The Relative Comparison of Scholastic Performance with Learning Style and Technology

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ABSTRACT

This study explored the relationship and comparison among the constructs in learning style, learning technology, and scholastic performance. The descriptive-correlational-comparative designs in the analyses of the data gathered had been run. The respondents' learning styles were identified using a learning style index by Felder and Soloman (1991), and they were grouped into four preferences: active-reflective, sensing-intuitive, visual-verbal, and sequential-global. This study is based on the Adaptive Learning Theory and Piaget's Theory of Constructivism (1896-1980), accentuating the adaptive theory concept. The stratified random sampling, the data were gathered using the adopted questionnaires and subjected to the SPSS for analysis. The findings indicate that learning style preference has no difference with academic performance. The Pearson product-moment correlation test displayed a very weak monotonic association with scholastic performance and no relationship with each other, respectively. Thus, the learning technology is not significant and has a very weak monotonic association with scholastic performance. The ANOVA test was also employed with the scholastic performance and learning style and scholastic performance and demographic profiles. Both tests showed no significance difference. However, it was recommended that learning style must be identified and recognized in the teaching and learning process. Also, provision and acquisition of gadgets/devices and internet connectivity at school, home, and in other localities wherever education process will take place. Finally, it was recommended that training on the web-based instruction (web page design, graphic editing, and digital audio) must be provided. It is therefore to enhance the learning capability of the learners who are in the forefront of the academic instruction.

Keywords: *active-reflective, index of learning style, Information Communication Technology, learning style, learning technology, sequential-global, scholastic performance, sensing-intuitive, visual-verbal*

INTRODUCTION

The idea of scholastic performance considers the assimilation of knowledge, skills, and attitudes into a collective series of acts in the pedagogical endeavor of teaching and learning processes toward complexities in education that may create desired results. There is, in fact, a performance theory with six critical conceptual frameworks that may be utilized to describe the performance and its evolution in creating valued and desirable results. Students are more likely to succeed when they participate and accomplish as an individual or a group via a joint effort to navigate the activity (Elger, 2020).

However, it is akin to taking on a journey of scholastic predictability of performance is examined, and where they are situated is regarded as their degree of achievement. The six holistic performance categories highlight context, level of knowledge, level of skills, level of identity, personal aspects, and fixed variables. This performance is improved by the performer's thinking, absorption in an enriching environment, and participation in reflective practice (Elger, 2020). Moreover, one of our policymakers' main goals is to raise the number of years of primary schooling to provide greater access to and gain more skills in education. Nevertheless, the ultimate purpose of providing schooling is to educate pupils in the classroom on learning content (as measured by TIMMS) and how to teach skills and transfer knowledge (as measured by PISA). While we analyze and evaluate students' scholastic achievement using our national standards, other worldwide assessment bodies and organizations test students' scholastic or academic performance using a predefined norm or standard. In this situation, comparative results are provided as bases for some reinforcement, remediation, or enhancement of the learning process that are factors to the attainment of the learners' lower or mediocre performance level. The Program for International Student Assessment (PISA) assessed half a million 15-year-old pupils representing 28 million people from 72 nations and economies. (OECD, 2018). PISA statistics reveal that the average student score is 500, with a standard deviation 100. PISA aims to assess the application of skills to real-life issues while highlighting contextual importance and the ability of students to utilize their abilities at school, at home, and in society. (Roser et al., 2020). The three academic areas and disciplines in which students are assessed are science, reading, and mathematics. The results of the scholastic performances and statistics of the world's foremost education systems and economies, as measured by PISA in 2018, are given, examined, and explained. Students in the United States outperformed the OECD average in reading (505 points), science (502), and maths (502 points) (478). In at least two of these three disciplines, their results were comparable to those of students from Australia, Germany, New Zealand, Sweden, and the United Kingdom. Since 2000, the trend lines of the United States' mean performance in reading, mathematics, and science have been constant, with no substantial improvement or loss. In Italy, they scored lower than the OECD average in reading and science but higher than the OECD average in mathematics. Their average score in reading and science decreased while remaining unchanged in mathematics. Japanese pupils outperformed the OECD average in reading (504 points), maths (527),

