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BEHAVIORAL FACTORS PREDICTING THE TECHNICAL SKILLS OF GRADE 7 LEARNERS

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ABSTRACT

This study investigated the behavioral factors influencing the development of technical skills among Grade 7 learners in a public secondary school during the school year 2024–2025. Specifically, it examined classroom engagement, self-regulation, learning interaction, and emotional behavior in relation to learners' technical skills in internet navigation, basic mensuration and calculation, and multimedia project creation. A quantitative correlational research design was employed using a stratified random sample of 175 learners from a population of 327. Data were gathered through researcher-made survey and test questionnaires, which underwent expert validation using Lawshe's Content Validity Ratio and reliability testing using Cronbach's alpha and KR-20. Statistical tools such as mean, Mann-Whitney U test, Kruskal-Wallis test, correlation, and regression analysis were utilized. Findings revealed that behavioral factors were significantly related to technical skills, and certain demographic variables influenced both behavioral and technical outcomes. Moreover, behavioral factors significantly predicted technical skills. The study highlights the importance of integrating behavioral support mechanisms to enhance technical competencies in Technology and Livelihood Education.

Keywords*: behavioral factors, technical skills, self-regulation, classroom engagement, TLE learners*

INTRODUCTION

The development of fundamental skills among learners, particularly in the early years of secondary education, is essential in preparing them for both academic success and future workforce demands. As learners transition into Grade 7, they encounter

increased academic and technological challenges that require a balance of cognitive, behavioral, and technical competencies. Globally, education systems emphasize technical skill development to equip learners with practical competencies relevant to modern industries (Adam et al., 2016).

In the Philippine context, Technology and Livelihood Education (TLE) is integrated into the K–12 curriculum to provide learners with foundational technical skills. However, despite curricular inclusion, many learners still struggle to develop these competencies. Studies have shown that learners' behavioral characteristics—such as engagement, persistence, and interaction—play a significant role in shaping academic outcomes (Ahmed et al., 2022a; Barghaus et al., 2021).

Classroom engagement, as a multidimensional construct, has been consistently linked to improved academic performance and skill acquisition. Learners who actively participate in classroom activities demonstrate better understanding and retention of concepts (Ahmed et al., 2022b). Similarly, self-regulation enables learners to control their learning processes, manage time effectively, and persist in challenging tasks, which are essential for technical skill development (Creswell & Creswell, 2020).

Emotional behavior also plays a crucial role in learning. Learners who can regulate their emotions are better able to cope with academic stress and maintain focus during skill-based tasks (Bierman & Sanders, 2020). Furthermore, interaction with peers and teachers enhances collaborative learning, allowing learners to develop both technical and social competencies (Bird et al., 2024).

Socioeconomic factors and family background may also influence learners' behavioral and technical development. Research indicates that parental involvement and socioeconomic status significantly affect learners' academic performance and engagement (Bodovski & Youn, 2011; Alves et al.,2016). In the Philippine setting, variations in family income may impact access to learning resources and opportunities for skill development (Albert, 2024).

Despite these insights, existing literature has primarily focused on cognitive and instructional variables, with limited attention given to behavioral factors as predictors of technical skill development, particularly in TLE. This gap highlights the need for further investigation into how behavioral dimensions influence learners' acquisition of technical competencies.

This study therefore examined the relationship between behavioral factors and technical skills among Grade 7 learners, considering the influence of demographic variables such as sex, age, family income, and academic performance. This study contributes to the limited body of literature examining the role of behavioral factors in technical skill development among junior high school learners in the Philippine context.

Research Questions

The study aimed to investigate and analyze the behavioral factors influencing the development of technical skills of grade 7 learners in a large public secondary school in a highly urbanized city.

Specifically, this study sought to answer the following questions:

1. What is the level of behavioral factors among Grade 7 learners in terms of:
    1.1. Classroom Engagement
    1.2. Self-Regulation
    1.3. Learning Interaction
    1.4. Emotional Behavior

when taken as a whole and when grouped according to sex, age, family income, and academic performance?

2. What is the level of technical skills of Grade 7 learners in terms of:
    2.1. Internet Navigation
    2.2. Basic Mensuration and Calculation
    2.3. Creating Multimedia Projects

when grouped according to demographic variables?

3. Is there a significant difference in behavioral factors when grouped according to demographic variables?
4. Is there a significant difference in technical skills when grouped according to demographic variables?
5. Is there a significant relationship between behavioral factors and technical skills?
6. Do behavioral factors predict the technical skills of Grade 7 learners?
7. What program may be developed based on the results of the study?

METHODOLOGY

This study employed a quantitative correlational research design to examine the relationship between behavioral factors and the technical skills of Grade 7 learners.

