

## Exploratory study of MOOC learners' demographics and motivation: The case of students involved in groups

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### Abstract

This paper reports preliminary findings on students enrolled in a massive open online course, who were also assigned to work in groups. Part of a larger study on the effect of groups on retention and completion in MOOCs, the paper provides students' demographics (i.e., location, gender, education level, and employment status), and motivation for taking the course. Findings show that women outnumbered men and that students mostly enrolled into the course because of a friend. Indeed, research on MOOCs demonstrates that men outnumber women and that educational pursuit and professional development are the main motivators for taking MOOCs. Yet, this paper shows that when group work is included in a MOOC, women participate more. Furthermore, for students assigned to groups in a MOOC, friends are the principal incentive for enrolling into the course. These results are discussed in light of previous research, and implications for teaching and learning in online environments addressed.

**Keywords:** MOOCs; demographics; motivations; group learning; gender

### Introduction

Massive open online courses (MOOCs) are a recent trend in online or distance education, and research in this area is burgeoning. While some researchers argue that innovations such as MOOCs will disrupt higher education by causing some universities to disappear, or academic degrees to be replaced by MOOC completion certificates (Gregory, 2012; Schierenbeck, 2012), others contend that MOOCs do not present a threat to higher education sector (Kalman, 2014). In Kalman's (2014) view, the fact that MOOCs currently cannot reach and provide support to underprivileged students in developing countries illustrate MOOCs' inability to completely disturb higher education. In other words, MOOCs seem not diverse enough to include students from diverse background (e.g., education, gender, and employment).

Discussions on learners' demographics and motivations for taking a course have been to some extent covered in MOOC research (Despujol, Turro, Busqueis & Canero, 2014; Guo & Reinecke, 2014). Research shows that MOOCs attract diverse students from different countries (Despujol et al., 2014). However, studies addressing participants' demographics and reasons for enrolling in MOOCs integrating group work are rare. Understanding that MOOCs are "here to stay" (Cooper & Sahami, 2013), that group work positively affects performance and engagement in MOOCs (Kulkarni, Cambre, Kotturi, Bernstein & Klemmer, 2016), and that MOOC learners are inclined to collaboration (Li et al., 2014), this paper purposes to describe the characteristics of MOOC learners assigned to group work. Thus, identifying characteristics of learners engaged in group work, and their motivations for taking the course can add to the literature on group work in MOOCs and can also give insights into how to enhance learning experiences and meet the learning needs of MOOC students working in groups.

The following literature review is divided into two areas: (a) demographics of MOOC learners in terms of gender, employment status and level of education and (b) motivation for enrolling into MOOCs. Taken together, the literature provides a rationale for the main research questions: What

are the characteristics of students participating in a MOOC online group work (i.e., gender, education level, and employment status)? And what motivates participants in this study to take the course?

## Literature review

MOOC research shows that MOOC learners are diverse in terms of cultural background and country of origin, online experience, education level, employment status and in their reasons for enrolling in a MOOC (Dillahunt, Chen & Teasley, 2014; Guo & Reinecke 2014; Woodgate, Macleod, Scott & Haywood, 2015).

### MOOC learners' demographics

MOOC learners are in their vast majority college degree holders (Despujol et al., 2014; Ding et al., 2014) and employed (Macleod, Haywood, Woodgate & Alkhatnai, 2014; Dillahunt, Wang & Teasley, 2014). Indeed, Christensen et al. (2013) study reported that 83% of MOOC students have a post-secondary degree, 79.4% of students have a Bachelor's degree or higher and 44.2% indicated a level of education beyond a Bachelor degree.

With regard to gender, males often constitute the majority of learners (Davis et al., 2014). Christensen et al. (2013) research showed that 56.9% of participants were males; and 62.4% were employed full-time or self-employed, while 13% were unemployed or retired. Despujol et al. (2014) found similar results: 56% of participants in their study reported male as their gender and 44% indicated to be female. Dillahunt, Chen et al. (2014) also noted that most participants in their study comparing learners who could afford to those who could not afford higher education were male (68.65%). Additionally, this research revealed that individuals who said they could not afford higher education had in their majority a bachelor degree, indicating that MOOC learners are not diverse when it comes to educational background. It should be mentioned here that the authors did not offer information related to participants' employment status. Nevertheless, the authors revealed that individuals with some college degree or experience are the ones benefiting the most from MOOCs free access (Dillahunt, Chen et al., 2014). Christensen et al. (2013) equally discovered that learners in MOOCs are mostly males and employed. Nevertheless, studies discussing MOOC learners' employment status are scarce and this may be explained by the fact that MOOCs are still relatively new (Clow, 2013).

