Do MOOC Conversations Matter? Investigating the Role of Social Presence and Course-Relevant Discussion in Career Advancement

Shruti Mehta
Graduate School of Education,
University of Pennsylvania,
Philadelphia, PA, US
shrmeh@upenn.edu

Namrata Srivastava
Department of Computer Science,
Vanderbilt University,
Nashville, TN, US
namrata.srivastava@vanderbilt.edu

Xiner Liu
Graduate School of Education,
University of Pennsylvania,
Philadelphia, PA, US
xiner@upenn.edu

Kirk Vanacore
Learning Sciences and Technologies,
University of Pennsylvania,
Worcester, MA, US
kirk.vanacore@gmail.com

Ryan S. Baker
Graduate School of Education,
University of Pennsylvania,
Philadelphia, PA, US
ryanshaunbaker@gmail.com

Abstract

While MOOCs have been widely studied in terms of student engagement and academic performance, the extent to which engagement within MOOCs predict career advancement remains underexplored. Building on prior work, this study investigates how participation in discussion forums, specifically social presence and the use of course-relevant keywords, affects career advancement. Using GPT-assisted content analysis of forum posts, we assess how these engagement factors relate to both achievement during the course and post-course career advancement. Our findings indicate that social presence and use of course-relevant keywords has a positive relationship with course achievement during the MOOC. However, no significant relationship was found between career advancement and either social presence or course-related keywords in discussion forums. These findings suggest that while active engagement in MOOC discussion forums enhances academic achievement, it might not directly translate into career advancement, highlighting a possible disconnect between learning participation in MOOCs and professional outcomes.

CCS Concepts

• Applied computing → E-learning• Social and professional topics → Adult education

Keywords

career advancement, social presence, course-relevant keywords

1 Introduction

Massive Open Online Courses (MOOCs) are a widely accessible platform for learners seeking to acquire new skills and advance their careers. Over the past decade, research has primarily focused on academic performance, course completion rates, and learner interaction in discussion forums [1, 8]. However, limited studies have explored the connection between learner engagement during the course and subsequent career advancement after completion.

One study by [26] explored this relationship by analyzing discussion forum interactions (such as reading posts, posting messages, responding, and upvoting or downvoting) and their relationship to career progression [26]. While their findings provided valuable insights into how learners' overall participation in online discussion forums influences their career advancement within the same field as the MOOC, they did not explore how the content of posts by learners can be associated with career advancement.

Building on [26], our study explores how the content of discussion forum posts relates to career advancement. Specifically, we focus on two aspects of discussion forum interaction: a) social presence, which refers to students' ability to actively engage and interact within an online learning community [17], and b) course-relevant interaction, using keywords from the course materials in discussion posts. Including these keywords may demonstrate on-task learning by reflecting a deeper understanding of the course content [23, 28].

Prior research has linked social presence to course completion and grades in online courses, but its relationship with career advancement remains less understood [17, 21].

Additionally, course-relevant keywords in discussion forum posts may indicate cognitive engagement and the degree to which the discourse and vocabulary in an academic discipline is internalized [20, 23]. Therefore, we hypothesized that both higher social presence and higher use of course-relevant keywords are associated with post-course career advancement within the same field as the MOOC. In line with this objective, this study seeks to answer the following research questions:

> RQ 1. Are learners' social presence and use of course-relevant keywords in MOOC discussion forums associated with course achievement?
>
> RQ 2. Is the content of discussion forum posts associated with post-MOOC career advancement?

To address the first research question, we replicate study by [17] on social presence and course achievement in online courses and extend the exploration in the context of MOOCs. For the second, we build on the work by [26]-leveraging the data set of career advancers they identified -and explore if social presence and course-relevant discussions in forums are linked to career advancement.

2 Related Work

While performance and interaction within MOOCs have been extensively studied, fewer studies have examined their relationship with learners' future career outcomes [7, 26, 27]. [7] found participation in MOOCs leads to better employment retention but does not affect wages. [26, 27] explored career advancement among learners through their participation in communities of practice, including conference paper submissions and memberships in professional societies related to the course domain. Career advancers demonstrated greater course performance and higher engagement, completing the course at higher rates and interacting more with pages, videos, and assignments than other learners. [26] found that while career advancers read the forum, they were less likely to post, comment or vote than their peers. Although [26] analyzed learners' discussion forum interactions using log data, they did not examine the content of discussion forum posts or the relationship between discussion forum interactions and course achievement. Since discussion forums serve as a critical space for interaction and collaboration in MOOCs, analyzing learners' social interaction in closer detail could offer further insights into post-course career advancement [17, 25]. Specifically, exploring learners' social presence and the use of course-relevant keywords in discussion posts may provide a meaningful lens to understand career advancement from MOOCs.

