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Synchronous E-Learning, Digital Literacy, and Writing Strategies: A Structural Equation Modeling Analysis of Grammatical Competence

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Abstract. This research investigated the relationship between students' synchronous e-learning, digital literacy, and writing strategies and their grammatical competence, focusing on 400 Filipino major students enrolled in public and private colleges and universities within the Davao Region. A quantitative, causal-comparative, and correlational research design was employed, utilizing stratified random sampling. Statistical tools, including the mean, standard deviation, Pearson product-moment correlation, and multiple linear regression, were used to analyze the data. Furthermore, Structural Equation Modeling (SEM) was applied to enhance the study's credibility and rigor through model specification, estimation, and evaluation. Results revealed that students exhibited a high level of synchronous e-learning, digital literacy, and writing strategies, while their grammatical competence was at a moderate level. A significant relationship was found between digital literacy and grammatical competence, whereas no significant relationship was observed between synchronous e-learning and writing strategies with grammatical competence. However, a combined influence of all three variables—synchronous e-learning, digital literacy, and writing strategies—on grammatical competence was observed, although no singular variable had a strong individual influence. The best-fit model, structural model 3, indicates that grammatical competence is strongly influenced collectively by synchronous e-learning, digital literacy, and writing strategies. The study emphasizes the need to enhance language education by strengthening the grammatical competence of Filipino major students through effective strategies and supportive environments. It recommends exploring grammar instruction across various educational levels and examining the impact of digital and social media on language learning. The study also emphasizes the importance of utilizing practical, localized teaching materials to enhance grammar mastery and overall language proficiency.

Keywords: Synchronous e-learning; Digital literacy; Writing strategies; Grammatical competence; Structural equation model

1.0 Introduction

One of the significant challenges in the field of education is the lack of grammatical competence among students. Although this is a crucial factor in developing meaningful communicative competence, many learners still struggle to use correct grammar in both speaking and writing (Alqahtani, 2022). Insufficient grammar skills hinder clear and effective communication. In the study by Cuyos (2024), common student errors were identified, including incorrect use of subject-verb agreement, punctuation, modals, and verb voice, which serve as clear indicators of the persistent grammatical challenges in education. Bodbod (2024) further emphasized that these issues hinder students from writing creatively and logically.

Grammatical competence is essential for effective communication, as it serves as the foundation for understanding and conveying meaning in any language. A firm grasp of grammar enables individuals to construct clear and coherent sentences, thereby enhancing their writing strategies. This skill not only facilitates the comprehension of messages but also enables students to express their thoughts in a socially acceptable manner, thereby improving their overall communicative ability (Sioco & Devera, 2018). Furthermore, grammatical competence is particularly beneficial in academic contexts, where mastery of grammar is crucial for producing high-quality written work and achieving academic success (Widya & Wahyuni, 2018). In summary, grammatical proficiency is vital for effective communication across various contexts, including both professional and educational development.

In the modern educational system, the connection between grammatical competence and students' participation in synchronous e-learning is evident, as college students now engage in classes through various online platforms. These platforms enable instructors to provide immediate feedback and foster more active participation in discussions. Such interaction supports the development of grammatical skills by providing students with the opportunity to correct their mistakes in real-time as they learn. However, a lack of digital literacy can hinder the learning process and lead to more frequent grammatical errors. According to a study, factors such as self-motivation and interaction with teachers and peers can have both positive and negative effects on students' grammatical development (Olayres, 2024).

The rise of both digital literacy and grammatical competence presents challenges for students, particularly in the context of synchronous e-learning. Despite the advantages of online education, many learners struggle with the use of technology, which hinders their academic progress. According to a study by Liu and Huang (2020), limited access to devices and poor internet connectivity often lead to misunderstandings of lesson content, resulting in a higher frequency of grammatical errors. Furthermore, the lack of digital skills restricts students' ability to practice and enhance their writing, leading to a decline in output quality and an increase in anxiety or uncertainty about their grammatical accuracy. As Bailey (2021) emphasizes, training and support in digital literacy are crucial for enhancing students' grammatical competence in today's digital learning environment.

Writing strategies play a vital role in enhancing students' learning by providing a structured approach to organizing ideas, improving clarity, and fostering grammatical competence. Techniques such as brainstorming, outlining, and drafting help prevent confusion and support effective communication (Nhung, 2023). The absence of these strategies often results in grammatical errors and weak writing performance, especially among college students (Kim, 2020). Writing also requires awareness of appropriate language use, proper grammar, and organization to convey ideas effectively. Teaching writing strategies leads to improved academic outcomes and a deeper understanding (Chien, 2021) while also promoting critical thinking, information analysis, and the logical structuring of content (Raofi et al., 2017).

This research is grounded in Jean Piaget's Constructivist Theory, as cited in Blyth's study (36–45), which is rooted in the idea that learners actively construct knowledge through meaningful experiences and interactions. Constructivism positions grammar learning as an active and contextual process rather than a passive acquisition of rules. In this view, students develop their understanding of grammar through authentic language use, including writing, speaking, and collaborative activities, rather than memorizing isolated rules. Learners acquire grammatical competence by using structures in real-life contexts where language serves a communicative purpose.

Several scholars, including Scott et al. (2018), Sutcu (2020), Haryanti et al. (2022), and Zhang et al. (2021), have investigated the impact of synchronous e-learning, digital literacy, and writing strategies on improving students' writing skills. However, their focus often excluded grammatical competence, which is essential in mastering language structures and effective written communication. Aghajani (2018) emphasized that understanding grammar, such as sentence structure and verb usage, is crucial for language mastery. To address this research gap, the current study aims to explore how synchronous e-learning, digital skills, and writing strategies affect students' grammatical competence, especially in online learning contexts.

This research is vital not only for teachers, who can use the findings to develop effective and up-to-date strategies, but also for students, as it enhances their grammatical competence in digital learning environments. It can guide

educational institutions in shaping curricula that foster language awareness, improve communication, and reduce common grammatical errors. Ultimately, the study serves as a valuable model for future researchers seeking to develop effective, adaptive teaching methods that respond to societal changes and support the communicative growth of both students and teachers.