Locale

The study was conducted in a public secondary school under the Department of Education in the Philippines during the School Year 2024-2025. The school is situated in a relocation community where learners come from diverse socioeconomic backgrounds. This setting provided a relevant context for examining how behavioral factors influence the development of technical skills in Technology and Livelihood Education.

Respondents

The respondents of the study consisted of Grade 7 learners, with a sample size of 175 students drawn from a total population of 327. The sample size was determined using the Cochran formula to ensure adequate representation. Stratified random sampling technique was employed to ensure proportional representation across sections. The respondents were grouped according to demographic variables, including sex, age, family income, and academic performance, to allow for comparative analysis.

Table 1
Distribution of the Respondents

Grade 7 Learners Section	N	n	Percent
Star	46	25	54%
Altair	47	25	53%
Antares	47	25	53%
Deneb	46	25	54%
Polaris	47	25	53%
Rigel	47	25	53%
Serius	47	25	53%
Total: 7	**327**	**175**	**54%**

Instruments

The study utilized researcher-made instruments consisting of two main parts:

1. Behavioral Questionnaire.
   This instrument measured four dimensions:
   1.1. Classroom Engagement
   1.2. Self-Regulation
   1.3. Learning Interaction
   1.4. Emotional Behavior

The questionnaire used a 4-point Likert scale, ranging from strongly disagree to strongly agree.

2. Technical Skills Test
   This instrument assessed learners' competencies in:
   2.1. Internet Navigation
   2.2. Basic Mensuration and Calculation
   2.3. Creating Multimedia Projects
   This test consisted of structure items designed to measure practical and applied skills aligned with the TLE curriculum.

The validity of an instrument refers to the extent to which a study accurately reflects or assesses a specific concept that the researcher is attempting to measure (Creswell & Creswell, 2020). The validity of the research instrument was assessed using the Lawshe' (1975) Content Validity Ratio (CVR) test. The objective was to determine the extent to which each item was considered necessary for assessing the constructs relevant to the study.

For a panel size of ten experts, the critical CVR value required for an item to be considered valid is 0.62. This threshold ensures that the item was deemed essential by a significant majority of the panel.

The instrument demonstrated strong content validity, as determined by 10 subject matter experts. Each item within the areas of Classroom Engagement, Self-Regulation, Learning Interaction, Emotional Behavior, Internet Navigation, Basic Mensuration & Calculation, and Creating Multimedia Project achieved a Content Validity Ratio (CVR) of 1, signifying unanimous agreement on the validity of each item.

Lawshe, (1975) established a statistical method for determining the content validity of items using expert validation. According to his formula, the minimum acceptable CVR value depends on the number of experts. For 10 experts, the minimum required CVR is 0.62 to be statistically significant at the 0.05 level. Which means that at least 8 out of 10 experts must rate the item as essential.

The Content Validity Index (CVI) which measures the proportion of experts who agree on the relevance of each item should at least have a 0.78 threshold to be considered acceptable. the instrument as a whole exhibited a Content Validity Index (CVI) of 1, reinforcing its overall validity and suitability for its intended purpose.

Lynn (1986) suggested that a minimum item-level CVI of 0.78 is considered acceptable when the number of experts ranges from 6 to 10. This threshold ensures strong agreement among experts on the relevance of an item.

Reliability is defined as the extent to which a measurement procedure yields the same result on repeated trials (Nunnally et al, 2021). Using Cronbach's Alpha and Kuder-Richardson Coefficient, specifically KR20, to test the instrument reliability and internal consistency the instrument was piloted to 30 Grade 7 students of the same school who were not included on actual respondents of the study.

The Cronbach's Alpha coefficient yielded an alpha value of 0.939, indicating that the survey questionnaire exhibits high internal consistency and is therefore considered reliable for measuring the intended constructs. The Kuder-Richardson 20 (KR-20) coefficient, which evaluates the internal consistency reliability of the test, was found to be 0.789. This result indicates that the 30-item test questionnaire was reliable.

Data Gathering Procedure

In the administration of the research instrument, strict adherence to the following procedures or steps were ensured and implemented diligently.

The data gathering began by submitting a request for authorization to the Public Schools Division Superintendent to conduct the study in selected school within the division of Bacolod City. The formal request included an explanation of the research objectives, methodology, and anticipated results. After the request was approved, contact

was made with the head of the selected School. The meeting with the administrator of the said school was scheduled to discuss and agree on the research objectives, methodology, and logistics regarding data gathering.

