



The Interplay of Behavioral, Emotional, and Cognitive Engagement in English for Specific Purposes among Nutrition Students: A Mixed-Methods Study

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Article Info	Abstract
Received: 2026-08-04 Revised: 2026-08-19 Accepted: 2026-09-10 Keywords: <i>behavioral engagement;</i> <i>cognitive engagement;</i> <i>emotional engagement;</i> <i>English for Specific Purposes;</i> <i>mixed methods;</i> <i>Nutrition students;</i> <i>student engagement.</i> DOI: 10.24256/ideas.v14i2. 12168 Corresponding Author: Rahman Efendi rahmanefendi.id@gmail.com Pendidikan Bahasa Inggris, Universitas Muhammadiyah Pare-pare, Sulawesi Selatan	<i>Student engagement is an important component of English for Specific Purposes (ESP) learning, particularly for health science students who need English for academic and future professional purposes. However, limited research has examined behavioral, emotional, and cognitive engagement together in ESP learning among Nutrition students. This study aimed to examine the levels of behavioral, emotional, and cognitive engagement, the relationships among the three dimensions, the factors shaping students' engagement, and students' perceptions of the importance of English and the challenges they encountered in maintaining engagement. A sequential explanatory mixed-methods design was employed with 27 third-semester Nutrition students at Politeknik Kesehatan Sorong, Indonesia. Quantitative data were collected using a 58-item student engagement questionnaire and analyzed using descriptive statistics and Pearson Product-Moment correlation. Qualitative data were obtained through semi-structured interviews with three randomly selected students and classroom observations conducted across four English learning sessions, and were analyzed thematically. The results showed that behavioral engagement ($M = 3.14$), emotional engagement ($M = 3.40$), and cognitive engagement ($M = 3.14$) were all at the moderate level. Significant positive associations were found between behavioral and cognitive engagement ($r = .919, p < .001$), behavioral and emotional engagement ($r = .870, p < .001$), and cognitive and emotional engagement ($r = .831, p < .001$). The qualitative findings indicated that perceived professional relevance of English, learning motivation, emotional experiences, instructional practices, and classroom conditions shaped students' engagement. Students generally perceived English as important for their academic and professional development, but limited vocabulary, low confidence, fear of making mistakes, difficulties understanding English materials, and</i>

inadequate preparation presented challenges to maintaining engagement. The findings indicate that behavioral, emotional, and cognitive engagement were strongly associated in this sample and that students' engagement in ESP learning was shaped by interconnected personal, instructional, and professional factors.

1. Introduction

The growing internationalization of higher education and healthcare has substantially increased the importance of English proficiency among health science students. English functions as the dominant language of scientific communication, enabling students to access current research findings, evidence-based clinical guidelines, and international professional networks. Within this context, English for Specific Purposes (ESP) has become an essential component of health education because it equips learners with language skills tailored to the communicative demands of their disciplines. Rather than emphasizing general language proficiency, ESP focuses on discipline-specific vocabulary, academic literacy, and professional communication that support students' academic achievement and future careers. For nutrition students, English proficiency is particularly important because most scientific literature, nutritional guidelines, and global health publications are published in English.

Consequently, inadequate engagement in ESP learning may limit students' opportunities to develop the academic and professional competencies required in an increasingly globalized healthcare environment. This educational context highlights the need to understand how students engage in ESP learning and what factors influence that engagement. (Pelicioni et al., 2023)(Susandi et al., 2026)(Fitria, 2026)(Adebisi et al., 2024)

Although ESP provides the linguistic foundation required in health education, successful learning depends not only on curriculum design but also on students' engagement throughout the learning process. Student engagement has consistently been recognized as one of the strongest predictors of learning quality, academic achievement, persistence, and professional readiness. Contemporary engagement theories conceptualize engagement as a multidimensional construct comprising behavioral, emotional, and cognitive dimensions that interact dynamically during learning. Behavioral engagement refers to students' active participation in classroom activities, emotional engagement reflects students' interest, motivation, and attitudes toward learning, whereas cognitive engagement represents learners' investment in understanding, self-regulation, and critical thinking.