Previous work has shown that social presence in online learning environments serves as a predictor of academic performance, and course retention [18, 21]. [17] examined the relationship between indicators of social presence and academic performance and found certain indicators to be significant predictors of final grades. However, the relationship between indicators of social presence and post-course career advancement has not been explored. Like social presence, cognitive engagement in MOOCs can also be assessed through the use of course-relevant keywords in discussion forum posts [23]. These keywords indicate engagement with course content and facilitate domain-specific knowledge sharing [25, 29].

3 Method

3.1 Study Context and Participants

This study used data from the first iteration of Big Data in Education MOOC (BDEMOOC) delivered via Coursera. The data was accessed via MORF platform [2, 13]. Researchers have previously used BDEMOOC to study learner motivation, course completion, and identifying student cohesion patterns, among others [9, 26, 30].

The first iteration of the MOOC enrolled 55,180 learners. Among them, 153 learners later published a paper either in the International Conference on Educational Data Mining (EDM) or the Learning Analytics & Knowledge (LAK) conferences. Additionally, 35 learners joined the International Educational Data Mining Society within two years of completing the first iteration of the course in 2013. These variables were manually distilled in a prior work on this data set [26].

3.2 Operationalization and Coding- Social Presence and Course-Relevant Keywords

We examined the relationship between the content of discussion forum posts and career advancement, focusing on social presence and use of course-relevant technical keywords. In doing so, we adopted the definition of social presence from [17], where social presence refers to students' ability to interact, communicate, and establish meaningful connections with peers and instructors within an online learning community. We omitted two codes used by [17] --the "quoting from others' messages" category because this coding category referred to the use of a specific quotation feature that was not available in BDEMOOC. The second code, "referring explicitly to others' messages" was not found in our dataset in sufficient numbers to merit inclusion.

Each discussion post was labeled with a binary value (0 or 1) for the remaining social presence indicators. We measured social presence at the learner level by summing the total number of indicators across all learner posts. A post was classified as course-relevant if it contained terms specific to the field of Educational Data Mining (EDM), including concepts such as learning analytics, predictive modeling, and student behavior analysis. These keywords were selected based on their alignment with the topics covered in the first iteration of the MOOC [3]. Each post was coded for the presence of course-relevant keywords using a binary scale (0 or 1), which was then aggregated across all forum posts at the learner level. We qualitatively coded a total of 3,109 forum posts and student comments, excluding posts written by teaching assistants and instructors. Before humans coded the data, we de-identified the posts using OpenAI GPT-4o, as many posts contained sensitive information such as learner names, locations, social media links, and other personally identifying information (PII) [24].

To ensure coding reliability, two human coders independently coded a sample of 100 posts, selected at random from the full dataset. Inter-rater reliability (IRR) between human coders was established. For each code, the coders reached a Cohen's kappa (κ) greater than 0.70.

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Table 1: Social Presence Indicators and their Definitions in the GPT Prompt

Indicators	Human-GPT κ	Construct Definitions (part of the GPT Prompt)
Affective Expression	0.75	Recognize and respond to both conventional emotional expressions (e.g., 'I am excited', 'I am confused with these questions too') and unconventional ones (e.g., '....', '!!', 'I was so confused....', 'Yay!', 'WOW WOW WOW, thank you so much!', or 'I can't believe it!! :(') , including the use of repetition, exaggerated punctuation, capitalization, and emoticons like ':)' or ';)', adapting your response accordingly.
Self-Disclosure	0.89	Presents details of life outside of class for example workplace or profession. Examples including but not limited to -or expresses vulnerability e.g. 'I am a student', 'I am a professor',' I found R hard to use', 'I am lazy'"
Asking questions	0.88	Students ask questions of other students or the moderator.
Complementing, Expressing appreciation	0.70	Complimenting others or contents of other messages. Examples include but not limited to: 'I appreciate your help', 'Great question'.
Expressing agreement	0.82	Agreeing with other people or content of others' messages or agreeing to similarity in experience. Examples including but not limited to: 'That makes sense', 'That is true', 'I got the same answer'
Vocatives	0.75	Addressing or referring to participants by name. This may occur when a post replies to another person or expresses gratitude to another person\'s help or requesting help from others, as long as the post needs to contain a person\'s name (everyone, anyone, does not count) but not as a signature.
Addresses refers to the group using inclusive pronouns	0.70	A post that addresses the group (participants in the course/discussion forum) using inclusive language such as 'we,' 'us,' 'our,' or 'group'
Phatic & Solutions	0.70	Communication that serves a purely social function, greetings, closures. Self-introduction posts (including information about where they are from (their nationalities), where they are living, and why they are taking the course) should be coded as 0. Posts expressing why they love the course or asking homework questions should also be coded as 0.
Use of Humor	0.74	The use of teasing, playful expression, cajoling, irony, understatements, and sarcasm.
Continuing a thread	---	---
Course-relevant keywords	0.76	Course-relevant terms and concepts related to Educational Data Mining. Include words and phrases associated with topics like classifiers, predictive modeling, machine learning, model evaluation and validation (e.g. Kappa), ...[complete prompt in the Digital Appendix][31] -