and science (529). Korean pupils outperformed the OECD average in reading, maths, and science. In Korea, a higher proportion of students performed at the highest levels of competence (Level 5 or 6) in at least one topic compared to the OECD average; at the same time, a higher number of students attained a minimal level of competence (Level 2 or above) in at least one subject. Singaporean students outperformed the OECD average in reading, maths, and science. In Singapore, a higher proportion of students performed at the highest levels of proficiency (Level 5 or 6) in at least one topic compared to the OECD average; at the same time, a higher proportion of students attained a minimal level of competence (Level 2 or above) in at least one subject. Students in Russia scored lower than the OECD average in reading but not considerably lower than the OECD average in mathematics or science. In comparison to the OECD average, a smaller proportion of students in Russia attained the highest levels of competence (Level 5 or 6) in at least one subject. However, a more significant proportion obtained minimal competence (Level 2 or above) in at least one subject. (OECD, 2019).

In the Philippines, fifteen-year-old pupils performed worse in reading, mathematics, and science than students from most nations and economies participating in PISA 2018. The country's average reading score was 340, par with the Dominican Republic. The Philippines and the Dominican Republic received the lowest scores. In mathematics and science, students in the Philippines scored 353 and 357 points, respectively, on par with the performance in Panama. The Philippines outperformed the Dominican Republic in mathematics and science. Over 80% of students in the Philippines did not reach a minimum level of proficiency in reading, which is one of the most significant shares of low performers amongst all PISA-participating countries and economies (OECD, 2019). In this connection, DepEd recognizes the urgency of addressing issues and gaps in attaining the quality of primary education in the Philippines. Launching the Sulong Edukalidad by implementing aggressive reforms in four key areas: (1) K to 12 reviews and updates, (2) Improvement of learning facilities, (3) Teachers and school heads' upskilling and reskilling through a transformed professional development program; and (4) engagement of all stakeholders for support and collaboration (Briones, 2019). Furthermore, the National Achievement Test (NAT) scores at the national, regional, and division levels of the DepEd, public and private, revealed the low performance and huge disparities across all disciplines. (David and Hoggang, 2018).

As a result of the pandemic, the delivery of instructional content and materials has switched dramatically to online instruction. It might result in a variety of modalities of delivery, including video conferencing, synchronous and asynchronous online courses, open scheduled online courses, hybrid distance education, computer-based distance education, and fixed-time online courses (FU, 2020). The teaching-learning pedagogies (student-teacher interactions, methods, approaches, and strategies) must be examined and remediated for this online teaching engagement. It is critical to understand how to manipulate these Internet gadgets; teachers must be more knowledgeable than their students. It is a recognized truth not to diminish instructors' abilities that most students understand and manipulate cyber technology in education better than their teachers. As

a result, pieces of training and orientations for this remote learning or remote education are done sequentially. Teachers should be equipped with these online teaching techniques for the learning process for the students (Sharma, 2016). E-teaching and e-learning tactics that are equally important include interacting online, establishing a supportive learning environment, employing a mix of learning technologies for greater engagement, giving continual feedback, and making e-learning information mobile for improved accessibility. (Cooper, 2016). It is known and widely recognized by educators, classroom policymakers, and instructors of the recommended requirement to know students' learning styles and preferences, which are essentially the basis of what and how instructional pedagogies and learning technologies would be employed and integrated into the teaching-learning process. (Laurilliard, 2012). Indeed, numerous characteristics of learning styles and associated teaching styles for instructors are articulated, as proven by the Felder-Soloman Index of learning styles (ILS). These are to mention the following: (perception: sensory-intuitive; input: visual-verbal; processing: active-reflective; understanding: sequential-global) corresponding to teaching styles (emphasized content: concrete-abstract; mode of presentation: visual-verbal; facilitated participation: active-passive; provided perspective: sequential-global) (Cardak, 2016). The baseline criteria are to build a broader ICT curriculum, increase teachers' capabilities, and ensure teachers' professional development training. Plans and initiatives for creative teaching adaption must be revisited and revised. The importance of broadening the breadth of assessment and evaluation criteria in gauging students' content capacity to learn and skills application to real-life situations cannot be overstated. The academic performance of pupils, as evaluated by their learning abilities and achievements, is used to determine the quality of education (Garcia & Weiss, 2016). This study considers scholastic performance as a result of numerous factors, such as learning styles and technologies.