This study examined a structural model related to students' grammatical competence. Specifically, it aimed to address the following objectives to ascertain the level of students' synchronous e-learning in terms of: perceived usefulness, perceived ease of use, learners' confidence in using computers, learners self-efficacy, system accessibility, perceived flexibility, perceived learner interaction and perceived student satisfaction; to ascertain the level of students' digital literacy through: digital tool application, digital application usage, digital media awareness, information seeking skills, and information sharing behavior; to ascertain the level of students' writing strategies in terms of: before writing, while writing, and revising; the level of students' grammatical competence in terms of: prepositions, subject-verb-agreement, verb tenses, modals, and verb voice; to ascertain if there is a significant relationship between synchronous e-learning, digital literacy, writing strategies and grammatical competence; to ascertain if there is a single and combined influence between synchronous e-learning, digital literacy, writing strategies to grammatical competence; and to identify the best fit model for grammatical competence of students in Filipino.

2.0 Methodology

2.1 Research Design

This research employed a combination of descriptive, correlational, and causal-comparative research designs. A descriptive design was employed to portray the current state of the situation at the time of the study. Its purpose is to examine the underlying causes of the specific problem being investigated. Descriptive research aims to describe particular characteristics of a group of people. This descriptive study utilized quantitative data to examine the research problem. The quantitative approach was deemed appropriate for gathering data from respondents using questionnaires. The collected responses provided numerical data helpful in analyzing the issue at hand. The data gathered from respondents is typically continuous and may be represented using a normal distribution (Umstead, 2018). In the correlational research design, the study examined the relationship between two or more variables. The goal of this design was to determine the extent of association among the variables under investigation. The study used procedures to measure and analyze the correlation among these variables. In addition, the research employed a Structural Equation Modeling (SEM) approach to assess further the relationships between variables (Creswell, 2015). The use of Structural Equation Modeling (SEM) in this research helped strengthen the study's integrity and quality. The analysis involved several steps: model specification, data collection, model estimation, model evaluation, and potential model modification. If the hypothesized model did not statistically fit the data, an alternative model better suited to the data would be developed (Chen, Curran, Bollen, Kirby, & Paxton, 2001).

2.2 Participants and Sampling Technique

In this study, the researcher selected Filipino major students who experienced blended learning, a combination of face-to-face and online instructional delivery from various public and private universities and colleges across Region XI during the academic year 2024–2025. Based on the enrollment data provided by the institutions where respondents were drawn, the total population of Filipino major students in Region XI reached 2,251. From this total population, 400 Filipino major students were selected to serve as respondents of the study. These participants were drawn from different universities and colleges across Region XI using the Raosoft sample size calculator to ensure a statistically valid and appropriate number of respondents (Adam, 2020). The breakdown of participants is as follows: 111 from Davao del Norte, 94 from Davao Oriental, 159 from Davao del Sur, and 36 from Davao de Oro. The number of samples drawn from each institution was proportionate to their respective population sizes to meet the total sample size of 400. According to Marcoulides (2020), a sample size ranging from 200 to 400 or more is ideal when employing the Structural Equation Modeling (SEM) approach. Respondents were selected through stratified random sampling to ensure representativeness and enhance the credibility and validity of the data, resulting in a rich and comprehensive understanding of the studied phenomenon (Williams, 4923–4939).

Furthermore, the researcher applied inclusion criteria, targeting second- to fourth-year college students enrolled in the Bachelor of Secondary Education Major in Filipino program and currently engaged in blended learning within Region XI. These academic levels were chosen as they represent critical stages in the acquisition of essential

competencies related to digital literacy, writing strategies, and grammatical competence. Students at these levels have demonstrated proficiency in synchronous e-learning, possess adequate digital skills, and have developed competence in writing strategies and grammatical accuracy. At this stage, they are also considered ready to synthesize various knowledge areas relevant to their professional trajectory in the field of education. Conversely, based on the exclusion criteria, first-year college students were excluded from the study. This is because they are still in the early stages of adapting to new academic concepts, instructional styles, and learning approaches, which are generally consolidated and applied in the later years of their studies. Additionally, universities and colleges that do not implement blended learning were excluded, as their participation would not align with the research objectives.

2.3 Research Instrument

This study employed a survey questionnaire adapted from various established research instruments and refined by the researcher using the target language. The instrument underwent rigorous validation processes, including accurate translation and adequate contextualization of selected items, as well as preservation of semantic flow from the original instruments to ensure clarity and relevance in participants' responses. The finalized research tool was structured into four major components: (1) Synchronous e-learning, adapted from the study of Gashi, Krasniqi, and Zhushi (2024), comprising eight sections and 49 items; (2) Digital literacy, based on the work of Hong and Kim (2018), consisting of four parts and 17 items; (3) Writing strategies, drawn from the study of Petric and Czarl (2003), which includes three sections and 38 items; and (4) grammatical competence and is adapted from Yan's (2007) study. The test consists of 100 multiple-choice items, with each correct response awarded one point. It is structured into five sections, each containing 20 items, which assess the following areas: prepositions, subject-verb agreement, verb tenses, modals, and active and passive voice.

To measure the levels of synchronous e-learning, digital literacy, and writing strategies, the study employed a 5-point Likert scale anchored by semantic differential pairs, ranging from "Strongly Agree" to "Strongly Disagree." The scale was interpreted as follows: a mean range of 4.20–5.00 indicated a "Very High" descriptive level, meaning the attribute was consistently demonstrated; 3.40–4.19 was classified as "High," indicating frequent demonstration; 2.50–3.39 as "Moderate," meaning it was occasionally demonstrated; 1.80–2.59 as "Low," indicating it was rarely demonstrated; and 1.00–1.79 as "Very Low," indicating the attribute was never demonstrated.