The coders then conducted social moderation to resolve all disagreements and reach full consensus. Given the size of the dataset, the human-coded results served as the ground truth dataset for training and evaluating GPT-4o coding performance, which, once validated, was applied to automatically code the remaining posts [11, 16].

Then, we employed both zero-shot and few-shot learning approach with GPT-4o API to automate the qualitative coding process [4]. We first applied a zero-shot approach across all constructs, used default hyperparameter settings, and set the temperature to 0 to control for variability in the output [22]. We then examined whether incorporating additional examples in the prompt would improve the accuracy of the model's output.

Further, we calculated a κ between ground truth labels and GPT output for each prompting method. For each indicator, we selected the prompt that yielded the highest κ and produced consistent results across three runs, with no more than five variations in the output. After GPT reached κ>0.70 with human coders on all indicators, we proceeded to code the full dataset with verified prompts [4, 11].

We coded the "continuing a thread" indicator separately using a Python script, since the raw data included information indicating whether a post was a reply to an existing thread. We assigned a value of 1 for learners who made posts to an already existing thread. Table 1 provides an overview of the social presence indicators and construct definition used as a part of the prompts for training a GPT model for coding indicators of social presence and course-relevant keywords.[1]

3.3 Analysis

To examine the relationship between learner interaction in discussion forums with course achievement and career advancement, this study first attempted to replicate the findings of [17], who identified specific indicators of social presence, such as continuing a thread, complimenting, and expressing appreciation, as significant predictors of academic performance in MOOCs.

Following their methodology, we computed Spearman's correlation between cumulative social presence score and numerical course grades, to replicate their analysis. Additionally, correlations between individual social presence indicators and course grades were analyzed. To account for multiple testing (11 tests in total), we applied the Benjamini-Hochberg alpha correction [5]. Further, spearman's correlation was calculated to study the relationship between the cumulative use of course-relevant keywords across discussion posts and course grades.

To investigate the role of social presence and use of course-relevant keywords in discussion forums as a potential predictor of career advancement, we conducted a series of logistic ridge regression models. Logistic regression was selected due to the binary nature of the predicted variable (career advancer) [14]. Ridge regression was applied to account for the low prevalence of the predictor variable by incorporating a penalty term (λ) in the regression model to prevent overfitting [10].

We developed three logistic ridge regression models to analyze factors influencing career advancement. Model 1 examined the cumulative measure of social presence as a predictor of career advancement. Model 2 explored the use of multiple individual social presence indicators and career advancement. Model 3 investigated the association of using course-relevant keywords on career advancement.

For all three models, students' total number of posts was included as a covariate because we wanted to estimate the association between social presence and course-related key terms above and beyond participation.

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[1] The codebook and prompt are in Digital Appendix [31]

The optimal λ value for ridge regression was determined through ten-fold cross-validation for each model [10]. Bootstrapping was employed to estimate coefficient distributions, standard error, confidence intervals and p-values. All logistic regression analyses were conducted using the *glmnet* (v1.1–12) package in R [12, 15], with p-values for fixed effects estimated using *lmerTest* (v2.0–33) [19]. Bootstrapping procedures were implemented using the *boot* package [6].

4　Results

Out of the 55,180 participants in the MOOC, only 748 learners posted in the discussion forums. Among all participants, 168 learners experienced post-course career advancement in the same field as the course. However, only 15 of those 168 career advancers had participated in the discussion forums.

