International Journal of Education & Social Sciences (IJESS)
ISSN: 2754-2793
Vol. 3 Issue 10, October - 2022

Active Learning Attitude, Reading Profile, Learning Strategies: Structural Equation Model on Technical Writing Competency of Senior High School Students

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***Abstract*—This study was conducted to determine the best-influencing factors in the senior high school (SHS) students' technical writing competency (TWC) in Region XII. Structural equation modeling (SEM) was used as the main statistical tool to analyze the relationship between active learning attitude, reading profile, learning strategies, and TWC. The 400 respondents were selected through stratified random sampling. Survey-questionnaire was used as the main instrument. The students answered the questionnaire through a Google form. The mean, Pearson r, and regression were used as statistical tools. The study revealed a high level of active learning attitude, reading profile, learning strategies, and technical writing skills. Likewise, the result showed that active learning attitude, reading profile, and learning strategies significantly correlate with students' TWC. The result of SEM significantly influences three exogenous variables as predictors of TWC. Among the five models, model 5 appeared to be the most suitable model of TWC fit even though all indices met the set criteria against the obtained model fit value.**

***Keywords*— education, active learning attitude, reading profile, learning strategies, technical writing competency, structural equation model, Philippines**

I. INTRODUCTION

Technical writing is an important aspect of higher education, and success depends on writing ability (Olivier & Olivier, 2016; Olivier, 2016). It is important to note that academic writing involves more than proper syntax and evocative language (Roxas, 2020). It can shape their confidence to communicate, which is very important to developing young people or students. However, currently, students are experiencing concerns about how to start their paragraph about the topic to be written along with the wrong use of words and punctuation, which is a problem in technical writing, especially in terms of grammar.

Meanwhile, technical writing is important because it helps deliver meaningful, clear, and accurate information to a standard audience with a specific purpose and perspective (Isnin, 2017). In addition, the development of technical writing skills is also related to the enhancement of students' critical thinking and active learning and meets the needs of students with different learning styles, as well as effective methods to evaluate students' understanding of technical knowledge (Wu, 2022)

On the other hand, attention was paid to the variables influencing technical ability. One of them is Isnin's (2017) study on the relationship between technical writing and beliefs in active learning attitudes, identifying active learning attitudes about students' motivational intensity in learning, such as the desire to learn and interest in international schoolwork. It was found that the results of the study indicated that the students showed low to a moderate agreement with their knowledge, skills, and active learning in technical writing. It suggests that students lack technical writing skills. Students according to Bulut and Pinar (2017) who write well and effectively and develop their academic skills greatly advantage over those who lack knowledge. Writing also allows students to expand their thinking, organize their knowledge, use language, and create mental dictionaries because writing involves thought processes.

The study also discovered that reading profiles, such as reading experience contributing to students' reading challenges and translation as a teaching strategy, can be used to improve reading comprehension and technical writing (Boakye, 2017). Although English is the language of instruction, it is an additional language for most students. Students' home language and literacy skills can be used as a resource for understanding before they engage in deeper textual writing or technical writing. It is expected that this could lead to a better and easier understanding of concepts and theories, provide social relevance, and promote cultural awareness among students (Boakye, 2015).

There is general agreement that there is a connection between reading and writing. Still, students know surprisingly little about the nature of this connection or the interactions between reading strategies and technical writing regarding student progress and success. Examining the relationship between reading strategies and technical writing, what characteristics and abilities identify those who struggle with these skills should be communicated. Some interesting similarities and differences can be noted between reading and writing. Both (along with other language arts skills, listening and speaking) involve

knowledge of vocabulary (words, their internal morphology, and their meanings in context) and syntax (sentence structure, complex sentences, and how users can change the intended message). Both involve understanding different genres and skillful application of different styles (Olson, 2021).

A study on learning strategies focused on self-regulatory strategies as an indicator to assess the effects of a five-month writing instruction program based on self-regulation strategies and found some positive results in terms of second language writing performance and academic self-efficacy. Students became more active in developing different self-regulation strategies, which became effective according to the educational program. In addition, it helped students develop a deeper understanding of the effectiveness of self-regulatory strategies from a multi-dimensional perspective, understand the breadth of the methods of this strategy, improve their writing performance skills, and create positive writing self-esteem (Teng & Zhang, 2018). Learning strategies are an important component of success in the classroom, but little research exists that examines differences across key domains regarding teachers' use and emphasis on learning strategies (Dumford et al., 2016). The theory of Social Constructivism proposed by Piaget emphasizes our knowledge and how to build it. Additionally, the learning theory of Social Constructivism proposed by Vygotsky et al. (2018) underscores the need for social interaction.

In general, students can use self-regulatory strategies to create active, self-directed participation in learning, especially in writing (Teng, 2022). It is important to explore how students' unique self-regulation strategies predict writing performance. As a result, it appears critical to investigate how individuals influence students' self-regulatory strategies on their writing performance. This strategy also includes reminders to ensure that students' self-regulatory styles are used purposefully and effectively without becoming a distraction in the learning environment, (Dent & Koenka, 2016).

A study proved that technical writing is just as challenging as discourse writing. It was found that the students at the University of Anbar do not have much ability in writing discourses because many of them showed errors in lexical, syntactic, semantics, literal translation, repetition of words, cohesion, and anaphoric and cataphoric errors. Students experience these mistakes because of the difficulty of learning English as a foreign language (Khalaf & Fadel, 2020).