However, when addressing gender disparities, Macleod et al. (2014) sustained that gender differences are related to the type of course taught. In terms of gender representation, gender differences in traditional education courses are replicated in MOOCs (Macleod et al., 2014). In other words, courses, fields, or majors such as science, technology, engineering, and math where women are underrepresented in traditional education will experience the same gap in MOOCs.

### Motivation for enrolling

Learners frequently join a MOOC for educational pursuits, professional development, or to learn new things (Radford, Coningham & Horn 2015; Macleod et al. 2014). In their survey of MOOC students, Chang, Hung and Lin (2015) found that instructor's suggestions, development of professional skills, and the possibility to explore areas of interest also motivated learners to participate in MOOCs. Belanger and Thornton (2013), in a pre- and post-course survey of MOOC students' motivation for enrolling, identified the following: students enrolled to support lifelong learning or to gain an understanding of the subject matter with no specific completion or achievement expectations; students signed up for fun, entertainment, social experience and intellectual stimulation; students enrolled for convenience often because of barriers to traditional education options; and students also registered to explore or experience online education.

Investigating the reasons why students take MOOCs, Christensen et al. (2013) also revealed that advancing in a current job and curiosity were the main reasons explaining students' enrollment into MOOCs. However, the reason for joining MOOCs was also dependent on the type of course offered. For instance, 74.6% of students who took humanities courses (e.g., poetry, or music) were driven by curiosity and 11.9% took these courses to improve their job performance (Christensen et al., 2013). For the social sciences MOOCs, 54.1% enrolled to acquire skills to improve their job performance; half registered out of curiosity (Christensen et al. 2013). However, 39% of students who joined science, health science and math MOOCs did so to gain skills that will help them do their job better (Christensen et al., 2013).

Zhong, Zhang, Li and Liu (2016) bring a different perspective by studying Chinese learners. In this study of learners enrolled in a MOOC developed by a Chinese university, Zhong et al. (2016) found that participants (55%) mostly chose MOOC because it appeared interesting and a good way to obtain knowledge. Twenty seven percent selected their MOOC to gain new skills necessary for job search; and 85% mentioned the convenience of working at their own time and location (Zhong et al., 2016). While these results are in alignment with previous studies on MOOCs, learners also mentioned repeatability, which helps with understanding the content deeply (61% of participants), discussion forum (28% of participants), preference for MOOC over traditional classroom teaching (27% of participants), and visual effects of lectures (19% of participants) as motivations for enrolling in MOOCs (Zhong et al., 2016). Still, these studies on MOOC learners' motivation did not investigate the motivation of learners assigned to groups in MOOCs. Furthermore, unfamiliarity with online environments, preference for physical classroom, lack of face-to-face interactions, absence of real group discussion time, and fear of MOOCs operation were also identified in the literature as main reasons for not enrolling in a MOOC (Chang et al., 2015). Chang et al. (2015) study seems to suggest that creating groups, establishing interactions within MOOCs, and learners' familiarity with online environments can motivate students to participate in a MOOC.

Studies on the demographics and motivations of MOOC learners assigned to online group work are still in their infancy. To add to the literature, this exploratory study looked at the demographics of participants—who voluntarily participated in a MOOC course providing enrollees the opportunity to work in groups—in terms of location, gender, employment status, and education. The study also explored students' motivations for participating in this MOOC.

Drawing from the literature, participants were surveyed to understand if the characteristics of the population in this study focused on grouping students enrolled in this MOOC to assess group effect on persistence and retention, were similar to the characteristics identified in the literature. Based on the literature, the majority of participants in this study was expected to be from different countries, to hold a college degree, to be employed, and with more male students than female students since the course was cross-listed under engineering. Finally, it was also predicted that participants' primary motivations for taking the course will be related to educational pursuits, professional development, and job performance since the literature shows that learners in MOOCs register for lifelong learning purposes or to gain a better understanding of a topic. Additionally, literature also reports that students in MOOCs related to STEM often enroll to improve job performance and gain skills.

## Methods

### Participants

The data presented in this paper are derived from the pre-course survey of MOOC students enrolled in a course offered by the Pennsylvania State University through Coursera platform. The *Creativity, Innovation and Change* (CIC 2.0) was an eight week course, with a total enrollment of 150,317

(Jablokow, Matson & Velegol 2014). However, only findings from course enrollees who volunteered to be assigned to groups and who responded to the pre-course survey (655) are discussed in this paper.

