



INTERCULTURAL COMPETENCE AND DIGITAL LITERACY AS PREDICTORS OF STUDENT ENGAGEMENT AMONG SHS STUDENTS

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Abstract:

This descriptive-correlational design aimed to investigate which of the intercultural competence and digital literacy could significantly predict student engagement. It also assessed the levels of intercultural competence, digital literacy, and student engagement, and the correlations between intercultural competence and student engagement, as well as between digital literacy and student engagement. Surveys were administered to 181 senior high school students from the University of Mindanao, Matina Campus. The results indicated that the levels of intercultural competence, digital literacy, and student engagement were high. Furthermore, it was found that there was a significant correlation between intercultural competence and student engagement, as well as between digital literacy and student engagement. Both intercultural competence and digital literacy significantly predicted student engagement. However, intercultural competence demonstrated a slightly stronger influence, suggesting that students' ability to understand and interact across cultures contributed more to their engagement than their digital literacy skills. This implies that fostering intercultural understanding alongside digital literacy can enhance students' active participation and meaningful engagement in learning environments. The study contributes to the growing body of research on educational engagement by highlighting the intertwined roles of cultural awareness and digital competence in shaping effective and inclusive classroom experiences.

Keywords: education, intercultural competence, digital literacy, student engagement, descriptive-correlational, senior high school, Davao City, Philippines

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1. Introduction

Engagement among learners remains a challenge today as it is influenced by factors such as teaching methods, classroom dynamics, and available resources (Denessen *et al.*, 2015). Moreover, high levels of student engagement reflect increased effort and consistent involvement in classroom activities; engaged students become more focused on their goals and learn efficiently, making it a good predictor of academic performance (Bergdahl *et al.*, 2023; Dacillo *et al.*, 2022). However, despite its importance, engagement level remains low (Gumban & Tan, 2019). While traditional strategies to enhance student engagement are well-documented, it is necessary to explore whether intercultural competence and digital literacy can serve as predictors for student engagement. In this context, developing cultural and digital literacy, which fosters effective communication and ethical use of technology, has been shown to enhance student engagement (Ahadiyyah *et al.*, 2024). Therefore, integrating intercultural competence and digital literacy into classroom practices enhances students' engagement in the classroom.

In support of this, the low level of engagement within educational systems in Malaysia remains one of the greatest concerns in higher educational institutions, especially in universities. Some factors that contribute to students' low engagement are course activities, self-directed learning, Learning management system navigation and design, interface, interaction among students, and interaction between students and their teachers (Aldowah *et al.*, 2025). The most crucial indicators of low engagement among students' characteristics are their insufficient digital and online skills and experience (Shah & Cheng, 2019). Similar to the study, Jain *et al.* (2013) found that significant contributors to low student engagement are problems with LMS, course design, and activities. Lastly, the study by Christopoulos *et al.* (2018) emphasized the importance of active, interactive, and collaborative learning, as well as the effective design of course content, in enhancing student engagement.

Additionally, within the Philippine context, the education system faces several factors contributing to the decline in student engagement, including the need to adapt educational technologies, improve teacher professional development, and address discrepancies in educational quality (Ormo, 2024). A study conducted in the municipality of San Luis, Province of Agusan Del Sur, particularly at San Mariano Elementary School, shows that teacher-respondents were concerned about the lack of student engagement. Student-respondents prefer to play around the classroom rather than listen and participate in class. These concerns accentuate the need for effective strategies to strengthen the engagement of Filipino students (Rone *et al.*, 2023).

Finally, within the local context, in Licup Elementary School, Samal Island, Davao Del Sur, it has been found that student engagement, specifically among diverse learners, is influenced by several factors such as peer and family support, management and importance of coursework, student and teacher interaction, and long-term goals and ambitions. Low engagement across these factors highlights the need to develop strategies that strengthen relationships, relevant school work, a supportive environment, and help

students build clear future goals. This aligns with broader challenges in education, where student engagement is affected by teaching methods, classroom dynamics, and cultural factors (Fuertes *et al.*, 2023).

Theoretical frameworks underlying the relationships between intercultural competence and student engagement, as well as digital literacy and student engagement, are presented. Sociocultural Theory as proposed by Lev Vygotsky (1978) can provide a framework for linking intercultural competence and student engagement. It states that learning is highly social and deeply rooted in culture. Since this theory posits that human intelligence develops through interaction with society, the primary focus of this theory is on social, historical, and cultural interactions as the origin of learning (Karki & Karki, 2024). At the classroom level, it implies that students receive the best experience when they are engaged in conversations and activities with students from other cultural backgrounds. Cross-cultural interactions not only facilitate the development of interculturally appropriate behavior but also foster a more substantial sense of connectedness and belonging in the classroom. When students are exposed to and well-informed about diverse views, they become more positive, respectful, and engaged. Therefore, the teachings by Vygotsky favor the notion that interaction in the classroom is gained when the students are exposed to group learning (where social interaction and technology become critical learning tools) with different cultures and backgrounds (Shonfeld *et al.*, 2021).