Previous research has focused on the bivariate relationship between learning style and scholastic performance (Newton et al., 2017) and learning technology and scholastic achievement (Rodriguez, 2019). Hence, the researcher has yet to find a study assessing the combined effects of learning style and technology on academic performance.

This research examines the multivariate relationship between two independent variables and one dependent variable in the new typical education setting. Furthermore, most prior studies have been conducted in the classroom and in face-to-face instruction, but fewer studies have been conducted in the online education environment. With this advancement, there is a need to undertake research that can produce teaching and learning methodologies based on identifying learning styles and technologies to enhance students' scholastic achievement. As a result, the findings of this study may be used by school administrators and authorities to design policies for interventional and long-term curricular programs in the school.

Furthermore, this study is relevant in various academic institutions delivering instruction using Information Communication Technology (ICT). It should contribute to and further update the knowledge required for adaptive educational processes by

developing disruptive educational and pedagogical technologies suitable for short or long-term adaptation of the phenomena that now influence our education system.

Administrators. They are utilized for personnel management, supervision, and enhanced monitoring and assessment of instructors' performance and learning outcomes.

Coordinators. The knowledge and abilities gained are used in school teaching-learning technology programs.

Curriculum developers. They are the foundation for implementing curricular modifications in teaching, learning, and technology.

Policymakers. The study's findings assist policymakers in designing and enacting policies to improve teaching and learning processes.

Researchers. They serve as a springboard for additional research in other areas of interest, notably in distant teaching and learning aspects.

Teachers. They successfully lead him/her in selecting, providing, and manipulating educational technology.

Statement of the Problem

This study aimed to determine the student's scholastic performance compared or associated with learning styles and technologies utilized in distance education.

Specifically, it sought to answer the following questions:

1. What is the demographic profile of the respondents in terms of:
   1.1 Gender,
   1.2 Age,
   1.3 Level of enrolled course,
   1.4 Physical or learning disability, and
   1.5 Mode of learning?

2. What is the profile of the preferred learning style of the respondents in terms of:
   2.1 Active-Reflective,
   2.2 Sensing-Intuitive,
   2.3 Visual-Verbal, and
   2.4 Sequential – Global?

3. What is the level of the learning technology of the respondents in terms of:
   3.1. gadgets/devices used,
   3.2. location of access,

3.3 internet access, and
3.4 use of ICTs?

4. What is the level of students' scholastic performance in terms of the achievement rating?

5. Is there a significant relationship between learning technology and scholastic performance?

6. Does the scholastic performance differ significantly with the groups of the demographic profiles and learning styles?

Hypotheses

Ho1: There is no significant relationship between the learning style and scholastic performance.

Ho2: There is no significant difference between the scholastic performance compared to the demographic profile and learning style groups.

Theoretical Framework

Adaptive Learning Theory. Continuous learning is one of the brain's distinguishing qualities. It provides a timely reaction to various ways the world might alter. It responds to changes in sudden/abrupt, incremental, steady, recurring ideas, and outliers (no gist). It goes on to say that the components of the static learning bottleneck are the training-learning-testing chain. On the other hand, the input-output is the brain's adaptive learning that is continually adapted during the operational learning process (Vineyard, C.M. et al., 2017). It tells us something about learning how to use technology, specifically the use of technology in distance education.