A study has proven the frequent mistakes of students in writing essays at the University of Majmaa'h in the Kingdom of Saudi Arabia. Students were asked to write three essays. It was discovered that the most frequent mistakes made by students are in punctuation, followed by spelling mistakes, use of prepositions, articles, wrong aspect of the verb, and wrong use of the appropriate word in the sentence. It has also been proven that the cause of this error is the transfer of Interlingual and intralingual (Khatter, 2019).

A study reinforces students' ability to write descriptive texts. It was discovered that the students were classified as having good to average knowledge. Their ability to use language was low, their proficiency in using vocabulary was only average, and in terms of mechanics, it was only average. The result also showed the students' difficulty in developing relevant ideas, lack of understanding of simple current aspects, lack of vocabulary, and mistakes in writing mechanics (Jayanti, 2019).

Vygotsky's Social Cultural Theory of Writing emphasizes the importance of motivation and social influence in the component of writing skills. It explains learning as a social process and how an individual's talents and abilities are derived from society and culture. In addition to this theory, interaction is crucial in developing mental learning. Vygotsky's Zone of Proximal Development states that the learner needs help and interaction to develop self-confidence, (Hodge, 2017). It is supported by Behaviorism Theory which says that children are born with the ability to learn. Their behavior can be shaped by controlling their environment. Children's intellectual abilities can be enriched and developed with the help of appropriate reinforcements. A behaviorist emphasizes taking care of intellectual development by motivating, encouraging, and strengthening it.

There is also a belief that a child can perform any task if taught and given the right direction. Similarly, the Psycho-Linguistic theory is not only focused on textual clues but the development of predictions. These theories play an important role in the development of meaning, vocabulary when students associate words, analysis of morphological aspects, and use of prior knowledge to identify the meaning. The next is the Strategy Inventory of Language Learning Theory. This strategy memory is about creating thoughts, applying images and sounds, and using action; Cognitive strategy that includes training, receiving and sending messages, analyzing and reasoning, creating a structure for input and output; and metacognitive strategies centered on learning, organizing and planning, learning and evaluating learning (Altmisdort, 2016).

This study also investigated the relationship of the independent variables: Active learning attitude, Reading profile and Learning strategy to the independent variable TWC. The latent endogenous variable is the TWC of SHS students adapted from the study of (Isnin et al., 2017) with three indicators attitude which refers to the reaction that students show to technical writing; skills that refer to technical writing work and knowledge that refers to students' proficiency in writing technical writing.

Active learning attitude (Impacts of the Problem-Based Learning Pedagogy on English Learners' Reading Comprehension, Strategy Use, and Active Learning Attitudes) by Lin (2017) contains the following indicators: motivational intensity, which pays attention to the level of attitude of the students when it comes to learning the Filipino Language; Desire to learn, the student desires to learn the Filipino

Language; Interest in international affairs, this is related to students' interest in obtaining information on foreign affairs; Communication inside and outside the class, this refers to the active participation of students in answering classroom tasks and using the Filipino language outside the classroom.

The reading profile (Exploring Students' Reading Profiles to guide a Reading Intervention Program) by Boakye (2015), contains the following indicators: experience with reading, which refers to the special skills students have acquired from the past, and attitude towards reading. It relates to reading that causes a student to approach or avoid the reading situation; reading and self-efficacy refer to students' belief in their ability to read successfully; reading strategies, it is the attempt to control or change the reader's effort to understand and develop the meaning of a text; Reading habits, this refers to how often the student reads.

Learning strategies by Warr and Downing (2000), contain various indicators. Mental learning strategies improve a student's ability to process information more deeply, transfer and apply information to new situations, and result in better and more sustained learning. Behavioral learning strategies refer to the help of personal search, asking for help, and practical application of the -students. Self-regulatory strategies refer to controlling, motivating, and monitoring students' understanding of the learning process.

The diagram shows the relationship between active learning attitude, reading profile, learning strategy, and technical writing ability of Senior High School students.

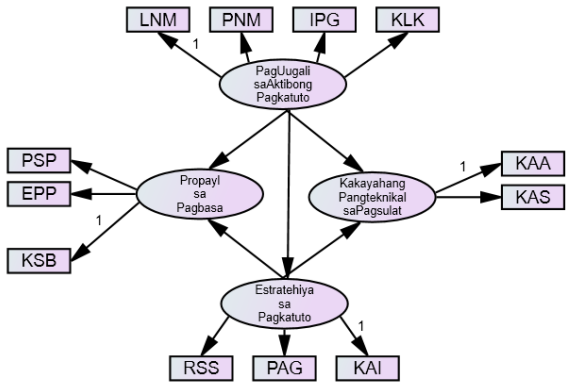

Figure 1. The Conceptual Model Showing Direct Latent Exogenous Relationship

LNM- motivational intensity
PNM-desire to learn
IPG-interest in international affairs
KLKI-communication inside and outside the class
KSB-past experience with reading
EPP-reading habit
PSP-reading strategies
KAI-mental
PAG-behavioral
RSS-self-regulatory
KAA- knowledge
KAS-skills

Although some studies have been mentioned and to the researcher's knowledge, there have not been many local studies to determine if there is a relationship between active learning attitude, reading profile, learning strategies, and the students' TWC. So the researcher was motivated to conduct a study to help increase awareness of the writing task, especially the technical type of writing. It can also help to increase the quality of education in the Philippines and make the programs included in it more prosperous. The study was conducted to help fill the gaps in students' technical writing-related issues. Above all, this study can be a way to ensure the students' TWC to develop and be active in their writing skills in the SHS in Region XII, specifically in Tacurong City, General Santos City, Kabacan, North Cotabato, and South Cotabato provinces.

