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Towards Interprofessional Education and Collaboration to Improve Students' Competences

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Abstract

Interprofessional education collaboration (IPE/C) among undergraduate students is a pivotal learning experience to build comprehensive competencies in a better understanding of communication, teamwork, and the roles of different professions. This study aimed to investigate the interprofessional education collaboration among nursing students in clinical nursing practices, with a descriptive quantitative research design. A total of 69 undergraduate nursing students participated who had experienced interprofessional practices in 2024. Data were collected using a structured, self-administered questionnaire adopted from the Psychometric Evaluation of Interprofessional education collaboration Competency Tool (PEIEC). The result of this study showed the highest professional identity, 43 (62%), and other competences 38% regarding teamwork, roles, responsibility, and communication. The findings revealed generally positive exploring very good competences (54%) for doing team collaboration and good competences for others, including communication (26%) and 20% (professional identity). IPE/C has been widely studied and recognized for its benefits in healthcare education and practice. IPE/C has been reported as pivotal in preparing students for the health workforce, where teamwork is an essential competency required for practice. Numerous studies have demonstrated that IPE/C fosters interprofessional collaboration, reduces barriers and preconceptions among different healthcare student groups, and enhances professional competencies. In conclusion, the Interprofessional education collaboration is essential to advancing competencies, enhancing collaboration, and contributing to better patient care outcomes.

Introduction

The integration of interprofessional education collaboration (IPE/C) among nursing students is becoming increasingly important in dealing with the complexity of healthcare issues and nursing care. As healthcare systems expand, so does the need for collaborative practice among diverse healthcare professions, stressing the need for IPE/C in educating students for clinical and community settings in the real world. The integration of interprofessional education collaboration (IPE/C), often referred to as IPE/C, has become increasingly essential in addressing the complexity of modern healthcare practice. IPE/C involves two or more health professions learning with, from, and about each other to improve collaboration and the quality of care. When effectively combined with IPE/C, defined as coordinated, collaborative teamwork among healthcare

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professionals, IPE/C prepares students to enter the workforce with the competencies needed for collaborative, patient-centered care. Educators benefit from insights into students' experiences, allowing them to develop teaching methods that cultivate collaborative competencies. By aligning program development with students' perceptions, institutions can create IPE/C experiences that are more engaging, practical, and beneficial, ultimately fostering graduates who are well-equipped for collaborative professional environments (Interprofessional Education Collaborative, 2023).

Interprofessional education (IPE/C) is being implemented for undergraduate and graduate degrees in healthcare professional education worldwide. IPE/C is an educational procedure that allows healthcare professionals to share knowledge with the goal of enhancing learning and teamwork (Beckman *et al.*, 2022). Previous research has highlighted the importance of IPE/C in promoting teamwork, communication, and mutual respect among healthcare professionals (Çınar Tanrıverdi *et al.*, 2025). A collaborative effort among healthcare workers has proven effective in reducing medical errors, increasing patient satisfaction, improving patient care, and broadening knowledge and abilities. Physicians, nurses, pharmacists, therapists, and nutritionists are common members of an interdisciplinary healthcare team (Brennan *et al.*, 2021).

IPE/C aims to break down professional boundaries and foster a culture of teamwork and mutual respect among healthcare providers. According to the World Health Organization (WHO), successful interprofessional collaboration can result in improved health outcomes, increased patient safety, and higher job satisfaction among healthcare workers. By participating in IPE/C, students learn to value the roles and skills of their colleagues from many disciplines, which is essential for providing comprehensive and patient-centered care (Xing *et al.*, 2024). IPE/C is necessary for effective clinical practice, but it is difficult to apply. Implementing IPE/C presents obstacles, particularly in understanding how students perceive and experience these instructional activities. According to research, students who participate in IPE/C activities report feeling more confident in their abilities to work with other healthcare professionals (Abusabeib *et al.*, 2024). Beckman *et al.* (2022) discovered that student-led interprofessional clinical placements significantly increased students' competence in interprofessional practice. However, students confront a variety of challenges, including variable degrees of involvement and varying expectations from their peers and educators (Xing *et al.*, 2024).