Additionally, the instruments were reviewed by six subject-matter experts who evaluated the structure and clarity of the questionnaire. A pilot test was conducted involving 30 participants who were excluded from the actual study. The reliability of each instrument was assessed using Cronbach's Alpha coefficient, yielding strong internal consistency: the synchronous e-learning scale (49 items) recorded a coefficient of .951, digital literacy (17 items) a coefficient of .860, and writing strategies (38 items) a coefficient of .902. The overall average rating from the experts during validation was 4.45, indicating a high level of appropriateness and clarity of the instrument, ensuring both its reliability and validity for the actual research.

2.4 Data Gathering Procedure

This study was conducted in strict adherence to the ethical standards and protocols established by the University of Mindanao Ethics Review Committee. The researcher obtained informed consent from all participants and ensured that the selection of respondents was appropriate and ethically sound. Furthermore, following the comprehensive validation of the research instruments, the University of Mindanao Ethics Review Committee (UMERC) granted official approval to proceed with data collection, as indicated by Protocol No. UMERC-2025-041. This certification confirmed that the researcher adhered to ethical principles throughout the process, particularly in safeguarding the identities and responses of participants and in maintaining the integrity and credibility of the study.

2.5 Ethical Considerations

The researcher adhered strictly to the ethical guidelines established by the University of Mindanao Ethics Review Committee (UMERC) to ensure the integrity and credibility of the research process. Specifically, the researcher adhered to ethical standards, including voluntary participation, maintaining privacy and confidentiality, the informed consent process, and avoiding plagiarism, fabrication, and falsification of data. Participants were granted complete freedom to participate without fear of coercion or consequences should they choose not to

participate. Adequate time and space were provided for them to respond voluntarily to the questionnaire. The confidentiality of all collected information was safeguarded, and respondents were given the option to remain anonymous. The researcher communicated the potential benefits of the study to the participants and acknowledged all intellectual contributions from previous scholars, ensuring proper citation and avoiding any misappropriation of ideas.

Furthermore, the researcher ensured that all findings presented were genuine and derived from the data gathered without any form of invention or alteration. All conclusions were based on sound interpretation of existing studies, using appropriate theoretical frameworks. Data manipulation was strictly avoided, and no modifications were made to influence the results in a way that would align with the study's hypothesis. The integrity of the research was preserved throughout the process. As a testament to the ethical conduct of the research, the researcher received formal approval from the UMERC, as indicated by Protocol No. UMERC-2025-041, confirming that the research adhered to the required ethical procedures and standards.

3.0 Results and Discussion

3.1 Synchronous E-Learning

Table 1 presents the level of synchronous e-learning among students majoring in Filipino. Among the eight indicators, the highest mean score was 4.02 with a standard deviation of 0.67, corresponding to the indicator learners' confidence in using computers, which falls under the descriptive category of high. Conversely, the lowest mean score of 3.48, with a standard deviation of 0.64, was observed in the indicator related to perceived learner interaction, although it still fell within the high descriptive level. Overall, the students' level of synchronous e-learning yielded a total mean score of 3.75 with a standard deviation of 0.51, which is also classified as high, indicating that this behavior was frequently demonstrated. The study's findings indicate that Filipino major students exhibit a high level of experience, perception, and positive acceptance of the synchronous e-learning modality. Specifically, the indicator confidence in using computers received the highest mean score of 4.02, suggesting that students are comfortable and proficient in using technology. This implies that they are effectively able to adapt to the technical aspects of synchronous e-learning.

Table 1. *Level of Synchronous e-learning of Filipino major students in Region XI*

Indicators	SD	Mean	Descriptive Level
Perceived Usefulness	0.70	3.91	High
Perceived Ease of Use	0.68	3.85	High
Learners' Confidence in Using Computers	0.67	4.02	High
Learners' Self-Efficacy	0.68	3.71	High
System Accessibility	0.68	3.77	High
Perceived Flexibility	0.54	3.70	High
Perceived Learner Interaction	0.64	3.48	High
Perceived Student Satisfaction	0.69	3.54	High
Overall	**0.51**	**3.75**	**High**

The results are aligned with existing studies on synchronous e-learning. One of the key findings is that students' high level of confidence in using computers can be supported by studies on computer self-efficacy conducted by Hedayati (2023), who emphasized that high computer self-efficacy significantly enhances learners' motivation, engagement, and readiness in online environments. They found a positive correlation between self-efficacy and online learning readiness, concluding that students who are confident in their technical skills are more prepared to navigate digital learning platforms. Although the indicator of student interaction received the lowest mean score, it still fell within the high descriptive level. This finding aligns with those of Shin (2023), who noted that interaction is a critical factor in determining student engagement and satisfaction in synchronous learning settings. His study among secondary school students in South Korea revealed that increased interaction leads to more active participation and improved learning experiences.

3.2 Digital Literacy

Table 2 presents the level of digital literacy among college students. Among the five indicators, the usage of digital applications obtained the highest mean score of 4.44 with a standard deviation of 0.65, corresponding to a descriptive level of very high. On the other hand, among the five indicators, the digital tool application recorded the lowest mean score of 3.58 with a standard deviation of 0.76, falling under the High descriptive level. Overall,

the students' digital literacy registered a total mean score of 4.09 with a standard deviation of 0.51, also classified as High, indicating that the students frequently demonstrate this skill. Based on the results recorded in the table, it is evident that the students possess a high to very high level of digital literacy. This indicates that they are proficient and confident in using technology, particularly in aspects such as digital application usage, digital media awareness, and information sharing behavior. Other indicators, such as the application of digital tools, awareness of digital media, information-seeking skills, and attitudes toward sharing information, also demonstrate their significant role in strengthening students' overall digital competence.