This study investigated the most appropriate model for students' knowledge of TWC. This study aimed to assess the level of active learning attitude of SHS students in motivational intensity, desire to learn, interest in international affairs, and communication inside and outside the class. It determined the reading profile level of SHS students in experience with reading, attitude toward reading, reading and self-efficacy, reading strategies, and reading habits. It measured SHS students' level of mental, behavioral, and self-regulatory learning strategies. It evaluates the level of SHS students' TWC in knowledge, skills, and attitude. It identified the significant relationships between the active learning attitude and TWC, the reading profile of students, and TWC and learning strategy in TWC. The combined and single influence of active learning attitude, reading profile, and learning strategy on TWC in SHS is known. Finally, the study determined the most appropriate model of TWC.

Technical writing can be considered a global communication tool. When looking for a job, academic performance and oral or written communication skills are looked at. Hence, the key to success in any literature, discipline, and profession is the ability to use language, especially technical writing skills.

It could help the students a lot. Through this study, students, especially in SHS, can be assisted to excel in academic work in the field of writing any type of technical writing. In this way, students can be allowed to cultivate and further develop their knowledge of writing. The ability to write technical papers is a very important competency that a student must learn to use in any situation. To other researchers related to this type of study, this may help to be the basis of their study. They can use the result of this study to develop their studies.

In the field of education, the welfare of students is always considered. The discovery and research on effective learning methods continue to realize every academic institution's goal to obtain useful and quality education, especially during the pandemic. In this way, the responsibility for cultivating writing skills can be much lighter, and the importance of giving feedback on each student's writing condition could greatly help cultivate this skill.

For parents, this could serve as a challenge to further guide their children about technical writing skills, especially in building confidence and self-esteem, moreover, to the researchers in the future that the results of this study may be helpful as a basis

for the discovery of lived experiences in the discovery of other issues or problems faced by students in their TWC.

As for the education leadership or DepEd in Region XII, administrators can take steps to increase the technical writing ability of students by considering factors such as active learning attitude, reading profile, and learning strategies. Similar studies should be conducted to identify other possible strong predictors of TWC to serve as a reference and guide for future researchers.

II. METHOD

A. *Research Design*

The study respondents were 400 students from the SHS students of Region XII of the Academic Year 2021-2022. They came from Tacurong City, South Cotabato, North Cotabato and General Santos City.

To determine the respondents who were suitable for the Structural Model of Belief, the rule of the thump was followed, in which the researcher used the stratified random sampling method as a basis, Chou et al. (2019). Regarding the number of participants, there are several arguments from experts. Creswell (2012) explains that there must be 400 participants to prove a connection. According to Fraenkel et al. (2012), the minimum acceptable sample size of less than 400 can give an inaccurate level result in the correlation of variables. Of the 400 respondents, 100 were from General Santos City, 100 were from Tacurong City, 100 were from Kabacan, North Cotabato, and 100 were from South Cotabato.

The respondents include SHS students currently enrolled in 2021-2022. They were seventeen years old and expected to share their learning experience, especially in the students' TWC. Their participation is with the consent of their parents or guardians and is supported by a consent form signed by the parent or guardian. Therefore, their participation in the study was voluntary and not compulsory. They also underwent orientation to know what information they could ask concerning the study being conducted.

Also, the respondents were from SHS at seventeen years of age studying outside the research can not be part of the main respondents. A potential study respondent who is not enrolled and is not an SHS student at said school can be excluded from the study. Some students voluntarily participate in the conducted research but, without the consent of their parents or guardians, can not be allowed to participate in the study. Furthermore, students who fail to attend the orientation that can be conducted regarding the required information can also not be allowed to participate. Because it is a proportional percentage, the number of respondents from each school varies depending on the number of groups and total population in each school in Region XII.

Respondents were given the freedom to participate based on their own volition. Even if their participation in the study is voluntary, if they ever want to withdraw as a participant in the study, they can still change their decision, and their refusal involves no fines and penalties. They cannot be deprived of legal privileges, rights, and benefits just because of not continuing to be a participant in the study being conducted. Therefore, after the purpose and benefits of the study have been announced and shown to the selected participants, the rights of the participants to contribute knowledge can be carefully considered and followed. This study was conducted in the public schools of Region XII, specifically in Tacurong City, Koronadal City, Kabacan, North Cotabato, and General Santos.

B. *Research Instrument*

To ensure the instrument's validity, the researcher consulted a panel of experts who corrected the questionnaire. It also went through a pilot test. Each item was analyzed and presented to the statistician to assess the validity of each item. Cronbach's alpha procedure was used to determine the reliability of the items.