The TPACK theory (Koehler, 2006) explains the relationship between digital literacy and student engagement. TPACK theory suggests that integrating technology into teaching increases enthusiasm among learners. The students also participate more in teaching and learning activities due to the application of various technologies, such as computers, the internet, projectors, and interactive learning software, in these activities. The students are also less constrained in expressing themselves and sharing their ideas and answers with others, becoming more inventive and innovative in their responses, tasks, and even questions (Maimanah *et al.*, 2025). In addition, technology enables highly personalized learning through an adaptive system that tailors content to each student's performance, effectively serving the needs and learning styles of each student. Moreover, multimedia tools, including videos, animations, and simulations, are more likely to bring abstract concepts closer to learners and make them more comprehensible, thereby enhancing cognitive engagement. Consequently, the integration of technology is not only changing the traditional educational approach but also improving classroom participation and learning outcomes for students by making the learning process more personal and interactive, in the sense of being communicative. (Sabri *et al.*, 2024).

However, despite the possible connection between the variables, the researcher has not encountered a descriptive-correlational study in predicting student engagement through intercultural competence and digital literacy, particularly in the Philippine context. In the study by Enerio (2021), conducted in Northwestern Mindanao State College of Science of Science Technology, Tangub City, Misamis Oriental, Philippines, student engagement was examined, focusing on its significant relationship with key

factors: the transaction between the teacher and students, the transaction between the institution and its students, student competence, autonomy, and relatedness. As a result, the student-teacher transaction was the best predictor of student engagement. Whereas Enerio (2021) focused on predicting student engagement through general factors such as student-teacher transaction, this study utilized specific factors of student engagement, including intercultural competence and digital literacy, which are important in today's rapidly evolving world.

Furthermore, the researcher was motivated to conduct this study because no prior studies have utilized the same variables, particularly in a local setting. This study could provide valuable perspectives and insights for teachers, students, and school leaders in identifying sociological factors that deter student engagement, raise awareness of the importance of developing intercultural competence and digital literacy, and help address issues and concerns related to student engagement. Furthermore, this study can help teachers, school leaders, and institutions adopt a similar perspective on identifying classroom issues, teaching strategies, and sociological factors that deter excellent student engagement, and create programs that address related issues and concerns. The motivation behind the researcher's decision to conduct the study stems from an understanding of the relationship between these variables.

In conclusion, intercultural competence and digital literacy as predictors of student engagement have global significance, particularly in the context of the Sustainable Development Goals (SDGs) and social value. Through this study, the author contributed to the literature by highlighting the significance of information and communications technology (ICT) skills and digital literacy in promoting classroom involvement. Regarding the SDGs, the research aligns with SDG 4, related to establishing equal and inclusive education and fostering lifelong learning opportunities for every individual (Chistolini, 2019).

The study's results have a direct impact on educational institutions, highlighting the need to develop students' intercultural understanding and collaboration skills, as well as their digital literacy, to increase their involvement in classes and contribute to solving global issues, ultimately supporting sustainable development. The study's findings can be incorporated into the curriculum design and teaching methods of universities and colleges, enabling every student to practice their skills and develop intercultural competence and digital literacy. Teachers and educators can also utilize the study's findings to develop and implement intercultural communication and digital literacy programs, which would equip students with enhanced communication and collaboration skills in diverse cultural environments. Educational and regulatory leaders can utilize the results of this study in their policies and practices to develop a more diverse, innovative, and equitable learning environment, thereby encouraging diversity, equity, and inclusion in education.

Finally, the study answered the following questions:

- 1) identify the level of intercultural competence in terms of attitudes, interpretation, interaction, and cultural awareness;

- 2) identify the level of digital literacy in terms of underpinnings, experiential learning, and searching;
- 3) identify the level of student engagement in terms of behavioral engagement, cognitive engagement, social engagement and affective engagement;
- 4) investigate if there is a significant relationship between intercultural competence and student engagement, and between digital literacy and student engagement; and
- 5) determine which between intercultural competence and digital literacy highly predicts student engagement.

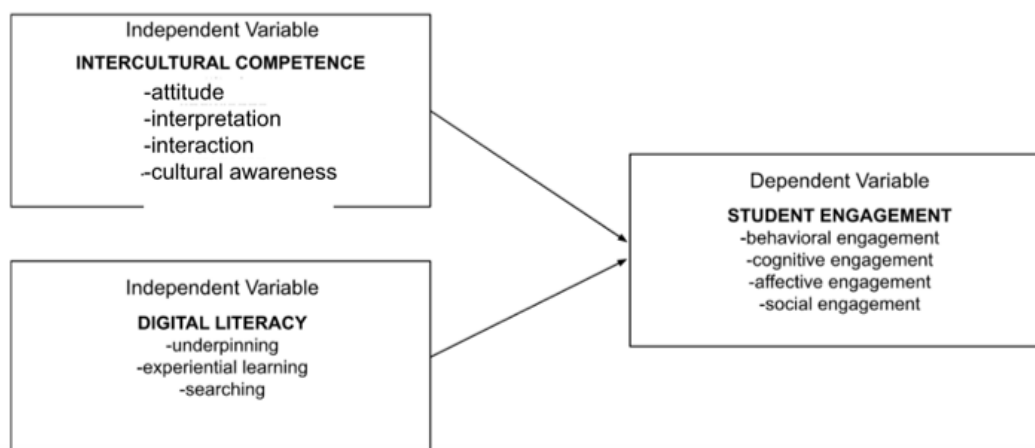


Figure 1: The Conceptual Framework

Figure 1 shows the variables of the study. There are two independent variables in this study. First, intercultural competence of the students involves *attitudes*, which refers to openness, respect, willingness, and interest toward engaging with diverse cultures; *interpretation*, which refers to empathy, and awareness and understanding of other culture competence; *interaction*, which refers to effective communication, and recognition of the similarities and differences of cultures; *cultural awareness*, which refers to awareness about different cultures, and evaluate their own and others' culture (Pereira, 2023). Second, digital literacy of the students involves *underpinnings*, which refers to proficiency in reading, writing, and using technology; *experiential learning*, which refers to the independent learning skills while demonstrating appropriate behavior in any digital platform; *searching*, which refers to knowledge of searching for information from different sources effectively (Tang & Chaw, 2016). On the other hand, the dependent variable is student engagement involves students' *behavioral engagement*, which refers to visible involvement in learning and their participation in class activities as well as their efforts to complete assignments; *cognitive engagement*, which refers to critical thinking and problem-solving skills, interest, attention and efforts invested in the class; *social engagement*, which refers to connection and belongingness of the students with their peers, teachers and administrative staffs; *affective engagement*, which refers to the