### **Course description**

CIC 2.0 MOOC was delivered from September through October 2013, and listed under information, technology, design, business, management, engineering, education and social sciences on the Coursera platform (Jablokow et al., 2014). The course aim was to give students tools that could help them become creative and innovative in order to positively change the world (Jablokow et al., 2014). Students had to watch videos, complete quizzes, engage in forum discussions, write reflections, and collaborate using different social media tools outside of Coursera (Jablokow et al., 2014).

To recruit participants, an email was sent out to students in the CIC 2.0 MOOC inviting students to volunteer for a research study in which they would be placed into groups to enrich their MOOC experience (Hristova & Bayeck, 2015). However, prior to recruiting participants, permission for conducting the study was obtained from the internal review board of the institution where the study and analysis of data were performed. To form the CIC 2.0 MOOC groups, participants were asked to answer prior to the course different questions related to: demographic information and group preferences (e.g., groups based on language, intentions to complete, or time availability). Another item on the pre-course survey was to rank nine statements on how they would like to be grouped with others on a scale of one to nine to capture the importance of each statement (Hristova & Bayeck, 2015). Participants ranked statements such as the language that will be spoken in the group is one in which I'm fluent; ages of the group members are similar to mine; education level of the members (finished high school, some college, advanced degree; or gender (female or male only). This pre-course survey was delivered online via Qualtrics. Six hundred and fifty-five (655) pre-course surveys were completed. Yet, the current paper only presents findings on participants' location, education level, employment status, gender and motivation for enrolling into the course.

### **Data collection procedure and analysis**

To investigate participants' gender, employment status and education level, learners were asked the following questions on the pre-course survey: "*What is your gender? What is the highest level of school you have completed or the highest degree you have received? And what is your current employment status?*" Participants' location was identified by asking the following question: "*What country do you live in now?*" The motivation for enrolling into the course was assessed by asking participants to rate the importance of statements such as "*I am personally interested in taking a course from this particular institution, the skills from this course may be useful for obtaining a new job, or I am interested in connecting with other students interested in the topic*" when enrolling into the course. Participants rated these statements using "*important, not at all important, very important, moderately important and absolutely critical*". For analysis purposes, "*Important*" (i.e., important, very important, moderately important, and absolutely critical) and "*Not important*" (i.e., not at all important) will be used. Frequency analyses were performed using SPSS to answer the research questions.

## Findings and Discussion

### Participants' location

Participants in this study who completed the pre-course survey and joined this study where they were assigned to groups lived in 82 different countries (Figure 1). Specifically, 25.2% lived in China, while around 19% reported living in the United States during the study. Nearly 8.2% lived in India, close to 4% in Canada and Mexico. Two point four percent (2.4%) lived in Australia, and 2.3% lived in Brazil. Moreover, less than 1% of participants lived in countries such as Iran, Israel, and Denmark, while less than 2% lived in Nigeria, Egypt, France, and Germany. The diversity of participants in this study does not differ from prior findings on MOOC learners (Despujol et al., 2014; Ding et al., 2014).