This is supported by the study of Fatima et al. (2022), which highlighted that students' use of digital applications and their behavior in sharing information through various digital technologies demonstrate their proficiency in utilizing and manipulating online platforms. The presence of digital collaboration among students also contributes to the enhancement of digital literacy, as it fosters cooperative and collaborative learning, further developing fluency in technology use (Getenet et al., 2024). Moreover, the students' high level of information-seeking skills and awareness of digital media reflects their critical thinking abilities and media literacy, as emphasized in the works of Liu and Huang (2020) and Moorhouse and Yan (2023). Meanwhile, although the application of digital tools also yielded a high score, it registered the lowest among the indicators, potentially suggesting a need for further training in handling more complex digital tools. This is consistent with Ramadhan et al.'s (2024) assertion that mastering advanced digital tools is a vital component of 21st-century skills.

Table 2. *Level of Digital Literacy of Filipino major students in Region XI*

Indicators	SD	Mean	Descriptive Level
Digital Tool Application	0.76	3.58	High
Digital Application Usage	0.65	4.44	Very High
Digital Media Awareness	0.67	3.96	High
Information Seeking Skills	0.68	4.11	High
Information Sharing Behavior	0.62	4.38	Very High
Overall	**0.51**	**4.09**	**High**

3.3 Writing Strategies

The results in Table 3 indicate that students demonstrate a high level of awareness and active use of various writing strategies across each stage of the writing process. This suggests that students possess a strong foundation in writing-related skills. Consequently, teachers may continue to reinforce and enhance instruction on these strategies further to improve the quality of students' written outputs. The high mean score during the while-writing stage reflects students' focus and active translation of ideas into text. However, the comparatively lower score in the revising stage highlights a need for additional support in refining content and correcting errors to produce clearer and more effective written work.

Table 3. *Level of Writing Strategies of Filipino major students in Region XI*

Indicators	SD	Mean	Descriptive Level
Before Writing	0.52	3.98	High
While Writing	0.51	4.24	Very High
Revising	0.52	3.74	High
Overall	**0.44**	**3.98**	**High**

Recent research corroborates that students often demonstrate a high level of awareness and active utilization of writing strategies throughout the composition process or while writing. For instance, Graham et al. (2020) found that integrating strategy instruction across the before-writing, while-writing, and revising phases significantly improves writing competence and confidence. This aligns with the current findings, suggesting that students have a solid foundation in composing and translating ideas into text during the while-writing stage, as evidenced by the high mean scores. However, the relatively lower performance observed in the revision stage reflects a common pedagogical gap. A study by Harris et al. (2018) emphasizes the effectiveness of structured peer and self-review workshops, which greatly enhance students' revision capabilities and overall text quality. Similarly, MacArthur and Philippakos (2021) argue that revision skills are underdeveloped unless they are explicitly taught; they report significant gains in students' editing and reorganizing proficiency following focused instruction on revision strategies.

3.4 Grammatical Competence

Table 4 presents the level of grammatical competence among students majoring in Filipino. Among the five indicators, the use of prepositions registered the highest mean score of 4.02, with a standard deviation of 0.61, indicating a high descriptive level. Conversely, the indicator on verb voice obtained the lowest mean score of 2.03 with a standard deviation of 0.42, which falls under the low descriptive category. Overall, the students' grammatical competence yielded a mean score of 3.22 and a standard deviation of 0.42, corresponding to a moderate descriptive level, indicating that such skills were demonstrated occasionally by the students. The findings in Table 4 reflect the varying levels of grammatical competence among students majoring in Filipino, with notable strength in the use of prepositions and significant challenges in mastering verb voice. This variation is consistent with several current and prior studies on grammatical acquisition among college students. The high performance in the use of prepositions aligns with the findings of Cordero and Tupas (2021), who observed that frequent exposure to both spoken and written academic Filipino enhances students' grasp of commonly used grammatical structures, such as prepositions. This suggests that repetitive usage in natural communication environments reinforces specific grammatical components more than others.

Table 4. *Level of Grammatical Competence of Filipino major students in Region XI*

Indicators	SD	Mean	Descriptive Level
Prepositions	0.61	4.02	High
Subject-Verb-Agreement	0.45	3.79	High
Verb Tense	0.72	3.15	Moderate
Modals	0.70	3.12	Moderate
Verb Voice	0.70	2.03	Low
Overall	**0.42**	**3.22**	**Moderate**

Moreover, Gonzales and Santiago (2022) emphasized that while Filipino students may perform adequately in rule-based grammar tasks, such as subject-verb agreement and preposition usage, they often struggle with applying more complex grammatical rules that require syntactic manipulation, such as changing verb voices. Their study supports the moderate overall grammatical competence reported in this research, suggesting that grammar instruction in many college-level Filipino programs focuses on foundational elements but lacks sufficient emphasis on higher-level grammatical skills.

3.5 Significant Relationship Between Synchronous e-learning and Grammatical Competence

The results presented in Table 5 show the correlation between synchronous e-learning and grammatical competence.

Table 5. *Significant Relationship Between Synchronous e-learning and Grammatical Competence XI*

Synchronous E-learning	Grammatical Competence					
	Prepositions	Subject-Verb Agreement	Verb Tenses	Modals	Verb Voice	Overall
Perceived Usefulness	-.038	-.101*	.026	.017	-.066	-.041
	.451	.044	.602	.732	.191	.418
Perceived Ease of Use	-.004	-.058	.054	-.017	-.012	-.005
	.938	.245	.278	.728	.813	.917
Learners' Confidence	-.061	-.042	.012	.002	.019	-.016
in Using Computers	.227	.401	.818	.968	.709	.745
Learners' Self-Efficacy	-.011	-.035	.048	.023	.051	.030
	.822	.486	.341	.645	.306	.552
System Accessibility	-.017	.024	.043	.002	.012	.020
	.741	.634	.386	.968	.811	.692
Perceived Flexibility	-.081	-.087	-.006	-094	-.044	-.092
	.105	.083	.905	.061	.379	.067
Perceived Learner	.081	-.116*	-.029	-.081	-.017	-.092
Interaction	.106	.021	.565	.107	.739	.065
Perceived Student	-.083	-.085	-.008	-.077	-.049	-.088
Satisfaction	.097	.090	.869	.125	.324	.078
Overall	-.059	-.080	.024	-.034	-.016	-.044
	.238	**.112**	**.629**	**.504**	**.743**	**.384**