Once permission had been approved from the relevant authorities, Data were then collected by conducting a structured survey and test questionnaire among the selected one hundred seventy-five (175) Grade 7 respondents of the school to participate in the study. Accompanying the instrument was an Informed Consent Form, emphasizing the respondents' voluntary participation in the research endeavor. The survey contained profiles designed to gather information on demographics, and items designed to assess behavioral factors. Conversely, the test questionnaire contained items designed to assess the level of technical skills of grade 7 learners learned from their 1st -3rd grading lessons. The survey questionnaire was distributed to the participants in a controlled classroom setting. The responses gathered from the survey was analyzed to predict which behavioral factor influence the most in technical skill development.

Statistical Treatment

The data collected from the researcher-made questionnaire were carefully encoded, tailed, and subjected to computer process using inferential statistical treatment.

For Research Question No.1 on the level of behavioral factors among Grade 7 learners, Mean and Standard Deviation were used to determine the general level of each behavioral factor. For categorical data such as sex, age, income, and academic performance grouping, Frequency Distribution and Percentage were used.

For Research Question No.02 on the level of technical skills among Grade 7 learners, Mean and Standard Deviation were used to describe the levels of each technical skill area. The data was disaggregated and analyzed by the same demographic groupings.

For Research Question No.03 on the significant difference in the level of behavioral factors when grouped according to their demographic profiles, independent sample t- test were used to compare Sex, while Kruskal- Wallis H-test was used to compare age and total monthly income, and academic performance. Post Hoc Test (pairwise comparison) was used to determine which specific group differ significantly.

For Research Question No.04 on the significant difference in the level of technical skills of Grade 7 learners when group according to their demographic profiles, independent sample t- test was used to compare Sex, while Kruskal- Wallis H-test was used to compare age, total monthly income, and academic performance. Post Hoc Test (Pairwise Comparisons) was used to determine which specific group differ significantly.

For Research Question No.05 on the significant relationship between behavioral factors and technical skills of Grade 7 learners, Spearman rho correlation was used to

examine the strength and direction of the relationship between behavioral factors and technical skills.

For Research Question No.06 on the areas of behavioral factors predicting the technical skills of Grade 7 learners, Multiple Linear Regression Analysis was used to determine the predictive capacity of the behavioral factors (classroom engagement, self-regulation, learning interaction, and emotional behavior) on overall technical skills. Regression Coefficients and R^2 values were interpreted to understand the strength of prediction.

RESULTS

Table 2
Level of Behavioral Factors among Grade 7 Learners in terms of Classroom Engagement, Self- Regulation, Learning Interaction and Emotional Behavior.

Factors	M	SD	Interpretation
Classroom Engagement;	2.95	0.45	Average
Self- Regulation;	2.91	0.43	Average
Learning Interaction;	2.93	0.47	Average
Emotional Behavior	3.06	0.46	Average
Whole	***2.96***	***0.38***	***Average***

Note: Mean Scale; 1.00-1.49 Very low, 1.50-2.49 Low, 2.50-3.49 Average, 3.50-4.49 High and 4.50-5.00 Very high

Table 3
Level of Behavioral Factors among Grade 7 Learners in terms of Classroom Engagement when grouped as to Sex, Age, Total Family Monthly Income and Academic Performance.

Variables	M	SD	Interpretation
Sex			
Female	3.08	0.42	Average
Male	2.83	0.44	Average
Age			
12 years old below	2.87	0.49	Average
13 to 14 years old	2.98	0.42	Average

15 to 16 years old	2.94	0.42	Average
17 years old above	3.20	-	Average
Total monthly income			
6,000 below	2.83	0.48	Average
6-10,000	2.98	0.43	Average
11,000 to <16,000	3.14	0.44	Average
16,000 to <21,000	3.09	0.44	Average
21,000 to <26,000	3.13	0.21	Average
26,000 to <31,000	3.01	0.23	Average
31,000 to <36,000	2.97	0.49	Average
41,000 to <46,000	3.05	0.21	Average
46,000 to <60,000	2.70	0.17	Average
Academic Performance			
Fairly Satisfactory	2.82	0.46	Average
Satisfactory	3.02	0.47	Average
Strongly Satisfactory	3.00	0.36	Average
Outstanding	3.13	0.32	Average

Note: Mean Scale; 1.00-1.49 Very low, 1.50-2.49 Low, 2.50-3.49 Average, 3.50-4.49 High and 4.50-5.00 Very high

Table 4
Level of Behavioral Factors among Grade 7 Learners in terms of Self-Regulation when grouped as to Sex, Age, Total Family Monthly Income and Academic Performance

Variables	M	SD	Interpretation
Sex			
Female	2.98	0.41	Average
Male	2.85	0.43	Average
Age			
12 years old below	2.89	0.46	Average
13 to 14 years old	2.92	0.40	Average
15 to 16 years old	2.78	0.62	Average

