Journal of Education and Practice
ISSN 2222-1735 (Paper) ISSN 2222-288X (Online)
Vol.14, No.31, 2023

Online Collaboration: The Influence of Faculty Characteristics, Training, and Presentation Mode

Author: Alex Evangelista
Department of Health Education, Borough of Manhattan Community College
199 Chambers Street New York, NY 10007
Aevangelista@bmcc.cuny.edu

Coauthor: Anika Thrower
Department of Health Education, Borough of Manhattan Community College
199 Chambers Street New York, NY 10007
Athrower@bmcc.cuny.edu

Abstract
The primary objective of this review was to investigate the various factors influencing faculty collaboration, as well as its impact on educational outcomes and practices. The historic pandemic of 2020 to 2023 forever altered the educational landscape. The gradual expansion of online programs gave way almost exclusively to full immersion in distance learning offering virtually no alternatives. The manner of presentation and how student groups and teachers could most effectively collaborate online became of paramount importance. In this regard, the present research examines recent studies, articles, and reports published in the fields of education, psychology, management, and information technology. Forty-four teachers from six institutions participated in the study, each completing the online Collaborative Learning Questionnaire.Multiple factors contribute to the facilitation or hindrance of collaboration among educators in particular the level of faculty training was found to influence collaboration, with more experienced educators often displaying higher levels of perceived skill in collaboration. The mode of instruction also shaped collaborative practices. Educational institutions vary in terms of their support for collaborative initiatives, which can significantly affect faculty collaboration. The choice between asynchronous and synchronous modes of instruction emerged as a critical factor influencing collaboration, with synchronous instruction more conducive to real-time interactions and meaningful collaboration.This study highlights the importance of formalized training and professional development in fostering effective collaboration among faculty members underscoring the need for structured training programs to equip educators with the necessary skills and competencies for successful collaboration in online environments. Training initiatives that focus on specific aspects of collaboration, technology proficiency, and pedagogical strategies can lead to more positive attitudes and increased willingness among educators to engage in collaborative endeavors.
Keywords: online collaboration, instruction mode, faculty training
DOI: 10.7176/JEP/14-31-06
Publication date: November 30th 2023

Introduction

Over the past twenty-five years, online distance learning has experienced significant growth across all education levels, particularly at junior and senior colleges. Initially, experts envisioned online learning as a gradual complement to traditional in-person education. However, the COVID-19 pandemic in 2020 accelerated the adoption of e-learning as a necessity, allowing students to access their courses during the global health crisis (Elfirdoussi et al., 2020). Notably, before the pandemic, online course participation had already risen from 21.4% (3.9 million students) in 2007 to 35.3% (approximately 7 million students) in 2018. At the onset of COVID-19, 98% of institutions shifted from in-person to online classes (National Center for Education Statistics [NCES], 2018).

The value of online collaborative learning

Collaboration stands as a vital aspect of enhancing teamwork, with extensive research highlighting its positive impact on learning, group synergy, performance, and satisfaction. In educational contexts, collaboration occurs when students mutually engage in efforts to understand concepts or solve central problems (Vassigh et al., 2014). Collaborative learning activities, as revealed by Wang et al. (2017), can improve students' understanding by facilitating explanations, elaboration, and knowledge reorganization.

Collaborative learning is not a new concept in American pedagogy, having been applied across various subjects and grade levels for nearly half a century. However, challenges persist regarding teachers, facilitators, and groups effectively implementing collaborative practices (Moseley et al., 2020). Effective teacher-led

collaboration involves motivating students to actively engage with each other, and it often presents obstacles related to context, content, educators, and learners (Hammond, 2017).

The 2020 pandemic forced institutions to swiftly transition courses to online formats, regardless of instructors' preparedness. Jacobs (2013) argued that distance learning can be as effective as in-person learning but necessitates different strategies from both teachers and learners. Starkey et al. (2021) identified significant issues, including ensuring technological access, providing instructor training and support, and developing students' proficiency in independent and collaborative learning with digital tools.

Dyer et al. (2013) identified four common issues affecting virtual teams: ineffective leadership, mistrust, unmet expectations, and inadequate training and technology use. Zhen (2011) found that students often disapproved of asynchronous online instruction due to the lack of substantive exchanges, despite its convenience. Ustati and Hassan (2013) identified three key themes for successful online learning: two-way communication with instructors and peers, online assistance for technical and academic support, and learners' autonomy for reflection. To achieve these, teachers should actively engage in class discussions, provide timely feedback, and encourage student participation.

Online learning offers opportunities for collaborative activities across various curricula, management practices, and social interactions. Despite the benefits of collaboration, limited faculty training and a lack of collaborative tools for online platforms have hindered effective implementation. For example, the quality and effectiveness of online programs have not always matched the rapid expansion (Huss et al., 2015). University presidents' top concerns about moving classes online were maintaining student engagement (81%) and training faculty for online teaching (75%) (Bustamante, 2021).