Understanding student perspectives of IPE/C and IPC implementation is essential for improving methods of instruction and assuring the effectiveness of these programs. According to Xing *et al.* (2024), focusing on students' experiences and feedback might provide useful insights into the strengths and flaws of present IPE/C projects. By addressing these observations, educators can create more personalized and effective IPE/C programs that better prepare students for collaborative practice in various healthcare settings. This study is unique in its focus on undergraduate nursing students' perceptions of IPE/C and IPC. IPE/C internship programs remain important due to their favorable impact on preparing students for clinical settings. The development of nursing internship programs, thus, may contribute to enhancing clinical outcomes and graduating highly qualified students. Interprofessional education and collaboration experiences must be carefully considered from students' perspectives (Abusabeib *et al.*, 2024).

Many studies have focused on educators' perspectives, but there has been little research on nursing students' points of view. The IPE/C experience and expectations of nursing students have not yet been thoroughly investigated. This study can provide a better understanding of nursing students' experiences and expectations when learning IPE/C, allowing for a more in-depth analysis of the future development of IPE/C and improved nursing students' participation in IPE/C. The successful implementation of IPE/C and IPC is critical to the future of healthcare. Educators can improve interprofessional education quality and patient care outcomes by focusing on student perceptions and experiences.

Method

This study employed a descriptive-analytic cross-sectional design conducted in 2024 at Politeknik Kemenkes Semarang, Indonesia, involving nursing students undertaking clinical nursing placements. The study included 69 students selected using proportional random sampling from eligible cohorts; eligibility was restricted to students who had participated in interprofessional learning activities for approximately one month during their placement period. Reporting of the study procedures and methodological elements followed cross-sectional reporting recommendations from the STROBE checklist (Cuschieri, 2019). Data were collected using a structured, self-administered questionnaire adopted from the Psychometric Evaluation of Interprofessional Education Collaboration Competency Tool (PEIEC). The questionnaires of this study consisted of demographic items (e.g., age, sex, semester, placement setting, and place of birth) and items assessing interprofessional learning experiences and the interprofessional competencies, including communication, teamwork/collaboration, and roles and responsibilities. All items were measured using a 4-point Likert scale ranging from 1 (strongly disagree), 2 (Disagree), 3 (Agree), and 4 (strongly agree). Prior to full data collection, the instrument was reviewed concerning content validity by academic experts in nursing education, clinical instructors, and nursing students through focus group discussion. A pilot test with 30 students was conducted to evaluate readability and internal consistency, yielding good reliability (Cronbach's alpha > 0.87).

Questionnaires were distributed to respondents at the end of learning sessions using a structured web survey. Students received a brief explanation of the study aims and procedures, provided informed consent, and completed the questionnaire voluntarily and anonymously. Data analysis comprised descriptive (univariate) statistics to summarise participant characteristics and variable distributions (frequencies, percentages, and measures of central tendency and dispersion). Data was extracted, and core competencies were categorised into four defined areas: roles and responsibilities; interprofessional communication; values for interprofessional practice; teams and teamwork. To identify determinants of Professional Identity and Quality Care, two separate multiple linear regression models were estimated, entering collaboration, communication, ethics/ efficiency, and organizational culture simultaneously as independent variables, with Professional Identity and Quality Care analysed as dependent variables in separate models; statistical significance was set at $p < 0.05$.