As stated in the hypothesis, the relationship was measured at the 0.05 level of significance. The overall R-value of -0.044 with a p-value of 0.384 (not significant), which is greater than 0.05, indicates that the null hypothesis was accepted. This means that there is no significant relationship between synchronous e-learning and students'

grammatical competence. The findings in Table 5.1, which reveal no significant relationship between synchronous e-learning and grammatical competence, align with some existing literature that suggests technological modalities alone may not directly enhance specific linguistic skills, such as grammar. Although synchronous e-learning offers real-time interaction and access to instructional materials, it may not be sufficient to develop nuanced grammatical knowledge without deliberate pedagogical interventions. In a recent study by Suntornnond et al. (2020), it was emphasized that while synchronous e-learning facilitates engagement and communication, its impact on grammar acquisition is limited when instruction is not explicitly focused on grammar. The lack of significant correlation in the present study could be attributed to the possibility that the synchronous sessions were centered more on content delivery rather than grammar-focused activities.Additionally, Shadiev et al. (2022) suggested that grammar learning requires more individualized, adaptive feedback and repetitive practice features that are not always optimally delivered in synchronous environments. Thus, the development of grammatical competence may require more targeted interventions than synchronous learning environments typically provide.

3.6 Significant Relationship Between Digital Literacy and Grammatical Competence

Table 6 presents the results of the analysis of the relationship between digital literacy and grammatical competence among students majoring in Filipino. As stated in the hypothesis, the correlation was examined at the 0.05 level of significance. The overall R-value of 0.165 with a p-value of 0.001 (significant), which is lower than 0.05, indicates that the null hypothesis was rejected.

This demonstrates a significant positive relationship between students' digital literacy and their grammatical competence. The data indicate that as the level of digital literacy increases, particularly in areas such as digital application usage, information-seeking skills, and information-sharing behavior, students' grammatical competence also improves. This includes aspects such as subject-verb agreement, verb aspects, use of modals, and verb voice. Among these, the use of digital applications shows the strongest correlation with all areas of grammatical competence, suggesting that integrating technology into learning has a positive impact on students' understanding and application of grammar.

Several studies have demonstrated the clear link between digital literacy and students' grammatical competence across various learning contexts. In the research conducted by Klimova and Pikhart (2020), it was emphasized that the use of various digital applications, digital media awareness, information-seeking skills, and behaviors related to information sharing have a positive impact on the development of students' grammatical competence, particularly in the accurate use of sentence structure and syntax.

Table 6. *Significant Relationship Between Digital Literacy and Grammatical Competence*

Digital Literacy	**Grammatical Competence**					
	Prepositions	**Subject-Verb-Agreement**	**Verb Tenses**	**Modals**	**Verb Voice**	**Overall**
Digital Tool Application	-.050 .315	.025 .616	.042 .402	.030 .547	.053 .291	.033 .514
Digital Application Usage	.044 .385	.164** .001	.161** .001	.125* .012	.196** .000	.212** .000
Digital Media Awareness	.001 .983	.035 .489	.104* .038	.101* .044	.121* .016	.117* .019
Information Seeking Skills	.013 .802	-.015 .771	.119* .017	.146** .003	.113* .024	.127* .011
Information Sharing Behavior	.080 .110	.152** .002	.188** .000	.092 .067	.015 .762	.157** .002
Overall	.019 **.709**	.091 **.071**	.157** **.002**	.128* **.011**	.130** **.009**	.165** **.001**

Similarly, Albiladi and Alshareef (2019) highlighted that the integration of digital tools fosters active participation and a deeper understanding of grammar among students. Likewise, Cruz (2022) asserted that the use of various educational media as tools for language learning contributes to enhancing students' grammatical proficiency in Filipino, especially in writing and speaking. These studies collectively indicate that digital literacy is not merely a technical skill but a crucial component in the advancement of grammatical learning.

3.7 Significant Relationship Between Writing Strategies and Grammatical Competence

Table 7 presents the significance of the relationship between writing strategies and grammatical competence among students majoring in Filipino. Based on the stated hypothesis, the relationship was examined at the 0.05

level of significance. The computed R-value of 0.087, with a p-value of 0.082 greater than 0.05, indicates that there is no statistically significant relationship. Thus, the null hypothesis is accepted, suggesting that there is no strong correlation between the use of writing strategies and the grammatical competence of Filipino major students. In a study conducted by Ismail and Dedi (2021) in Indonesia, it was discovered that despite the frequent use of cognitive, metacognitive, and socio-affective writing strategies during the writing process, such as before writing, while writing, and revising, the correlation with grammatical competence remained weak. Their findings suggest that while these strategies aid in organizing and generating ideas, they do not necessarily translate to improved grammatical accuracy. Similarly, Rodriguez (2023) examined Filipino majors in the Philippines and found that although students frequently employed various language learning strategies, their grammatical competence was only moderately developed. This reinforces the idea that writing strategies alone are insufficient in significantly enhancing grammar skills, especially in academic contexts where precision is essential.

Table 7. *Significant Relationship Between Writing Strategies and Grammatical Competence*

Writing Strategies	Grammatical Competence					
	Prepositions	Subject-Verb-Agreement	Verb Tenses	Modals	Verb Voice	Overall
Before Writing	-.011	.007	.070	.053	.023	.048
	.832	.889	.162	.292	.643	.339
While Writing	.079	.057	.130**	.130**	.078	.150**
	.113	.257	.010	.009	.121	.003
Revising	.013	-.020	.059	.040	-.013	.029
	.790	.697	.235	.421	.793	.563
Overall	.031	.017	.100*	.085	.034	.087
	.532	**.739**	**.046**	**.088**	**.495**	**.082**

3.8 Significant Influence of Synchronous E-Learning, Digital Literacy, and Writing Strategies on Grammatical Competence

Table 8 presents the influence of synchronous e-learning, digital literacy, and writing strategies on students' grammatical competence. The computed F-value of 7.247, with a corresponding p-value of 0.000, indicates that the regression model is statistically significant, leading to the rejection of the null hypothesis. This suggests that there are variables that can significantly explain students' grammatical competence. Furthermore, the R^2 value of 0.053 implies that the predictor variables of synchronous e-learning, digital literacy, and writing strategies can explain 5.3% of the variance in grammatical competence. In comparison, the remaining 94.7 percent may be attributed to other factors beyond these three variables. The analysis reveals that the standardized coefficient (beta) for digital literacy is the highest at 0.252, indicating that digital literacy has the most significant influence on students' grammatical competence. This is in contrast to synchronous e-learning, which has a negative beta value of -0.198, and writing strategies, which have a minimal influence with a beta of 0.035.