The importance of faculty training

Higher education remains essential for individuals seeking advanced knowledge and specialized skills. The pandemic has opened new opportunities for students to earn degrees through flexible online arrangements. However, this transition poses challenges for educational institutions moving into uncharted online environments. Innovative approaches, such as curricula incorporating collaborative learning, can help educators develop essential soft skills and better address students' needs for inclusion and value. This paper aims to explore the knowledge, attitudes, and abilities of health education faculty in employing collaboration within their distance learning programs, with anticipated findings contributing to enhanced teacher education and training (Robinson et al., 2017). Although collaboration is recognized for its benefits, challenges like limited faculty training and the absence of collaborative tools persist.

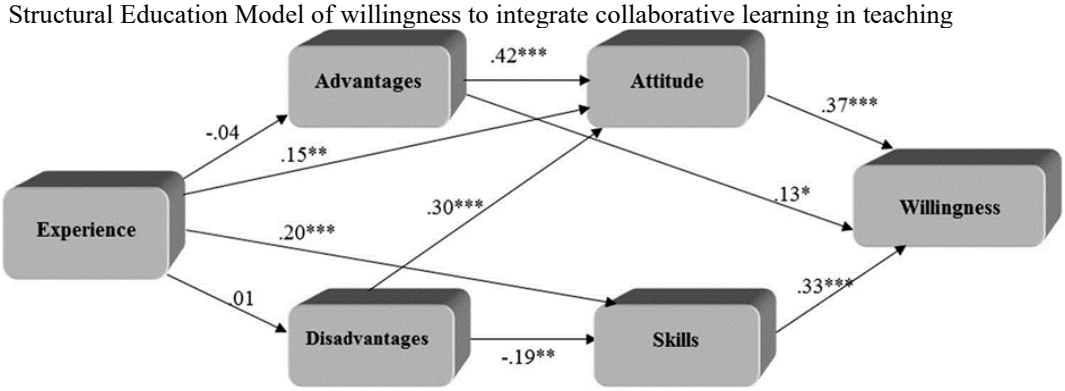
Effective training is crucial to help teachers translate their existing skills into the virtual education world (Shonfeld et al., 2019). Training in health and physical education often requires active and, in some cases, certified components. Designing practical modalities for integrating physical activities into online healthcare classes can be a major concern.

Despite these challenges, effective instructional design, quality teacher training, and strategies to overcome obstacles can lead to successful program implementation. Instructors may need to adjust their pedagogical approach, but the online environment can help students better understand physical health and well-being. However, many instructors lack the necessary training for effective collaboration, including methods and models (Sharan, 2010; Slavin, 2010). The absence of competent instructor/facilitator and participant training often impedes the achievement of quality outcomes.

The role of faculty behaviors

Collaborative learning among students has been widely studied, however, there is limited research on teacher characteristics and sentiments. In 2018, Weinberger and Shonfeld conducted an investigation to examine student teachers' demographics, attitudes, knowledge, and abilities related to collaboration in the classroom. Based upon their results, a SEM (Figure 1) was proposed in which faculty experience was found to be directly associated with both their attitudes and skills, while benefits, disadvantages, attitude, and skills served as mediating variables impacting the willingness to integrate collaborative learning in teaching. However, the authors recognized the limited generalizability of their study prompting their recommendation for additional research across additional colleges and countries.

Figure 1. Structural Education Model of willingness to integrate collaborative learning in teaching



Evangelista and Thrower (2023) sought to replicate and extend the Shonfeld and Weinberger's model (2018, 2019) by studying how United States health educators employed distance learning during the COVID-19 pandemic. Evangelista and Thrower (2023) supported some but not all aspects of the model. Their research found the only mediating variable strongly and consistently predictive of instructor willingness was attitude. In addition, there was evidence that educator's awareness of the advantages/benefits of online learning were significantly related to their attitude toward online collaboration.

Materials and Methods

Sampling Procedure

This study involved 44 university health education faculty members from six different educational institutions. Three of these institutions were located in urban New York City, while the remaining three were situated in suburban areas on Long Island, New Jersey, and Williamsburg, Kentucky. To ensure confidentiality, each participant was assigned a unique code, and no identifiable faculty information was collected beyond what was necessary for the Collaborative Learning Questionnaire (CL) demographics.

Data Collection

Data for this study was collected exclusively through the Collaborative Learning Experiences Questionnaire (CL), originally developed by Shonfeld and Weinberger in 2018. This questionnaire was constructed by drawing constructs from three previous questionnaires: Collaborative Learning (McNamara & Brown, 2008), The Collaborative Learning, Social Presence, and Satisfaction (Spears, 2012), and Leading a System-wide Pedagogical Change (Weinberger, 2018). The CL Questionnaire had previously undergone psychometric analysis, showing reliability with Cronbach's alpha values ranging from .67 to .82 (Weinberger & Shonfeld, 2018; Shonfeld & Weinberger, 2019).