connection, engage in collaborative activities, and positive and negative emotion towards their teachers and other students (Bowden *et al.*, 2019).

2. Method

This chapter presented the methods and steps used by the researcher in conducting the study. The study covered the respondents, research design, research instrument, data collection procedure, and statistical data analysis.

2.1 Research Respondents

The respondents in this study were senior high school students at the University of Mindanao, Matina Campus in Davao City, Davao del Sur. They were selected based on the following criteria: first, their increased exposure to technology and considerable opportunities to meet people both online and offline. This made them a good group to study when examining digital literacy and intercultural competence. Additionally, as adolescents in the transition to higher education and greater independence, they were more likely to take the survey seriously and provide honest answers, which helped ensure the accuracy of the data collected. Moreover, the respondents were selected through total population sampling, and the data were collected via a survey. Total population sampling is a type of purposive sampling method in which the researcher examined the entire population that shared similar characteristics (Jaya *et al.*, 2022).

The study had a total of 181 respondents across all grades and strands of the Senior High School Program at the University of Mindanao, Matina Campus. In particular, the Senior High School at Matina Campus comprised strands named: Science, Technology, Engineering and Mathematics (STEM) and Accounting and Business Management (ABM).

2.2 Research Materials and Instruments

This section of the study explained the instruments utilized to gather quantitative data from the respondents. Professionals in questionnaire design validated three sets of adapted questionnaires from various authors. Organizational cohesiveness was considered carefully as the questionnaire was devised.

3.2.1 Intercultural Competence

The questionnaire is adapted from “*The Development and Validation of an Intercultural Competence Evaluation Instrument*” by Schat *et al.* (2021). This tool has four indicators: attitudes, interpretation, interaction, and cultural awareness, with a five-item design ranging from 5 – Very High to 1 – Very Low. The descriptive level of students’ intercultural competence is interpreted using the Likert scale. A rating of 5 indicates ‘Very High’, meaning that intercultural competence is consistently manifested. A rating of 4 indicates ‘High’, meaning that intercultural competence is manifested most of the time. A rating of 3 indicates ‘Moderate’, meaning that intercultural competence is neither

consistently manifested nor consistently shown; it varies. A rating of 2 indicates 'Low', meaning that intercultural competence is unusually manifested. Lastly, a rating of 1 indicates 'Very Low', meaning that intercultural competence is not manifested at all. The means are interpreted as follows: Very Low in the point range of 1.00 - 1.80, Low 1.81 - 2.60, Moderate 2.61 - 3.40, High 3.41 - 4.20, and Very High 4.21 - 5.00.

3.2.2 Digital Literacy

The questionnaire is adapted from *"Digital Literacy: A Prerequisite for Effective Learning in a Blended Learning Environment"* by Tang and Chaw (2016). This tool comprises three indicators: underpinnings, experiential learning, and searching. This tool contains a five-item structure that labels 5 – Very High to 1 – Very Low. The descriptive level of students' digital literacy is interpreted using the Likert scale. A rating of 5 indicates 'Very High', which means that digital skills and knowledge are consistently manifested. A rating of 4 indicates 'High', which means that digital skills and knowledge are manifested most of the time. A rating of 3 indicates 'Moderate', which means that digital skills and knowledge are neither manifested nor shown; it varies. A rating of 2 indicates 'Low', which means that digital skills and knowledge are unusually manifested. Lastly, a rating of 1 indicates 'Very Low', which means that digital skills and knowledge are not manifested at all. The means are interpreted as follows: Very Low in the point range of 1.00 - 1.80, Low 1.81 - 2.60, Moderate 2.61 - 3.40, High 3.41 - 4.20, and Very High 4.21 - 5.00.

3.2.3 Student Engagement

The questionnaire is adapted from *"Student Engagement in English Language Classes: An Evaluative Study"* by Mekki *et al.* (2022). This tool comprises four indicators: behavioral, affective, social, and cognitive. The tool contains a five-item design of 5 – Very High to 1 – Very Low. The descriptive level of student engagement is interpreted using the Likert scale. A rating of 5 indicates Very High, which means that student engagement and motivation are consistently manifested. A rating of 4 indicates High, which means that student engagement and motivation are manifested most of the time. A rating of 3 indicates Moderate, which means that student engagement and motivation are neither manifested nor shown; it varies. A rating of 2 indicates 'Low', which means that student engagement and motivation are unusually manifested. Lastly, a rating of 1 indicates 'Very Low', which means that student engagement and motivation are not manifested at all. The means are interpreted as follows: Very Low in the point range of 1.00 - 1.80, Low 1.81 - 2.60, Moderate 2.61 - 3.40, High 3.41 - 4.20, and Very High 4.21 - 5.00.

