

Bridging the gender gap: Investigating disparities in student communication skills in the digital education era

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Article Information	Abstract:
Submitted: 2024-01-25 Revised: 2024-04-20 Published: 2024-06-15	The communication gap between male and female students remains a subject of debate. In the digital education era, it is necessary to examine whether gender differences truly influence communication skills or whether other factors play a more dominant role. This study examines students' communication skills by gender, identifying similarities and differences across language use, interpersonal abilities, communication ethics, and technology utilization in the learning process. This study employed a comparative descriptive method with a sample of 38 students selected through quota sampling. Data were collected using a questionnaire, analyzed with SPSS, and tested using an independent samples t-test, with assumptions of normality and homogeneity of variance being assessed. The study findings reveal: (1) female students demonstrate higher levels of communication skills in language use, listening ability, and logical thinking, whereas male students perform better in communication ethics and technology utilization; multilingual communication remains the main weakness for both groups. (2) Gender-based communication skill scores show a very small difference between females (3.32%) and males (3.28%), with a minimal gap of 0.04, confirming that there is no statistically significant difference. The study concludes that there is no significant difference in communication skills between genders, thereby rejecting biological determinism. Multilingual communication is a shared weakness, accompanied by dependence on digital translation tools. This study contributes to supporting the social construction of gender, rejecting biological determinism, and demonstrating that an equal educational environment and student-centered learning are effective in neutralizing communication bias.
Keywords: Communication Skills; Digital Education Era; Gender.	



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To cite this article (APA Style):

Zamista, A. A., Azmi, K. & Onia, S. I. (2024). Bridging the gender gap: Investigating disparities in student communication skills in the digital education era. *An-Nisa' Journal of Gender Studies*, 17(1), 1–12. <https://doi.org/10.35719/annisa.v17i1.219>

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INTRODUCTION

In the learning process, disparities in communication patterns are still observed among students and between students and teachers. Some students actively engage in discussions, ask questions, and express their opinions, while others tend to be passive and less involved in classroom interaction (O'Connor et al., 2017; Yashima et al., 2016; Sjølie et al., 2022). Conceptually, communication originates from the Latin word *communis*, meaning “shared,” and refers to the collective process of exchanging information (Etkin et al., 2022; de Moor et al., 2022; Huh, 2020). Communication is also understood as the process of disseminating knowledge, values, and ideas to achieve specific goals (Yeşil, 2010; Nurhalizah et al., 2020; Mahanal et al., 2022). This disparity is presumed to be associated with gender factors that influence students’ participation in learning communication (Allen, 2023; Hall & Sandler, 1982; Ruthotto et al., 2020). Thus, communication is a key element in building effective learning interactions.

Numerous previous studies have examined students’ communication skills in learning contexts, which this study categorizes into three main streams. First, communication skills enable students to actively construct understanding through effective interaction between teachers and peers (Asrar et al., 2018; Batista et al., 2021; Priadi, 2020; Šejtanić & Ilić, 2016; Munna & Kalam, 2021; Xie & Derakhshan, 2021). Second, prospective teachers require communication skills to facilitate students’ learning and to meet future workplace demands (Polakova et al., 2023; Alkathiri et al., 2024; Dahmani et al., 2024). Third, the development of digital technology has transformed modern learning and requires students to possess adaptive communication skills to interact effectively in digital learning environments (Mudjijanti & Srimulyani, 2023; Sudibjo et al., 2019; Sutiah & Supriyono, 2024). However, previous studies have not specifically examined gender differences in the communication skills of prospective teachers. The novelty of this study lies in its investigation of differences in communication skill levels between male and female students, while also identifying the weaknesses shared by both groups.

This study is grounded in the argument that communication skills cannot be reduced solely to gender categories. Although slight differences appear in several aspects, these variations are not substantial enough to indicate the dominance of one group over the other. This finding suggests that the construction of communication skills is more strongly influenced by contextual factors, such as learning experiences, the intensity of social interaction, and academic environments that shape everyday communication practices. Therefore, the assumption that gender serves as the primary determinant of communication competence should be critically reconsidered, as it is not entirely consistent with empirical realities. These findings highlight the importance of a more holistic analytical approach in understanding communication competence, positioning gender as only one variable that does not independently explain variations in students’ communication abilities.