17 years old above	3.00		Average
Total monthly income			
6,000 below	2.81	0.46	Average
6-10,000	2.94	0.35	Average
11,000 to <16,000	2.94	0.40	Average
16,000 to <21,000	2.96	0.48	Average
21,000 to <26,000	3.27	0.31	Average
26,000 to <31,000	3.24	0.46	Average
31,000 to <36,000	2.73	0.42	Average
41,000 to <46,000	3.40	0.71	Average
46,000 to <60,000	2.77	0.40	Average
Academic Performance			
Fairly Satisfactory	2.81	0.45	Average
Satisfactory	2.97	0.38	Average
Strongly Satisfactory	2.90	0.40	Average
Outstanding	3.07	0.39	Average

Note: Mean Scale; 1.00-1.49 Very low, 1.50-2.49 Low, 2.50-3.49 Average, 3.50-4.49 High and 4.50-5.00 Very high

Table 5
Level of Behavioral Factors among Grade 7 Learners in terms of Learning Interaction when grouped as to Sex, Age, Total Family Monthly Income and Academic Performance

Variables	M	SD	Interpretation
Sex			
Female	3.06	0.47	Average
Male	2.82	0.45	Average
Age			
12 years old below	2.84	0.49	Average
13 to 14 years old	3.00	0.46	Average
15 to 16 years old	2.54	0.37	Average
17 years old above	2.90		Average
Total monthly income			

6,000 below	2.86	0.48	Average
6-10,000	2.91	0.49	Average
11,000 to <16,000	3.03	0.41	Average
16,000 to <21,000	3.10	0.54	Average
21,000 to <26,000	3.10	0.10	Average
26,000 to <31,000	3.16	0.34	Average
31,000 to <36,000	2.87	0.50	Average
41,000 to <46,000	3.50	0.42	Average
46,000 to <60,000	2.70	0.17	Average
Academic Performance			
Fairly Satisfactory	2.80	0.48	Average
Satisfactory	3.03	0.51	Average
Strongly Satisfactory	2.92	0.37	Average
Outstanding	3.15	0.32	Average

Note: Mean Scale; 1.00-1.49 Very low, 1.50-2.49 Low, 2.50-3.49 Average, 3.50-4.49 High and 4.50-5.00 Very high

Table 6
Level of Behavioral Factors among Grade 7 Learners in terms of Emotional Behavior when grouped as to Sex, Age, Total Family Monthly Income and Academic Performance

Variables	M	SD	Interpretation
Sex			
Female	3.17	0.44	Average
Male	2.95	0.46	Average
Age			
12 years old below	3.00	0.44	Average
13 to 14 years old	3.09	0.48	Average
15 to 16 years old	2.94	0.34	Average
17 years old above	3.10		Average
Total monthly income			
6,000 below	2.95	0.46	Average

6-10,000	3.08	0.44	Average
11,000 to <16,000	3.16	0.39	Average
16,000 to <21,000	3.14	0.55	Average
21,000 to <26,000	3.33	0.12	Average
26,000 to <31,000	3.17	0.33	Average
31,000 to <36,000	3.00	0.95	Average
41,000 to <46,000	3.85	0.21	Average
46,000 to <60,000	2.87	0.15	Average
Academic Performance			
Fairly Satisfactory	2.93	0.46	Average
Satisfactory	3.15	0.50	Average
Strongly Satisfactory	3.07	0.51	Average
Outstanding	3.25	0.24	Average

Note: Mean Scale; 1.00-1.49 Very low, 1.50-2.49 Low, 2.50-3.49 Average, 3.50-4.49 High and 4.50-5.00 Very high

Table 7
Level of Technical Skills of Grade 7 Learners in terms of Internet Navigation, Basic Measurement and Conversion, and Creating Multimedia Projects

Technical skills	M	SD	Interpretation
Internet Navigation	3.85	2.03	Fairly satisfactory
Basic Mensuration and Calculation	4.11	2.10	Satisfactory
Creating Multimedia Project	4.32	2.60	Satisfactory
Whole	12.27	5.12	Satisfactory

Note: Mean Scale 10-items;
0.00-1.99 Did not meet expectations, 2.00-3.99 Fairly satisfactory, 4.00-5.99 Satisfactory, 6.00-7.99 Strongly satisfactory, and 8.00-10.00 Outstanding
30-items;
0.00-5.99 Did not meet expectations, 6.00-11.99 Fairly satisfactory, 12.00-17.99 Satisfactory, 18.00-23.99 Strongly satisfactory, and 24.00-30.00 Outstanding

Table 8
Level of Technical Skills of Grade 7 Learners in terms of Internet Navigation when grouped as to Sex, Age, Total Family Monthly Income and Academic Performance