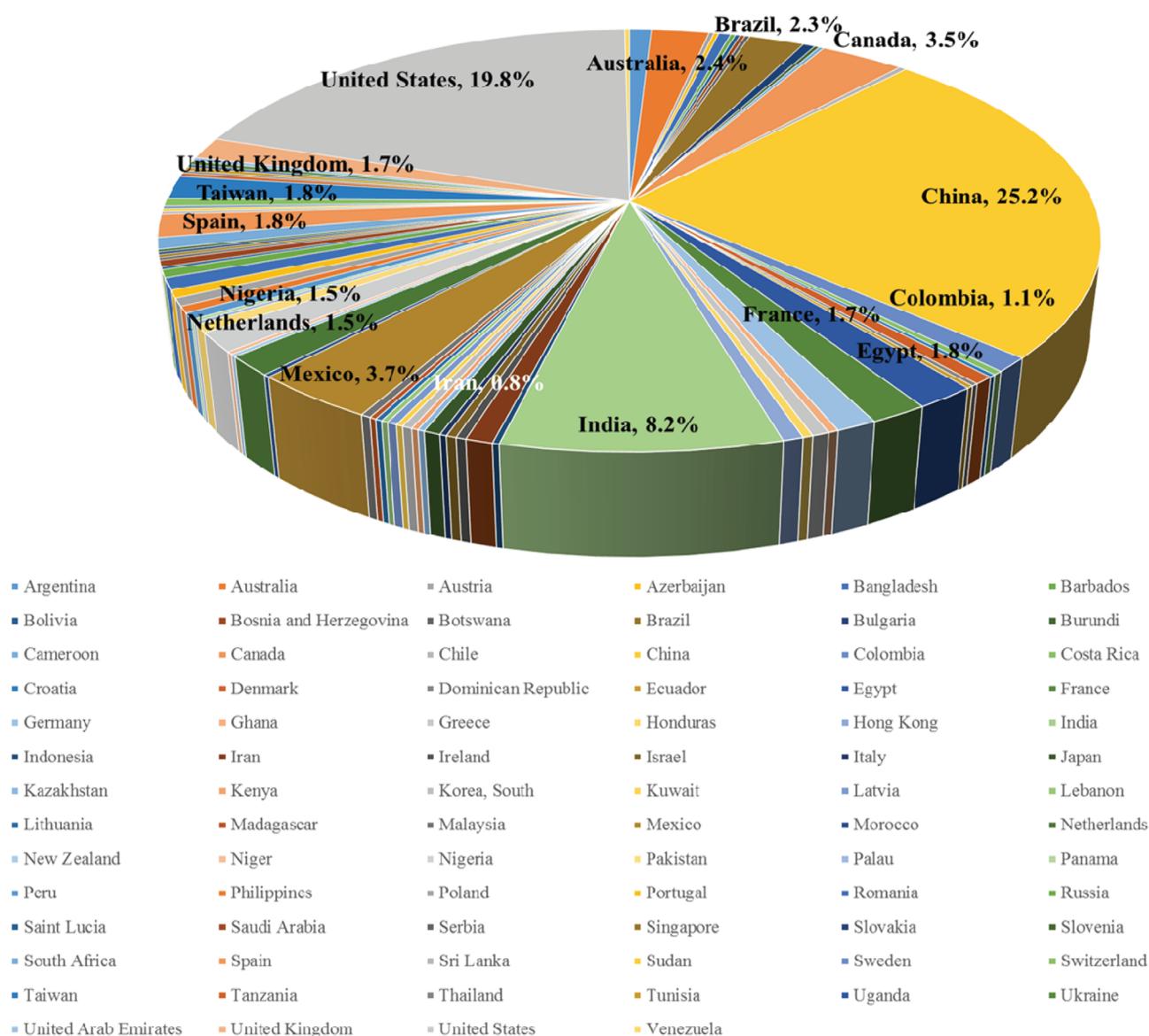
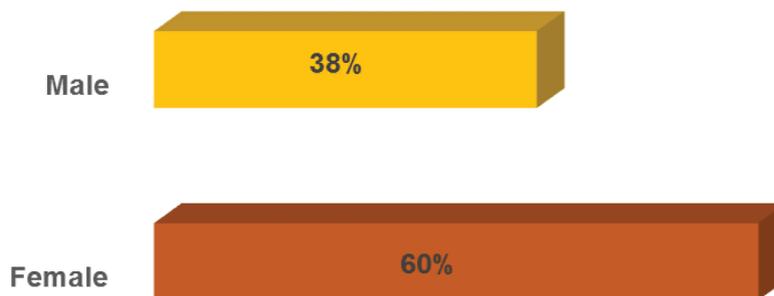


Figure 1: Participants by country

### **Participants' gender**

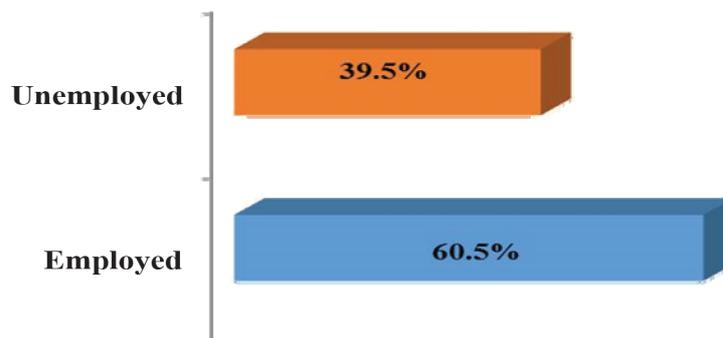
Although approximately 2% of participants chose not to respond to the question related to gender, females in this study form the majority of participants (60%) as shown in Figure 2. These results do not align with previous research demonstrating that male students generally constitute the majority of learners in MOOCs (Davis et al., 2014). However, the fact that women outnumbered men in our study may be explained by gender differences in collaboration pattern between men and women. Female students tend to prefer collaboration even in online settings (Johnson, 2011). The invite to participate in a course where they would be assigned to groups may then explain why women are more represented than men in this study. However, based on this result, it may also be assumed that collaboration (if group work is assimilated to collaboration) appeals more to women than men, which aligns with Chan, Huang, Hui, Li and Yu's (2013) findings on women preference for collaboration.