This study aims to analyze students’ communication skill levels based on gender and to identify patterns of differences and similarities across various aspects of communication, including language use, interpersonal skills, communication ethics, and the utilization of technology. Based on these objectives, the study addresses the following research questions: (1) How do male and female students differ in communication skills regarding language use, listening ability, logical thinking, communication ethics, technology utilization, self-confidence, and multilingual communication? (2) Is there a significant difference between the communication skills of male and female students? These questions are important for determining whether gender truly serves as a meaningful differentiating factor within the context of academic communication. Theoretically, this study contributes to strengthening

the social construction perspective of gender. Practically, the findings support the development of inclusive strategies, the reinforcement of multilingual communication, and gender-neutral interventions for lecturers in improving students' communication competencies.

METHOD

Research Approach

This study employed a comparative descriptive method to evaluate students' communication skills and analyze the influence of gender factors within the context of digital technology-based learning in the Physics Education Study Program (Guillen-Gámez et al., 2021; Qazi et al., 2022). This method was selected because it is appropriate for addressing the research problem, namely whether there are differences in communication skills between male and female students, as well as identifying their communication profiles in linguistic, interpersonal, ethical, technological, and multilingual aspects. Specifically, this study aims to identify communication skill differences between male and female students across these dimensions.

Sampling and Participants

Sampling was conducted using the quota sampling method, a non-probability technique in which the researcher determines a specific number of participants from subgroups representing particular population characteristics. In this study, the quota consisted of 19 male students and 19 female students, resulting in a total sample of 38 participants. The limited sample size was due to the study's focus solely on Physics Education students at UIN Imam Bonjol Padang. Although quota sampling enables the representation of specific subgroups, this method has limitations, including potential selection bias and limited generalizability of the findings to a broader population.

Research Instrument

This study employed a questionnaire based on seven indicators of communication skills: (1) the ability to understand, manage, and create effective communication, including the use of digital technology; (2) self-confidence in expressing ideas; (3) language use appropriate to context and audience; (4) honesty and responsibility toward conveyed information; (5) the ability to listen to and respect others' opinions; (6) logical and structured thinking patterns; and (7) multilingual communication skills. These indicators are relevant to digital technology-based learning contexts.

Data Analysis

Furthermore, the students' communication skill scores obtained from the questionnaire were calculated and analyzed using SPSS to test the research hypotheses. The null hypothesis (H_0) states that there is no significant difference between the mean communication skill scores of male and female students, or $\mu_A = \mu_B$. Meanwhile, the alternative hypothesis (H_1) states that there is a significant difference between the mean communication skill scores of the two groups, or $\mu_A \neq \mu_B$. This hypothesis testing was conducted to determine whether gender truly serves as a meaningful differentiating factor in students' communication skills.

Assumption Testing

Before conducting the independent samples t-test, the assumptions of normality and homogeneity of variance must be satisfied. Normality, referring to the normal distribution of data within each group, can be tested using the Shapiro Wilk or Kolmogorov Smirnov tests; if this assumption is violated, the t-test results may become invalid. Homogeneity of variance,

which refers to the equality of variances between the two groups, is tested using Levene's test. If this assumption is violated, the standard t-test may produce misleading results, and Welch's t-test should be considered as an alternative. Fulfilling these assumptions is essential to ensure the validity and reliability of the independent samples t-test results.