The instrument was divided into four. The first part is from "Impacts of the Problem-Based Learning Pedagogy on English Learners' Reading Comprehension, Strategy Use, and Active Learning Attitudes," adapted from a previous study by Lin (2017). The second part is the reading profile adapted from the previous study "Exploring Students' Reading Profiles to Guide a Reading Intervention Program" by Boakye (2015). The third part is the learning strategy from the questionnaire that can be developed to study "Learning strategies, learning anxiety, and knowledge acquisition." British Journal of Psychology" by Warr et al. (2000). The fourth part is the TWC. The instrumentation used is from Students' perceived TWC needs: a pilot study of Malaysian polytechnics by Isnin et al. (2017), which has three indicators. The responses for each item of the learning indicator used the following scales, descriptive equivalents, and interpretations:

Range of Mean	Level	Interpretation
4.20-5.00	Highest	Consistently demonstrates active learning attitude, reading profile, learning strategies, and TWC.
3.40 - 4.19	High	Often demonstrates active learning attitude, reading profile, learning strategies, and TWC.
2.60-3.39	Medium	Occasionally demonstrates active learning attitude, reading profile, learning strategies, and TWC.
1.80-2.59	Low	Rarely demonstrates active learning attitude, reading profile, learning strategies, and TWC.
1.00-1.79	Lowest	Never demonstrated active learning attitude, reading profile, learning strategies, and TWC.

Several methods were used to collect the data used in the study. The first procedure is obtaining consent to administer the study; it was obtained from the University of Mindanao Ethics Review Committee

(UMERC). After receiving certification from UMERC, the researcher conducted pilot testing. Six experts validated the questionnaire with an overall rating of 4.69 or excellent. After validation, pilot testing was conducted. Cronbach alpha was used to evaluate the validity of the questionnaire in the following dimensions: active learning behavior (.933), reading profile (.959), learning strategy (.940), and technical writing ability (.925).

This study used a quantitative causal research method using the appropriate SEM since it can collect different types of quantitative data about active learning attitudes, reading profiles, and learning strategies. As variables. Ercan et al. (2016) stress causal research as explanatory research that investigates cause-and-effect relationships. To determine causation, it is important to observe the difference in the hypothesized variable to cause the change in the other variables and then measure the changes in the other variables. Similarly, the method measures and describes statistical associations of variables with different scale levels Crossman et al. (2018). The SEM Approach, compared to other statistical methods, is one of the more complex methods of data analysis where it determines a structure for covariance between transformed variables, which gives an alternative name of covariance structure modeling, thus, offering more meaningful and valid results by Colier (2020). It is an advanced multivariate technique to examine multiple causal relationships between variables simultaneously. Using the SEM in this study reinforces the integrity and rigor of this research because the analysis goes through the steps of defining the model, collecting data, estimating the model, analyzing the model, and possible modification of the model. Thus, when the hypothesized model is rejected based on goodness of fit statistics, an alternative model that fits the data needs to be created by Carrión and Cepeda (2016).

The goodness of Fit Statistics for Alternative Models by Analysis of Moment Structure (AMOS). To determine the most appropriate model, all the presented important signs must be aligned with the following criteria.

Chi-Square/Degree of Freedom (CMIN/DF)	0 < value < 2
P Value	>.05
Normative Fit Index (NFI)	>.95
Comparative Fit Index (CFI)	>.95
The goodness of Fit Index (GFI)	>.95
Tucker-Lewis Index	>.95
Root Mean Square Error of Approximation (RMSEA)	<.05
P-close	>.50

The researcher took the following steps in gathering the data. The questionnaire was based on the various studies that have been reviewed or adopted. It was translated into the Filipino language. It was also analyzed to obtain a reliable and valid instrument. Experts validated the questionnaire. Their suggestions and comments were integrated. After the validation, the questionnaire was forwarded to the University of Mindanao Ethics Reviewer Committee (UMERC). The questionnaire's contents were improved. Then, the researcher started collecting enriching data while considering the study ethics. The letter was approved by the adviser and the Dean of the Graduate College of the University of Mindanao. The researcher obtained approval from the principals, teachers, and respondents. The questionnaire was answered through Google forms. The researcher explained the method of answering so that the respondents would not be confused in writing their answers. Respondents were given enough time to understand the questions. In case of confusion in the words and context of the statement in the questionnaire, the researcher was readily available to address the concerns.

Further, the researcher reviewed the answered Google form. The researcher also checked the deficiency or inaccuracy in the forms. After the data were collected, the data were recorded or tallied for consolidation and further statistical treatment. For a more extensive and meaningful interpretation of the data, the researcher employed the mean to describe the level of active learning behavior, reading profile, learning strategy, and technical writing ability. The Standard Deviation was used to measure the dispersion of a frequency distribution. The Pearson Product Moment Correlation was used to determine the relationship between active learning behavior, reading profile, learning strategies, and technical writing ability. Multiple Regression was used to determine the significant predictor of TWC. Likewise, SEM was employed to identify the best and most appropriate model. It was necessary to perform factor analysis on latent variables to suggest a cut-off value of 0.50, while Ullman and Bentler (2003) used 0.45 in modeling construction safety culture. According to Savalei and Victoria (2014), the essence of the test is to ensure the elimination of characteristics with low correlations with the characteristics of other latent factors in the final SEM. The sample size affects the cut-off value, but a range of 0.45 to 0.50 would be appropriate. In addition, this tool was used to determine the model that best fits the knowledge of technical writing ability.