These three dimensions collectively determine whether students merely participate in learning activities or actively construct meaningful learning experiences. In ESP classrooms, where learners are expected to master discipline-specific language within authentic professional contexts, understanding these interconnected dimensions becomes particularly important for improving instructional effectiveness.(E. R. Kahu & Nelson, 2018)(Habley et al., 2012)(Alam & Mohanty, 2024)

This study is grounded primarily in the multidimensional conceptualization of student engagement, which views engagement as a construct encompassing behavioral, emotional, and cognitive dimensions. Behavioral engagement refers to students' participation, effort, persistence, and involvement in learning activities. Emotional engagement concerns students' interest, motivation, attitudes, and emotional responses toward learning, while cognitive engagement reflects students' psychological investment in understanding, self-regulation, strategic learning, and higher-order thinking. Rather than

functioning as isolated components, these dimensions are conceptually interconnected and may reinforce one another during the learning process.

This multidimensional perspective is particularly relevant to English for Specific Purposes (ESP), where successful learning requires more than observable participation. Students may participate in classroom activities while experiencing anxiety or low confidence, or they may recognize the professional value of English without consistently investing effort in learning. Therefore, examining behavioral, emotional, and cognitive engagement together provides a more comprehensive understanding of how students experience and participate in ESP learning.

The framework is further informed by Kahu's conceptualization of student engagement, which emphasizes the relationship between students' psychological processes and their learning behaviours. From this perspective, engagement emerges through the interaction between students' internal experiences and their learning environment. This perspective supports the present study's assumption that behavioral, emotional, and cognitive engagement should be examined as interconnected dimensions rather than independent aspects of learning.

In the context of Nutrition students, this framework is particularly appropriate because English learning is closely connected to students' academic and future professional needs. Students' perceptions of the relevance of English, their motivation and emotional experiences, classroom practices, and learning challenges may shape how they participate behaviorally, respond emotionally, and invest cognitively in ESP learning. Accordingly, the present study uses the multidimensional engagement framework to examine both the levels of the three engagement dimensions and the relationships among them, while qualitative evidence is used to explain the factors underlying the observed patterns.

Recent studies have increasingly examined student engagement within English language learning and ESP contexts. emphasized that engagement is a key predictor of successful English language learning and recommended student-centered pedagogical strategies to foster active participation. demonstrated that educational technologies such as simulation, flipped classrooms, and virtual learning environments significantly enhanced engagement among medical students. highlighted that effective ESP instruction should be built upon learners' specific academic and professional needs, while reported that tailored ESP courses improved English vocabulary acquisition and learner autonomy among health students.

Similarly, found that authentic ESP materials contributed positively to students' language development by addressing discipline-specific communication needs. Other studies have emphasized the influence of motivation, learning environment, faculty support, and instructional strategies on students' behavioral, emotional, and cognitive engagement. Collectively, these studies demonstrate that engagement is a multifaceted phenomenon influenced by both internal and external factors and remains central to successful ESP learning. Ginting et al., (2024) (Lasaiba et al., 2025) (Basturkmen, 2022) (Fraser et al., 2025) Achouri, (2025)

Despite these growing contributions, several important gaps remain in the literature. First, most previous studies have focused on general English learning or ESP instruction among medical, nursing, pharmacy, or mixed health science students, while nutrition students have received considerably less scholarly attention. Second, earlier investigations have frequently examined individual dimensions of engagement or identified influencing factors without adequately explaining how behavioral, emotional, and cognitive engagement interact within a single learning context. Third, relatively few studies have employed mixed-methods designs that integrate quantitative measurement with qualitative evidence to provide a comprehensive understanding of student engagement.

Consequently, the dynamic interplay among engagement dimensions in ESP learning, particularly within nutrition education in developing educational contexts, remains insufficiently understood.