The concept of validity refers to the extent to which an instrument measures the intended concept it targets to evaluate; therefore, the instruments used in this study have undergone a validation process before the researcher conducted testing (Taherdoost, 2016, as cited in Chikodi & Abike, 2025). The instruments used in this study were adapted from other studies that focused on intercultural competence, digital literacy, and student engagement. The questionnaires underwent validity and reliability procedures. The

validity of the research instrument was confirmed by analyzing the 68-item survey questionnaire through a reliability statistical treatment. This resulted in a Cronbach's Alpha of 0.986, confirming the reliability of the research tool for data collection.

The validation and assessment process of the questionnaire took place. In addition, an informed consent form was used, with an introduction script that made it easier for the respondents to understand the intent of the study. Moreover, each of the respondents participated voluntarily and confidentially, and their identities remained undisclosed.

3.3 Research Design and Procedure

The research employed the methodology of a descriptive correlational design. A descriptive correlational design is a research design that provides a picture of a situation and a study of relationships between various variables. It enabled the researcher to carry out measurement and examination of data that concern two variables or more without manipulating them. The design can be applied to come up with the relationships between the variables in real-life scenarios where applying experimental manipulation is not possible or unethical. Statistical analysis using such relationships helps the researchers to determine any trend, pattern, and correlation that can be used in theory, intervention, or policy making (McBurney & White, 2009).

Regression analysis is a form of statistical analysis used to examine the relationship between variables that affect a phenomenon and its determinants. It makes it well understood how a variable can affect another and come up with predictions concerning the relationship. The advocate of regression analysis is the one or the organization proposing the use of regression analysis in the research or decision-making process as a way of learning how relationships between variables are organized, approximating values, making predictions, and controlling the impacts of independent variables as it carries out the study of the relationship of one variable to another (Tyagi *et al.*, 2022).

3.3.1 Asking Permission to Conduct the Study

The researcher wrote a letter to the Dean of the Basic Education Program of the University of Mindanao, Matina Campus. The researcher requested permission to conduct the study with the students in the Senior High School Program at the University of Mindanao, Matina Campus. After the researcher received approval from the department head, the researcher distributed the survey questionnaires, making sure that the students participated.

3.3.2 Administration and Retrieval of Questionnaires

Following the approval of the department head, the researcher thoroughly explained to the respondents and their teachers how to correctly answer the questionnaires. To ensure that the respondents understood the questions well, the researcher explained each question during the actual survey process, thereby ensuring accurate answers. All senior high school students in all grade levels of STEM and HUMSS strands were asked to

answer every question thoroughly. The researcher collected the data after the respondents had wholly and truthfully answered the questionnaire.

3.3.3 Gathering and Tabulation of Data

Once the survey questionnaires were distributed and collected, the data were compiled and tabulated. After that, the important data was analyzed and interpreted using appropriate statistical tools. The statistical tools applied to compute and analyze the data are: Mean, to describe the level of intercultural competence and the level of digital literacy towards student engagement among senior high students at the University of Mindanao, Matina Campus, Maa, Davao City. Next, Pearson used a regression analysis to determine the significance of the relationship between intercultural competence and digital literacy towards student engagement. Lastly, regression analysis was used to predict the impact of intercultural competence and digital literacy on student engagement. By analyzing the data using regression analysis, the researcher aimed to understand how these two factors, intercultural competence and digital literacy, influence student engagement levels. This statistical method helped quantify the relationship between intercultural competence and digital literacy with student engagement. It provided insights into the extent to which these competencies affected how students engaged in various activities or behaviors within educational contexts.

4. Results and Discussions

This section provides the output of the study and how it was interpreted. The findings, analysis, and interpretation are based on the facts collected in the survey.

4.1 Intercultural Competence

Table 1 presents the mean and standard deviation scores for the level of intercultural competence among senior high students, along with the four indicators: attitudes, interpretation, interaction, and cultural awareness.

Table 1: Level of Intercultural Competence among Senior High School Students

Indicators	Mean	Standard Deviation
Attitude	4.01	.600
Interpretation	3.95	.578
Interaction	3.97	.756
Cultural Awareness	3.97	.657
Overall	4.03	.489

The overall mean is 4.03 (SD = .489), which indicates the category of high. This implies that the variable is manifested most of the time. In this way, students will have an opportunity to adjust, learn, respect, and work with different cultures. This result is corroborated by a statement by Habib *et al.* (2025): students with a good level of intercultural competence can interact, adjust, and adapt well to a variety of social

situations. Moreover, intercultural competence enables students to interact with individuals from diverse cultural backgrounds, fostering the exchange of ideas, empathy, and cooperation among students from different cultural contexts. Consequently, students with high intercultural competence tend to thrive in diverse classroom settings (Guillén-Yparrea & Ramírez-Montoya, 2023). Ultimately, including intercultural competence in education is important to equip students with the skills to navigate diverse cultural interactions successfully (Rastgoo, 2024).

Furthermore, the high level of intercultural competence is supported by its indicators, which also achieve high mean scores. In terms of attitude, the overall mean is 4.01 (SD = 0.600), which falls within the high category. This means that the indicator is manifested most of the time among the respondents. Thus, Senior High School students exhibit a high level of openness, respect, readiness, willingness, and interest toward engaging with diverse cultures. According to the study of Vu and Dinh (2021), individuals who are interculturally competent seem to confidently facilitate positive attitudes when engaging and bridging intergroup communication, thus avoiding potential conflict. Moreover, in the study of Pena-Acuña (2024), it is established that intercultural openness is an essential component for understanding, engaging, and mutual appreciation between students of different origins. Intercultural communication promotes understanding of cultural complexities. Finally, the Lopez-Rocha (2016) study notes that interaction with representatives of other cultures is crucial to be interculturally competent since this notion consists of knowledge, skills, and attitudes (respect, openness, and curiosity) and the ability to adjust to new cultural environments and overcome culture shock.