4.1　Relationship between Social Presence, Course-relevant keywords and Course Grades

For 748 participants in discussion forums, we found a positive correlation between overall social presence and course grades (ρ= 0.389), replicating the findings of [17]. Among the indicators of social presence, the strongest positive correlations with course grades were found for: continuing a thread (ρ=0.387), asking questions (ρ=0.339), and complimenting or expressing agreement (ρ=0.328). Further, a positive correlation was found between the use of course-related keywords and final course grades (ρ=0.305). Correlations between social presence, course relevant keywords and course grades are presented in Table 2.

Table 2: Correlations --Final grade with social presence and course relevant keywords

Predictors	Spearman's Rho	P value	Adj. Alpha
Social Presence (*cumulative*)	**0.389**	**<.001**	**0.018**
Continuing a thread	0.387	<.001	0.0005
Expressing agreement	0.224	<.001	0.036
Use of humor	0.161	<.001	0.045
Addresses or refers to the group using inclusive pronouns	0.216	<.001	0.0041
Asking questions	0.339	<.001	0.009
Affective expression	0.276	<.001	0.027
Self-disclosure	0.286	<.001	0.023
Vocatives	0.269	<.001	0.032
Complimenting, expression appreciation	0.328	<.001	0.014
Phatic, salutations	0.125	<.001	0.05
Course-relevant keywords (*cumulative*)	**0.305**	**<.001**	-

4.2　Social Presence, Technical Keywords and Career Advancement

All 15 career advancers who participated in the discussion forums demonstrated social presence through their contributions. However, social presence was not a significant predictor of career advancement. Results of the logistic ridge regression model with social presence (β = 0.0002, 95% CI [-0.0001,0.0006], *p* = 0.512) and post count (β = 0.0001, CI [-0.0001,0.0004], *p* = 0.630) as predictors indicate that the relationships between these variables and the career advancement may not be strong enough to draw definitive conclusions. Similar results were found with individual indicators of social presence predicting career advancements with p values > .05. (Full results in digital appendix).

For regression predicting career advancement and the use of technical keywords, we found that use of technical keywords (β = 0.0001, 95% CI [-0.0001,0.0005], *p* = 0.415) in discussion posts did not predict career advancement. The covariate post count (β = 0.0001, CI [-0.0001,0.0004], *p* = 0.633) also did not significantly predict the outcome.

5　Discussion and Conclusion

Our findings support prior work showing that social presence in discussion forums is a significant predictor of course achievement, as measured by students' grades [17]. However, we did not find evidence that the influence of social presence extends to post-course career advancement. This suggests that the social interactions have limited impact, that may not extend to distal career outcomes. Additionally, career advancement is likely influenced by other external factors –such as industry trends, individual motivation, personal goals, and social support networks – that are beyond the scope of this study. The lack of significant findings could also be attributed to the small number of advancers compared to non-advancers, and the small proportion of advancers who accessed the discussion forum at all, suggesting the need for future studies with larger overall samples and balanced group sizes. Similarly, we found that the use of course-relevant keywords in discussion posts did not have any measurable effect on career advancement. While the integration of discipline-specific terminology may enhance academic discourse [20, 23, 28], and is associated with better grades within our data, we found no evidence that it contributes to career development after the course. Overall, these findings suggest that while fostering social presence and domain-specific discussions in online forums may support academic success, they may not independently drive post-course career progression. Future research could explore additional mediating or moderating factors such as individual motivation and social support to better understand the link between MOOC engagement and career development. However, a necessary step will be to replicate this analysis with a larger sample -a challenging task given the effort involved in identifying career advancers [26].

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References

[1] Omaima Almatrafi and Aditya Johri. 2019. Systematic Review of Discussion Forums in Massive Open Online Courses (MOOCs). *IEEE Trans. Learning Technol.* 12, 3 (July 2019), 413–428. https://doi.org/10.1109/TLT.2018.2859304

[2] Ryan Baker, Stephen Hutt, Michael Mogessie, and Haripriya Valayaputtar. 2022. Research Using the MOOC Replication Framework and E-TRIALS. In *2022 IEEE Learning with MOOCS (LWMOOCS)*, September 29, 2022. IEEE, Antigua Guatemala, Guatemala, 131–136. https://doi.org/10.1109/LWMOOCS53067.2022.9927934