Piaget's Theory of Constructivism (1896-1980) accentuates the concept of adaptive theory. It points out that we construct our understanding and knowledge of the world through experiences. When we encounter something new, which is the imposition of online or distance learning in the teaching process amidst this COVID-19 phenomenon, as learners or teachers, we have to reconcile it with our previous ideas and experiences, particularly face-to-face teaching and learning. Knowing such facts and situations might move us, either revising what they thought was inappropriate and proper or dismissing the new information as useless. They must devise novel solutions by implementing an adaptable system that provides for and adapts to new demands. Piaget's constructivism theory influences the learning curriculum because instructors must create a curriculum plan that improves students' logical and conceptual development and adaptability to new situations. We must focus on connecting students' previous experiences with their current emerging experiences. Teachers would ultimately aid the learning process if they understood the learners' needs and capabilities clearly. The teaching and learning process

emphasizes the significant roles and experiences or linkages with the surrounding environment that play an active part in student education. Individual learning styles must be considered when developing an instructional design template for online education. Identifying learning styles is a precursor to defining an appropriate framework for learning the design/methodology/technology/approach (Zapalska et al., 2006). Both instructors and students should equip and capacitate themselves to perform as necessary and needed, putting fear aside and emerging from their shelves to facilitate creative and adaptable learning.

Moreover, this theory covered learning theories, teaching methods, and education reform. This theory's two main components that operate on developing new information are accommodation and assimilation (Glasersfeld, 2014). Assimilation is how an individual incorporates new experiences into old ones, such as online teaching and distance learning, instead of face-to-face instruction as an alternate form of delivering curricular topics. It leads to the individual developing new perspectives, rethinking misconceptions in the existing situation, evaluating what is significant, and finally changing their perceptions. Accommodation, on the other hand, is the process of reframing the world and new experiences into the mental capacity that is already existent. We consider the learning style in terms of how each individual can deal with the learning process and how they choose to study. Then we have a look at the available learning technologies. If they are already present, we may make use of them. These tools are necessary for us to be resourceful and develop alternatives. They imagine a specific method for the world to function, and, via adaptation, we change the old method of doing things. When things do not work within that framework, they must adjust and reframe the outcomes' expectations (technology, 2020). We must optimize the learners' strengths and experiences so that we, as instructors, can actively interact with them. Finally, because of the teaching methodology, learning is facilitated. In conclusion, the learning process is exposed to a series of assessments and evaluations on the degree of scholastic achievement the students have obtained. The outcomes would be concreted and displayed through their achievement rating.