Furthermore, when it comes to interpretation, the mean of the overall equals 3.95 (SD = .578), thus belonging to the high category. This implies that the indicator is manifested most of the time by the respondents. Therefore, the rate of empathy among students in senior high school is high, as is the presence and realization of other cultural competencies. This is corroborated by the fact that, according to Taylor *et al.* (2023) as cited in Mayer *et al.* (2024), interculturally competent individuals know about the differences in cultures and adjust and establish empathetic relationships. Also, students who have learned about other cultures are more likely to be aware and knowledgeable about cultural differences through reading literature, attending cultural events and workshops, or spending time in various community events. Furthermore, research by Hernandez-Lopez *et al.* (2024) established that highly interculturally competent students are ready to work in a global market since such individuals possess extreme adaptability, empathy, and cultural awareness.

In interaction, the mean is 3.97 (SD = .756), which is in the range of high. This means that the indicator is manifested most of the time among the respondents. Thus, Senior High School Students exhibit a high level of effective communication and recognition of the similarities and differences of cultures. This is supported by the study of Li and Xue (2023), stating that the majority of students who exhibit intercultural competence adapt their behaviour to communicate appropriately with other learners from other cultures.

Moreover, the students acknowledge the fact that culture impacts the way they behave and their perspective. Thus, they understand what sets them apart from and what connects them to other students, particularly those from different cultures. Further, for students, it is important to acquire skills in communicating with others who have different cultural values and perspectives (Karimova *et al.*, 2024).

Lastly, in terms of cultural awareness, the overall mean is 3.97 (SD = .657), which falls within the high category. This means that the indicator is manifested most of the time among the respondents. Thus, Senior High School Students exhibit a high level of awareness about different cultures, and evaluate their own and others' cultures. Based on the study of Saygı and Köksal (2024), students showed that intercultural competence training led to significant increases in knowledge and awareness of other cultures. Students reported improved awareness of cultural issues and a reduction in stereotypes, indicating enhanced ability to evaluate both their own and others' perspectives. Further, students' intercultural competence is shaped by intercultural contact, interaction, and mutual understanding, resulting in greater awareness and evaluative abilities regarding different cultural perspectives (Xiaoyan *et al.*, 2024). Lastly, intercultural competence includes cultural awareness, language proficiency, adaptability, and empathetic relationship-building, which promotes global citizenship and reduces conflicts rooted in misunderstanding between cultures (Mayer *et al.*, 2024).

4.2 Digital Literacy

Table 2 presents the mean and standard deviation scores for the level of digital literacy among senior high students, along with the three indicators: underpinnings, experiential learning, and searching.

Table 2: Level of Digital Literacy among Senior High School Students

Indicators	Mean	Standard Deviation
Underpinnings	4.44	.531
Experiential Learning	4.18	.623
Searching	4.52	.756
Overall	4.37	.466

The overall mean is 4.37 (SD = .466), which falls within the very high category. This indicates that the variable is manifested all the time. Thus, students can utilize and understand technology and digital tools, and are competent in seeking information and sources. Gutiérrez-Ángel *et al.* (2022) emphasized that digital literacy in school promotes self-confidence and proficiency in reading, content creation, and writing using digital tools. Further, the findings of their study revealed that students possess digital literacy and use both the Internet and digital media effectively, with a higher level of communication and collaboration skills. Moreover, the study of Holm (2024) found that students' data literacy, communication, and collaboration skills significantly predicted academic success. It highlights that digital literacy encompasses accessing, evaluating, and using digital information effectively. Lastly, Digital literacy helps students improve

their academic performance, learning interest, and preparedness to face future challenges (Murtadho *et al.*, 2023).

Furthermore, the very high level of digital literacy is supported by its indicators, which also achieve high mean scores. In terms of underpinnings, the overall mean is 4.44 (SD = .531), which falls within the very high category. This means that the indicator is manifested all the time among the respondents. Thus, Senior High School Students exhibit a very high understanding and utilization of technology and digital tools. This is supported by the study of Nazzal *et al.* (2021), as cited in Chanda *et al.* (2024), which stated that students who have regular access to technologies are more likely to develop important digital skills, including online communication and the use of various educational software. Moreover, the study of Erwin and Mohammed (2022) concludes that digital literacy skills instruction is essential as it enables individuals to use technology to achieve their goals effectively. Further, competence in the utilization of digital tools was an essential skill for students to be prepared for work outside the classroom (Fidalgo *et al.*, 2016, as cited in Erwin & Mohammed, 2022). Additionally, through the process of digital literacy development, students have access to an extended range of various learning resources, and they acquire the ability to learn on their own (Vergara-Burgos & Anthony, 2024). To conclude, digital literacy is the skills needed by students to conduct scholarly research, gain access to and analyze data, and engage in critical thinking associated with a digital world (Mokhtari, 2023).