The questionnaire consisted of 27 items distributed across six sections (Appendix A): Section One: Demographic information, including gender, age, educational facility, function, online program being taught, and years of teaching. Section Two: Background and knowledge, including prior training, mode of online instruction, previous integration of collaborative teaching, characteristics, benefits, and disadvantages of collaborative learning. Sections Three and Four: Attitudes and experiences related to collaboration, assessed using a five-point Likert Scale. Section Five: two Likert Scale items about the respondent's skills in practicing online collaborative learning and their willingness to incorporate collaborative learning into their courses. Section Six: Two open-ended questions to capture faculty insights and observations.

Research Questions and Statistical Procedures

The study addressed two general research questions:

1. Did the characteristics of the samples account for the model findings as presented by Shonfeld and Weinberger's (2018, 2019) and Evangelista and Thrower (2023)?
2. How do prior training and collaborative instruction relate to the model components delineated by Shonfeld and Weinberger's (2018, 2019) and further described by Evangelista and Thrower (2023)?

Data was collected using Survey Monkey and analyzed in IBM SPSS 2020 Windows Edition and JASP Statistical Packages. For the purposes of Research Question 1, the characteristics of the participants included: Item 1 (gender), Item 2 (age), Item 5 (primary function), and Item 6 (years of teaching). Research Question 2 was gleaned from Item 7, "Did you integrate collaborative teaching in your online classes?" Item 8, type of specific training, and collaborative instruction from Item 9 "What is your mode of online instruction?"

Results

Survey Participants

There was an overall 27.0% survey response rate amongst the instructors teaching in the cooperating departments. This rate was at respectable levels for Colleges A (48.1%), D (38.9%), E (36.4%), and F (27.1%). In contrast, relatively low returns were collected for Colleges B (8.7%) and C (4.0%).

The 44 participants self-identified as 27 females and 17 males. Females were generally older, reporting that 17 or almost 63% of all females were aged 40 to 60 years. A chi-square relationship was revealed for the distribution of gender by age, x2(4, N = 44) = 10.43, p = .03. Expectedly, a significant relationship was identified between the participant's age and years of teaching producing a chi-square x2(16, N = 44) = 52.71, p < .001 with a strong Cramer's V = .55. The majority of respondents (68.2%) have been teaching between 4 and 20 years. Only 14 respondents have been instructing for fewer than four years (11.4%) or over 20 years (20.4%).

Teachers primarily served in an educational capacity and were relatively evenly split between instructor or adjunct staff (50%) and career-line professors (45.5%). Adjuncts are part-time or contingent instructors, often called 'visiting professors' in other countries. Two additional subjects listed themselves as lecturers. The faculty's primary function, item 5, was related to Item 9, Mode of Instruction x2(4, N = 44) = 12.63, p = .01, but not significantly associated with the remaining items of interest. Here Professors were more likely to employ Synchronous or both modes of instruction (90%) than were Instructors/Adjuncts who utilized Asynchronous (45.5%) most often.

The results from item 7 of the questionnaire illustrated that 18 of the 44 respondents, or almost 41%, reported having integrated collaborative teaching into their online classes. A larger proportion, however, over 59%, had not implemented such procedures. More astonishing was the finding from item 8, revealing that over 70% had not received any collaboration training whatsoever. Importantly, having received collaborative training was found to be significantly related to in turn integrating collaborative teaching, displaying a chi-square x2(2 N = 44) = 7.00, p = .03 and Cramer's V =.40. Nine of the 18 respondents, or 50% of those specifically trained, said they did, in fact, integrate collaborative teaching into their online classes, while 22 or 84.6% of those not trained did not integrate. Neither items 7 nor 8 were significantly related to the other variables measured above and considered for the research questions proposed.

Comparisons of model samples

Weinberger and Shonfeld (2018) and Shonfeld and Weinberger (2019) created and then employed earlier versions of the CL Questionnaire in Hebrew. Their studies each reported several key demographics of these samples, so there is some ability to compare these educators with the faculty involved in the present research investigation.

Table 1 indicates that compared with the previous research, the current study reported a much higher degree of male participation, accounting for 38.6% of the entire sample, with the remaining 61.4% female respondents. The Shonfeld and Weinberger 2019 paper was based upon a sample that was only 11.6% male and 88.4% female; Weinberger and Shonfeld 2018 was almost exclusively female, 92.6%, with just 7.4% males. Chi-square tests conducted indicated that the teachers responding to this paper consisted of significantly more males and fewer females when compared with both groups of Israel instructors, $x^2(1, N = 130) = 12.90$, $p < .001$ and $x^2(1, N = 349) = 37.07$, $p < .001$.

The structure of the age data groupings also allowed for direct analysis of the previous studies with the faculty employed in this research. The three groups were found to differ significantly x2(4, N = 435) = 217.86, p < .001. This huge chi-square was a function of the 2018 participants being much younger than the 2019 and present sample; less than 15% were over 40 years old compared with more than 88% for the more recent samples.