Table 8. *Significant Influence of Synchronous e-learning, Digital Literacy, and Writing Strategies*

Grammatical Competence (Variables)	*B*	β	*t*	*Sig.*
Constant	2.869		14.286	.000
Synchronous E-learning	-.163	-.198	-3.277	.001
Digital Literacy	.204	.252	3.831	.000
Writing Strategies	.033	.035	.546	.585
R=.231				
R^2=.053				
ΔR=0.046				
F=7.247				
ρ=0.000				

Synchronous e-learning was found to have a negative and statistically significant effect on students' grammatical competence (B = -0.163, β = -0.198, t = -3.277, p = .001). This result suggests that students may encounter challenges in real-time interaction during synchronous learning, such as pressure to respond immediately and limited time to process grammatical information, which can potentially diminish the quality of their grammatical output. Meanwhile, writing strategies did not show a significant effect on grammatical competence, as indicated by the results (B = 0.033, β = 0.035, t = 0.546, p = .585). This implies that students' knowledge or actual use of these strategies may be insufficient to produce a direct impact on their grammatical proficiency.

The studies reviewed highlight the significant role of digital competence in enhancing students' grammatical skills, particularly in modern, technology-driven learning contexts. Tools such as grammar checkers and writing platforms help students identify and correct their grammatical errors, supporting long-term grammatical development (Ng, 2021; Spante et al., 2018). Students with higher digital literacy tend to perform better in writing tasks, especially when using platforms that offer grammar suggestions (Delos Santos, 2023). On the other hand, synchronous e-learning, despite its strength in fostering real-time communication, does not automatically improve grammatical competence unless carefully designed with explicit grammar instruction (Hrastinski, 2022; Moorhouse & Kohnke, 2021). The effectiveness of synchronous platforms depends heavily on structured teacher interventions, such as providing feedback and engaging in grammar-focused activities (Valle & Francisco, 2023).

3.9 Overall Results of Goodness of Fit Measures among the Three Models

Revealed in Table 9 is the result of the goodness of fit measures of the Generated Model 3. As can be seen in the results, all model fit values have successfully met the criteria set by each index: CMIN/DF < 2, GFI, CFI, NFI, and TLI> 0.95, and RMSEA <, with a P-value> 0.05. The result aligns with the criteria set by Arbuckle and Wothke (1999), emphasizing that the CMIN/DF should be less than 2. The Tucker-Lewis Index (TLI), Comparative Fit Index (CFI), Normed Fit Index (NFI), and Goodness-of-Fit Index (GFI) should be greater than 0.95. Moreover, the RMEA and PCLOSE values are supported by Browne and Sugawara (1996), indicating that 0.01, 0.05, and 0.08 correspond to excellent, good, and mediocre fits, respectively, with a P-Close value greater than 0.05.

Table 9. *Summary of Goodness of Fit Measures of the Three Generated Models*

Model	P-value (>0.05)	CMIN / DF (0<value<2)	GFI (>0.95)	CFI (>0.95)	NFI (>0.95)	TLI (>0.95)	RMSEA (<0.05)	P-close (>0.05)
1	.000	4.973	.815	.796	.759	.770	.100	.000
2	.000	3.029	.878	.898	.856	.883	.071	.000
3	.108	1.359	.984	.990	.965	.983	.030	.916

Legend: **CMIN/DF** – *Chi Square/Degrees of Freedom* **NFI** –*Normed Fit Index*
GFI– Goodness *of Fit Index* **TLI** -*Tucker-Lewis Index*
RMSEA– *Root Mean Square of Error Approximation* **CFI** – Comparative *Fit Index*

Figure 1 illustrates Hypothesized Model 1, which shows the direct relationship between the exogenous variables of synchronous e-learning, digital literacy, and writing strategies, and the model's relationship with the endogenous variable of students' grammatical competence. In the analysis of Model 1, using the goodness of fit indices: the Chi-Square divided by the degrees of freedom (CMIN/DF) is .4.973; the Normed Fit Index (NFI) is .759; the Tucker-Lewis Index (TLI) is .770; the Comparative Fit Index (CFI) is .796; the Goodness of Fit Index (GFI) is .815; the Root Mean Square Error of Approximation (RMSEA) is .100; and the P of Close Fit (P-close) is .000.