The present study addresses these gaps by focusing specifically on nutrition students, a group whose English learning needs differ from those of students in medicine or nursing. Unlike medical students, who primarily require English for clinical interaction and patient communication, nutrition students frequently engage with scientific literature, nutritional epidemiology, dietary guidelines, food science research, and evidence-based nutritional interventions. Their professional development depends heavily on the ability to interpret scientific publications and apply research findings within nutrition practice. These distinctive academic and professional demands require an ESP learning environment that supports not only language acquisition but also sustained behavioral, emotional, and cognitive engagement. Examining engagement within this specific population therefore provides insights that may not emerge from studies involving broader health science disciplines and offers a more contextualized understanding of ESP learning in nutrition education.

Based on these considerations, this study seeks to answer four research questions: (1) What are the levels of behavioral, emotional, and cognitive engagement among Nutrition students in English for Specific Purposes learning? (2) What are the relationships among behavioral, emotional, and cognitive engagement among Nutrition students in English for Specific Purposes learning? (3) What factors shape Nutrition students' engagement in English for Specific Purposes learning? and (4) How do Nutrition students perceive the importance of English for their academic and professional development, and what challenges do they encounter in maintaining engagement? To address these questions, the study employs a sequential explanatory mixed-methods design in which quantitative findings are followed by qualitative evidence to explain and elaborate the observed patterns of student engagement.

This study contributes to the literature in three important ways. Theoretically, it extends the application of multidimensional student engagement theory within the context of English for Specific Purposes in health education by examining the interconnected nature of behavioral, emotional, and cognitive engagement. Methodologically, it demonstrates the value of integrating quantitative and qualitative evidence through a sequential explanatory mixed-methods approach to provide a richer understanding of student engagement. Practically, the findings offer evidence-based implications for ESP lecturers, curriculum developers, and higher education institutions in designing learning environments that foster meaningful engagement among nutrition students. By providing empirical evidence from an underrepresented educational context in Indonesia, this study also broadens current discussions on student engagement within ESP and contributes to the growing body of research on English language education for health professionals.

2. Method

Research Design and Context

This study employed a sequential explanatory mixed-methods design to investigate behavioral, emotional, and cognitive engagement in English for Specific Purposes (ESP) among Nutrition students. The design consisted of two sequential phases: a quantitative phase followed by a qualitative phase. The quantitative phase was conducted first to determine students' levels of behavioral, emotional, and cognitive engagement and to examine the relationships among the three dimensions. The qualitative phase subsequently

explored students' learning experiences, perceptions, and challenges to provide contextual explanations of the quantitative findings. This design was therefore used not only to obtain complementary quantitative and qualitative evidence but also to connect the two phases at the interpretation stage. (Li & Wang, 2023)

Participants and Sampling

The quantitative phase involved 27 third-semester students enrolled in the Nutrition Study Program at Politeknik Kesehatan Sorong. The participants constituted the respondents included in the quantitative analysis. Following completion of the questionnaire, three students were randomly selected from the 27 respondents to participate in the qualitative interview phase. All questionnaire respondents were eligible for interview selection, and random selection was used to minimize researcher selection bias and give each respondent an equal opportunity to participate in the interview.

The three selected students participated in semi-structured interviews focusing on their experiences, perceptions, motivation, learning strategies, and challenges in English learning. The interview participants were not intended to statistically represent the 27 respondents; rather, their accounts were used to provide contextual explanations of the quantitative patterns.

Data Collection Procedure

The data collection procedure followed a sequential QUAN → QUAL process. After obtaining institutional approval and participants' informed consent, the questionnaire was administered to the 27 students during regular English classes. Following completion of the quantitative phase, three students were randomly selected from the questionnaire respondents for semi-structured interviews.