[3] Ryan S. Baker, Yuan Wang, Luc Paquette, Vincent Aleven, Octav Popescu, Jonathan Sewall, Carolyn Rosé, Gaurav Singh Tomar, Oliver Ferschke, Jing Zhang, Michael J. Cennamo, Stephanie Ogden, Therese Condit, José Diaz, Scott Crossley, Danielle S. McNamara, Denise K. Comer, Collin F. Lynch, Rebecca Brown, Tiffany Barnes, and Yoav Bergner. 2016. EDUCATIONAL DATA MINING: A MOOC EXPERIENCE. In *Data Mining and Learning Analytics* (1st ed.), Samira ElAtia, Donald Ipperciel and Osmar R. Zaïane (eds.). Wiley, 55–66. https://doi.org/10.1002/9781118998205.ch4

[4] Amanda Barany, Nidhi Nasiar, Chelsea Porter, Andres Zambrano, Alexandra Andres, Dara Bright, Mamta Shah, Xiner Liu, Sabrina Gao, Jiayi Zhang, Shruti Mehta, Jaeyoon Choi, Camille Giordano, and Ryan Baker. 2024. *ChatGPT for Education Research: Exploring the Potential of Large Language Models for Qualitative Codebook Development.*

[5] Yoav Benjamini and Yosef Hochberg. 1995. Controlling the false discovery rate: a practical and powerful approach to multiple testing. *Journal of the Royal statistical society: series B (Methodological)* 57, 1 (1995), 289–300.

[6] Angelo Canty and Brian Ripley. 2017. Package 'boot.' *Bootstrap Functions. CRAN R Proj* (2017).

[7] Jonatan Castaño-Muñoz and Margarida Rodrigues. 2021. Open to MOOCs? Evidence of their impact on labour market outcomes. *Computers & Education* 173, (November 2021), 104289. https://doi.org/10.1016/j.compedu.2021.104289

[8] Carleton Coffrin, Linda Corrin, Paula De Barba, and Gregor Kennedy. 2014. Visualizing patterns of student engagement and performance in MOOCs. In *Proceedings of the Fourth International Conference on Learning Analytics And Knowledge*, March 24, 2014. ACM, Indianapolis Indiana USA, 83–92. https://doi.org/10.1145/2567574.2567586

[9] Scott Crossley, Mihai Dascalu, Danielle S McNamara, Ryan Baker, and Stefan Trausan-Matu. 2017. Predicting success in massive open online courses (MOOCs) using cohesion network analysis. . Philadelphia, PA: International Society of the Learning Sciences.

[10] Sam Doerken, Marta Avalos, Emmanuel Lagarde, and Martin Schumacher. 2019. Penalized logistic regression with low prevalence exposures beyond high dimensional settings. *PLoS ONE* 14, 5 (May 2019), e0217057. https://doi.org/10.1371/journal.pone.0217057

[11] Brendan Eagan, Jais Brohinsky, Jingyi Wang, and David Williamson Shaffer. 2020. Testing the reliability of inter-rater reliability. In *Proceedings of the Tenth International Conference on Learning Analytics & Knowledge*, March 23, 2020. ACM, Frankfurt Germany, 454–461. https://doi.org/10.1145/3375462.3375508

[12] Jerome Friedman, Trevor Hastie, and Robert Tibshirani. 2010. Regularization Paths for Generalized Linear Models via Coordinate Descent. *J. Stat. Soft.* 33, 1 (2010). https://doi.org/10.18637/jss.v033.i01

[13] Josh Gardner, Christopher Brooks, Juan Miguel Andres, and Ryan Baker. 2018. Replicating MOOC predictive models at scale. In *Proceedings of the Fifth Annual ACM Conference on Learning at Scale*, June 26, 2018. ACM, London United Kingdom, 1–10. https://doi.org/10.1145/3231644.3231656

[14] Jenine K Harris. 2021. Primer on binary logistic regression. *Fam Med Com Health* 9, Suppl 1 (December 2021), e001290. https://doi.org/10.1136/fmch-2021-001290

[15] Trevor Hastie and Junyang Qian. 2014. Glmnet vignette. *Retrieved June* 9, 2016 (2014), 1–30.