Variables	M	SD	Interpretation
Sex			
Female	4.05	1.81	Satisfactory
Male	3.66	2.20	Fairly satisfactory
Age			
12 years old below	4.02	1.89	Satisfactory
13 to 14 years old	3.86	2.10	Fairly satisfactory
15 to 16 years old	2.00	1.00	Fairly satisfactory
17 years old above	2.00		Fairly satisfactory
Total monthly income			
6,000 below	3.49	1.94	Fairly satisfactory
6-10,000	3.70	1.96	Fairly satisfactory
11,000 to <16,000	4.16	1.95	Satisfactory
16,000 to <21,000	4.36	1.87	Satisfactory
21,000 to <26,000	5.33	0.58	Satisfactory
26,000 to <31,000	5.14	1.77	Satisfactory
31,000 to <36,000	2.33	2.52	Fairly satisfactory
41,000 to <46,000	4.00	2.83	Satisfactory
46,000 to <60,000	7.33	3.06	Strongly satisfactory
Academic Performance			
Fairly Satisfactory	3.19	1.91	Fairly satisfactory
Satisfactory	3.84	2.00	Fairly satisfactory
Strongly Satisfactory	4.12	1.58	Satisfactory
Outstanding	5.52	1.66	Satisfactory

Note: Mean Scale 10-items;
0.00-1.99 Did not meet expectations, 2.00-3.99 Fairly satisfactory, 4.00-5.99 Satisfactory, 6.00-7.99 Strongly satisfactory, and 8.00-10.00 Outstanding

Table 9
Level of Technical Skills of Grade 7 Learners in terms of Basic Mensuration and calculation when grouped as to Sex, Age, Total Family Monthly Income and Academic Performance

Variables	M	SD	Interpretation
Sex			
Female	4.69	2.26	Satisfactory
Male	3.59	1.80	Fairly satisfactory
Age			
12 years old below	3.95	1.90	Fairly satisfactory
13 to 14 years old	4.20	2.23	Satisfactory
15 to 16 years old	3.60	1.34	Fairly satisfactory
17 years old above	5.00		Satisfactory
Total monthly income			
6,000 below	3.34	1.71	Fairly satisfactory
6-10,000	4.14	1.89	Satisfactory
11,000 to <16,000	4.37	1.77	Satisfactory
16,000 to <21,000	4.79	2.69	Satisfactory
21,000 to <26,000	8.00	2.00	Outstanding
26,000 to <31,000	6.00	2.30	Strongly satisfactory
31,000 to <36,000	3.67	2.31	Fairly satisfactory
41,000 to <46,000	7.00	1.41	Strongly satisfactory
46,000 to <60,000	6.33	3.06	Strongly satisfactory
Academic Performance			
Fairly Satisfactory	3.36	1.69	Fairly satisfactory
Satisfactory	3.65	1.63	Fairly satisfactory
Strongly Satisfactory	4.82	1.94	Satisfactory
Outstanding	6.52	2.08	Strongly satisfactory

Note: Mean Scale 10-items;
0.00-1.99 Did not meet expectations, 2.00-3.99 Fairly satisfactory, 4.00-5.99 Satisfactory, 6.00-7.99 Strongly satisfactory, and 8.00-10.00 Outstanding

Table 10
Level of Technical Skills of Grade 7 Learners in terms of Creating Multimedia Project when grouped as to Sex, Age, Total Family Monthly Income and Academic Performance

Variables	M	SD	Interpretation
Sex			
Female	4.81	2.61	Satisfactory
Male	3.88	2.53	Fairly satisfactory
Age			
12 years old below	4.30	2.66	Satisfactory
13 to 14 years old	4.30	2.59	Satisfactory
15 to 16 years old	5.20	2.86	Satisfactory
17 years old above	3.00		Fairly satisfactory
Total monthly income			
6,000 below	3.59	2.35	Fairly satisfactory
6-10,000	4.20	2.48	Satisfactory
11,000 to <16,000	5.26	2.45	Satisfactory
16,000 to <21,000	4.93	2.90	Satisfactory
21,000 to <26,000	6.00	1.00	Strongly satisfactory
26,000 to <31,000	7.00	2.94	Strongly satisfactory
31,000 to <36,000	4.00	3.61	Satisfactory
41,000 to <46,000	5.50	0.71	Satisfactory
46,000 to <60,000	6.00	4.58	Strongly satisfactory
Academic Performance			
Fairly Satisfactory	3.39	2.20	Fairly satisfactory
Satisfactory	3.92	2.33	Fairly satisfactory
Strongly Satisfactory	5.22	2.44	Satisfactory
Outstanding	7.03	2.21	Strongly satisfactory

Note: Mean Scale 10-items;
0.00-1.99 Did not meet expectations, 2.00-3.99 Fairly satisfactory, 4.00-5.99 Satisfactory, 6.00-7.99 Strongly satisfactory, and 8.00-10.00 Outstanding