Results and Discussion

The result of this study showed that more than half of the respondents (85%) were female, and the respondents were equally distributed in terms of level of study with 83% senior and 17% junior students. The proportions of the students from each program were 26% from the *international class*, 42% from the Regular Class, and 32% from the Recognition of Prior Learning Class when the students have experienced more job from workplace. The result of this study showed that the majority of students' communication competences of interprofessional education and collaboration in clinical nursing practice have very good (39%) and good (38%) perceptions. When viewed from each subscale, in teamwork and collaboration, 41% of the students have good perceptions. In the professional identity subscale, 61% students have good feelings regarding their competencies. In terms of roles and responsibilities, more than half of the students have good perceptions (62%). Slightly different from the results of the assessment of students' perceptions of interprofessional education and collaboration in community settings, most students have good perceptions (49%). Meanwhile, we look at each subscale, the majority of teamwork and collaboration, and subscale roles and responsibility are in the good perception category, while the professional subscale is very good. Data on students' perceptions of interprofessional education and collaboration are shown in Table 1.

The overall mean score for the

Table 1. The Students' Competences

Scales	Poor	Good	Very Good
The students' perceptions for interprofessional education and collaboration in clinical settings			
Communication	16 (23%)	26 (38%)	27 (39%)
Teamwork and Collaboration	18 (26%)	28 (41%)	23 (33 %)
Professional Identity	0 (0 %)	42 (61%)	27 (39 %)
Roles and Responsibility	1 (1%)	43 (62%)	25 (36 %)
The students' perceptions for interprofessional education and collaboration in community settings			
Communication	11 (16%)	34 (49%)	24 (35%)
Teamwork and Collaboration	14 (20%)	32 (46%)	23 (33 %)
Professional Identity	0 (0%)	26 (38%)	43 (62%)
Roles and Responsibility	0 (0 %)	44 (64%)	25 (36%)

Source: Primary data (2024)

questionnaire of students' perceptions for interprofessional education and collaboration in clinical settings was 42.49 (SD ±4.84). The mean score for each statement in the questionnaire is presented in Table 3. The highest mean score, 3.62 (SD ± 0.49), was obtained for the statement "IPE/C requires healthcare workforce resources to be competent in collaboration and communication". Regarding the domain comparison, the mean score for the Teamwork and Collaboration subscale was 17.81 (SD ±2.05), the Professional Identity subscale was 10.67 (SD ± 1.29), and the Roles and Responsibility subscale was 14.01(SD ± 1.76).

Regarding the domain comparison, the highest mean score of item analysis for the Teamwork and Collaboration subscale, 3.62 (SD ± 0.49), was obtained for the statement "IPE/C requires healthcare workforce resources to be competent in collaboration and communication". The highest mean score of the Professional Identity subscale, 3.52 (SD ± 0.5), was obtained for the statement "IPC/E activities provide an opportunity to address issues more comprehensively" and "IPE/C provides more effective services". The highest mean score of the Roles and Responsibilities subscale, 3.58 (SD ± 0.5), was obtained for the statement "Collaboration with other healthcare professionals makes my job easier". The mean score for each statement in the questionnaire is presented in Table 3.

Table 4 shows students' perceptions while learning in the nursing community. The overall mean score for the questionnaire of students' perceptions for interprofessional education and collaboration in community settings was 35.75 (SD ±3.41). The mean score for each statement in the questionnaire is presented in Table 4. Regarding the domain comparison, the mean score for the Teamwork and Collaboration subscale was 14.19 (SD ±1.53), the Professional Identity subscale 7.39 (SD ± 0.83), and the Roles and Responsibilities subscale 14.1(SD ± 1.69).

The highest mean score was found in two subscales, that is, teamwork and collaboration, with the statement "Collaborating with other healthcare professionals can enhance skills" and the subscale professional identity with the statement " Involving other health professions and the community from various sectors to make decisions in the design of public health programs". Both statements have a mean score of 3.71 (SD ±0.46),

Table 6 summarizes the multiple linear regression findings for two outcome variables—Professional Identity and Quality Care using collaboration, communication, ethics/efficiency, and organizational culture as predictors. The table reports unstandardized coefficients (), standardized coefficients (Beta), -values, -values, and 95% confidence intervals for (CI95%B), enabling evaluation of both the direction and statistical significance of each predictor while controlling for the others.