Classroom observations were conducted across four English learning sessions, with each session lasting 100 minutes (2 × 50 minutes). Each observation covered the entire duration of the scheduled English learning session. A structured observation checklist was used to document students' behavioral, emotional, and cognitive engagement, including participation, interaction, attention, responses to learning activities, and involvement in classroom tasks. The researcher acted as a non-participant observer and did not actively intervene in the learning activities.

The qualitative data from the interviews and observations were subsequently used to explain and elaborate the patterns identified in the quantitative findings.

Mixed-Methods Integration

Integration was conducted following the sequential explanatory mixed-methods design (QUAN → QUAL). The quantitative phase was conducted first to identify the levels of behavioral, emotional, and cognitive engagement and to examine the relationships among the three dimensions. The quantitative findings then informed the qualitative phase, in which interviews and classroom observations were used to explore students' experiences, perceptions, and challenges underlying the observed engagement patterns.

The quantitative and qualitative findings were integrated at the interpretation stage. Specifically, qualitative evidence was used to explain and elaborate the quantitative results concerning students' engagement levels and the relationships among the three dimensions. The interview and observation findings were compared with the quantitative patterns to identify areas of convergence, complementarity, and divergence. A triangulation matrix was used to organize the integration of questionnaire, interview, and classroom observation findings. Through this process, the qualitative findings were not treated as a separate set of results but were used to provide contextual explanations for the quantitative findings.

Instruments

Three instruments were used for data collection: a student engagement questionnaire, semi-structured interview protocols, and a classroom observation checklist.

The student engagement questionnaire consisted of 58 items rated on a five-point Likert scale. The questionnaire comprised 20 behavioral engagement items, 18 cognitive engagement items, and 20 emotional engagement items. The behavioral dimension focused on students' participation and involvement in learning activities; the cognitive dimension addressed students' learning strategies, understanding, and cognitive investment; and the emotional dimension addressed students' interest, motivation, attitudes, and emotional responses toward English learning.

Conceptually, the questionnaire was organized around the behavioral, emotional, and cognitive dimensions of multidimensional student engagement. The indicators within each dimension were operationalized using relevant learning-domain taxonomies to construct the questionnaire items. Behavioral engagement measured students' participation in classroom activities, assignment completion, and attendance; emotional engagement examined students' interest, motivation, and attitudes toward English learning; while cognitive engagement assessed learning strategies, critical thinking, and students' efforts to understand English learning materials.

Validity and Reliability

Before the main analysis, the questionnaire was evaluated for item validity and internal consistency. Item validity was assessed using the Corrected Item–Total Correlation, with coefficients of .30 or higher considered acceptable. The behavioral engagement scale consisted of 20 valid items, with Corrected Item–Total Correlation coefficients ranging from .560 to .919. The cognitive engagement scale consisted of 18 valid items, with coefficients ranging from .551 to .930, while the emotional engagement scale consisted of 20 valid items, with coefficients ranging from .624 to .875.

Internal consistency was assessed using Cronbach's Alpha. The behavioral, cognitive, and emotional engagement scales demonstrated high internal consistency, with Cronbach's Alpha coefficients of .967, .965, and .961, respectively. These results indicated that the three scales demonstrated satisfactory reliability for the purposes of the present study.

Data Analysis

Quantitative data were analyzed using IBM SPSS. Descriptive statistics were calculated for each engagement dimension, including the mean, standard deviation, minimum, and maximum scores. Mean scores were interpreted using five categories based on the five-point Likert scale: 1.00–1.80 = very low, 1.81–2.60 = low, 2.61–3.40 = moderate, 3.41–4.20 = high, and 4.21–5.00 = very high. These categories were applied consistently to the behavioral, cognitive, and emotional engagement scores.

Before conducting Pearson's correlation analysis, the relevant assumptions were examined. Normality was assessed using the Shapiro–Wilk test, given the sample size of 27. Potential univariate outliers were examined using boxplots, and linearity was assessed through visual inspection of scatterplots for each pair of engagement dimensions.