[16] Leslie Rupert Herrenkohl and Lindsay Cornelius. 2013. Investigating Elementary Students' Scientific and Historical Argumentation. *Journal of the Learning Sciences* 22, 3 (July 2013), 413–461. https://doi.org/10.1080/10508406.2013.799475

[17] S. Joksimović, D. Gašević, V. Kovanović, B. E. Riecke, and M. Hatala. 2015. Social presence in online discussions as a process predictor of academic performance. *Computer Assisted Learning* 31, 6 (December 2015), 638–654. https://doi.org/10.1111/jcal.12107

[18] Ines Kožuh, Zoran Jeremic, Andrej Sarjaš, Julija Bele, Vladan Devedzic, and Matjaž Debevc. 2015. Social Presence and Interaction in Learning Environments: The Effect on Student Success. *Educational Technology & Society* 18, (January 2015), 223–236.

[19] Alexandra Kuznetsova, Per B. Brockhoff, and Rune H. B. Christensen. 2017. **lmerTest** Package: Tests in Linear Mixed Effects Models. *J. Stat. Soft.* 82, 13 (2017). https://doi.org/10.18637/jss.v082.i13

[20] Jean Lave and Etienne Wenger. 1991. *Situated Learning: Legitimate Peripheral Participation* (1st ed.). Cambridge University Press. https://doi.org/10.1017/CBO9780511815355

[21] Simon Y Liu, Joel Gomez, and Cherng-Jyh Yen. 2009. Community college online course retention and final grade: Predictability of social presence. *Journal of Interactive Online Learning* 8, 2 (2009).

[22] Xiner Liu, Andres Felipe Zambrano, Ryan S. Baker, Amanda Barany, Jaclyn Ocumpaugh, Jiayi Zhang, Maciej Pankiewicz, Nidhi Nasiar, and Zhanlan Wei. 2025. Qualitative Coding with GPT-4: Where it Works Better. *Learning Analytics* 12, 1 (March 2025), 169–185. https://doi.org/10.18608/jla.2025.8575

[23] Priya Sharma, Mahir Akgun, and Qiyuan Li. 2024. Understanding student interaction and cognitive engagement in online discussions using social network and discourse analyses. *Education Tech Research Dev* 72, 5 (October 2024), 2631–2654. https://doi.org/10.1007/s11423-023-10261-w

[24] Shreya Singhal, Andres Zambrano, Maciej Pankiewicz, Xiner Liu, Chelsea Porter, and Ryan Baker. 2024. *De-Identifying Student Personally Identifying Information with GPT-4.*

[25] Wei Wang, Lihuan Guo, Ling He, and Yenchun Jim Wu. 2019. Effects of social-interactive engagement on the dropout ratio in online learning: insights from MOOC. *Behaviour & Information Technology* 38, 6 (June 2019), 621–636. https://doi.org/10.1080/0144929X.2018.1549595

[26] Yuan Wang, R. Baker, and Luc Paquette. 2017. Behavioral predictors of MOOC post-course development. In *Proceedings of the Workshop on Integrated Learning Analytics of MOOC Post-Course Development*, 2017. 100–111.

[27] Yuan Wang, Luc Paquette, and Ryan Baker. 2014. A longitudinal study on learner career advancement in MOOCs. *Journal of Learning Analytics* 1, 3 (2014), 203–206.

[28] Alyssa Friend Wise, Yi Cui, WanQi Jin, and Jovita Vytasek. 2017. Mining for gold: Identifying content-related MOOC discussion threads across domains through linguistic modeling. *The Internet and Higher Education* 32, (January 2017), 11–28. https://doi.org/10.1016/j.iheduc.2016.08.001

[29] Kathryn Woods and Kadi Bliss. 2016. Facilitating successful online discussions. *Journal of Effective Teaching* 16, 2 (2016), 76–92.

[30] Yiqiu Zhou, Juan Miguel Andres-Bray, Stephen Hutt, Korinn Ostrow, and Ryan S. Baker. 2021. A Comparison of Hints vs. Scaffolding in a MOOC with Adult Learners. In *Artificial Intelligence in Education*, Ido Roll, Danielle McNamara, Sergey Sosnovsky, Rose Luckin and Vania Dimitrova (eds.). Springer International Publishing, Cham, 427–432. https://doi.org/10.1007/978-3-030-78270-2_76

[31] Shruti Mehta, Namrata Srivastava, Xiner Liu, Kirk Vanacore and Ryan S. Baker. 2025. *Digital Appendix for Do MOOC Conversations Matter? Investigating the Role of Social Presence and Course Relevant Keywords on Career Advancement.* OSF. https://osf.io/t59w7/files/osfstorage?view_only=58099c53d86f4ab2969f9a94c686b084