Moreover, as regards experiential learning, the mean is 4.18 (SD = .623), thus lying in the range of high. This means that the indicator is manifested most of the time among the respondents. Thus, Senior High School Students exhibit a high level of good behavior in a digital environment and learn independently. The study of Dangprasert (2023) concluded that Hands-on exercises, Group projects, and Online Learning Resources were effective in promoting digital technology and digital content development skills in students. Further, according to the study of Vergara-Burgos and Anthony (2024), digital literacy enables students to independently access, evaluate, and use digital information, fostering learning independence and critical problem-solving skills in online environments. Ultimately, good digital literacy enables independent learning and enhances student achievement and engagement in the classroom when personalized learning is applied. (Putra & Budiningsih, 2023).

Lastly, in terms of searching, the overall mean is 4.52 (SD = .756), which falls within the very high category. This means that the indicator is manifested all the time among the respondents. Thus, Senior High School Students exhibit a very high ability to seek out information and resources related to their studies. The study by St. Clair *et al.* (2023) found that students use multiple strategies to assess credibility, such as starting with trusted sources and consulting various resources. The study revealed that students prioritize credibility more for academic information than for entertainment. Additionally, their credibility judgments were socially influenced. Moreover, in the study of Graciano and Benablo (2023), it was found that students demonstrated very high digital literacy skills and online information searching strategies, which significantly

influenced their academic performance. It focused on the ability of the students to effectively search, critically analyze, evaluate, and utilize obtained information from various digital resources. Lastly, Erwin and Mohammed (2022) noted that by developing digital literacy, students learn how to effectively find information from reliable resources and how to use it properly. Without these skills, students are vulnerable to the risks of misinformation and dangerous online content. Additionally, according to St. Jean *et al.* (2017), as cited by Erwin and Mohammed (2022), digital literacy skills are important for students to accurately find and evaluate the credibility and relevance of information they encounter online.

4.4 Student Engagement

Table 3 presents the mean and standard deviation scores for the level of student engagement among senior high students, along with the four indicators: behavioral engagement, cognitive engagement, social engagement, and affective engagement.

Table 3: Level of Student Engagement among Senior High School Students

Indicators	Mean	Standard Deviation
Behavioral Engagement	3.93	.701
Cognitive Engagement	4.30	.439
Social Engagement	4.32	.551
Affective Engagement	4.03	.734
Overall	4.14	.454

The overall mean is 4.14 (SD = .454), which falls within the high category. This indicates that the variable is manifested most of the time. This means students can participate and get involved in learning, showing interest, attention, and effort, and connect with others. This result is supported by the study of Joshi *et al.* (2022), which shows that students possess high levels of cognitive, emotional, and social engagement, while behavioral engagement was moderate. Tannoubi *et al.* (2025) found that behavioral, cognitive, and emotional engagement positively correlate with academic success among university students, showing that engaged students participate actively, focus attention, and invest effort in learning. Engaged students focus more on their studies, develop the capacity to organize and manage their learning plans, seek new knowledge, collaborate with their classmates, and finish their activities in advance (Ginting, 2021). Lastly, in the study by Fuertes *et al.* (2023), it was revealed that higher engagement among students was associated with consistent class attendance and higher grades, in comparison to students with low engagement.

Furthermore, the high-level student engagement is supported by its indicators, which also achieve high mean scores. In terms of behavioral engagement, the overall mean is 3.93 (SD = .701), which falls within the high category. This means that the indicator is manifested most of the time among the respondents. Thus, Senior High School Students exhibit a high level of attention and participation in activities and tasks, and have a sense of belonging inside the classroom. This is supported by the study of Li

and Xue (2023), which revealed that student engagement includes a sense of belonging and plays a crucial role in promoting learning quality and performance. It emphasizes the relationship between learner participation and instructor presence. Moreover, students who are engaged in the classroom are attentive, participative, put effort into class activities, and show interest and motivation to learn (Fuertes *et al.*, 2023).

Moreover, in terms of cognitive engagement, the overall mean is 4.30 (SD = .439), which falls within the very high category. This means that the indicator is manifested all the time among the respondents. Thus, Senior High School Students exhibit a high level of critical thinking and problem-solving skills, as well as interest, attention, and efforts invested in the class. Highly cognitively engaged students often achieve academic success because they are more inclined to absorb the material and apply it outside the classroom setting (Gul *et al.*, 2022). Moreover, cognitively engaged students meet the requirements, and achieve and demonstrate strong academic performance (Ahmad *et al.*, 2022; Gul *et al.*, 2022; Zhou *et al.*, 2022). Furthermore, Rotgans and Schmidt (2011, as cited in Kew & Tazir, 2021) noted that higher levels of cognitive engagement are associated with independent learning, increased knowledge, and self-confidence among individuals. Thus, highly cognitively engaged students make consistent efforts when writing and responding to forum discussions. Lastly, when students participate in higher-order cognitive activities, they are more likely to experience richer or deeper learning and improved academic performance (Kew & Tazir, 2021).

Furthermore, in terms of social engagement, the overall mean is 4.32 (SD = .551), which falls within the very high category. This means that the indicator is manifested all the time among the respondents. Thus, Senior High School Students exhibit a very high level of connection to their peers and engage in collaborative activities. This is supported by the study of Fuertes *et al.* (2023), who found that students with higher levels of social engagement consistently attend their classes and obtain higher grades compared to students with low levels of engagement. Moreover, engaged students often participate in classroom activities, are mindful of their actions and words, put effort into every activity, and show learning interest and motivation in their learning. Ginting (2021) stated in his study that students learn to manage their learning schedules when they are actively engaged in their studies and cooperate with their classmates. Lastly, in the study of Shao and Kang (2022), it is identified that students' classroom engagement, boosted by self-efficacy and academic resilience, promotes stronger peer relationships and collaborative activities.