Table 2. Mean Score for Each Subscale of the Students' Competences

Subscales	**Mean**	**SD**
Overall	42.49	4.84
Teamwork and Collaboration	17.81	2.05
Profesional Identity	10.67	1.29
Roles and Responsibility	14.01	1.76

Source: Primary data (2024)

Tabel 3. Interprofessional Collaboration Competences

Interprofessional Collaboration Competences	**Mean**	**SD**
Teamwork and collaboration		
IPE/C develops interprofessional collaboration for clinical practice services	3.58	0.50
Collaboration with other healthcare professions can increase time, and resource efficiency	3.61	0.49
IPE/C requires healthcare workforce resources to be competent in collaboration and communication	3.62	0.49
Collaboration with patients enhances health effectiveness	3.43	0.50
Collaborating with other healthcare professionals can enhance skills	3.57	0.50
Professional identity		
IPE/C improves the quality of interprofessional services	3.48	0.50
IPC/E activities provide an opportunity to address issues more comprehensively	3.52	0.50
IPE/C provides more effective services	3.52	0.50
IPE/C is capable of providing comprehensive health information according to the patient's needs	3.49	0.53
Roles and responsibility		
IPE/C can realize health promotion to support health services	3.57	0.50
Collaboration with other healthcare professionals makes my job easier	3.58	0.50
IPE/C can be implemented in clinical practice by involving nursing as facilitators	3.52	0.50

Source: Primary data (2024)

Table 4. Mean score for each subscale of the students' Competences

Subscales	**Mean**	**SD**
Overall	35.75	3.41
Teamwork and Collaboration	14.19	1.53
Professional Identity	7.39	0.83
Roles and Responsibility	14.1	1.69

Source: Primary data (2024)

Table 5. Item Level Analysis

Items statements	Mean	SD
Teamwork and collaboration		
Collaboration with the community increasing community compliance with health programs	3.39	0.52
Collaboration with the community enhances the effectiveness of health programs	3.62	0.49
Collaborating with other healthcare professionals can enhance skills	3.71	0.46
IPE/C develops interprofessional collaboration in healthcare services within the community	3.49	0.50
Professional identity		
IPE/C based on culture and values is an effective method in providing healthcare services to the community.	3.70	0.46
Involving other health professions and the community from various sectors to make decisions in the design of public health programs	3.71	0.46
Roles and responsibility		
Conducting health promotion together with other healthcare workers to improve healthcare services	3.55	0.50
Collaborate with other healthcare professions to improve community satisfaction	3.55	0.50
Collaboration with other healthcare professions can increase the efficiency of time and resources	3.55	0.50

Table 6. Multiple linear regression results predicting Professional Identity (PI) and Quality Care (QC)

Dependences	Predictors	B	Beta	t	p	$CI95\%B$
PI (PI_ Professional_ Identity)	Constanta	1.890	—	1.649	0.104	-0.400–4.180
	Collaboration	0.280	0.240	2.013	0.048	0.002–0.558
	Communication	0.357	0.071	0.870	0.387	-0.462–1.176
	Ethics_Efficience	0.717	0.493	3.416	0.001	0.298–1.136
	Culture	0.428	0.151	1.391	0.169	-0.187–1.042
QC (QC_ Quality_Care)	Constanta	1.611	—	2.136	0.037	0.104–3.117
	Collaboration	0.139	0.184	1.517	0.134	-0.044–0.322
	Communication	0.126	0.039	0.468	0.641	-0.413–0.665
	Ethics_Efficience	0.456	0.485	3.302	0.002	0.180–0.731
	Culture	0.439	0.240	2.167	0.034	0.034–0.843

Source: Primary data (2024)

PI: Adjusted $R^2 = 0.805$; ANOVA $p < 0.001$ $(F(4,64) = 71.276)$.

QC: Adjusted $R^2 = 0.798$; ANOVA $p < 0.001$ $(F(4,64) = 68.270)$.

Table 3. Multiple linear regression results predicting Professional Identity and Quality Care.