Pearson Product–Moment correlation was used to examine the relationships among behavioral, emotional, and cognitive engagement. Correlation coefficients were interpreted in terms of their direction and magnitude, and statistical significance was evaluated using a two-tailed test at the .05 significance level.

Interview and classroom observation data were analyzed thematically. The analysis involved four stages: transcription and familiarization with the data, initial coding, development and refinement of themes, and interpretation of the themes in relation to the

quantitative findings. Interview responses were coded to identify recurring patterns related to students' perceptions, motivation, learning experiences, instructional practices, and challenges in English learning. Observation notes were analyzed alongside the interview data to identify behavioral and contextual evidence that could support or qualify the interview findings.

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3. Results

RQ1. Levels of Behavioral, Emotional, and Cognitive Engagement

The quantitative findings showed that the three dimensions of student engagement were at the moderate level. Behavioral engagement had a mean score of 3.14, emotional engagement had a mean score of 3.40, and cognitive engagement had a mean score of 3.14. Based on the predefined interpretation criteria, all three dimensions were categorized as moderate.

Table 1. Behavioral, Emotional, and Cognitive Engagement Level

Dimension	Mean	Category
Behavioral Engagement	3.14	Moderate
Emotional Engagement	3.40	Moderate
Cognitive Engagement	3.14	Moderate

Among the three dimensions, emotional engagement obtained the highest mean score ($M = 3.40$), followed by behavioral engagement ($M = 3.14$) and cognitive engagement ($M = 3.14$). Although all three dimensions fell within the moderate category, the findings indicate that students' emotional engagement was relatively higher than their behavioral and cognitive engagement.

RQ2. Relationships among Behavioral, Emotional, and Cognitive Engagement

Assumption Testing for Pearson Correlation

The assumptions underlying Pearson's correlation analysis were examined before interpreting the relationships among the three engagement dimensions. The Shapiro–Wilk test indicated that behavioral engagement scores deviated significantly from normality, $W = .896$, $p = .011$, and cognitive engagement scores also deviated significantly from

normality, $W = .874$, $p = .004$. In contrast, emotional engagement scores did not significantly deviate from normality, $W = .958$, $p = .338$. No apparent extreme univariate outliers were identified based on the boxplots, while the scatterplots indicated approximately linear relationships among the three pairs of engagement dimensions.

Pearson Correlation Results

Pearson Product–Moment correlation analysis showed strong positive associations among the three dimensions of student engagement. Behavioral engagement was strongly correlated with cognitive engagement, $r = .919$, $p < .001$. Behavioral engagement was also strongly correlated with emotional engagement, $r = .870$, $p < .001$, while cognitive engagement was strongly correlated with emotional engagement, $r = .831$, $p < .001$.

Table 2. Pearson Correlation among Student Engagement Dimensions

Variables	r	p-value
Behavioral – Cognitive	.919	< .001
Behavioral – Emotional	.870	< .001
Cognitive – Emotional	.831	< .001

Overall, the results indicate strong positive associations among behavioral, emotional, and cognitive engagement in the present sample. These findings suggest that students who reported higher engagement in one dimension also tended to report higher engagement in the other dimensions.

RQ3. Factors Shaping Student Engagement

The qualitative findings identified several factors shaping students' engagement in English for Specific Purposes learning. Analysis of the semi-structured interviews and classroom observations resulted in four main themes: (1) perceived relevance of English, (2) learning motivation and emotional responses, (3) instructional practices, and (4) challenges limiting engagement. These themes provide contextual explanations of the quantitative findings by illustrating how students' perceptions, emotional experiences, classroom experiences, and learning challenges shaped their engagement in English learning.

Students' perceptions of the relevance of English emerged as an important factor shaping their engagement. The interview findings indicated that students recognized English as relevant to their academic studies and future professional development. In particular, students associated English proficiency with accessing scientific literature and understanding nutrition-related information.