Table 1. Sample Comparisons

Demographic	Weinberger and Shonfeld 2018 (305 responses)	Shonfeld and Weinberger 2019 (86 responses)	Present Study (44 responses)
Gender:			
Male	7.4%	11.6%	38.6%
Female	92.6%	88.4%	61.4%
Age:			
20-29	62.4%	0.00%	0.0%
30-39	23.1%	9.3%	11.4%
40-49	11.9%	27.9%	31.8%
50-59	2.6%	39.5%	25.0%
60+	0.0%	23.3%	31.8%
Function:			
PA/Professor		39.3%	45.5%
Instructor/Lecturer		60.7%	54.5%
Years of experience:			
1 - 3		14.1 %	11.4%
4 - 9		12.9%	36.4%
10 - 19		22.4%	31.8%
20 - 29		24.7%	13.6%
30 +		25.9%	6.8%

Shonfeld and Weinberger (2019), teacher function was declared as either "lecturers" accounting for 60.7% or "pedagogical advisor" identified for 39.3%. This distinction is not typical in the United States educational system. If "lecturers" align with our choices of lecturer, instructor, or adjunct, then this group would comprise 54.5% of the entire current sample and the professor, associate and assistant professors 45.5%. Finally, years of experience were provided by Shonfeld and Weinberger (2019), but not the 2018 research by Weinberger and Shonfeld. Here, the years of teaching exhibited a significant and powerful chi-square across the two studies $x2(4, N = 130) = 19.50$, $p < .001$. A cell comparison revealed that over 50% of the Shonfeld et al. sample in 2019 had more than 20 years' experience as opposed to just 20.4% in this present study.

The demographic data from the previous studies and the current research confirm that these three samples differed in important ways. Gender, function, age, and particularly years of faculty experience may have profound effects on teaching style along with the ability and willingness to implement collaborative learning strategies. The prior model as developed by Weingerger and Shonfeld (2028) and later refined by Shonfedl and Weingerger (2019) could very well reflect the unique influence of these sample characteristics and not necessarily applicable to more generalized populations of educators.

Analysis of Research Questions

The six parameters represented in Figure 1 were identified from the Collaborative Learning Experiences Questionnaire. The number of Advantages was computed from the number of selections endorsed in question 11"In your opinion, what are the benefits of online collaborative learning?" Disadvantages, question 12 was the number of choices an instructor made to "In your opinion, what are the disadvantages of online collaborative learning?" Experience was obtained from calculating the average of the five-point Likert Scale responses to the six questions in Section Four. Similarly, Attitude resulted from averaging five Likert Scale items of Section Three. Finally, Section Five was comprised of two Likert Scale items; question 24, indicating the respondent's skill to practice online collaborative learning, and question 25, which the CL Questionnaire creators described as their measure of "willingness" to use collaboration. This question asks: How much are you willing to incorporate collaborative learning in your courses? The selections on these two items were coded from 1, Strongly Disagree to 5, Strongly Agree.

Each of the demographic variables pertaining to Research Question 1 were submitted for MANOVA analysis separately as fixed factors along with the six original constructs of the Weinberger and Shonfeld (2018) model examined as dependent variables. None of the demographic variables were found to be significantly related to the model presented in Figure 1. Items 2,5 and 6 required that the fixed factors be collapsed to ensure that there were adequate cases across all parameters. The age of the instructor was reduced to two categories: under and those over 40 years old. Primary Function required including the two Lectures with "Instructor or Adjunct." Years of Teaching were regrouped into three categories: under 10, 10 to 20, and over 20 years. Table 2 displays the MANOVA results obtained for these statistical analyses.

Table 2. MANOVA: Pillai Test for Research Question 1

Variable examined	Approx. F	df	p
Item 1 - gender	1.00	6	0.44
Item 2 - age of instructor – collapsed	1.00	6	0.44
Item 5 - primary Function – collapsed	1.37	6	0.25
Item 6 - years of Teaching - collapsed	0.52	12	0.89

Research question 2 was similarly assessed by conducting separate MANOVA procedures (Table 3) for the three variables: item 7 having integrated collaborative teaching, Item 8, type of specific training, and Item 9, mode of online instruction. Items 8 and 9 again required consolidation due to frequency and variability in some cells. The entire sample of 44 faculty responding to question eight revealed that the majority, 31 (70.5%) of instructors, had no formal training in collaboration. Of the remaining 13, nine had online collaboration instruction, and four more stated they received collaboration, but not online training. The two groups with collaboration training collapsed and compared with the 31 respondents answering "No." The combined question eight was then analyzed with each of the elements in the proposed model. Item 9 combined the selection "Both Asynchronous and Synchronous online instruction" with the Synchronous category. As a result, the comparison was between those 24-faculty using Asynchronous mode exclusively as compared with the 20-employing synchronous instruction in part or entirely.

Table 3. MANOVA: Pillai Test for Research Question 2

Variable examined	Approx. F	df	p
Item 7 – integrated collaborate teaching	0.17	6	0.99
Item 8 – type of specific training – collapsed	1.53	6	0.20
Item 9 – mode of instruction - collapsed	1.56	6	0.19

While none of the overall MANOVAs conducted proved significant, a distinct ANOVA between the collapsed type of training variable, item 8 and question 24, skilled enough to practice online collaboration was found to be significant (Table 4). The means and standard deviations differed for the comparison (M = 4.08, SD =.49) and (M =3.35, SD = 1.02) displaying a higher mean for the newly combined training group, as well as significantly less variance.