Table 11
Difference in the Level of Behavioral Factors in terms of the aforementioned areas affecting Grade 7 Learners when grouped as to Sex

Factors	U	p	Interpretation
Classroom Engagement	5044.50*	< .001	Significant
Self-Regulation	4536.50*	0.031	Significant
Learning Interaction	5052.00*	< .001	Significant
Emotional Behavior	4858.50*	0.002	Significant

*p < 0.05 **

Table 12
Difference in the Level of Behavioral Factors in terms of the aforementioned areas affecting Grade 7 Learners when grouped as to Age

Factors	X^2	df	p	Interpretation
Classroom Engagement	2.807	3	0.422	Not significant
Self-Regulation	0.533	3	0.912	Not significant
Learning Interaction	8.302	3	0.050	Not significant
Emotional Behavior	3.106	3	0.376	Not significant

*p < 0.05 **

Table 13
Difference in the Level of Behavioral Factors in terms of the aforementioned areas affecting Grade 7 Learners when grouped as to Total Monthly Income

Factors	X^2	df	p	Interpretation
Classroom Engagement	11.6	8	0.169	Not significant
Self-Regulation	13.4	8	0.098	Not significant
Learning Interaction	11.5	8	0.177	Not significant
Emotional Behavior	13.0	8	0.112	Not significant

*p < 0.05 **

Table 14
Difference in the Level of Behavioral Factors in terms of the aforementioned areas affecting Grade 7 Learners when grouped as to Academic Performance

Factors	X^2	df	p	Interpretation
Classroom Engagement	12.83*	3	0.005	Significant
Self-Regulation	8.23*	3	0.042	Significant
Learning Interaction	14.38*	3	0.002	Significant
Emotional Behavior	13.92*	3	0.003	Significant

*p < 0.05 **

Table 15
Difference in Level of Technical Skills of Grade 7 Learners in terms of the aforementioned areas when grouped as to Sex

Factors	U	p	Interpretation
Internet Navigation	3422	0.231	Not significant
Basic Mensuration and Calculation	2621*	<.001	Significant
Creating Multimedia Project	3008*	0.015	Significant

*p < 0.05**

Table 16
Difference in Level of Technical Skills of Grade 7 Learners in terms of the aforementioned areas and when grouped as to Age

Skills	X^2	df	p	Interpretation
Internet Navigation	7.018	3	0.071	Not significant
Basic Mensuration and Calculation	0.721	3	0.868	Not significant
Creating Multimedia Project	0.826	3	0.843	Not significant

*p < 0.05 **

Table 17
Difference in Level of Technical Skills of Grade 7 Learners in terms of the aforementioned areas and when grouped as to Total Monthly Income

Skills	X^2	df	p	Interpretation
Internet Navigation	13.7	8	0.090	Not significant
Basic Mensuration and Calculation	27.2*	8	<.001	Significant
Creating Multimedia Project	17.4*	8	0.026	Significant

*p < 0.05**

Table 18
Difference in Level of Technical Skills of Grade 7 Learners in terms of the aforementioned areas and when grouped as to Academic Performance

Skills	X^2	Df	p	Interpretation
Internet Navigation	28.9*	3	<.001	Significant
Basic Mensuration and Calculation	43.4*	3	<.001	Significant
Creating Multimedia Project	41.0*	3	<.001	Significant

*p < 0.05**

Table 19
Relationship between the Behavioral Factors and Technical Skills of the Grade 7 Learners

Relationship		r_s	df	p	Interpretation
Technical skills					
	Classroom Engagement	0.202*	172	0.007	Significant
	Self-Regulation	0.143	172	0.059	Not significant
	Learning Interaction	0.197*	172	0.009	Significant
	Emotional Behavior	0.289*	172	< .001	Significant

*p < 0.05 **

Table 20
Areas of Behavioral Factors Predict the Technical Skills of the Grade 7 Learners

Model		Unstandardized	Standard Error	Standardized	t	p
H_0	(Intercept)	12.274	0.387		31.736	< .001
H_1	(Intercept)	2.501	3.036		0.824	0.411
	Classroom Engagement	0.715	1.143	0.062	0.625	0.533
	Self-Regulation	-0.347	1.134	-0.029	-0.306	0.760
	Learning Interaction	-0.591	1.328	-0.055	-0.445	0.657
	Emotional Behavior	3.406	1.283	0.308	2.655	0.009
	F (4, 170) = 4.022	R = 0.294	R^2 = 0.086			0.004

Formula: $TS = 12.274 + EB\ (3.406)$

DISCUSSION

Research Question 1. What is the level of behavioral factors among Grade 7 learners in terms of:

1.1. Classroom Engagement
1.2. Self-Regulation
1.3. Learning Interaction
1.4. Emotional Behavior

when taken as a whole and when grouped according to sex, age, family income, and academic performance?