Theme 1. Perceived Relevance of English to Future Professional Practice

Most participants perceived English as an essential competency for their future careers as nutrition professionals. Students emphasized that English proficiency would enable them to read international journals, understand nutrition-related literature, access evidence-based health information, and communicate within broader professional contexts. This perceived relevance strengthened their motivation to engage in ESP learning.

Theme 2. Learning Motivation and Emotional Responses

Students' motivation and emotional experiences also influenced their engagement in English learning. The interview data indicated that students' willingness to participate was associated with their interest in English, confidence in using the language, and emotional responses during classroom activities. Positive experiences could encourage participation, whereas anxiety or limited confidence could make students less willing to participate actively.

Theme 3. Instructional Practices Supporting Engagement

Students consistently reported that interactive teaching approaches—including classroom discussions, presentations, collaborative learning, and audiovisual media—enhanced their participation and learning interest. Classroom observations confirmed that students became more engaged when instructional activities encouraged interaction rather than passive learning.

Theme 4. Challenges Limiting Student Engagement

Several challenges constrained students' engagement in ESP learning. Internal factors included limited vocabulary, speaking anxiety, low self-confidence, and insufficient mastery of English. External factors involved teaching approaches, lecturer support, classroom interaction, learning media, and limited exposure to English outside the classroom. These challenges help explain why behavioral and cognitive engagement remained moderate despite students' relatively positive emotional attitudes.

RQ4. Perceptions of English and Challenges in Maintaining Engagement

The qualitative findings indicated that the interviewed students generally perceived English as important for both their academic studies and future professional development. Students associated English proficiency with the ability to understand medical information, access academic resources, communicate with international patients or professionals, and pursue future study or employment opportunities. One participant explained that English would be necessary when seeking employment abroad because communication would require English. Another participant emphasized the importance of English for communicating with foreign patients in the future. These responses indicate that students recognized the relevance of English to their academic and professional needs in the healthcare field.

Despite these positive perceptions, the interviews revealed several challenges that made it difficult for students to maintain active engagement in English learning. The most prominent challenges were limited vocabulary, low confidence in using English, fear of making mistakes, difficulties understanding English texts and medical terminology, and inadequate preparation before attending class. Some students reported that they were not confident when speaking English and were afraid of making mistakes when writing or speaking. Other students reported that they sometimes attended English classes without prior preparation.

Students also described several strategies for dealing with these challenges. They reported using Google Translate, YouTube, internet resources, and peer discussion to understand unfamiliar vocabulary and English learning materials. These strategies indicate that although students experienced difficulties, they attempted to overcome them through technological resources, independent vocabulary searches, and peer support.

In addition, teaching practices and lecturer support emerged as contextual factors that helped students maintain their engagement. Students responded positively to interactive teaching methods and clear explanations from the lecturer. However, some students still participated passively despite the lecturer's efforts, suggesting that supportive instructional practices alone did not completely overcome students' personal challenges.

Overall, the findings suggest that students recognized the importance of English for their academic and professional development, particularly in healthcare contexts. However, positive perceptions did not always translate into consistent engagement. Limited vocabulary, low confidence, fear of making mistakes, difficulties understanding English materials, and inadequate preparation remained important barriers to sustained engagement.

4. Discussion

Discussion of RQ1: Levels of Behavioral, Emotional, and Cognitive Engagement

The findings showed that behavioral, emotional, and cognitive engagement among Nutrition students were all at a moderate level. Behavioral engagement obtained a mean score of 3.14, emotional engagement obtained the highest mean score of 3.40, and cognitive engagement obtained a mean score of 3.14. This pattern indicates that students generally demonstrated a moderate degree of participation, positive emotional responses, and cognitive investment in English for Specific Purposes (ESP) learning.

The relatively higher mean score for emotional engagement suggests that students' positive attitudes and perceptions toward English were comparatively more evident than their behavioral participation and cognitive investment. The qualitative findings provide further context for this pattern. Students generally recognized the importance of English for their academic studies and future professional development in the healthcare field. However, they also reported challenges including limited vocabulary, low confidence, fear of making mistakes, and difficulties understanding English materials.