Table 4: ANOVA online training and question 24 skilled enough

Cases	**Sum of Squares**	**df**	**Mean Square**	**F**	**p**
(Intercept)	560.205	1	560.205	691.614	< .001
Q8Collapse	4.776	1	4.776	5.896	0.020
Residuals	34.020	42	0.810		

In summary, there was no significant support found to substantiate either of the two Research Questions posited. Neither the characteristics of the present sample nor prior training and type of presentation were related to major parameters set forth in the model of Shonfeld and Weinberger (2018, 2019).

Several additional findings were, however, noteworthy. Educators having received prior collaborative training described themselves as feeling more skilled in practicing online collaborative learning with their pupils. They were also increasingly likely to integrate collaborative teaching in their own online classes. Professors more often employed Synchronous or both modes of instruction than Instructors/Adjuncts who primarily utilized Asynchronous techniques alone.

Discussion

Comparison with Prior Research

The current study examined various aspects of online collaborative education, drawing comparisons with previous research conducted by Weinberger and Shonfeld (2018) and Shonfeld and Weinberger (2019). Notably, this sample of U.S. participants exhibited a higher proportion of male instructors, which contrasted with the predominantly female samples in the earlier studies. This difference in gender distribution may have implications for collaborative teaching approaches, as gender can influence teaching styles and perspectives. Furthermore, our study revealed significant variations in years of teaching experience among participants compared to the previous research. Shonfeld and Weinberger (2019) reported that a substantial portion of their sample had over

20 years of teaching experience, whereas our study showed a lower percentage of participants in this category. These differences in experience may impact instructors' readiness to adopt collaborative teaching strategies.

The National Center for Education Statistics (NCES), the federal agency charged with compiling educational data, published its most recent report for the academic 2018 school year. This data revealed that of all educators at post-secondary institutions in the United States, 53.9% were designated full-time, with almost 50% female. Also, in the same year, Zippia (2018) analyzed 491 college teacher resumes across various demographics. They recorded 62.4% females and 37.6% males, with 49% over 40 years of age for all types of instructors. It should be noted when this study compared gender ratio by type of educator, a substantial disparity was noted; females made up 85% of early childhood education instructors, 71% of health educators, 69% of student teachers, but only 39% of physical education teachers.

Gender and function in this paper were relatively comparable with the independent measures presented for United States educators; however, the Israeli samples were not. This conclusion was particularly true of the 2018 study where the participants were overwhelmingly female, relatively homogenous, and substantially younger with less teaching experience. No doubt, the constitution of this sample was affected by the student population itself, namely, drawn from pre-service teachers in the undergraduate programs and in-service teachers from the graduate programs at the Kibbutzim College of Education, Technology and the Arts in Tel Aviv, Israel. As the authors acknowledged that their findings may not generalize to different groups and educational contexts.

The present study was not able to discern and differentiate patterns of collaborative attributes that may be a function of differences in demographic attributes. The lack of qualitative data in the prior studies further hindered the ability to identify crucial variables and practices that may have influenced the results obtained. Other unidentified variables may account for the demographic and subsequent interplay of collaboration found in the previous research. The selection of students for the Israeli programs and their specific training could account for some of the student characteristics as well as the dynamics of collaboration described in Figure 1.

Training for Online Collaborative Education

One key finding from our study was the importance of training for online collaborative education. A significant portion of our participants reported not having received any formal collaboration training, which aligns with concerns raised in prior research. Bustamante (2021) and Starkey et al. (2021) emphasized the critical role of faculty training in online collaboration. Furthermore, Blömeke et al.'s (2022) research underscores the necessity for comprehensive professional development. The study indicates that an instructor's pedagogical competence may serve as a more robust predictor of students' learning outcomes than their subject matter expertise alone. This finding underscores the need for ongoing faculty development programs focused on collaboration in online teaching.

Instructors who had received prior collaborative training in our study expressed greater confidence in their ability to practice online collaborative learning and were more likely to integrate collaborative teaching into their online classes. This aligns with previous research that highlighted the link between training and teacher competence in collaborative learning. The absence of training was a significant barrier to the adoption of collaborative practices (Weinberger and Shonfeld, 2018). These authors stated, "lecturers in institutions of higher education tend to avoid integrating collaborative practices in their teaching... not the least of which is the fact that they lack the required training."

Effective training programs must be targeted, engaging, practical, and flexible. They should provide instructors with a comprehensive understanding of online collaboration, including its benefits and practical implementation. Additionally, training should cover essential knowledge of the learning platform used at the institution, as familiarity with online tools and procedures is crucial for successful collaboration. Training should also focus on designing engaging collaborative assignments that optimize student learning and promote creative thinking.

Mode of Instruction in Collaborative Learning

This investigation examined the mode of instruction in online collaborative education, specifically differentiating between asynchronous and synchronous formats. While no significant associations were found between mode of instruction and willingness to collaborate or the modeled paths from 2018 research, some interesting patterns emerged.