Table 2 presents the behavioral factors of grade 7 learners providing insights into different domains. The findings revealed that the overall behavioral factors of Grade 7 learners were at an average level (M = 2.96), with all domains-classroom engagement, self-regulation, learning interaction, and emotional behavior falling within the same category. Among these, emotional behavior obtained the highest mean, while self-regulation slightly lagged behind.

This suggests that while learners demonstrate moderate behavioral readiness, there is still room for improvement, particularly in sustaining independent learning behaviors. The findings support the assertion that behavioral engagement plays a critical role in academic and technical learning (Ahmed et al., 2022a; Barghaus et al., 2021). Furthermore, the importance of self-regulation aligns with the work of Zimmerman and Schunk (2011), emphasizing that learners who can manage their learning processes tend to perform better in skill-based tasks.

The average level across all domains implies that learners are functioning at a baseline level of readiness, but without targeted intervention, they may not reach optimal technical performance.

Tables 3-6 showed variations in behavioral factors when grouped according to sex and academic performance, with females and academically higher-performing learners demonstrating relatively stronger behavioral attributes. However, no significant differences were observed in terms of age and family income.

These findings are consistent with studies indicating that gender differences influence engagement and learning interaction styles (Palomares-Ruiz & García-Perales, 2020). Female learners' stronger performance may be attributed to higher levels of self-efficacy and collaborative tendencies, which are essential in technical learning environments (Alves et al., 2016; Lam, 2023).

Additionally, the influence of academic performance reinforces the idea that behavioral factors and academic success are interrelated. Learners who are already performing well academically are more likely to exhibit positive learning behaviors such as persistence and engagement.

Research Question 2. What is the level of technical skills of Grade 7 learners in terms of:

2.1. Internet Navigation
2.2. Basic Mensuration and Calculation
2.3. Creating Multimedia Projects
when grouped according to demographic variables?

The results indicated that learners demonstrated satisfactory levels of technical skills across internet navigation, basic mensuration and calculation, and multimedia project creation. However, variation across domains suggests uneven skill mastery.

This finding supports previous studies that highlight the role of exposure and practice in developing technical competencies (Adam et al., 2016). Learners tend to perform better in tasks that are more frequently encountered or supported by available resources, such as internet navigation.

Research Question 3. Is there a significant difference in behavioral factors when grouped according to demographic variables?

Significant differences were found in behavioral factors when grouped according to sex and academic performance, while age and income did not show significant variation.

This indicates that behavioral development is more strongly influenced by individual learner characteristics rather than demographic factors such as age or socioeconomic status. The findings align with literature emphasizing that engagement and motivation are shaped by personal and academic experiences (Ahmed et al., 2022b).

Research Question 4. Is there a significant difference in technical skills when grouped according to demographic variables?

Similarly, technical skills significantly differed based on sex and academic performance, with females and high-performing students showing better outcomes in certain domains

This supports the idea that learning preferences and behavioral tendencies influence technical performance. Studies have shown that collaborative learning and structured environments—often preferred by female learners—enhance skill acquisition (Kniveton, 2006; Wang et al., 2011).

Research Question 5. Is there a significant relationship between behavioral factors and technical skills?

The study found a significant positive relationship between behavioral factors—particularly classroom engagement, learning interaction, and emotional behavior—and technical skills.

This confirms that learners who are more engaged, emotionally stable, and interactive tend to perform better in technical tasks. This is consistent with the findings of Bierman and Sanders (2020), who emphasized the role of emotional and social competencies in academic success.

Interestingly, self-regulation did not show a significant relationship, suggesting that independent learning behaviors alone may not directly translate into technical skill proficiency without active engagement and interaction.

Research Question 6. Do behavioral factors predict the technical skills of Grade 7 learners?

Among all behavioral factors, emotional behavior emerged as the strongest predictor of technical skill development.

This highlights the critical role of emotional stability in learning. Learners who can manage stress, maintain motivation, and regulate emotions are more likely to succeed in practical, skill-based tasks. This finding strongly supports the work of Denham et al. (2012) and Byiringiro (2023), who emphasized the importance of emotional competence in learning outcomes.

Research Question 7. What program may be developed based on the results of the study?

The findings justify the development of intervention programs focusing on emotional behavior and behavioral engagement, such as the proposed Technical Education and Character-Based Habits Empowerment Program.

This aligns with literature suggesting that structured behavioral support systems improve both academic and technical performance (Bird et al., 2024). Programs that integrate emotional coaching, interactive learning, and self-regulation tools can significantly enhance learner outcomes.