**Figure 2: Participants by gender**

### **Employment status**

Figure 3 shows that 39.5% of participants in this study were unemployed, while 60.5% were working. These results endorse the hypothesis of the study as well as Dillahunt, Wang et al. (2014) findings. In this regard, it may be argued that MOOCs fail to fulfill the goal of democratizing education by providing quality education to those who cannot economically afford quality education (Dillahunt, Wang et al., 2014).



**Figure 3: Participants by employment status**

### **Participants' education level**

Table 1 reveals that of the 655 participants in this study, 55.6% had an undergraduate degree or a degree below it; 31.5% had a graduate or professional degree, while 1.2% and 11.8% of learners

had either a primary level or high school level of education. These findings confirm the hypothesis of this study and previous literature on MOOC learners' education level. MOOC research indicates that college degree holders often make up the majority of MOOC learners (Despujol et al. 2014; Ding et al. 2014).

**Table 1: Results of participants' Education Level**

	Frequency	Percent	Cumulative Percent
Primary school	8	1.2	1.2
High school or below	77	11.8	13.0
Degree (undergraduate and below)	364	55.6	68.5
Degree (graduate and professional)	206	31.5	100.0
Total	655	100.0	

### **Motivation for taking the course**

Figure 4 displays the different reasons that motivated students in our study to enroll into this course. One of the greatest motivating factors for students was friends taking the course (99.7%). Professors teaching the course also encouraged students to enroll into the course (91.6%). 81.2% took the course because they wanted to use the skills they will acquire in the course, while 71.9% were driven by their job And 66.7% were stimulated by personal interests. The institution reputation (65.5%) and desire to connect with others (57.9%) appear to be other incentives for students to join in the course. These findings seem to suggest, in terms of importance, that taking the course with friends, professors teaching the course, acquiring skills, course relationship with the job, personal interest, the institution reputation, connecting with others interested in the topic, and earning credits are principal stimuli of respondents in this study. Participants' motivation for taking the course can be placed in these three main categories:

- Build relationships which includes the following reasons: friends and connect with others;
- Personal development category that contains acquiring skills, course related to job, earning credits, and personal interest;
- Reputation, which encompasses professors and institution.

These findings to some extent do not differ from previous studies that report skills development, exploration of areas of interest, and the desire to learn new concepts as motivating factors for learners to register in MOOCs (Chang et al., 2015). However, compared to other studies (Radford et al., 2015; Stokes, Towers, Jinks & Symington, 2015; Zhong et al., 2016), earning credits and the relationship with participants' program, which can be assimilated to educational pursuit in previous studies, are not as important as friends when it comes to stirring students to enroll into a MOOC. For instance, 53.7% were stimulated by the connection of the course to their program, but 79.5% did not enroll to earn credits. Additionally, these findings tend to suggest that friends have great influence on students' choice of course. The majority of students (99.7%) joined the course because of their friends. This finding (i.e., taking the course because of friends) may be explained by participants' location. Indeed, students living in China and the United States formed the majority of learners (Figure 1). Furthermore, this MOOC was translated in Chinese which may explain why the factor of "friends taking the course" appears as one of the top reasons for taking the course among

participants in our study. Therefore, it is likely that friends may have recommended or decided to take the similar course

Interestingly, researchers investigating the relationship between friends and college choice and/or experience described for example the relationship between friends' and education. Alvarado and López-Turley (2012) in their study found that the likelihood for Latinos and White students with college-oriented friends to apply to a four-year college or any college was high compared to students who did not have college-oriented friends. Friends do inform decisions about higher education institutions or potential schools, and courses selection (Brooks, 2003; Johnston, 2010; Alvarado & López-Turley, 2012). Although these studies were not related to MOOCs or other form of online education, they do shed some light on the findings of this study. These findings suggest that more research needs to be conducted to better understand the impact of friends on course choice and the influence friends may have on retention and performance in MOOCs and other type of online education.