The researcher complied with all the study criteria following the assessment protocol and standardized criteria. Voluntary Participation, Privacy and Confidentiality, Informed Consent Process, Recruitment, Risk, Benefits, Plagiarism, Falsification, Conflict of Interest (COI), Deceit, Permission from Organizational/Location, and Technology Issues were fully followed as stipulated by the University of Mindanao Ethics Reviewer Committee. Once the papers submitted for approval were returned, the researcher was given a Certificate of approval with UMERC Protocol No. 2022-066.

III. Results and Discussion

A. Level of Active Learning Attitude of SHS Students

Table 1 shows the level of knowledge of the active learning attitude of SHS students of Region XII. It has a mean range of 3.52-397, with a total mean of 3.82, a high descriptive level, and a corresponding standard deviation of 0.49. It only means that the respondents often exhibit an active learning attitude. The respondents often demonstrate active learning attitudes such as motivational intensity, desire to learn, interest in international affairs, and communication inside and outside the class. The motivational intensity of teachers in teaching can serve as a force in students' active learning because this is the measure of each student. The teaching style must be appropriate so that students can better understand the topic to be discussed.

TABLE 1. LEVEL OF ACTIVE LEARNING ATTITUDE OF SHS STUDENTS

Indicator	SD	Mean	Descriptive Level
Motivational Intensity	0.61	3.85	High
Desire to Learn	0.59	3.94	High
Interest in International Affairs	0.83	3.52	High
Communication Inside and Outside the Class	0.62	3.97	High
Overall	0.49	3.82	High

Meanwhile, in the study of Rossi et al. (2021), the active desire to learn consists of strategies that focus more on developing students' skills than transmitting information students need to perform activities that require higher-order thinking. Consequently, students use critical thinking, which involves analysis, reflection, analysis, interpretation, and inference to synthesize information obtained through reading, observation, communication, or experience to answer a question.

B. Level of Reading Profile

Table 2 shows the reading profile level with a mean range from 3.38-4.03 with an overall mean of 3.71 with a standard deviation of 0.42. It has a high descriptive level. Hence, the respondents often express the reading profile with indicators of experience with reading, attitude towards reading, reading and self-efficacy, reading strategies, and reading habits.

Students often exhibit a reading profile, such as experience with reading, attitudes, strategy, and activities. Like, when a student who has a good experience in reading can easily learn in different lessons and is sure that he is high in writing which is the main goal of the teacher in his teaching – to build a citizen who can read and write can be the backbone of a society.

TABLE 2. LEVEL OF READING THE PROFILE OF SHS STUDENTS

Indicator	SD	Mean	Descriptive Level
Past Experience with Reading	0.63	3.84	High
Attitude Towards Reading	0.56	4.03	High
Attitudes Towards Reading	0.61	3.38	Moderate
Reading Strategies	0.52	3.77	High
Reading Habit	0.63	3.50	High
Overall	0.42	3.71	High

Whereas, in Boakye's (2017), reading of the profile of students' experiences, it is accepted that students' experiences impact their reading ability. Reading ability is influenced by various elements, including children's reading experiences at home and school, attitudes, self-efficacy, methods used, reading habits, and socioeconomic position. However, not much research has been done on the influence of these elements on the reading of sociology texts or, more specifically, on identifying the need for reading intervention.

C. Level of Learning Strategies

Table 3 describes the level of learning strategies of SHS students with a mean range from 3.78- 3.81 with a total mean score of 3.79 and a standard deviation of 0.49, which is high, which means that it is often exhibited by respondents the learning strategy with the indicator mental strategy, behavior and self-regulation.

TABLE 3. LEVEL OF LEARNING STRATEGY OF SHS STUDENTS

Indicator	SD	Mean	Descriptive Level
Mental	0.54	3.81	High
Behavioral	0.55	3.79	High
Self-regulatory	0.53	3.78	High
Overall	0.49	3.79	High

Although they have similar descriptive levels, their mean is different. The one with the highest mean is the mental development strategy which scored 3.81 with a corresponding standard deviation of 0.54. It was followed by the behavioral strategy with a mean of 3.79 with a corresponding standard deviation of 0.55; the self-regulatory strategy had a mean of 3.78 with a corresponding standard deviation of 0.53, which means high respondents frequently

demonstrated the use of the strategy. In this regard, respondents often demonstrate mental, behavioral, and self-regulation strategies as learning strategies. The use of the strategy is having sufficient knowledge and understanding of approaches and methods that can help to involve students in interactive and meaningful learning. Whereas, in the study of Palermo and Thompson (2018), the self-regulation strategy was identified as the awareness and behavior that students do in their learning process, involving goal setting and self-evaluation. In the learning process, students set learning goals, monitor and control their learning process, and self-reflect on their cognition, motivation, and behavior. On the other hand, by linking writing strategies to writing comprehension in an ESL classroom, the Western writing model can add to students' comprehension.

D. Level of Technical Writing Competency

Table 4 shows the level of technical ability in the writing of SHS students with a mean range from 3.66-3.69 with an overall mean of 3.68 and a standard deviation of 0.55, which is high, which means that technical competency is often demonstrated in writing as knowledge, skills, and attitudes.

