduate student at a university or college
A graduate student at a university or college
A community college student
None of the above
- 13) Are you currently enrolled as a full-time or part-time student?
Full time
Part-time
None of the above
- 14) What is your employment status?
Employed full-time
Employed part-time
Voluntarily
Not employed

Appendix 2

Recruitment Flyer

Have you taken online courses at Coursera, Udemy, Udacity, Lynda, or others? We want to hear your experiences!

Researchers at the Rutgers School of Communication and Information are studying the adoption and use of online learning platforms for personal development in young adults.

Have you taken online courses from any of existing online learning platforms, such as Khan Academy, Udemy, Udacity, Codecademy, Lynda, or other similar online learning platforms for more than 3 months? We would like to hear from you about your experiences of taking online courses!

If you are interested in sharing your experience, please complete the short survey here. Once you complete the survey, one researcher in our team will contact you to ask for participating in a follow-up interview. Anybody between 18-24 years of age, who uses an online learning platform for personal development, and is comfortable with written and oral English, is eligible to participate.

For more questions about the study, please contact Tyreek Huston at phone number (609) 284-2411 or trh61@scarletmail.rutgers.edu.

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Appendix 3

Interview Script

Awareness

1. From your survey results, it indicates that you are very familiar with ____ (Online Learning Platform) and use it. How did you hear about the platform?

Adoption

2. Why did you use it?
3. How did you start using the platform?

Overall Experience

4. What courses or modules have you taken so far?
 - a. Why have you taken those?
 - b. Did you have any difficulty finding the course?
 - c. How did you overcome them?

Decision Factors

5. What made you decide to take those courses?
6. From the courses that you have taken, would you have paid for them if they were not free?
 - a. Why
 - b. What price would you have paid for the courses if they were not free

Contextual Factors

7. From the courses you have taken, what devices have you used to access the course?
 - a. Why?
 - b. Is there a preference?
 - c. Where do you partake in the online learning courses?
 - i. Why?

Development Factors

8. What online courses are you currently taking?
 - a. Why?
9. From the courses mentioned, were there any benefits to taking the courses?
 - a. Can you explain them?
10. How does it contribute to your personal development?

Journey

11. Can you take me on a journey on and tell me how to go to (platform from survey response) and select the course you are interested in?