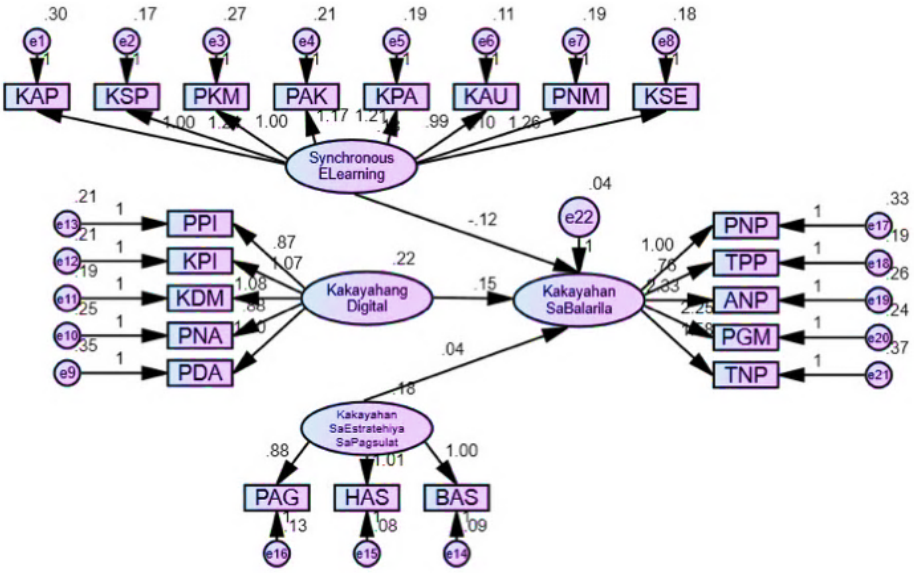

Figure 1*: Hypothesized Model 1*

3.10 Regression Weights of the Three Models

Table 10 presents the regression weights of the three models that examine the relationship between the endogenous variable and the exogenous variables, including synchronous e-learning, digital literacy, and writing strategies. By analyzing the p-values and regression coefficients, it is possible to identify which factors have significant effects. The table provides essential data regarding the strength and direction of influence of each variable, which helps deepen the understanding of the models under investigation.

Table 10. *Regression Weights of the 3 Generated Models*

	Exogenous Variables to Endogenous Variables		
Model	**Synchronous E-learning**	**Digital Literacy**	**Writing Strategies**
1	-.121***	.148***	.036^{NS}
2	-.152**	.191**	-.001^{NS}
3	-.128^{NS}	.154^{NS}	-.046^{NS}

In Model 1, digital literacy showed the strongest and most significant effect (.148, p = 0.000), while synchronous e-learning had a negative but significant effect (-.121, p = 0.000). Meanwhile, writing strategies did not exhibit a significant effect (p = .036, NS). In Model 2, digital literacy continued to exert a dominant influence on grammatical competence (.191, p = 0.000). At the same time, synchronous e-learning remained negative but significant (-0.152, p = 0.000), and writing strategies showed no significant effect (p = 0.001, NS).

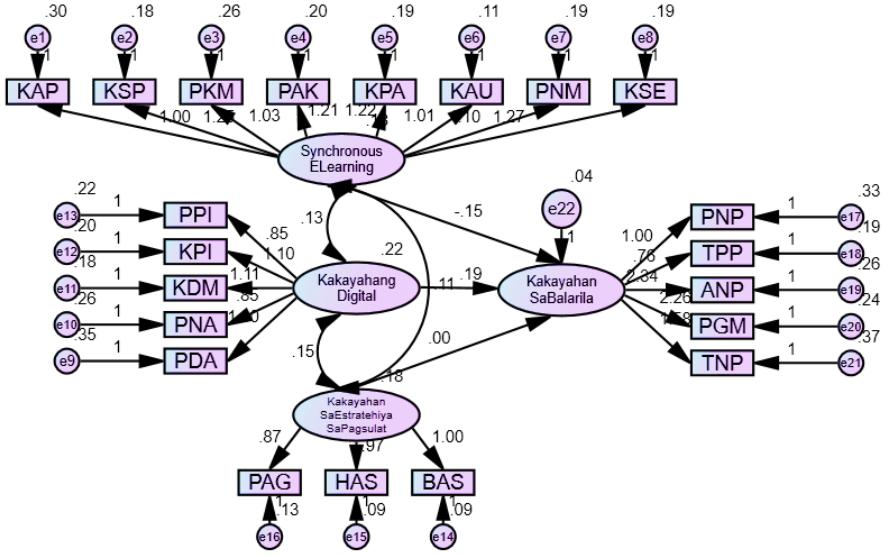

Figure 2: *Hypothesized Model 2*

Figure 2 illustrates Hypothesized Model 2, which shows the relationship between the exogenous variables of synchronous e-learning, digital literacy, and writing strategies, and their direct connection to the endogenous variable, grammatical competence. As shown in Table 8, digital literacy had the highest beta value (.191), followed by writing strategies (beta = -.001) and synchronous e-learning (beta = -.152). However, the goodness-of-fit results indicated that the values of this model did not meet the established standards for fit indices. Specifically, the CMIN/DF was greater than 2, and the GFI, CFI, NFI, and TLI were all below 0.95. In contrast, the RMSEA was higher than 0.05, and the P-Close was below 0.05. Therefore, this model is considered weak and inappropriate.

The analysis of Model 3 as shown using the goodness of fit indices: Chi-Square divided by degrees of freedom (CMIN/DF) is 1.359; the Normed Fit Index (NFI) is .965; the Tucker-Lewis Index (TLI) is 0.983; the Comparative Fit Index (CFI) is 0.990; the Goodness of Fit Index (GFI) is 0.984; the Root Mean Square Error of Approximation (RMSEA) is 0.030; and the P of Close Fit (Pclose) is 0.916. As shown in Table 8, digital literacy had the highest beta value (.154), followed by writing strategies (beta = -.046) and synchronous e-learning (beta = -.128). The goodness-of-fit result of model 3 is highly acceptable because all the indices met the established standards against the

obtained fit value of the model. These indices meet the requirements of goodness-of-fit measures. Moreover, this indicates that Model 3 is a very suitable model for this study.