RESULTS AND DISCUSSION

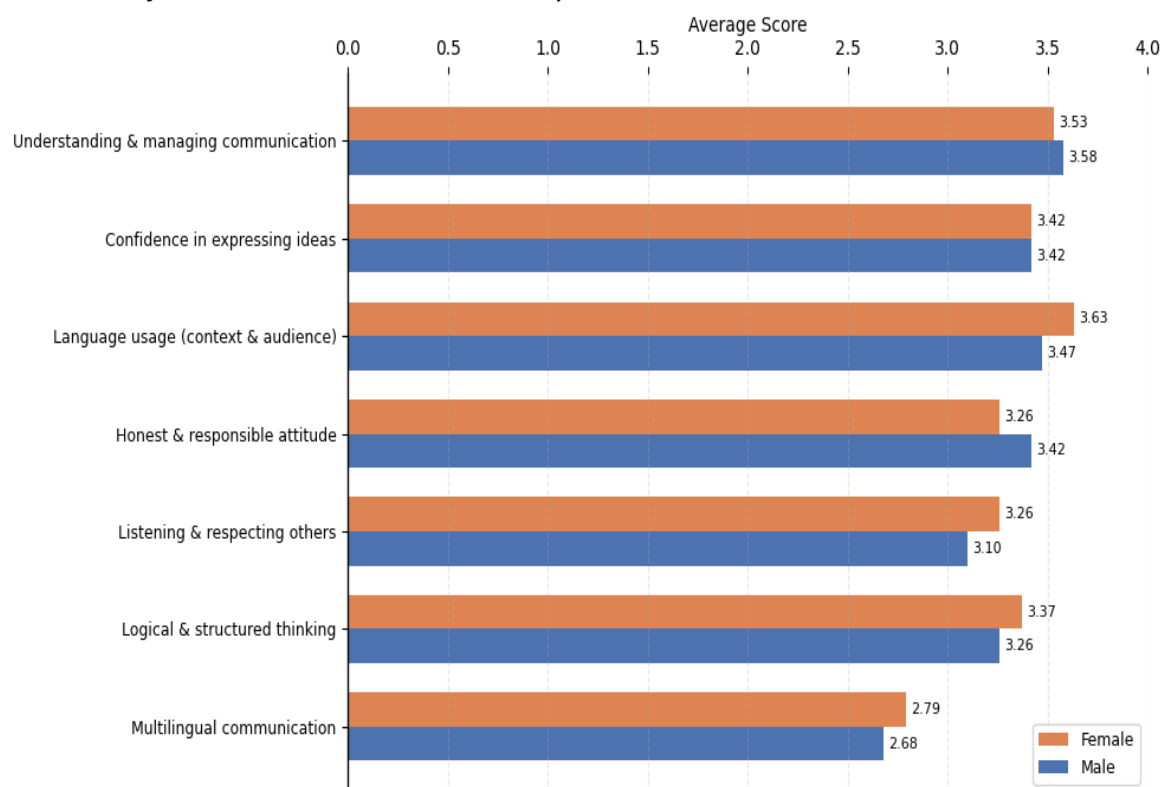
Result

Communication skill levels of students based on gender

The development of communication skills has become an important aspect of the educational process because it plays a significant role in supporting thinking abilities, social interaction, and the effective expression of ideas. Each individual possesses different communication characteristics in terms of language use, interpersonal abilities, and the utilization of technology in communication. Therefore, studies on communication skills need to be conducted comprehensively in order to provide a clearer understanding of the strengths and challenges faced by students in responding to learning and communication demands.

Figure 1

Evaluation of Students' Communication Skills by Gender



Source: Processed by the researchers, 2024.

Figure 1 shows that the evaluation of students' communication skills based on gender reveals only slight differences in the mean scores across most indicators. Female students demonstrate higher performance in contextual language use (3.63 vs. 3.47), listening to and respecting others' opinions (3.26 vs. 3.10), as well as logical and structured thinking (3.37 vs. 3.26). Male students score slightly higher in the ability to understand and manage communication (3.58 vs. 3.53) and in demonstrating honesty and responsibility (3.42 vs. 3.26). Both genders obtain identical scores in self-confidence (3.42). Multilingual communication skills receive the lowest scores for both groups (males 2.68; females 2.79).

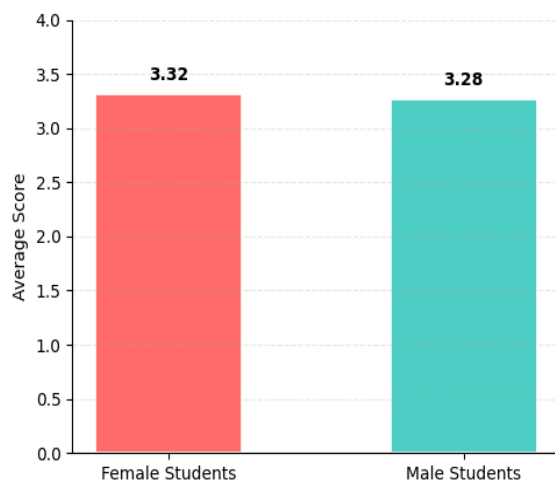
Based on the findings, female students tend to demonstrate stronger performance in linguistic and interpersonal aspects, such as contextual language use and the ability to listen to and respect others' opinions. In contrast, male students show advantages in communication ethics, particularly honesty and responsibility, as well as in technology-based communication understanding. Both genders display relatively equal levels of self-confidence in expressing themselves. The most significant weakness identified in both groups is multilingual communication, with mean scores below 2.80, indicating the need to strengthen foreign or regional language competencies. This pattern suggests that although there is no substantial gender gap, each group demonstrates different tendencies of strength: females in relational and linguistic aspects, and males in ethical and technological aspects.