This finding is consistent with the multidimensional conceptualization of student engagement proposed by Fredricks et al. (2004), Kahu et al. (2013), and Trowler (2010), which conceptualizes engagement as comprising behavioral, emotional, and cognitive dimensions. From this perspective, students' engagement cannot be understood solely from their observable classroom participation. The present findings demonstrate that students may hold positive attitudes toward English while still experiencing difficulties in maintaining consistent participation and cognitive investment.

In the context of ESP learning, this moderate level of engagement may reflect the additional demands associated with learning English alongside discipline-specific content. Nutrition students are expected to develop English competence that is relevant to academic and professional contexts, while also dealing with language-related difficulties. Therefore, the findings suggest that students' engagement was present but had not yet reached a consistently high level across the three dimensions.

Discussion of RQ2: Relationships among Behavioral, Emotional, and Cognitive Engagement

The quantitative findings revealed statistically significant and very strong positive associations among the three dimensions of student engagement. Behavioral engagement was strongly associated with cognitive engagement ($r = .919$, $p < .001$), behavioral engagement was strongly associated with emotional engagement ($r = .870$, $p < .001$), and cognitive engagement was strongly associated with emotional engagement ($r = .831$, $p < .001$).

These results indicate that the three dimensions were strongly associated in the present sample. Students with higher behavioral engagement scores also tended to report higher cognitive and emotional engagement scores. Similarly, higher emotional engagement scores were associated with higher cognitive engagement scores. However, these correlations should be interpreted as associations rather than evidence of causal relationships. The correlational design does not establish that one dimension causes an increase or decrease in another dimension.

The findings support the multidimensional perspective of student engagement, in which behavioral, emotional, and cognitive engagement are conceptually related aspects of students' engagement in learning (Fredricks et al., 2004; Kahu et al., 2013; Trowler, 2010). The strong associations observed in this study are consistent with the view that these dimensions can coexist within students' learning experiences rather than functioning as completely independent aspects.

The particularly strong association between behavioral and cognitive engagement ($r = .919$) suggests that students who reported greater participation and involvement in English learning activities also tended to report greater cognitive investment. Likewise, the strong association between behavioral and emotional engagement ($r = .870$) indicates that students' reported participation was closely related to their emotional experiences toward English learning. These findings provide empirical support for examining student engagement as a multidimensional construct in the ESP context.

Importantly, the results should not be interpreted as demonstrating that improving one dimension will necessarily cause improvement in the other dimensions. Rather, the findings indicate that the three dimensions were closely related within the present group of Nutrition students.

Discussion of RQ3: Factors Shaping Student Engagement

The qualitative findings identified several factors that shaped students' engagement in English learning. These included students' perceptions of the relevance of English, emotional experiences and confidence, learning strategies, instructional practices, and challenges related to vocabulary and comprehension. The findings therefore provide contextual explanations for the moderate quantitative engagement levels.

First, students' perceptions of the relevance of English appeared prominently in the interview data. Students viewed English as important for their academic studies and future professional needs, particularly in relation to communication with foreign patients, international contexts, and professional development. This perceived relevance represents an important contextual factor associated with students' willingness to engage in English learning.

Second, emotional experiences were closely connected with students' classroom engagement. Although students recognized the importance of English, several reported low confidence and fear of making mistakes, particularly when speaking or writing in English. These findings suggest that positive perceptions of English may coexist with emotional barriers that make active participation more difficult.

Third, students reported using various learning strategies to deal with difficulties in English learning. These included Google Translate, YouTube, internet resources, independent vocabulary searches, and peer discussion. Such strategies indicate that students were making efforts to address learning difficulties, although their reliance on technological resources also reflects the challenges they experienced in understanding English materials.