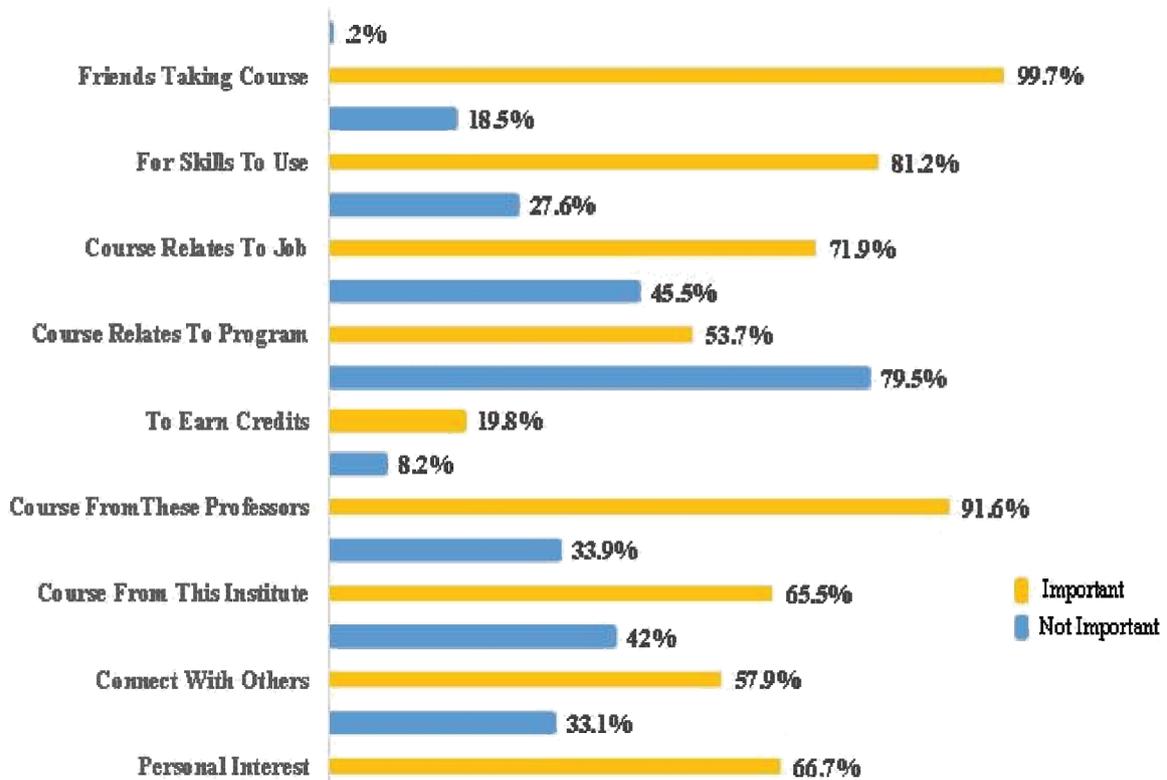


Figure 4: Importance of motivating factors

### Conclusions and Implications

Findings show a different trend in terms of gender differences in MOOC enrollments. Compared to previous studies, our findings indicate that women in this study surpassed men in number. The results suggest that group work/collaboration seems to appeal to women even though the course was listed as an engineering course. It may therefore be proposed that to attract more women and ensure their persistence in fields such as science, technology, engineering, and mathematics (STEM), group work as a teaching and learning strategy should be integrated in STEM courses. Indeed, research explains that the percentage of women in STEM field majors is low compared to

men's (Little & León de la Barra, 2009). Adding group work or collaborative work to other strategies designed to increase the percentage of women in STEM fields might be a plus for online and face-to-face learning environments.

The findings also indicate that even in this study on groups in a MOOC, the majority of students were college degree holders, with employment. In other words, college degree holders, and employed individuals are still the ones benefiting from MOOCs availability. To make instruction accessible to those who would not otherwise have access to high quality education, developers and MOOC providers might need to democratize MOOCs' distribution. For example, partnering with organizations (e.g., non-governmental organization, or community centers) that work with individuals in financial need might be an excellent approach to reach and attract low-income individuals. MOOC providers may use those organizations as centers individuals can visit to enroll into MOOCs and even take MOOC since this population does not always have access to the internet. The aforementioned strategy might make MOOCs more accessible to economically disadvantaged or non-college holder individuals. Engaging with governments around the world, specifically in emerging or developing countries might be another approach to making MOOCs accessible to masses.

Participants' primary motivation for taking this course was "friends taking the same course." Although previous studies revealed that professional and educational pursuits for example are among principal motivators for MOOC learners (Stokes et al., 2015; Radford et al., 2015), these results seem to signal the importance of friendship in MOOCs and other learning environments. While Belanger and Thornton (2013) did find that MOOC learners were also motivated by social experience, this study reveals the effect friends have on MOOC enrollment. Creating a friendly environment might be conducive for learning and affect motivation. For instance, Kember, Ho and Hong (2010) found that teacher's friendliness, among other factors, motivated students' learning. Furthermore, for MOOC and other online course developers, this may imply providing tools that can enhance and sustain friendship; tools that can encourage socialization in an online learning environment. Discussion forums are already used in MOOCs; but if the following definition of "friend" by the Thesaurus online dictionary is adopted: "a person attached to another by feelings of affection or personal regard", integrating tools that may allow for more privacy may be better than discussion forums. These findings may also suggest that course recruitment and/or advertisement strategies might need to change to include individuals and their friends. A community-type approach may be adopted by MOOC providers to target individual students but also their friends. Simply said, teachers, MOOC providers, or institutions may need to emphasize in their message to potential learners the following "*Tell your friends*", or "*Enroll with your friends*" in order to recruit individual students and their friends.