Gender-based differences in communication skills

The view that gender serves as the primary factor in determining communication ability appears to require reconsideration. The very small difference in scores between male and female students indicates that communication competence is not entirely influenced by gender differences. This condition suggests that other factors, such as social experience, educational environment, and interactional context, may play a more significant role in shaping individuals' communication abilities. Therefore, communication skills should be understood through a more comprehensive and multidimensional perspective.

Figure 2

Communication Skills of Male and Female Students



Source: Processed by the researchers, 2024.

Figure 2 shows that the evaluation of students' communication skills based on gender indicates that female students obtained a mean score of 3.32, while male students obtained a mean score of 3.28. The difference between the two groups is very small, amounting to only 0.04 points. Therefore, there is no significant difference between the communication skills of female and male students. Both genders fall within an almost identical score range, with female students showing only a slightly higher score despite the minimal margin. Overall, both female and male students demonstrate relatively equivalent levels of communication skills.

Based on the findings, female students obtained slightly higher mean communication scores than male students. However, this very small difference can be statistically disregarded, indicating that gender is not a meaningful differentiating factor in communication skill achievement. Both groups fall within the same category, slightly above the midpoint of the available scale. These findings suggest that, within the context of this evaluation, female and male students possess relatively balanced abilities in understanding, managing, and creating

effective communication. No clear dominance of one gender over the other was identified. Other factors, such as experience, motivation, or learning environment, may exert a greater influence on communication skills than gender itself.

Discussion

The findings of this study regarding the communication skills of male and female students indicate two main conclusions. First, the evaluation of communication skill levels shows that female students demonstrate stronger performance in language use, listening ability, and logical thinking, whereas male students perform better in communication ethics and the utilization of technology; multilingual communication remains the primary weakness for both genders. Second, the gender-based communication skill scores of female students (3.32%) and male students (3.28%) reveal a very small difference (0.04), confirming the absence of a significant gender-based difference in communication skills. Therefore, male and female students demonstrate strengths in different communication aspects, yet overall, no significant difference based on gender is identified. In addition, multilingual communication ability emerges as the main weakness for both groups and requires greater attention in the learning process.

This study is socially relevant in supporting the strengthening of gender equality in students' communication competencies. In the digital era, women still frequently face stereotypes as less competent communicators in public spheres (Munira et al., 2020; Rafikova & Voronin, 2024). However, the findings of this study demonstrate that when equal educational opportunities are provided through student-centered learning approaches and the integration of digital technology, female students are able to exhibit communication skills comparable to those of male students (Lovell et al., 2009; Yavuz & Güzel, 2020). This is particularly important because the modern workplace increasingly demands cross-gender collaboration. Society, therefore, needs to reconsider the assumption that gender determines communication quality. As explained by Park et al. (2012) and Zhang and Pell (2022), differences in speaking styles are influenced more by social and cultural factors than by biological determinants. An inclusive educational ecosystem is thus essential for dismantling deeply rooted gender biases.

Theoretically, this study strengthens the social construction perspective on gender differences in communication. fMRI studies show that males tend to activate the left hemisphere during phonological tasks, whereas females activate both hemispheres; however, these differences do not significantly affect language efficiency (Kaiser et al., 2009; Allendorfer et al., 2012; Sato, 2020). Male students' stronger performance in honesty and responsibility, alongside female students' stronger contextual language use, reflects historical social roles in which men were positioned as dominant leaders and women as more sensitive to linguistic norms (Gregersen & Røyneland, 2009; Holmes, 2013; Kusters & Lucas, 2022). Nevertheless, these differences disappear when equal educational opportunities are provided, as indicated by the non-significant t-test results. This finding confirms that environmental factors and equal treatment are more influential than neurobiological differences in shaping students' communication skills.

This study provides an understanding that fair and inclusive education can create genuine equality, including in communication skills. Cronin & Roger (1999) and Rauf et al. (2021) emphasized the importance of building a gender-balanced educational ecosystem. The findings suggest that assumptions regarding the superiority of one gender in communication are merely myths perpetuated by unequal educational access in the past. When students receive equal treatment through student-centered approaches and digital technology

integration, the remaining differences become statistically insignificant (Haleem et al., 2022; Cheng & Yang, 2023). Another important lesson is that digital technology is inherently ambivalent: although it enhances communication in general, technologies such as Google Translate may weaken students' motivation to learn foreign languages (Bin Dahmash, 2020; Dunbar & Yadav, 2022; Urlaub & Dessein, 2022). Furthermore, ease of access does not always generate positive outcomes; critical awareness is required to ensure that technology does not replace efforts to master fundamental competencies such as multilingual communication.