Fourth, instructional practices and lecturer support emerged as relevant contextual factors. Students responded positively to interactive teaching approaches and clear explanations, while classroom observations indicated that discussions, presentations, and audiovisual activities were associated with greater participation and enthusiasm. Nevertheless, some students remained passive despite the lecturer's efforts.

Taken together, these findings indicate that student engagement in this ESP context was shaped by a combination of personal and instructional factors. The qualitative evidence helps explain why engagement remained moderate despite students' generally positive perceptions of English. In particular, the combination of perceived relevance, emotional barriers, learning strategies, and classroom conditions provides a more contextualized understanding of students' engagement.

Discussion of RQ4: Perceptions of English and Challenges in Maintaining Engagement

The findings for RQ4 showed that Nutrition students generally perceived English as important for their academic and professional development. Students connected English with their future work in healthcare, communication with foreign patients or professionals, and access to academic and professional information. This finding indicates that students were aware of the practical relevance of English beyond the immediate classroom context.

However, recognizing the importance of English did not always correspond with consistently high engagement. Students reported several challenges, including limited vocabulary, difficulties understanding English texts and medical terminology, low confidence, fear of making mistakes, and inadequate preparation before class. These challenges help explain the moderate levels of behavioral and cognitive engagement observed in the quantitative findings.

The findings also show that students attempted to manage these challenges through various strategies, including the use of translation applications, YouTube, internet resources, and peer discussion. These strategies demonstrate students' efforts to cope with learning difficulties, although they do not necessarily indicate a consistently high level of cognitive engagement.

The role of classroom instruction was also evident. Students generally viewed the lecturer's explanations positively and responded favorably to interactive learning activities. Nevertheless, some students continued to participate passively despite the supportive instructional environment. This finding suggests that maintaining engagement involves not only students' recognition of the importance of English but also their confidence, language resources, preparation, and classroom learning experiences.

Overall, the findings suggest a discrepancy between students' perceived importance of English and their ability to maintain consistent engagement in learning. Students understood why English mattered for their academic and professional futures, but vocabulary limitations, low confidence, fear of mistakes, and difficulties with English learning materials remained barriers to sustained engagement. This finding is particularly relevant to ESP instruction because students' professional awareness of the value of English needs to be accompanied by learning conditions that support their participation, confidence, and cognitive investment.

5. Conclusion

This study examined behavioral, emotional, and cognitive engagement in English for Specific Purposes among 27 third-semester Nutrition students at Politeknik Kesehatan Sorong using a sequential explanatory mixed-methods design. The findings showed that all three dimensions of engagement were at a moderate level, with emotional engagement obtaining the highest mean score ($M = 3.40$), followed by behavioral and cognitive engagement (both $M = 3.14$). The three dimensions were also significantly and strongly associated with one another, although these correlations should be interpreted as associations rather than causal relationships.

The qualitative findings provided contextual explanations for these quantitative patterns. Students generally perceived English as important for their academic and future professional development, particularly in relation to their roles in the healthcare field. However, limited vocabulary, low confidence, fear of making mistakes, difficulties understanding English materials and terminology, and inadequate preparation presented challenges to sustained engagement. Instructional practices that encouraged interaction, discussion, presentation, and the use of relevant learning materials were perceived as supportive of students' participation and interest.

Overall, the findings suggest that student engagement in nutrition-focused ESP learning is multidimensional and closely associated across behavioral, emotional, and cognitive domains. The study therefore highlights the importance of considering students' participation, emotional experiences, and cognitive investment together when understanding engagement in ESP contexts. For ESP instruction in nutrition education, learning activities that are relevant to students' academic and professional needs and that provide supportive opportunities for participation may help create more engaging learning environments.

This study should be interpreted in light of its limitations. The sample consisted of 27 students from a single Nutrition Study Program, and the cross-sectional design captured engagement at one point in time. Therefore, the findings should not be generalized beyond similar contexts without further evidence. Future research could employ larger and more diverse samples, longitudinal designs, and comparative studies across health-related disciplines to examine how engagement develops over time and across different ESP contexts.

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