TABLE 4. LEVEL OF TWC OF SHS STUDENTS

Indicator	SD	Mean	Descriptive Level
Knowledge	0.62	3.69	High
Skills	0.66	3.66	High
Attitudes	0.69	3.69	High
Overall	0.55	3.688	High

Students' knowledge, skills, and attitudes often demonstrate TWC. Students can share their knowledge and attitude on a topic they want to share and write important events about themselves or something else. Being able to express the correct attitude of the students could help them to convey what they want to write. It can help them to use the correct vocabulary for everyday communication. Technical writing is important for higher education, and this skill is necessary for student success, Oliver 27-47. Students' ability to present information and write about their thoughts highly depends on their writing ability for academic and professional success, Olivier and Olivier, 317. To succeed academically and professionally, students should be able to effectively express their thoughts and facts through technical writing.

E. Significant Relationship between Active Learning attitude and Technical Writing competency of Senior High School

Table 5.1 shows the significant relationship between active learning attitude knowledge and students' technical writing competency with a total r-value of .589 with a corresponding probability value of .000, which is much lower at the .05 level of significance set in this study. Then the hypothesis is rejected and conforms to the alternative hypothesis that there is a significant relationship between active learning attitude and the students' TWC. Hence, when the knowledge of active learning attitude is high, the knowledge of TWC of students is also high.

TABLE 5.1 SIGNIFICANT RELATIONSHIP BETWEEN ACTIVE LEARNING AND TWC OF SHS STUDENT

Active Learning Attitude	Technical Writing Competency			
	Knowledge	Skills	Attitudes	Total
Motivational intensity	.453** .000	.463** .000	.361** .000	.504** .000
Desire to learn	.447** .000	.436** .000	.443** .000	.525** .000
Interest in international affairs	.257** .000	.268** .000	.225** .000	.296** .000
Communication inside and outside the class	.423** .000	.440** .000	.364** .000	.485** .000
Total	.514** .000	.523** .000	.452** .000	.589** .000

In further analysis, active learning attitude on motivational intensity has a significant relationship with TWC with a total R-value of .504 and a p-value of .000 (significant). Desire to learn has a significant relationship with TWC with a total R-value of .525 and with a p-value of .000 (significant); interest in international affairs has a significant relationship with the knowledge of TWC with a total R-value of .296 and a p-value of .000 (significant); communication inside and outside the class has a significant relationship with TWC with a total R-value of .485 and a p-value of .000 (significant). The total that obtained the highest correlation with the TWC was the active learning attitude skill of SHS students, with an r-value of .523 and a p-value of .000 (significant). The one that scored the lowest was knowledge, with an r-value of .514 and a p-value of .000 (significant).

According to Barrientes (2015), it is necessary to organize the details to be written efficiently because what the students write could reflect their ability, skill, and efficiency in expressing emotions. It gives great need so that the active learning attitude of students in technical writing skills is clear, meaningful, interesting, realistic, and based on reality.

F. Significant Relationship between Reading Profile and Technical Writing Competency of Senior High School

Table 5.2 shows the relationship between the reading profile and TWC of SHS students in Region XII with a total R-value of .662 and a p-value of .000 (significant) below the .05 significance level set in this

study. Hence, the hypothesis was rejected and conformed to the alternative hypothesis that there is a significant relationship between reading profile and TWC. It just means that when the reading profile is high, the students' TWC is also high.

TABLE 5.2 SIGNIFICANT RELATIONSHIP BETWEEN READING PROFILE AND TWC OF SHS STUDENTS

Reading Profile	Technical Writing Competency			
	Knowledge	Skills	Attitudes	Total
Past Experience with Reading	.449** .000	.391** .000	.308** .000	.452** .000
Attitude Towards Reading	.411** .000	.409** .000	.286** .000	.436** .000
Reading and Self-Efficacy	.132** .008	.270** .000	.331** .000	.294** .000
Reading Strategies	.532** .000	.507** .000	.438** .000	.584** .000
Reading Habit	.470** .000	.543** .000	.539** .000	.617** .000
Total	.552** .000	.589** .000	.531** .000	.662** .000

In detailing the data, there is a significant correlation between experience with reading with an r-value of .452 and a p-value of .000 (significant); Meanwhile, attitude towards reading has a significant relationship with TWC with an r-value of .436 and a p-value of .000 (significant); Still related, reading and self-efficacy have a significant relationship with TWC with an r-value of .294 and a p-value of .000 (significant); reading strategies has a significant relationship with TWC with an r-value of -584 and a p-value of .000 (significant); In addition, reading habit has a significant correlation with TWC with an r-value of .617 and a p-value of .000 (significant). The one with the highest significant correlation with TWC with an r-value of .589 and a p-value of .000 (significant). The one that scored the lowest was attitude, with an r-value of .531 and a p-value of .000.

The student reading profile is used to gather data to understand students' reading and writing strengths and weaknesses. Student profiles result in a comprehensive view of students' strengths and weaknesses in many aspects of the reading and writing process that can be used to design an instructional program that addresses all aspects of the process, especially teaching students' technical writing (Ntereke & Ramoroka, 2017).

G. Significant Relationship between Reading Profile and Technical WritingSignificant Relationship between Learning Strategies and Technical Writing Competency of Senior High School

Table 5.3 shows the significant relationship between learning strategy and TWC of SHS students with a total R-value of .710 and a p-value of .000 (significant), which is well below the .05 significance level set in this study.