Previous studies have demonstrated that participatory learning through structured group discussions significantly improves students' communication skills (Muslim, 2020), while the analysis of scientific journal articles is effective in enhancing prospective teachers' communication abilities (Hikmawati et al., 2021). From a gender perspective, Udeh-Momoh & Watermeyer (2021) and Hong et al. (2021) argue that neuropathological differences do not result in differences in language efficiency between genders. In contrast to earlier studies that identified disparities due to unequal educational access, this study demonstrates equality because all participants received the same learning treatment. The novelty of this research lies in the finding that when socio-ecological factors are controlled, gender is not a significant predictor of communication skills; the observed differences appear only in specific aspects influenced by culture rather than fundamental capacity. In addition, this study reveals the negative impact of Google Translate on motivation to learn foreign languages, consistent with the findings of Qureshi et al. (2021).

Based on the study findings, several practical recommendations can be proposed. First, lecturers and study program administrators should design learning activities that explicitly train students' communication skills in English or other foreign languages, for example by requiring regular short presentations in English and reducing dependence on online translators through the use of printed dictionaries or scheduled vocabulary tests. Second, educators should maintain student-centered learning approaches that have proven effective while incorporating collaborative project-based assessments across genders to further reduce bias. Third, institutions should organize soft-skill development programs, such as public speaking workshops and English debate activities, which should be mandatory for all students. Finally, future studies with larger samples are needed to explore other influencing factors, including internal motivation and family environment.

CONCLUSION

This study concludes that although female students demonstrate stronger performance in linguistic aspects, listening ability, and logical thinking, while male students perform better in communication ethics and technology utilization, statistical testing confirms that there is no significant difference in communication skills between genders. These findings challenge the long-standing assumption of biological determinism. Multilingual communication emerges as the most concerning shared weakness, receiving the lowest scores across all indicators. Ironically, digital technology, which should function as a bridge for communication development, instead creates dependence on translation applications, thereby reducing motivation to learn foreign languages. Thus, differences in communication patterns between genders can be understood as social constructions that may be eliminated through an equitable educational ecosystem; however, the greatest current challenge lies in fostering multilingual independence amid the convenience offered by digital technology.

This study contributes to strengthening the social construction perspective in understanding gender differences in communication skills. The findings reject the biological view that males and females inherently possess different communication capacities. Instead,

the results demonstrate that an equitable educational environment is capable of neutralizing gender bias. Practically, this study provides evidence that student-centered learning approaches supported by digital technology are effective in developing communication skills in general. However, in the multilingual aspect, learning practices require fundamental revision. Educational institutions should reduce dependence on online translation tools and design more immersive foreign language learning strategies, positioning technology as a supporting instrument rather than a substitute for students' conscious learning efforts.

The limitation of this study lies in the relatively small sample size, which was restricted to a single study program at one university; therefore, the generalization of the findings should be approached with caution. In addition, the descriptive quantitative design was unable to capture the qualitative dynamics of cross-gender communication processes. The use of self-report questionnaires also carries the potential for subjective bias. Future research is recommended to conduct comparative studies across study programs and universities with larger and more diverse samples. Experimental studies are also needed to examine learning interventions specifically aimed at improving multilingual communication without creating dependence on technology. Furthermore, qualitative ethnographic studies of communication could provide deeper insights into how the social construction of gender operates within real interactions in digital classrooms.

ACKNOWLEDGMENTS

The authors would like to express their gratitude to Imam Bonjol State Islamic University Padang for the support and facilities provided. The authors also extend their sincere appreciation to Dr. Prima Aswirna, S.Si., M.Sc., Head of the Physics Education Study Program, for her guidance and support throughout the research process, as well as to all respondents who participated in and contributed to this study.

AUTHOR CONTRIBUTION STATEMENT

Adelia Alfama Zamista: Conceptualization; Data Curation; Formal Analysis; Investigation; Methodology; Writing Original Draft. **Khairul Azmi:** Conceptualization; Formal Analysis; Supervision; Visualization; Writing Review & Editing. **Saifaldin Idris Onia:** Formal Analysis; Supervision; Visualization; Writing Review & Editing.