Lastly, in terms of affective engagement, the overall mean is 4.03 (SD = .734), which falls within the high category. This means that the indicator is manifested most of the time among the participants. Thus, Senior High School Students exhibit a very high level of interest and motivation. This is supported by the study of Batool *et al.* (2021) and Gul *et al.* (2022), stating that emotional engagement is important for students to develop a sense of closeness, collaboration, and belonging toward their teachers, classmates, and even their institutions. It also enables students to have opportunities to grow as people and learn new things. Moreover, the study of Gray and Diloreto (2016) indicated that

personality, effort, motivation, attitude, and self-confidence are among the numerous affective factors associated with student engagement. Lastly, students are emotionally engaged in their learning when they are involved in their learning, motivated to do better in class, and are willing to put more effort into their activities (Khan *et al.*, 2023).

4.5 Correlation between Intercultural Competence and Student Engagement

Table 4 presents the results of a correlation analysis aimed at examining the relationship between intercultural competence and student engagement.

Table 4: Significant Relationship between Intercultural Competence and Student Engagement

Intercultural Competence	Student Engagement				
	Behavioral Engagement	Cognitive Engagement	Social Engagement	Affective Engagement	Overall
Attitude	0.087 (0.246)	0.115 (0.125)	0.289* (<.001)	0.183* (0.014)	0.225* (0.002)
Interpretation	0.078 (0.298)	0.215* (0.004)	0.282* (<.001)	0.202* (0.007)	0.253* (<.001)
Interaction	0.238* (0.001)	0.214* (0.004)	0.209* (0.005)	0.168* (0.025)	0.301* (<.001)
Cultural Awareness	0.182* (0.0015)	0.302* (<.001)	0.213* (0.004)	0.181* (0.015)	0.287* (<.001)
Overall	0.161* (0.031)	0.248* (<.001)	0.303* (<.001)	0.198* (0.008)	0.305* (<.001)

The result revealed that there is a significant relationship between intercultural competence and student engagement since the p-value is <.001 or less than .001 (reject). The relationship shows a low positive correlation ($r = 0.305$). This is supported by the research of Rokos (2024), which illuminates the critical factors that intercultural competence shapes students' adaptability and success, including the engagement in collective spaces and interactions, and the recognition and utilization of diverse perspectives.

Moreover, D'Orazzi and Marangell (2025) emphasize the importance of intercultural communicative competence, highlighting the benefits of culturally mixed groups and the need to equip students with tools to manage diverse interactions and to strengthen students' relationships with their peers. Further, it provides students the chance to be exposed to others with different cultures, opportunities to collaborate, and participate in cultural events (Riley *et al.*, 2016).

That is why Vu's (2022) study addresses institutions' need for comprehensive tools to assess intercultural communicative competence, which comprises interactional engagement and respect of cultural differences (p. 237). Therefore, intercultural competence expands students' cross-cultural exposure and global consciousness, and is reflected through their engagements with others on campus. Also, it enables students to adapt and adjust their behavior and communication styles when engaging with others in different cultural contexts (Halpern *et al.*, 2022). The results of the study of Malazonia *et*

al. (2021) confirmed that students' intercultural competence is positively associated with their willingness to be engaged in classroom activities. This confirmed Vygotsky's Cultural Historical Activity Theory that intercultural competence affects student engagement through social interactions, promoting connectedness and participation.

4.6 Correlation between Digital Literacy and Student Engagement

Table 5 presents the results of a correlation analysis aimed at examining the relationship between digital literacy and student engagement.

Table 5: Significant Relationship between Digital Literacy and Student Engagement

Digital Literacy	Student Engagement				
	Behavioral Engagement	Cognitive Engagement	Social Engagement	Affective Engagement	Overall
Underpinnings	0.086 (0.255)	0.101 (0.179)	0.172* (0.012)	0.030 (0.685)	0.119 (0.114)
Experiential Learning	0.110 (0.144)	0.189* (0.011)	0.208* (0.005)	0.079 (0.293)	0.178* (0.017)
Searching	0.212* (0.004)	0.194* (0.009)	0.263* ($<.001$)	0.179* (0.017)	0.281* ($<.001$)
Overall	0.142 (0.059)	0.205* (0.006)	0.263* ($<.001$)	0.108 (0.151)	0.255* (0.002)

The results revealed that there is a significant relationship between digital literacy and student engagement, including behavioral, cognitive, social, and affective engagement. Since the p-value is 0.002 (reject). The relationship shows a low positive correlation ($r = 0.225$). This result is supported by the study of Mawardi *et al.* (2024), which indicates that effective integration of digital literacy in the classroom boosts students' motivation, teamwork, and overall academic success. It equips them with critical thinking and problem-solving skills, and enhances their participation and collaboration, ultimately preparing them for the modern workforce.

Moreover, Jaya and Nurqamarani (2023) highlight the significance of developing digital literacy, which provides deeper and wider access to learning resources through digital devices; engaging with interactive digital tools and technology-based learning improves students' critical analysis of online information and their use of digital platforms (Soufghalem, 2024).