For Professional Identity, ethics/efficiency emerged as the strongest determinant (B = 0.717; CI95%B 0.298–1.136; p = 0.001), indicating that higher ethics/efficiency is associated with higher professional identity during clinical placement. This pattern is consistent with contemporary syntheses in nursing education describing professional identity as closely linked to professional values/ethics and the internalization of expected professional behaviors, which are strengthened through practice-based learning and reflection (Geoghan Marold, Strouse and Butcher, 2025). Collaboration also showed a positive and significant association with Professional Identity (B = 0.280; CI95%B 0.002–0.558; p = 0.048), supporting the view that meaningful teamwork experiences can contribute to identity development by clarifying roles and reinforcing professional commitment. (Patel *et al.*, 2025) In contrast, communication and culture were not significant predictors of PI in the multivariable model (communication: B = 0.357; CI95%B -0.462–1.176; p = 0.387; culture: B = 0.428; CI95%B -0.187–1.042; p = 0.169), which may reflect that these constructs exert indirect effects (e.g., via the quality of teamwork contact) or that between-student variability was limited in this cohort (Patel *et al.*, 2025).

For Quality Care, ethics/efficiency remained a significant determinant (B = 0.456; CI95%B 0.180–0.731; p = 0.002), consistent with interprofessional frameworks positioning values/ethics as core to collaborative practice and to safeguarding care quality. (IPEC, 2023; Patel *et al.*, 2025) Organizational culture also significantly predicted Quality Care (B = 0.439; CI95%B 0.034–0.843; p = 0.034), aligning with recent evidence that culture is an integral component of quality management in healthcare and supports sustained service improvement when rooted in shared values and responsibility. (Nowak, 2025) Meanwhile, collaboration and communication were not statistically significant predictors of Quality Care (collaboration: B = 0.139; CI95%B -0.044–0.322; p = 0.134; communication: B = 0.126; CI95%B -0.413–0.665; p = 0.641), suggesting that "communication quality" may require more specific operationalization (e.g., structured tools such as SBAR) to show measurable associations with quality outcomes. At the model level, both regressions were highly significant (ANOVA $p < 0.001$) and showed strong explanatory power (Adjusted R^2: Professional Identity = 0.805; Quality Care = 0.798), indicating that the predictor set jointly explains substantial variance in both outcomes, although causal inference remains limited by the cross-sectional design and purposive sampling approach (Patel *et al.*, 2025).

The findings of this study indicate that nursing students at the Semarang Health Polytechnic hold overwhelmingly positive perceptions toward Interprofessional Education and Collaboration (IPE/C). High mean scores across all questionnaire items demonstrate that students perceive IPE/C as beneficial, relevant, and feasible within both academic and practice-based learning environments. These results suggest that students recognize IPE/C not merely as an educational innovation, but as an essential approach to preparing competent health professionals capable of working effectively in complex healthcare systems. The positive perceptions observed in this study align with prior international evidence showing that health profession students generally view IPE/C as a valuable strategy for improving teamwork, communication, professional identity, and service quality (Song and Nam, 2022; Bashatah, 2023; Abusabeib *et al.*, 2024). The consistency of these findings across different cultural and educational contexts reinforces the universality of IPE/C principles and supports its integration into health professional curricula in Indonesia. The overall favorable perception also reflects students' readiness to engage in interprofessional learning and collaborative practice during clinical and community placements. This readiness is a critical prerequisite for effective interprofessional collaboration, as attitudes and perceptions significantly influence willingness to collaborate, openness to other professional roles, and engagement in shared decision-making processes.

The highest-rated subscale in this study was teamwork and collaboration, indicating that students strongly believe collaborative

learning is fundamental to professional competence. Notably, 100% of respondents agreed or strongly agreed that learning together with students from other health professions is an effective way to become competent members of healthcare teams. This finding underscores the perceived value of collaborative learning in preparing students for real-world healthcare environments where interprofessional teamwork is indispensable. This result is consistent with previous studies conducted in diverse settings, including Saudi Arabia, Lebanon, South Korea, China, and Indonesia, which reported similarly positive attitudes toward interprofessional collaboration among nursing and health profession students (Wang and Petrini, 2017; Fawaz and Anshasi, 2019; Yune *et al.*, 2020; Song and Nam, 2022; Abusabeib *et al.*, 2024). Such convergence suggests that the benefits of IPE/C—particularly in fostering teamwork and mutual respect—are widely recognized regardless of cultural or institutional differences.