## Future Research

This paper adds to the literature on MOOCs by describing the demographics of MOOC learners who participated in study on groups in a MOOC and their motivations for taking the course. Although the study found that the percentage of female was greater than the percentage of male students, it will be interesting to examine the completion rate of female compared to male students. It will also be interesting to investigate the completion rate of participants who were motivated by friends taking the course to register into this MOOC in order to assess the effect of friends on completion rate for example. Finally, comparing participants engaged in groups with participants who worked individually in this MOOC in terms of demographics and motivations may give more insight into the relationship among group work, demographics, and motivations.

## References

- Alvarado, S. E., & López-Turley, R. N. (2012). College-Bound Friends and College Application Choices: heterogeneous effects for Latino and White Students. *Social Science Research*, 41(6), 1451–1468. <http://dx.doi.org/10.1016/j.ssresearch.2012.05.017>
- Belanger, Y., & Thornton, J. (2013). Bioelectricity: A quantitative approach Duke University's first MOOC. Duke University. Retrieved from [http://dukespace.lib.duke.edu/dspace/bitstream/handle/10161/6216/Duke\\_Bioelectricity\\_MOOC\\_Fall2012.pdf](http://dukespace.lib.duke.edu/dspace/bitstream/handle/10161/6216/Duke_Bioelectricity_MOOC_Fall2012.pdf)
- Brooks, R. (2003). Young people's higher education choices: the role of family and friends. *British Journal of Sociology of Education*, 24(3), 283–297. <http://dx.doi.org/10.1080/01425690301896>
- Chan, R. Y. Y., Huang, J., Hui, D., Li, S., & Yu, P. (2013). Gender differences in collaborative learning over online social networks: Epistemological beliefs and behaviors. *Knowledge Management & E-Learning (KM&EL)*, 5(3), 234–250. Retrieved from <http://www.kmel-journal.org/ojs/index.php/online-publication/article/view/264>
- Chang, R. I., Hung, Y. H., & Lin, C. F. (2015). Survey of learning experiences and influence of learning style preferences on user intentions regarding MOOCs. *British Journal of Educational Technology*, 46(3), 528–541. <http://dx.doi.org/10.1111/bjet.12275>
- Christensen, G., Steinmetz, A., Alcorn, B., Bennett, A., Woods, D., & Emanuel, E. J. (2013). The MOOC Phenomenon: Who Takes Massive Open Online Courses and Why? *Social Science Research Network Journal*. <http://dx.doi.org/10.2139/ssrn.2350964>
- Clow, D. (2013). MOOCs and the funnel of participation. In *Proceedings 3rd International Conference on Learning Analytics and Knowledge (LAK '13)*, New York (pp. 185–189).
- Cooper, S., & Sahami, M. (2013). Reflections on Stanford's MOOCs. *Communications of the ACM*, 56(2), 28–30. <http://dx.doi.org/10.1145/2408776.2408787>
- Davis, H. C., Dickens, K., Leon Urrutia, M., Vera, S., del Mar, M., & White, S. (2014). MOOCs for Universities and learners an analysis of motivating factors. In *6th International Conference on Computer Supported Education*. Retrieved from <http://eprints.soton.ac.uk/363714/1/DavisEtAl2014MOOCsCSEDUFinal.pdf>
- Despujol, I. M., Turro, C., Busqueis, J., & Canero, A. (2014). Analysis of demographics and results of student's opinion survey of a large scale MOOC deployment for the Spanish speaking community. In *Proceedings of Frontiers in Education Conference* (pp. 1–8). Madrid, Spain: IEEE. Retrieved from [http://ieeexplore.ieee.org/xpls/abs\\_all.jsp?arnumber=7044102](http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=7044102)
- Dillahunt, T., Chen, B., & Teasley, S. (2014, March). Model thinking: demographics and performance of MOOC students unable to afford a formal education. In *Proceedings of the first ACM conference on Learning@ scale conference* (pp. 145–146). New York, NY, USA: ACM
- Dillahunt, T. R., Wang, B. Z., & Teasley, S. (2014). Democratizing higher education: Exploring MOOC use among those who cannot afford a formal education. *International Review of Research in Open and Distance Learning*, 15(5). Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/1841>
- Ding, Y., Wang, M., He, Y., Ye, A., Yang, X., Liu, F., & Wei, L. (2014). "Bioinformatics: Introduction and methods," a bilingual massive open online course (MOOC) as a new example for global bioinformatics education. *Plos Computational Biology*, 10(12), e1003955. <http://dx.doi.org/10.1371/journal.pcbi.1003955>
- Gregory, M. A. (2012, October 10). MOOC and you're out of a job: Uni business models in danger. *The Conversation*. Retrieved from <http://theconversation.com/mooc-and-youre-out-of-a-job-uni-business-models-in-danger-9738>
- Guo, P. J., & Reinecke, K. (2014). Demographic differences in how students navigate through MOOCs. *Proceedings of the First ACM Conference on Learning @ Scale* New York, NY: ACM (pp. 21–30).