Conclusions

Based on the results of the study, the following conclusions were drawn:

Only emotional behavior significantly influences the development of technical skills of Grade 7 learners, with emotionally stable learners performing better in technical tasks like internet navigation, measurement, and multimedia creation.

Classroom engagement, self-regulation, and learning did not significantly predict technical skill outcomes based on regression analysis, although they showed some correlation. This indicates that while these traits may influence learning in general, they do not independently drive technical skill acquisition when controlling for other variables.

Female students and those with higher academic performance consistently exhibited better behavioral and technical skills, underlining the importance of both behavioral and cognitive factors in skill development.

In contrast, family income had inconsistent effects on learners' behavioral and technical skills, suggesting that psychological and motivational factors may be more important than demographic characteristics for skill development.

Furthermore, educational programs may focus on strengthening emotional regulation and support systems, as these are more directly linked to learners' technical performance. Interventions targeting emotional readiness may help maximize engagement and success in technical courses.

Lastly, incorporating emotional behavior training into the TLE curriculum could enhance students' ability to engage and perform well in technical tasks. The findings support the integration of emotional intelligence and self-regulation into the curriculum, encouraging students to develop both behavioral competencies and technical skills.

Recommendations

Based on the findings of the study, the lowest result was observed in basic mensuration and calculation skills, and therefore recommendations were drawn:

The schools may develop and implement focused remedial instruction in basic mensuration and calculation for learners from low-income backgrounds. These programs should be differentiated, practical, and contextualized to everyday life to increase relevance and retention.

The Department of Education and school heads may ensure that all learners, especially those from economically disadvantaged families have access to appropriate learning materials and digital tools that can reinforce measurement and calculation skills both in school and at home.

The parents or guardians may attend workshops or information drives that impower them to support mathematical learning at home, even with limited resources. The community-based learning sessions may also be facilitated to extend learning beyond the classroom.

May provide encouragement with the use of low-cost, game-based learning and manipulatives in teaching basic math concepts. Strategies such as these may shown to improve learner engagement and conceptual understanding, especially for those who struggle with abstract computations.

May provide professional development opportunities for TLE and Math educators to adopt inclusive strategies that account for learners' socio-economic diversity, emotional needs, and varying levels of foundational skills acquisition.

Proposed Program

With the provide results, the proposed TECH-Empower Program (Technical Education and Character-Based Habits Empowerment Program) is designed to address the behavioral needs of learners through promoting emotional regulation, self-motivations, and active engagement in technical learnings. This program aims to equip students with emotional and behavioral competencies needed to acquire and apply technical skills, improving their whole performance in Technology and livelihood Education (TLE) and preparing them for future academic and vocational pathways.

Program Component	Objectives	Persons involved	Time Frame	Expected Learning outcomes
Behavioral coaching Sessions	To develop learners' emotional regulation, motivation, and confidence through guided sessions.	Guidance Counselors, TLE Teachers	Weekly	Learners will demonstrate improved emotional behavioral and motivation in technical tasks.
Interactive Technical Laboratories	To promote collaboration and hands-on engagement in technical activities.	TLE Teachers, Students	Twice per Week	Learners will apply technical skills effectively through teamwork and project-based outputs.
Teacher Emotional Sensitivity Training	To promote and develop teachers' ability to support students' behavioral and emotional needs.	School Admins, All Subject Teachers	Monthly (throughout the program)	Teachers will apply emotionally responsive methods in classroom instructions.
Digital Self-Regulation Tools	To develop students' self-monitoring and goal-setting behaviors.	ICT Coordinators, TLE Teachers	Daily (Throughout the program)	Learners will manage their learning routines and track progress toward

				technical proficiency.
Parent Empowerment Seminars	To guide parents in supporting their children's emotional and learning behaviors	School Admin, Parents, Guidance Counselor	Monthly	Parents will adopt home strategies that will reinforce learners' engagement and confidence in technical subjects.
Recognition and Reinforcement System	To motivated learners through recognizing behavioral and technical improvements.	TLE Teachers, School Admin	End of the month	Learners will show increased effort and consistency in behavioral and technical performance.

Compliance with Ethical Standards

The researcher strictly adhered to ethical standards in the conduct of this study. Prior to data collection, permission was obtained from the appropriate school authorities. Informed consent was secured from all participants, and their participation was entirely voluntary. Respondents were informed of their right to withdraw from the study at any point without any consequences. Confidentiality and anonymity of the participants were ensured throughout the research process. No identifying information was disclosed, and all data collected were used solely for academic and research purposes. The study complied with applicable data privacy regulations and upheld the principles of integrity, transparency, and respect for participants. The researchers declare that there is no conflict of interest regarding the publication of this study. All sources of information were properly cited to avoid plagiarism, and no fabrication, falsification, or bias influenced the results of the study.

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