Instructors in the professor’s career line were more likely to use both synchronous and asynchronous modes of instruction, while adjunct instructors primarily used the asynchronous format. These differences in instructional mode may have been influenced by teaching roles and preferences. However, the years of instructor experience were not significantly related to their primary function or mode of instruction.

Synchronous instruction allows for the expression of many positive aspects of collaboration, including cooperation, active involvement, sharing work, and learning together. Seals (2012) reported significantly more collaborative learning activities in face-to-face interactions compared to online courses, especially when

developing problem-solving skills through peer collaboration. Several studies have highlighted how the lack of verbal and non-verbal interaction can hinder online collaborative learning (Harris & Sherblom, 2018; Treem & Leonardi, 2012).

Future Directions

Additional research in the field of online collaborative education should focus on several key areas. First, best practices for training instructors in online collaborative learning should be developed and refined to enhance pedagogical skills. Understanding how learning management systems (LMS) can be adapted to better support collaboration is also essential for improving educational tools. Instructors with the capability to construct an innovative virtual platform are more adept at utilizing collaborative tools (Dahal, 2022).

Comparing collaborative learning in synchronous classes to hybrid models that combine online, and in-person activities can provide insights into the ease of implementing collaboration in various educational settings. Additionally, there is promising research on the benefits of using gamification, virtual reality (VR) and augmented reality (AR) that can enhance collaborative learning experiences in distance education. These findings indicate that incorporating such technologies can offer numerous advantages, aiding both students and educators alike (Lampropoulos et al. 2022).

In conclusion, our study contributes valuable insights into online collaborative education, shedding light on the importance of training and the impact of instructional modes. These findings can inform the development of effective training programs and strategies to promote collaborative learning in online education. Collaborative teaching remains a dynamic and evolving field, with opportunities for further research and innovation.

References

Abramo, G., D'Angelo, A. C., & Murgia, G. (2017). The relationship among research productivity, research collaboration, and their determinants. *Journal of Informetrics*, *11*(4), 1016-1030.

Beaver, D. (2013) The many faces of collaboration and teamwork in scientific research: Updated reflections on scientific collaboration. *COLLNET Journal of Scientometrics and Information Management, 7*(1), 45-54. https://doi.org/10.1080/09737766.2013.802629

Bedwell, W. L., Wildman, J. L, DiazGranados, D., Salazar, M., Kramer, W. S., & Salas, E. (2012). Collaboration at work: An integrative multilevel conceptualization. *Human Resource Management Review, 22*(2), 128-145, https://doi.org/10.1016/j.hrmr.2011.11.007

Blömeke, S., Jentsch, A., Ross, N., Kaiser, G., & König, J. (2022). Opening up the black box: Teacher competence, instructional quality, and students' learning progress. *Learning and Instruction*, *79*, 101600. https://doi.org/10.1016/j.learninstruc.2022.101600

Bolman, L. G., & Deal, T. E. (2017). *Reframing organizations: Artistry, choice, and leadership* (6th ed.). Jossey-Bass.

Broström, A., & McKelvey, M. (2015). "Universities and public research institutes as collaboration partners for firms," Chapters, in: Charlie Karlsson & Urban Gråsjö & Sofia Wixe (ed.), *Innovation and Entrepreneurship in the Global Economy* (pp. 44-64). Edward Elgar Publishing.

Bustamante, J. (2021, February 06). Distance learning statistics [2021]: Online education trends.

Chakraborty, S., Bhattacharya, S., & Dobrzykowski, D.D. (2014). Impact of supply chain collaboration on value co-creation and firm performance: A healthcare service sector perspective. *Procedia. Economics and Finance*, *11*, 676-694.

Cole, M. L., Cox, J. D., & Stavros, J. M. (2016). Building collaboration in teams through emotional intelligence: Mediation by SOAR (strengths, opportunities, aspirations, and results). *Journal of Management & Organization, 25*(2), 263-283. https://doi.org/10.1017/jmo.2016.43

Dahal, N. (2022). Understanding and uses of collaborative tools for online courses in higher education. *Advances in Mobile Learning Educational Research*, *2*(2), 435-442. https://doi.org/10.25082/AMLER.2022.02.012

Elfirdoussi, S., Lachgar, M., Kabaili, H., Rochdi, A., Goujdami, D., & Firdoussi, L. E. (2020). Assessing Distance Learning in Higher Education during the COVID-19 Pandemic. *Education Research International*, *2020*, 1–13. https://doi.org/10.1155/2020/8890633

Evangelista, A. and Thrower, A. 2023. Rethinking the online environment through collaborative learning. *Open Scholarship of Teaching and Learning*. 2, 3 (Jul. 2023). DOI:https://doi.org/10.56230/osotl.70.

Funder, D.C., Ozer, D. J. (2019). *Evaluating Effect Size in Psychological Research: Sense and Nonsense*. https://doi.org/10.1177/2515245919847202

Gomez-Mejia, L. R., Berrone, P., & Franco-Santos, M. (2014). Compensation and organizational performance: Theory, research, and practice. Routledge.