Conceptual Framework

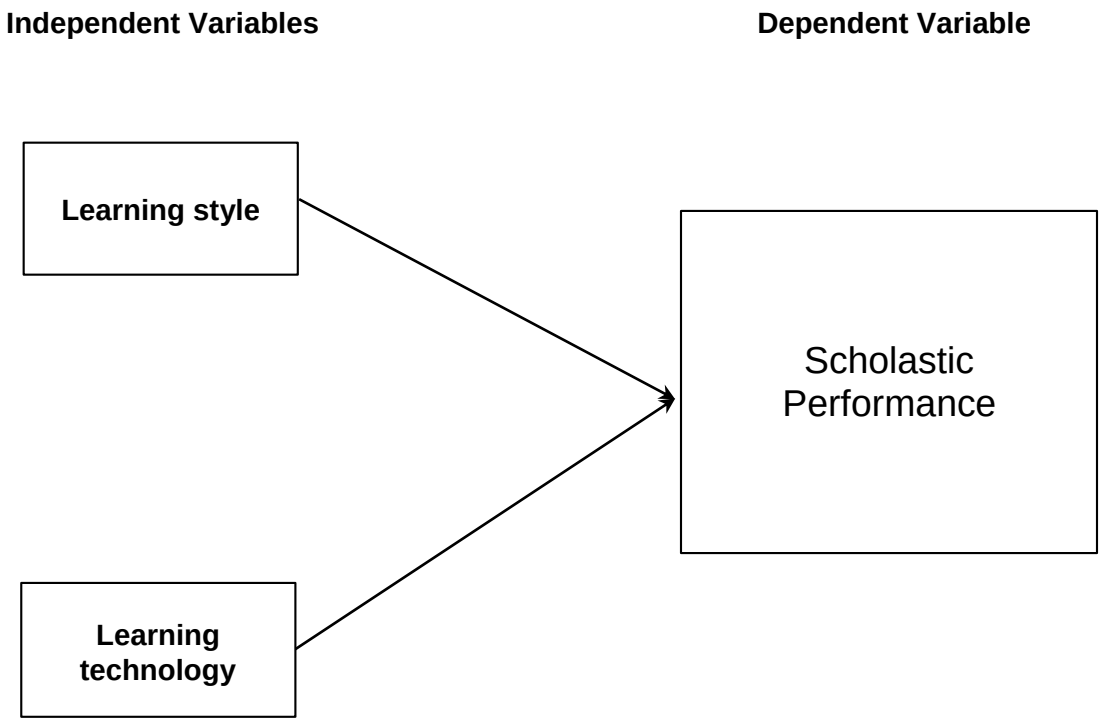


Figure 1. Conceptual framework of the study

METHOD

Research Design

This study utilized descriptive-correlational-comparison research designs. The descriptive design determines and describes the characteristics and status of a phenomenon, person, or object (Shuttleworth, 2008). On the other hand, the correlational design is used to explore the association between two or more variables (Creswell, 2012). This study determined the level of learning style and learning technology. Moreover, the relationship among the independent variables will also be explored. It uses a bivariate correlational analysis of the study (Nikita, 2017; Olkin, 2001). Furthermore, a comparison was also run to determine the significant difference between the predictor and outcome variables in the study.

Respondents

The study's respondents were students in a private Tertiary institution in Davao City. College students were the respondents of the study. Senior high school students aged 18 and above were also qualified as respondents. Stratified random sampling was utilized by creating a sample space representing the whole population from which data had been gathered.

Instruments

Two types (2) types of Survey Questionnaires were adopted in the study. The Survey Questionnaire for the Index of Learning Styles (ILS) (Felder & Soloman, 1993) contained forty-four (44) questions that categorized the learners into four dimensions active-reflective, sensing-intuitive, visual-verbal, and sequential –global? The Learning Technology Questionnaire (Kirkwood & Price, 2016) gathered data on online materials, gadgets, devices, and equipment the students have used in distance learning.

Mean Interval, Description, and Interpretation of the Learning Technology

Mean Interval	Description	Interpretation
4.21 -5.00	Almost always	Frequently use of learning technology
3.41 -4.20	Often	Almost every time use of learning technology
2.61-3.40	Sometimes	Occasionally use of learning technology
1.81 -2.60	Seldom	Almost never use of learning technology
1.00 -1.80	Never	No use/access of learning technology

The scholastic performance based on the achievement rating of the respondents.

The Mean Interval, Description, and Interpretation of the Scholastic Performance

Mean Interval	Description	Interpretation
4.21 -5.00	Very High	Exceptional achievement
3.41 -4.20	High	Extensive Achievement
2.61-3.40	Moderate	Acceptable achievement
1.81 -2.60	Low	Minimal achievement
1.00 -1.80	Very low	Inadequate achievement