- Hristova, A., & Bayeck, R. Y. (2015, March 08–13). Exploring the relation between women work in MOOC groups. Paper presented at the *Comparative International Education and Society conference: Ubuntu! Imagining a humanist education globally*, Washington, D.C.
- Jablokow, K., Matson, J., & Velegol, D. (2014). A multidisciplinary MOOC on creativity, innovation, and change: Encouraging experimentation and experiential learning on a grand scale. In *Proceedings of the ASEE 2014 Annual Conference & Exposition* (Paper #9669). Retrieved from <https://www.asee.org/papers-and-publications/papers>
- Johnson, R. (2011). Gender differences in E-learning: Communication, social presence, and learning outcomes. *Journal of Organizational and End User Computing*, 23(1), 79–94. <http://dx.doi.org/10.4018/joeuc.2011010105>
- Johnston, T. C. (2010). Who And What Influences Choice Of University? Student and University Perceptions. *American Journal of Business Education*, 3(10), 15–23. <http://dx.doi.org/10.19030/ajbe.v3i10.484>
- Kalman, Y. M. (2014). A race to the bottom: MOOCs and higher education business models. *Open Learning*, 29(1), 5–14. <http://dx.doi.org/10.1080/02680513.2014.922410>
- Kember, D., Ho, A., & Hong, C. (2010). Characterising a teaching and learning environment capable of motivating student learning. *Learning Environments Research*, 13(1), 43–57. <http://dx.doi.org/10.1007/s10984-009-9065-8>
- Kulkarni, C., Cambre, J., Kotturi, Y., Bernstein, M. S., & Klemmer, S. (2016). Talkabout: Making Distance Matter with Small Groups in Massive Classes. *Design Thinking Research*, 67–92. [http://dx.doi.org/10.1007/978-3-319-19641-1\\_6](http://dx.doi.org/10.1007/978-3-319-19641-1_6)
- Li, N., Verma, H., Skevi, A., Zufferey, G., Blom, J., & Dillenbourg, P. (2014). Watching MOOCs together: Investigating co-located MOOC study groups. *Distance Education*, 35(2), 217–233. <http://dx.doi.org/10.1080/01587919.2014.917708>
- Little, A. J., & León de la Barra, B. A. (2009). Attracting girls to science, engineering and technology: An Australian perspective. *European Journal of Engineering Education*, 34(5), 439–445. <http://dx.doi.org/10.1080/03043790903137585>
- Macleod, H., Haywood, J., Woodgate, A., & Alkhatnai, M. (2014). Emerging patterns in MOOCs: Learners, course designs and directions. *TechTrends*, 59(1), 56–63. <http://dx.doi.org/10.1007/s11528-014-0821-y>
- Radford, A. W., Coningham, B., & Horn, L. (2015). MOOCs: Not just for college Students—How organizations can use MOOCs for professional development. *Employment Relations Today*, 41(4), 1–15. <http://dx.doi.org/10.1002/ert.21469>
- Schierenbeck, C. (2012). Disruptive Innovations in higher education. *Fixing Higher Education*, 51–65. [http://dx.doi.org/10.1007/978-3-658-00213-8\\_4](http://dx.doi.org/10.1007/978-3-658-00213-8_4)
- Stokes, C. W., Towers, A. C., Jinks, P. V., & Symington, A. (2015). Discover dentistry: Encouraging wider participation in dentistry using a massive open online course (MOOC). *British Dental Journal*, 219(2), 81–85. <http://dx.doi.org/10.1038/sj.bdj.2015.559>
- Woodgate, A., Macleod, H., Scott, A., & Haywood, J. (2015). Differences in online study behaviour between sub-populations of mooc learners. *Educacion xx1*, 18(2), 147–163. <http://dx.doi.org/10.5944/educXX1.13461>
- Zhong, S.-H., Zhang, Q.-B., Li, Z.-P., & Liu, Y. (2016). Motivations and Challenges in MOOCs with Eastern insights. *International Journal of Information and Education Technology*, 6(12), 954–960. <http://dx.doi.org/10.7763/ijiet.2016.v6.824>