Hammond, M. (2017). Online collaboration and cooperation: The recurring importance of evidence, rationale & viability. *Education and Information Technologies, 22,* 1005-1024. https://doi.org/10.1007/s10639-016-9469-x

Huss, J. A., Sela, O., & Eastep, S. (2015). A case study of online instructors and their quest for greater interactivity in their courses: Overcoming the distance in distance education. *Australian Journal of Teacher Education, 40*(4). 71-86.

Jacobs, P. (2013). The challenges of online courses for the instructor. *Research in Higher Education Journal, 21,* 1-18. https://digitalcommons.sacredheart.edu/cj_fac/8/

JASP Team (2023). JASP (Version 0.17.3)[Computer software].

Lampropoulos, G., Keramopoulos, E., Diamantaras, K., & Evangelidis, G. (2022). Augmented Reality and Gamification in Education: A Systematic Literature Review of Research, Applications, and Empirical Studies. *Applied Sciences*, *12*(13), 6809. MDPI AG. Retrieved from http://dx.doi.org/10.3390/app12136809

McNamara, J., & Brown, C. (2008). Assessment of collaborative learning in online discussions. *ATN Assessment, Engaging Students in Assessment*. University of South Australia.

Moseley, C., Summerford, H., Paschke, M., Parks, C., & Utley, J. (2020) Road to collaboration: Experiential learning theory as a framework for environmental education program development. *Applied Environmental Education & Communication, 19*(3), 238-258.

National Center for Education Statistics (NCES) (2018, September 30). National Center for Educational Statistics. https://nces.ed.gov/s

Schumacker, R. E., Lomax, R. G. (2016, A Beginner's Guide to Structural Equation Modeling 4th Edition. Routledge.

Shonfeld, M., & Weinberger, Y. (2019). What influences teacher educator' use of collaborative learning? In M. Shonfeld & D. Gibson (Eds.), *Collaborative earning in a Global World*. Charlotte: IAP.

Spears, L. R. (2012). *Social presence, social interaction, collaborative learning, and satisfaction in online and face-to-face courses.* (Publication No: 3548436). [Doctoral Dissertation: Iowa State University]. ProQuest Dissertations.

Stadler, M., Cooper–Thomas, H., & Greiff, S. (2017). A Primer on Relative Importance Analysis: Illustrations of Its Utility for Psychological Research. *Psychological test and assessment modeling, 59*, 381.

Starkey, L., Shonfeld, M., Prestridge, S., & Cervera, M. G. (2021). *Special issue: Covid-19 and the role of technology and pedagogy on school education during a pandemic.* Technology, Pedagogy and Education, 1-5. https://doi.org/10.1080/1475939x.2021.1866838

Sullivan, G. M., & Feinn, R. (2012). Using Effect Size-or Why the P Value Is Not Enough. *Journal of graduate medical education*, *4*(3), 279–282. https://doi.org/10.4300/JGME-D-12-00156.1

Sideridis, G., Simos, P., Papanicolaou, A., & Fletcher, J. (2014). Using Structural Equation Modeling to Assess Functional Connectivity in the Brain Power and Sample Size Considerations. Educational and Psychological Measurement, dpi: 10.1177/0013164414525397

SPSS Statistics for Windows, Released 2021. Version 28.0. Armonk, NY: IBM Corp

Ustati, R., & Hassan, S. S. S. (2013). Distance learning students need: Evaluating interactions from Moore's theory of transactional distance. *Turkish Online Journal of Distance Learning, 14*(2), 292-304. issn:1302-6488.

Vassigh S., Newman, W., Behzdan, A., Zhu, Y., Chen, S., & Graham, S. (2014). Collaborative learning in building sciences enabled by augmented reality. *American Journal of Civil Engineering and Architecture, 2*(2), 83-88. https://doi.org/10.12691/ajcea-2-2-5

Vázquez-Martínez, A.I., & Alducin-Ochoa, J.M. (2014). Educational platforms and learning approaches in university education. *Asian Social Science*, *10*(1).

Wang, M., Cheng, B., Chen, J., Mercer, N., & Kirschner, P. A. (2017). The use of web-based collaborative concept mapping to support group learning and interaction in an online environment. *The Internet and Higher Education*, *34*, 28-40.

Weinberger, Y., & Shonfeld, M. (2018). Students' willingness to practice collaborative learning. *Teaching Education, 31*(2), 127-143. https://doi.org/10.1080/10476210.2018.1508280

Wolf, E. J., Harrington, K. M., Clark, S. L., & Miller, M. W. (2013). Sample size requirements for structural equation models an evaluation of power, bias, and solution propriety. Educational and Psychological Measurement, 73(6), 913-934. doi: 10.1177/0013164413495237

HEALTH EDUCATOR DEMOGRAPHICS AND STATISTICS IN THE US. Zippia. (n.d.). Retrieved September 10, 2022, from https://www.zippia.com/

Notes

Instrumentation

Collaborative Learning Experiences Questionnaire (Teacher)

The main objective of this instrument is to learn about your collaborative instructional experiences provided through a distance online program format.