Lastly, Zakir *et al.* (2022) state that students who perform well in school typically have greater access to learning opportunities on digital platforms, who are better equipped to work together, exchange knowledge and experiences, and work through problems as a group. Furthermore, digital literacy promotes more student participation and involvement in learning activities and will have an impact on enhancing student academic achievement (Khan *et al.*, 2022). Lastly, digital literacy skills can improve meaningful engagement and access to information in a technology-integrated classroom, thus creating interactive learning experiences (Chaerani *et al.*, 2024). This confirmed the

TPACK theory (Koehler, 2006) that digital literacy influences student engagement by integrating technology into teaching, thereby enhances participation, creativity, and personalized learning experiences.

4.7 Regression Analysis Predicting Students' Engagement

Table 6 shows the linear regression of Intercultural Competence and Digital Literacy as predictors of Student Engagement.

Table 6: Linear Regression of Intercultural Competence
and Digital Literacy as Predictors of Student Engagement

		95% Confidence Interval					95% Confidence Interval		
Predictor	Estimate	SE	Lower	Upper	t	p	SE	Lower	Upper
Intercept	2.245	0.3454	1.5613	2.927	6.50	<.001			
Intercultural Competence	0.243	0.0680	0.1087	0.377	3.57	<.001	0.262	0.1170	0.406
Digital literacy	0.210	0.0714	0.0692	0.351	2.94	0.004	0.216	0.0710	0.360

The model coefficients for student engagement reveal the effect of two predictors: intercultural competence and digital literacy, on the outcome variable of student engagement. The intercept is estimated at 2.245 (SE = 0.3454), representing the expected level of student engagement when both predictors are zero, and this value is statistically significant ($t = 6.50$, $p < .001$), indicating a strong baseline level of engagement. Further, the coefficient for intercultural competence is 0.243 (SE = 0.0680), suggesting that for each unit increase in intercultural competence, student engagement is expected to increase by 0.243 units, a relationship that is statistically significant ($t = 3.57$, $p < .001$) with a 95% confidence interval ranging from 0.1087 to 0.377, indicating a reliable positive effect on engagement. The standardized estimate ($\beta = 0.262$) suggests a moderate effect size. Furthermore, the coefficient for digital literacy is 0.210 (SE = 0.0714), indicating that each unit increase in digital literacy corresponds to a 0.210 unit increase in student engagement, which is also statistically significant ($t = 2.94$, $p = 0.004$) with a 95% confidence interval ranging from 0.1087 to 0.377. This reflects a positive contribution to student engagement, with a standardized estimate ($\beta = 0.216$) indicating a moderate effect size as well.

Intercultural competence and digital literacy have both positive effects on student engagement. By developing intercultural competence, students gain greater global understanding and more cross-cultural experiences, and this is apparent in students' collaboration and interactions on campus (Vu, 2022). Also, cultural competence, the preparation to interact appropriately with individuals of diverse cultures, increases students' interaction and learning capabilities (Sabbott, 2013). Moreover, digital literacy, the skill of navigating digital tools, enables students to access technological resources and exchange information with others to acquire more knowledge on a specific subject (Jaya & Nurqamarani, 2023). Moreover, digital literacy will encourage and sustain a larger

number of students and their involvement in the learning process and will contribute to the improved academic performance of the students (Khan *et al.*, 2022). Hence, both intercultural competence and digital literacy can be discussed as predictors of student engagement.

5. Conclusion and Recommendations

Intercultural competence, digital literacy, and student engagement are generally observed among senior high school students of the University of Mindanao. Despite the moderate relationships, the importance of intercultural competence and digital literacy has highlighted the central role of making intercultural and digital skills a part of education because both contribute to building students' classroom engagement. These positive results on student engagement reflect the development of intercultural awareness and effective communication between various cultures, and digital skills give students opportunities in the context of the growing classroom diversity and technology use to engage, collaborate, and participate effectively. Therefore, there is a need to use these factors in classroom practices to further students' interests in the classroom and boost their general academic achievements and social progress.

The study results recommend the possibility of intercultural competence and digital literacy becoming predictors of students' engagement in the classroom. This means that students with high intercultural competency and digital literacy grades are more inclined to participate actively in class. Thus, intercultural learning and digital literacy should be included in schools' curriculum to increase student engagement.

To facilitate this integration, the schools must offer professional growth or learning to the teachers and other school employees to expand their knowledge in cultural diversity and digital tools. Such training programs must incorporate a practice of inclusivity in teaching, training in the use of digital tools, and responsive digital citizenship.

Additionally, there must be a revision in the curricula, providing a more inclusive and technology-based education. Aside from revising the curricula, the schools must also implement rules and activities on campus, aligning with the objective of an inclusive and modernized school environment. The schools can implement collaborative digital activities, yearly cultural exchange events, and anti-discrimination rules.

Furthermore, teaching students about being responsible digital citizens and how to use tools is insufficient if the school does not provide opportunities for them to apply this knowledge. That said, the school must allow the students to use computers, projectors, and other learning tools in the classroom. Thus, providing technological tools and exposing the students to digital material is essential.

Lastly, schools must create effective formative assessment tools and provide constant feedback to evaluate whether the steps are practical in fostering intercultural competence and digital literacy. This recommendation targets and benefits educational policymakers and educational institutions.

Further research is needed to explore how to integrate the development of intercultural competence and digital literacy into curriculum design and to develop specific and solid teacher professional development programs that can enhance student engagement.

Another point is that these recommendations are derived from data collected within a specific demographic. As a result, the findings may differ or not be directly applicable to different populations. Therefore, further investigation is required to ensure its applicability across different educational settings.

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Conflict of Interest Statement

The authors declare no conflicts of interest.

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