TABLE 5.3 SIGNIFICANT RELATIONSHIP BETWEEN LEARNING STRATEGIES AND TWC OF SHS STUDENTS

Learning strategies	Technical Writing Competency			
	Knowledge	Skills	Attitudes	Total
Mental	.573** .000	.504** .000	.457** .000	.605** .000
Behavioral	.593** .000	.569** .000	.547** .000	.676** .000
Self-regulatory	.577** .000	.535** .000	.546** .000	.656** .000
Total	.639** .000	.589** .000	.568** .000	.710** .000

If so, the hypothesis is rejected and conforms to the alternative hypothesis that there is a significant relationship between learning strategies between students' TWC. It means that when the learning strategy is high, the students' TWC is also high. However, there is a significant relationship between mental strategy and TWC, with an r-value of .605 and a p-value of .000. (significant); which means that there is a significant relationship between the mental strategy and the knowledge of the students' TWC. In addition, there is a significant relationship between behavioral learning strategy and knowledge of TWC with an r-value of .676 and a p-value of .000 (significant), which means that there is a significant relationship between the self-regulatory strategy of students' knowledge of technical writing skills. In the same perspective, self-regulatory strategy is also significant between knowledge of TWC with an R-value of 606 and p-value of .000, which means that self-regulatory strategy has a significant relationship with the knowledge of TWC. The one with the highest technical competency in writing is knowledge, with an r-value of .639 and a p-value of .000. The one that scored the lowest was attitude, with an r-value of .568 and a p-value of .000.

Previous studies have proven that learning strategies, especially self-regulation strategies, are a tool that provides significant support for students' writing performance. During the writing process, the self-regulatory strategy will work and maintain students' cognition, meta-cognition, and socio-

behavioral aspects. Self-regulatory strategies also stand as a strong predictor of students' writing performance success (Mastan et al., 2017).

H. Significant Influence of Active Learning Attitude, Reading Profile, and Learning Strategies in Technical Writing Competency

Table 6 shows the significant influence of knowledge on active learning attitude, reading profile, and learning strategy on TWC of SHS students with an F-value of 161.561, R-value of .742 and R2 .550, and p-value of .000, which is well below the .05 level of significance set in this study.

TABLE 6. SIGNIFICANT INFLUENCE OF ACTIVE LEARNING, ATTITUDE, READING PROFILE, AND LEARNING STRATEGIES IN TWC OF SHS STUDENTS

Technical Writing Competency					
Exogenous Variables		B	B	T	Sig.
Constant		.078		.460	.646
Active Learning Attitude		.135	.121	2.367	.018
Reading Profile		.302	.231	3.964	.000
Learning Strategy		.519	.460	8.860	.000
R	.742				
R^2	.550				
∆R	.547				
F	161.561				
P	.000				

Table 6 shows the significant influence of active learning attitude, reading profile, and learning strategy on the TWC of SHS students of region XII with an F-value of 161.561, R-value which is .742, and R2 .550, and p-value of .000, which is well below the .05 level of significance set in this study. Details on the result pointed to the knowledge of active learning attitude in standardized and unstandardized coefficients of .135 and .121, t-value of 2.367 and p-value of .018 (significant); reading profile with standardized and unstandardized coefficients of .302 and .231, t-value of 3.964 and p-value of .000 (significant); learning strategies with standardized and unstandardized coefficients of .519 and .460, t-value of 8.860 and p-value of .000 (significant). It indicates that the three exogenous variables are predictors and significantly contribute to the knowledge of students' TWC.

It has been confirmed in a study that the active learning attitude affects the student's learning participation in the process that allows students to focus on the creation of knowledge with an emphasis on skills such as analytical thinking, problem-solving, and technical writing skills (Dermirci, 2017). According to Protacio (2021), English language courses aim to prepare students with the necessary skills in academic and technical contexts to prepare students to work in industries. However, technical writing has been found in. English is not fully implemented, and the assessment of written work is not significantly contributed to the course marking scheme for communication and TWC, Isnin (2017). According to Zhou (2011), learning strategy is a unique learning preference that helps teachers plan instruction more properly. Many things can be related to the learning style, and an example of this is the effect on academic performance, especially in the students' TWC. According to Chetty et al. 610-615, design students with the same learning style are more grouped, but there is almost no difference in results when viewed from a gender perspective. However, attention should be paid to the learning style because it can lead to a better quality of education.

I. Summary of Goodness of Fit Measures of Five Structural Models

Table 7 focuses on determining the most appropriate model that represents variables as predictors of technical writing performance. The five models developed in this study are summarized in this table.

TABLE 7. SUMMARY OF THE GOODNESS OF FIT MEASURES OF FIVE STRUCTURAL 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	12.894	.742	.696	.680	.633	.173	.000
2	.000	7.130	.844	.847	.827	.811	.124	.000
3	.000	7.130	.844	.847	.827	.811	.124	.000
4	.000	4.330	.886	.916	.894	.897	.091	.000
5	.130	1.258	.980	.996	.980	.993	.025	.982

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*

In determining the most appropriate model, all criteria must be contained within the acceptable range. In interpreting the results, Namuth-Covert et al., 64 gave the following explanation: The Chi-square/degrees of freedom value should be between 0 and 2, with a corresponding p-value greater than or equal to 0.05. The Root Mean square of Error Approximately value must be less than 0.05 and have a corresponding p-close value greater than or equal to 0.05. Other criteria, such as the Normed Fit Index, Tucker-Lewis Index, Comparative Fit Index, and Goodness of Fit Index, should all be higher than 0.90. All indices included must be within acceptable ranges in determining the most appropriate model. The chi-

square value/degrees of freedom must be less than 5 with a corresponding p-value greater than 0.05. The root means square error approximation value must be less than 0.05, and its corresponding P-close value must be greater than 0.05. Other indices, such as the normed fit index, Tucker-Lewis index, comparative fit index, and the goodness of fit index, should be higher than 0.95.