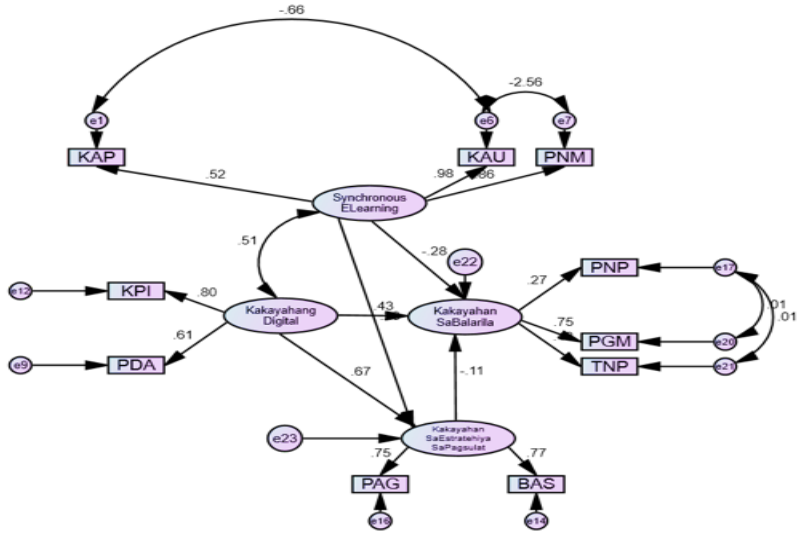

Figure 3: *Hypothesized Model 3*

Figure 3 presents the standard estimates of the developed and best-fit models. Based on this model, which is considered the best fit, synchronous e-learning, digital literacy, and writing strategies are exogenous variables that have a direct relationship with the grammatical competence of Filipino major students in Region XI. The model also illustrates the connection among the exogenous variables, showing that synchronous e-learning, digital literacy, and writing strategies all contribute to enhancing grammatical competence. Furthermore, as shown in Hypothesized Model 3, three out of the eight indicators of synchronous e-learning — namely, perceived usefulness, perceived flexibility, and perceived student interaction — remain significant factors affecting grammatical competence. Meanwhile, digital literacy has two important indicators out of five: the application of digital tools and information-seeking skills, both of which were found to influence grammatical competence. On the other hand, writing strategy has two significant indicators out of three, both of which show a positive effect on grammatical competence. Based on the results, it can be inferred that grammatical competence is primarily dependent on digital literacy, as measured by the application of digital tools and information-seeking skills; synchronous e-learning, as perceived through usefulness, flexibility, and student interaction; and writing strategy, as influenced by pre-writing and revision techniques. In addition, grammatical competence as an endogenous variable is measured using three indicators: the use of prepositions, modals, and verb voice. These indicators collectively explain how students develop and apply grammatical competence.

4.0 Conclusion

The study's findings revealed that Filipino major students demonstrated high levels of synchronous e-learning engagement, digital literacy, and effective writing strategies. However, their grammatical competence was found to be at a moderate level. When examining the relationship between the exogenous variables and the endogenous variable, the results showed no significant correlation between synchronous e-learning or writing strategies and students' grammatical competence. Notably, digital literacy emerged as the only factor with a significant relationship to grammatical competence. Despite the absence of strong individual influence, the combined effect of synchronous e-learning, digital literacy, and writing strategies was observed to have an impact on students' grammatical competence. Among the three structural models tested, only Model 3 consistently met all the required fit indices, indicating an excellent fit to the data. Therefore, it was identified as the most appropriate model. This model illustrates that the grammatical competence of Filipino major students measured through their use of prepositions, modals, and verb voice is influenced by several key factors: synchronous e-learning, represented by its usefulness, flexibility, and student interaction; digital literacy, indicated by the use of digital applications and information-seeking skills; and writing strategies, particularly before writing and revising techniques.

The results of the study support Jean Piaget's Constructivist Theory, which is rooted in the idea that learners actively construct knowledge through meaningful experiences and interactions, and posits grammar learning as an active and contextual process rather than a passive acquisition of rules. Through synchronous e-learning highlighted by its indicators of perceived usefulness, perceived flexibility, and perceived student interaction, combined with digital literacy skills such as digital application usage and information seeking skills, and writing strategies with pre-writing and revising as key components, students can enhance their correct usage of prepositions, modals, and verb voice. Through this, students build their understanding of grammar through authentic language use, such as writing, speaking, and collaborative activities, rather than memorizing isolated rules. Learners acquire grammatical competence by using structures in real-life contexts where language serves a communicative purpose. Vygotsky's social constructivism, particularly his concept of the Zone of Proximal Development (ZPD), emphasizes the significance of guided interaction and scaffolding from teachers and peers in the development of language skills. Additionally, Flower's Cognitive Process Theory of Writing emphasizes that writing is a complex mental process involving planning and revising. The use of writing strategies, particularly during the pre-writing and revising stages, sharpens students' awareness of logic and correct language structure. Through this process, grammatical competence is further strengthened, especially in the appropriate use of prepositions, modals, and verb voice, demonstrating the deep connection between strategic writing and grammatical development.

Based on the research results on synchronous e-learning, digital literacy, and writing strategies regarding students' grammatical competence, it is necessary to strengthen this area through technological innovation, interactive activities, and enhanced teacher-student relationships to expand grammatical knowledge further and promote critical thinking and effective writing. Similarly, more concrete training is needed in the use of digital applications for gathering meaningful information, creating projects, and analyzing data, as well as developing interactive modules and online games focused on grammar. In terms of writing strategies, it is essential to emphasize prewriting and revision techniques to ensure the proper use of grammar.

Teachers and students can focus on teaching grammatical aspects, such as verb voice, modals, and verb aspects, through contextualized and integrative activities. Teachers are encouraged to be trained in the effective use of online tools and pedagogical strategies. It is also recommended that HEIs in Region XI consider developing a grammar teaching model suited for students enrolled in the Bachelor of Secondary Education program in Filipino, in the modern context of education. Furthermore, integrating digital, grammatical, and writing strategies is suggested to ensure the holistic development of students. Finally, future researchers are encouraged to explore other factors such as motivation, learning environment, and the level of technology use to gain a deeper understanding of the influences affecting grammatical competence.

5.0 Contributions of the Author

The authors significantly contributed to the conception and design of the study, data collection, statistical analysis, interpretation of results, and drafting of the manuscript. The author approved the final version of the paper and is accountable for all aspects of the work, ensuring the integrity and accuracy of the research presented.

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7.0 Conflict of Interests

The authors declare that there is no conflict of interest regarding the publication of this research study.

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