This questionnaire consists of 27 items divided into 6 Sections and your response will take between 10 and 15 minutes. The survey will ask you for demographic information, experience and knowledge regarding collaborative learning and attitude, as well as, your perceptions concerning your online collaborative learning experiences.

Please answer honestly as this enables the results to be correct. All of your responses will be kept confidential when reporting the research results.

Thank you for your time answering this survey.

SECTION 1: Demographic information

1. What is your gender?

☐ Male

☐ Female

2. What is your age?

☐ 20-29

☐ 30-39

☐ 40-49

☐ 50-59

☐ 60 or above

3. In which Educational Facility and Program are you teaching?

_____

4. Do you teach:

☐ undergraduates

☐ graduate students

☐ a combination of both

Other: _____

5. What is your primary function?

☐ Instructor or Adjunct

☐ Professor: Assistant, Associate, Full

☐ Researcher

☐ Administrator

Other: _____

6. How many years are you teaching?

☐ 1-3

☐ 4-10

☐ 10-20

☐ 20-30

☐ More than 30

SECTION 2: Your prior experience and knowledge

7. Did you integrate collaborative teaching in your online classes?

☐ Yes

☉ No

7a. If you answered 'yes', please mention in which of your online courses and in what context (please write the name of the course):

1. _____
2. _____
3. _____

8. Were you specifically trained in:

☐ online collaboration

☐ collaboration, but not online collaboration

☉ No

9. What is your mode of online instruction? Please see the definitions below:

☐ Asynchronous - There are no planned virtual class meetings, students work independently throughout the course.

☐ Synchronous - Virtual meetings are planned throughout or at some points during the semester where students can engage directly with the teacher.

☐ Both Asynchronous and Synchronous online instruction.

☐ Neither – please explain _____

10. In your opinion, what are the characteristics of online collaborative learning?
Mark the appropriate sentence/s (You may choose more than one answer):

☐ Working together with other students on the same assignment or project

☐ Cooperating with peers during the lessons

☐ Being actively involved in the learning process

☐ Sharing work between learners

☐ Learning content from each other

ↄ Learning together online

Other: _____
_____

11. In your opinion, what are the benefits of online collaborative learning?
Mark the appropriate sentence/s (You may choose more than one answer):

☐ Better comprehension of the topics

☐ Fostered exchange of knowledge & experience

☐ Developing higher order thinking skills and abilities

☐ More relaxed atmosphere

☐ Enhanced communication skills

☐ Making new friends

12. In your opinion, what are the disadvantages of online collaborative learning?
Mark the appropriate sentence/s (You may choose more than one answer):

- ☐ Waste of time
- ☐ Difficulty getting members to actively participate in tasks
- ☐ Unfair evaluation of each student's investment in the process
- ☐ Communication difficulties

SECTION 3: Your attitude
Please, indicate your agreement with each of the statement below for online collaborative learning:

	1 Strongly Disagree	**2** Disagree	**3** Undecided	**4** Agree	**5** Strongly Agree
13. I like to incorporate collaborative working in my courses.	☐	☐	☐	☐	☉
14. My students prefer to do all their learning activities alone.	☐	☐	☐	☐	☐
15. The activities carried out in a group collaboratively, are important to my students' learning experience as students.	☐	☐	☐	☐	☐
16. My students learn more working in a group than alone.	☐	☐	☐	☐	☐
17. The activities carried out in a group collaboratively are important to my students' learning experience.	☐	☐	☐	☐	☐

SECTION 4: Your previous online collaborative learning experience
Please, indicate your agreement with each statement below:

	1 Strongly Disagree	2 Disagree	3 Undecided.	4 Agree	5 Strongly Agree
18. It's easy to organize and distribute tasks and responsibilities among group members.	☐	☐	☐	☐	☐
19. There are members who provide limited contribution to teamwork and benefit from the efforts of other members.	☐	☐	☐	☐	☐
20. Working in groups requires more time than working alone.	☉	☐	☐	☐	☐

	1 Strongly Disagree	2 Disagree	3 Undecided.	4 Agree	5 Strongly Agree
21. It is hard to maintain a smooth and continuous contact with all members of the group.	☐	☐	☐	☐	☐
22. It is easy to reach consensus in a group.	☐	☐	☐	☐	☐
23. It is unfair that members, who provided limited contribution to the work, receive the same rating as the rest.	☐	☐	☐	☐	☐

Section 5: Your skill and willingness to implement online collaboration

Please, indicate your agreement with each statement below:

24. I feel that I'm skilled enough to practice online collaborative learning with my pupils

1 Strongly Disagree	**2** Disagree	**3** Undecided	**4** Agree	**5** Strongly Agree
☐	☐	☐	☐	☐

Please elaborate:

_____

25. I am willing to incorporate online collaborative learning in my classroom.

1 Strongly Disagree	**2** Disagree	**3** Undecided	**4** Agree	**5** Strongly Agree
☐	☐	☐	☐	☐

Please elaborate:

_____

Section 6: Open Ended Questions

26. Tell us about your teaching experiences with online collaborative learning.

27. Do you have any other comments regarding online collaboration activities in your programs?