REFERENCES

- Alkathiri, S. A. N., Bakhiet, S. F. A., & Dutton, E. (2024). The effectiveness of a training program based on active learning strategies in developing the creative thinking skills of female students with learning disabilities. *Cogent Education*, 11(1). <https://doi.org/10.1080/2331186X.2024.2413235>
- Allen, B. J. (2023). *Difference matters: Communicating social identity*. Waveland Press. <https://books.google.com/books?hl=en&lr=&id=nV2mEAAQBAJ&oi=fnd&pg=PR1&dq=These+differences+in+communication+patterns+are+assumed+to+also+be+influence+d+by+gender+factors&ots=a3BfEqQ8pX&sig=pdD7RWXITdgYez80iL9lpBo0e-s>
- Allendorfer, J. B., Lindsell, C. J., Siegel, M., Banks, C. L., Vannest, J., Holland, S. K., & Szaflarski, J. P. (2012). Females and males are highly similar in language performance and cortical activation patterns during verb generation. *Cortex; a journal devoted to the study of the nervous system and behavior*, 48(9), 1218–1233. <https://doi.org/10.1016/j.cortex.2011.05.014>
- Asrar, Z., Tariq, N., & Rashid, H. (2018). The impact of communication between teachers and students: A case study of the faculty of management sciences, University of Karachi,

- Pakistan. *European Scientific Journal, ESJ*, 14(16), 32.
<https://doi.org/10.19044/esj.2018.v14n16p32>
- Batista, J., Santos, H., & Marques, R. P. (2021). The use of ICT for communication between teachers and students in the context of higher education institutions. *Information*, 12(11), 479. <https://doi.org/10.3390/info12110479>
- Bin Dahmash, N. (2020). 'I can't live without Google Translate': A close look at the use of Google Translate App by second language learners in Saudi Arabia. *Arab World English Journal*, 11 (3) 226 -240. <https://dx.doi.org/10.24093/awej/vol11no3.14>
- Cheng, C.-C., & Yang, Y.-T. C. (2023). Impact of smart classrooms combined with student-centered pedagogies on rural students' learning outcomes: Pedagogy and duration as moderator variables. *Computers & Education*, 207, 104911. <https://doi.org/10.1016/j.compedu.2023.104911>
- Cronin, C. and Roger, A. (1999), Theorizing progress: Women in science, engineering, and technology in higher education. *Journal of Research in Science Teaching.*, 36: 637-661. [https://doi.org/10.1002/\(SICI\)1098-2736\(199908\)36:6<637::AID-TEA4>3.0.CO;2-9](https://doi.org/10.1002/(SICI)1098-2736(199908)36:6<637::AID-TEA4>3.0.CO;2-9)
- Dahmani, N., Ali, W., Aboelenein, M., Alsmairat, M. A. K., & Faizi, M. (2024). From classroom interaction to academic success: Tracing the mediating role of effective communication in faculty-student dynamics. *Cogent Education*, 11(1). <https://doi.org/10.1080/2331186X.2024.2377847>
- de Moor, E. L., Nelemans, S. A., Becht, A. I., Meeus, W., & Branje, S. (2022). Personality development across adolescence and young adulthood: The role of life transitions and self-concept clarity. *European Journal of Personality*, 37(5), 587-604. <https://doi.org/10.1177/08902070221119782>
- Dunbar, K., & Yadav, A. (2022). Shifting to student-centered learning: Influences of teaching a summer service learning program. *Teaching and Teacher Education*, 110, 103578. <https://doi.org/10.1016/j.tate.2021.103578>
- Etkin, P., De Caluwé, E., Ibáñez, M. I., Ortet, G., & Mezquita, L. (2022). Personality development and its associations with the bifactor model of psychopathology in adolescence. *Journal of Research in Personality*, 97, 104205. <https://doi.org/10.1016/j.jrp.2022.104205>
- Gregersen, F., & Røyneland, U. (2009). Introduction: Sociolinguistics. *Nordic Journal of Linguistics*, 32(2), 185–189. <https://doi.org/10.1017/S0332586509990023>
- Guillen-Gamez, F. D., Mayorga-Fernández, M. J., & Contreras-Rosado, J. A. (2021). Incidence of gender in the digital competence of higher education teachers in research work: Analysis with descriptive and comparative methods. *Education Sciences*, 11(3), 98. <https://doi.org/10.3390/educsci11030098>
- Haleem, A., Javaid, M., Qadri, M. A., & Suman, R. (2022). Understanding the role of digital technologies in education: A review. *Sustainable Operations and Computers*, 3, 275–285. <https://doi.org/10.1016/j.susoc.2022.05.004>
- Hall, R. M., & Sandler, B. R. (1982). *The classroom climate: A chilly one for women?* <https://eric.ed.gov/?id=ED215628>
- Hikmawati, H., Sahidu, H., Ayub, S., & Kosim, K. (2021). Peningkatan keterampilan komunikasi mahasiswa calon guru melalui kegiatan analisis artikel ilmiah dari jurnal nasional. *Unram Journal of Community Service*, 2(2), 33–37. <https://doi.org/10.29303/ujcs.v2i2.32>
- Holmes, J. (2013). *An Introduction to Sociolinguistics* (4th ed.). Routledge. <https://doi.org/10.4324/9781315833057>
- Hong, G. P., Kim, M.-H., & Kim, H. J. (2021). Sex-related differences in glial fibrillary acidic protein-positive GABA regulate neuropathology following pilocarpine-induced status