One of the most salient findings was the high mean score (3.62 ± 0.49) for the statement that IPE/C requires healthcare workforce resources competent in collaboration and communication. This reflects students' awareness that effective interprofessional collaboration does not occur spontaneously but requires deliberate development of communication skills, shared learning experiences, and structured educational support. Interprofessional education provides a platform for students to exchange knowledge, develop mutual understanding, and integrate diverse professional perspectives, thereby enhancing readiness for team-based patient care (Goldsberry, 2018). The role of structured communication in supporting interprofessional collaboration is particularly noteworthy. Evidence from Sukesih and Faridah (2020) demonstrated that SBAR communication significantly improved nurses' attitudes and behaviors related to patient safety. SBAR offers a standardized framework that enhances clarity, accuracy, and efficiency in interprofessional communication, reducing misunderstandings and preventing adverse events. Within the context of IPE/C, SBAR aligns closely with interprofessional competency frameworks by strengthening shared mental models, coordination, and collaborative decision-making.

Although communication did not emerge as an independent determinant of Professional Identity or Quality Care in the multivariable analysis, this does not diminish its importance. Instead, communication appears to function as a foundational enabling competency that supports collaboration, ethical practice, and service quality indirectly. Effective communication facilitates teamwork, reinforces professional respect, and enables ethical decision-making, which collectively contribute to positive professional and service outcomes. Furthermore, collaborative learning was perceived to enhance role clarity and understanding of the healthcare delivery system. Students reported that learning together across professions helped them better understand each profession's roles, scopes of practice, and contributions to patient care. This finding is supported by studies from David *et al.* (2024) and Sahoo *et al.* (2022), which demonstrated that interprofessional learning improves role identification and prepares students to function effectively within multidisciplinary healthcare teams. The perception that IPE/C improves service quality is also noteworthy. The mean score of 3.48 ± 0.50 for the statement that IPE/C enhances interprofessional service quality reflects students' understanding that collaboration enables comprehensive, patient-centered care. Interprofessional collaboration allows healthcare providers to integrate diverse expertise, share information efficiently, and make joint clinical decisions, resulting in more holistic and effective patient care.

In addition to clinical contexts, IPE/C was perceived as highly beneficial in community settings. In this study, 80% of respondents demonstrated good perceptions regarding teamwork and collaboration in community-based IPE/C activities. Students perceived that interprofessional collaboration enhances community compliance with health programs and improves program effectiveness, reflecting an understanding of the complex and multifactorial nature of community health problems. These findings are strongly supported by community-based intervention

studies published in *KEMAS*. Azinar *et al.* (2020) demonstrated that the Care Support Education (CSE) model significantly improved knowledge, attitudes, negotiation skills, and preventive behaviors through structured and supportive communication. Although the study focused on female sex workers, the underlying principles of the CSE model—collaboration, communication, shared responsibility, and behavior change—are directly relevant to IPE/C implementation in community contexts.

Similarly, Siyam *et al.* (2020) reported that the MAPM Framework effectively increased adolescents' awareness of healthy behaviors through structured, collaborative educational interventions. Najib *et al.* (2020) also showed that community-based reproductive health communication models improved knowledge, attitudes, and access to contraception among early married couples. These studies collectively highlight that interprofessional, community-based approaches are effective in addressing complex public health challenges by integrating expertise from multiple disciplines. IPE/C in community settings also promotes cultural sensitivity and value-based collaboration. In this study, 78% of respondents reported good perceptions regarding culture- and value-based collaboration. This finding aligns with Nugraha and Syarifudin (2021), who emphasized the importance of reinforcing factors such as institutional support, leadership, and community engagement in improving health behavior standards. These results suggest that IPE/C is most effective when it is culturally responsive and embedded within supportive organizational and community structures.