J. Direct and Indirect Effect of Independent Variables on Knowledge Technical Writing Competency of Senior High School Students Model 1

Table 8 shows the Direct and Indirect Effects of Independent and Non-Independent Variables. According to Denis (2015), the following should be considered: (a) direct effects, (b) indirect effects, by averaging the path coefficients that link the causal variable to the results, and (c) total effect of direct and indirect effects

TABLE 8. DIRECT AND INDIRECT EFFECTS OF INDEPENDENT VARIABLES ON KNOWLEDGE TWC OF SHS STUDENTS

Variables	Direct Effect	Indirect Effect	Total Effect
Active Learning Attitude	.180	-	.180
Reading Profile	.180	-	.180
Learning Strategy	.479	-	.479

Table 8 shows the Direct and Indirect effects of the Independent and indirect variables. The study revealed that active learning attitude, reading profile, and learning strategy has a regression coefficient of .180, .180, and .479. It means that the independent variables positively contribute to the independent variable. Because of this, it is necessary to cultivate and do activities inside and outside the classroom to develop the aforementioned independent variables and increase students' TWC. In this regard, tension, anxiety, and time management can reduce learning skills, according to a study by Motevalli (2021). Additionally, it strengthens the student's learning strategy, improves their academic performance, and can boost learning effectiveness, especially in technical writing.

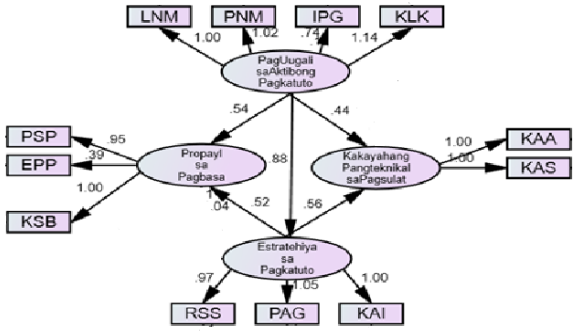

Figure 2. Best Fit Model in Technical Writing Competency

Legend :
LNM- motivational intensity
PNM- desire to learn
IPG- interest in international affairs
KLK- communication inside and outside the class
PSP- reading strategies
EPP- reading and self-efficacy
RSS- self-regulatory
PAG- behavioral
KAI- mental
KAA- knowledge
KAS- skills
KSB- experience with reading

Figure 2 shows the best-fitting structural model for students' TWC based on the goodness of fit measures shown in Table 7. The findings suggest that students' TWC is best anchored in: an active learning attitude that includes motivational intensity, desire to learn, interest in international affairs and communication inside and outside the class; reading profile covering reading strategy, reading and self-efficacy, and experience with reading; reading habits assessed using cognitive development, behavior, and self-regulatory strategies; and TWC measured in terms of knowledge and skills. Similar studies have found that students' attitudes toward active learning in technical writing skills are positive because of the results obtained from implementing different teaching methods and, in addition, the use of digital technology, Betak (2020). Considering the language research, students' reading profiles contribute to the issues as an instructional component that can be used to improve technical skills. Students' writing ability. Boakye (2017). As for learning strategies, using and focusing on effective technical writing skills in the curriculum could improve students' productive writing using various learning strategies (Holmes, 2019).

IV. CLUSION AND RECOMMENDATION

The use of the structural assessment model strengthened the study since the analysis conformed to the sequential process of the specific model. The level of active learning attitude, reading profile, learning strategy, and TWC of SHS students is high. There is an indication that students demonstrated the variables in Region XII. The overall results showed a high level of active learning attitude. So, it is still suggested that the teacher encourage the students to creatively participate in the activities and have feedback to further improve their class participation.

The overall results also showed that the students had a high level in the reading profile. Although the level of the reading profile is only high and does not reach the maximum, it is suggested to have

interventions such as reading different texts to get a good method and style and sharpen the children's reading even more. Use a tracking sheet to keep a careful, organized, detailed record of student progress. The overall revealed a high level of students' learning strategies. Although the learning strategy is only high and does not reach the maximum, it is still suggested that the teacher use a strategy that can increase the student's level of understanding. SQ3R, reading strategy stands for a survey question, read, recite and review. This strategy is suited to each student's ability, interest, level, and learning style. The teacher can also set aside time for the children or consultation so that the students know their performance.

The results also showed a high level of students' TWC, as demonstrated in their studies. However, overall, their level was only high and still not enough. So, it is suggested that students spend time reading different books in the classroom or library. For teachers, increase the reading time during class time in reading subjects. To encourage students to read more, it is recommended to the head of the library allocate funds to offer more materials or adequate and comfortable places for productive reading by students. Finally, similar studies need to be conducted to identify other possible strong predictors of TWC to serve as a reference and guide for future researchers.

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