- epilepticus. *Neuroscience*, 472, 157–166.
<https://doi.org/10.1016/j.neuroscience.2021.08.002>
- Huh, J. (2020). Smart communication for a digital world. *Journal of Interactive Advertising*, 20(3), 240–243. <https://doi.org/10.1080/15252019.2020.1849693>
- Kaiser, A., Haller, S., Schmitz, S., & Nitsch, C. (2009). On sex/gender related similarities and differences in fMRI language research. *Brain Research Reviews*, 61(2), 49–59.
<https://doi.org/10.1016/j.brainresrev.2009.03.005>
- Kusters, A., & Lucas, C. (2022). Emergence and evolutions: Introducing sign language sociolinguistics. *Journal of Sociolinguistics*, 26, 84–98.
<https://doi.org/10.1111/josl.12522>
- Lovell, B., Lee, R. T., & Brotheridge, C. M. (2009). Gender differences in the application of communication skills, emotional labor, stress-coping and well-being among physicians. *Archives: The International Journal of Medicine*, 2(3), 273+.
<https://link.gale.com/apps/doc/A209537187/HRCA?u=anon~6fdb4b2a&sid=googleScholar&xid=f52abf91>
- Mahanal, S., Zubaidah, S., Setiawan, D., Maghfiroh, H., & Muhaimin, F. G. (2022). Empowering college students' problem-solving skills through RICOSRE. *Education Sciences*, 12(3), 196. <https://doi.org/10.3390/educsci12030196>
- Mudjijanti, F., & Srimulyani, V. A. (2023). The impact of e-learning on student interest during the Covid-19 Pandemic. *European Journal of Education and Pedagogy*, 4(3), 135–142.
<https://doi.org/10.24018/ejedu.2023.4.3.693>
- Munira, S., Hossain, A. and Nessa, M. (2020). Gender and sex based differences in lexical directions: A study on language theories. *Advances in Applied Sociology*, 10, 93-102.
<https://doi.org/10.4236/aasoci.2020.104007>
- Munna, A. S., & Kalam, M. A. (2021). Teaching and learning process to enhance teaching effectiveness: A literature review. *International Journal of Humanities and Innovation (IJHI)*, 4(1), 1–4. <https://doi.org/10.33750/ijhi.v4i1.102>
- Muslim, A. (2020). Implementasi pembelajaran partisipatif melalui focus group discussion dalam meningkatkan kemampuan komunikasi mahasiswa. *Jurnal Paedagogy*, 4(1), 15-20. <https://doi.org/10.33394/jp.v4i1.3019>
- Nurhalizah, S., Zubaidah, S., Mahanal, S., & Setiawan, D. (2020). RICOSRE For The Empowerment Of Students' Creative Thinking Skills. *AIP Conference Proceedings*, 2215(1), 030010. <https://doi.org/10.1063/5.0000560>
- O'Connor, C., S. Michaels, Chapin, S., & Harbaugh, A. G. (2017). The silent and the vocal: participation and learning in whole-class discussion. *Learning And Instruction*, 48, 5–13.
<https://psycnet.apa.org/doi/10.1016/j.learninstruc.2016.11.003>
- Park, H. S., Levine, T. R., Weber, R., Lee, H. E., Terra, L. I., Botero, I. C., Bessarabova, E., Guan, X., Shearman, S. M., & Wilson, M. S. (2012). Individual and cultural variations in direct communication style. *International Journal of Intercultural Relations*, 36(2), 179–187.
<https://doi.org/10.1016/j.ijintrel.2011.12.010>
- Polakova, M., Suleimanová, J. H., Madzik, P., Copus, L., Molnarova, I., & Polednova, J. (2023). Soft skills and their importance in the labour market under the conditions of industry 5.0. *Heliyon*, 9(8), e18670. <https://doi.org/10.1016/j.heliyon.2023.e18670>
- Priadi, R. (2020). Teacher communication effectiveness in the learning process. *Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences*, 3(4), 3433–3444. <https://doi.org/10.33258/birci.v3i4.1378>