The regression analysis revealed that ethics/efficiency was the most consistent determinant associated with both Professional Identity and Quality Care. This finding aligns with interprofessional competency frameworks, such as those proposed by the Interprofessional Education Collaborative, which emphasize values and ethics as foundational domains of collaborative practice. Ethical conduct, mutual respect, accountability, and shared values are essential mechanisms that support professional identity formation and contribute to high-quality service delivery. Evidence from curriculum mapping studies further demonstrates that values and ethics are the most consistently embedded competencies across health professions education curricula, indicating their central role in shaping professional behavior and identity (Pitout *et al.*, 2025).

From a developmental perspective, professional identity formation is strongly influenced by the internalization of professional values through both formal education and clinical exposure. Realist synthesis evidence suggests that when interprofessional education (IPE) provides supportive contexts such as time for interaction, relevance to future careers, and organizational reinforcement, ethical values and collaborative norms become integrated into learners' personal value systems, thereby sustaining positive professional attitudes over time (Grand-Guillaume-Perrenoud *et al.*, 2025). This supports previous nursing education literature indicating that students who perceive a strong ethical climate are more likely to develop a clear sense of professional identity, professional commitment, and responsibility toward quality care (Rochmayani and Budiono, 2020).

Collaboration emerged as a significant determinant of Professional Identity, indicating that meaningful collaborative experiences play a crucial role in professional identity development. Through interprofessional collaboration, students engage in role clarification, shared decision-making, mutual dependence, and reflective practice, all of which strengthen their professional self-concept. Empirical evidence from interprofessional simulations and student-led clinical settings shows that experiential and authentic collaborative learning environments enhance students' confidence, role understanding, and interprofessional identity, particularly when students have prior exposure to IPE and clinical practice (Almukdad *et al.*, 2025; Prestes Vargas *et al.*, 2025). Furthermore, longitudinal research highlights that sustained exposure to real-world interprofessional collaboration, supported by role models and organizational culture, is critical for the development of a strong interprofessional identity during the transition to professional practice.

In contrast, communication and

culture were not statistically significant predictors of Professional Identity in this study, suggesting that professional identity formation may be more directly shaped by ethical values and active collaborative engagement than by communication frequency alone. Communication skills may function as enabling tools rather than primary drivers of identity development unless embedded within meaningful collaborative and ethically grounded experiences. For Quality Care, however, organizational culture emerged as a significant determinant, underscoring the importance of shared norms, values, leadership support, and a learning-oriented environment in shaping perceptions of quality care. This finding is consistent with evidence demonstrating that organizational culture influences teamwork effectiveness, patient satisfaction, safety outcomes, and overall service quality within healthcare systems (Prestes Vargas *et al.*, 2025)

Conclusion

This study concludes that nursing students at the Semarang Health Polytechnic demonstrate predominantly positive perceptions toward Interprofessional Education and Collaboration (IPE/C). Students perceive IPE/C as beneficial, feasible, and essential for developing teamwork, communication, professional identity, and service quality competencies. These findings indicate that students are well-prepared to engage in interprofessional learning and collaborative practice in both clinical and community settings. Teamwork and collaboration emerged as the strongest perceived benefits of IPE/C, reinforcing the importance of collaborative learning in preparing students for real-world healthcare practice. IPE/C was also perceived to enhance service quality and community health outcomes by promoting holistic, patient- and community-centered care. The findings further highlight the critical role of ethics and organizational culture in shaping professional identity and service quality. Overall, the results support the integration and strengthening of IPE/C within health professional education curricula. Educational institutions should prioritize structured interprofessional learning experiences, ethical value development, and supportive organizational cultures to optimize the impact of IPE/C on future healthcare professionals. Further research is recommended to explore longitudinal outcomes of IPE/C implementation and its direct impact on patient and community health outcomes.

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