- Qazi, A., Hasan, N., Abayomi-Alli, O. et al. (2022). Gender differences in information and communication technology use & skills: A systematic review and meta-analysis. *Educ Inf Technol* 27, 4225–4258. <https://doi.org/10.1007/s10639-021-10775-x>
- Qureshi, M. A., Khaskheli, A., Qureshi, J. A., Raza, S. A., & Yousufi, S. Q. (2021). Factors affecting students' learning performance through collaborative learning and engagement. *Interactive Learning Environments*, 31(4), 2371–2391. <https://doi.org/10.1080/10494820.2021.1884886>
- Rafikova, A., & Voronin, A. (2024). Unveiling gender differences: A semantic differential approach to studying mindsets in language learning. *International Journal of Multilingualism*, 1–22. <https://doi.org/10.1080/14790718.2024.2338735>
- Rauf, R., Wijaya, H., & Tari, E. (2021). Entrepreneurship education based on environmental insight: Opportunities and challenges in the new normal era. *Cogent Arts & Humanities*, 8(1). <https://doi.org/10.1080/23311983.2021.1945756>
- Ruthotto, I., Q. Kreth, Stevens, J., Trively, C., & Melkers, J. (2020). Lurking and participation in the virtual classroom: The effects of gender, race, and age among graduate students in computer science. *Computers & Education*, 151, 103854. <https://doi.org/10.1016/j.compedu.2020.103854>
- Sato, M. (2020). The neurobiology of sex differences during language processing in healthy adults: A systematic review and a meta-analysis. *Neuropsychologia*, 140, 107404. <https://doi.org/10.1016/j.neuropsychologia.2020.107404>
- Šejtanić, S., & Ilić, M. (2016). Verbal interaction between pupils and teachers in the teaching process. *European Journal of Education Studies*. <http://oapub.org/edu/index.php/ejes/article/view/315>
- Sjølie, E., Espenes, T. C., & Buø, R. (2022). Social interaction and agency in self-organizing student teams during their transition from face-to-face to online learning. *Computers & Education*, 189, 104580. <https://doi.org/10.1016/j.compedu.2022.104580>
- Sudibjo, N., Idawati, L., & Harsanti, H. R. (2019). Characteristics of learning in the era of industry 4.0 and society 5.0. *International Conference on Education Technology (ICoET)*, 276–278. <https://www.atlantis-press.com/proceedings/icoet-19/125925095>
- Sutiah, & Supriyono. (2024). Enhancing online learning quality: A structural equation modeling analysis of educational technology implementation during the COVID-19 Pandemic. *Telematics and Informatics Reports*, 16, 100175. <https://doi.org/10.1016/j.teler.2024.100175>
- Udeh-Momoh, C., & Watermeyer, T. (2021). Female specific risk factors for the development of Alzheimer's disease neuropathology and cognitive impairment: Call for a precision medicine approach. *Ageing Research Reviews*, 71, 101459. <https://doi.org/10.1016/j.arr.2021.101459>
- Urlaub, P., & Dessein, E. (2022). Machine translation and foreign language education. *Frontiers in Artificial Intelligence*, 5, 936111. <https://doi.org/10.3389/frai.2022.936111>
- Xie, F., and A. Derakhshan. (2021). A conceptual review of positive teacher interpersonal communication behaviors in the instructional context. *Frontiers in Psychology*, 12, 708490. <https://doi.org/10.3389/fpsyg.2021.708490>
- Yashima, T., Ikeda, M., & Nakahira, S. (2016). Talk and Silence in an EFL Classroom: Interplay of Learners and Context. In J. King (Ed.), *The Dynamic Interplay between Context and the Language Learner* (pp. 104–126). *Palgrave Macmillan UK*. https://doi.org/10.1057/9781137457134_7

- Yavuz, S., & Güzel, Ü. (2020). Evaluation of teachers' perception of effective communication skills according to gender. *African Educational Research Journal*, 8(1), 134–138. <https://doi.org/10.30918/AERJ.82.20.010>
- Yeşil, H. (2010). The relationship between candidate teachers' communication skills and attitudes towards the teaching profession. *Procedia-Social and Behavioral Sciences*, 9, 919–922. <https://doi.org/10.1016/j.sbspro.2010.12.259>
- Zhang, S., & Pell, M. D. (2022). Cultural differences in vocal expression analysis: Effects of task, language, and stimulus-related factors. *PloS one*, 17(10), e0275915. <https://doi.org/10.1371/journal.pone.0275915>