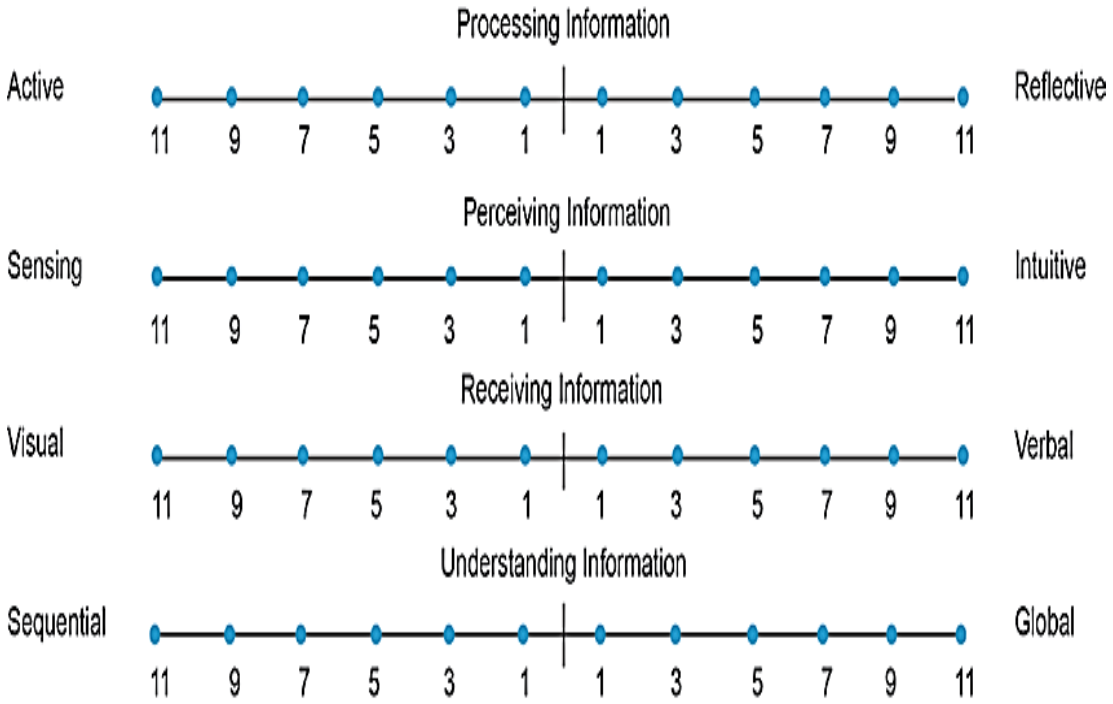
Procedures of the study

Letters sought approval were sent to the various offices, which are involved in the approval and accessibility of the data required. The survey questionnaires were sent through google forms, and the respondents were made to answer the survey. Automatic responses were recorded in the spreadsheet, and the result was consolidated for analysis.

Statistical Tools

The preferred learning style is measured by the Index of Learning Style (Felder et al.,1993). These scales analyze the respondents' scores to determine their preferred learning style. These are the legends in the scoring of the questions from the questionnaire. Active-Reflective: 1, 5, 9, 13, 17, 21, 25, 29, 33, 37, 41; Sensing-Intuitive : 2, 6, 10, 14, 18, 22, 26, 30, 34, 38, 42; Visual-Verbal: 3, 7, 11, 15, 19, 23, 27, 31, 35, 39, 43; Sequential-Global: 4, 8, 12, 16, 20, 24, 28, 32,3 6, 40, 44

If one score on a scale is 1-3, they are relatively well balanced on the two dimensions of that scale. If a score on a scale is 5 or 7, they have a moderate preference for one dimension of the scale and will learn more efficiently in a teaching environment that favors that dimension.



If the score on a scale is 9 or 11, they strongly prefer one dimension of the scale. It may have difficulty learning in an environment that does not support that preference.

The learning styles, learning technology, and scholastic performance are subjected to descriptive and correlational statistics using the Statistical Package for the Social Sciences (SPSS). For the descriptive statistics: frequency, percentage, and standard deviation were considered. The Pearson product-moment correlation, a parametric test, was utilized for the correlational statistical treatment among the independent and dependent variables. ANOVA was also utilized for the significant difference between the predictor and outcome variables.

Ethical Considerations

Social Value. The study aims to present insights to academic or non-academic institutions about the importance of strengthening employee involvement in productivity in the workplace. The study findings would help the company resource managers, directors, and supervisors in various institutions enhance the workforce's capability in the work area or field.

Informed Consent. A letter of consent is sent to the respondents together with the aims and purposes of the study. These informed consent forms were distributed to the respondents to guarantee their voluntary participation in the research endeavor.

Vulnerability of Research Participants. Questions profiling and descriptions in their field of work, and these questions are purely about their participation in their jobs. In this study, the research respondents are employees of a particular private school; hence they are ready for this endeavor.

Risks, Benefits, and Safety. The research proposal and the questionnaire or interview schedule are submitted to the Research Ethic Committee of Jose Maria College to review the possible risks the study respondents may experience.

Privacy and Confidentiality. Adherence to the Data Privacy Act of 2012 is done. The respondents have the right to privacy and confidentiality of the answers in the survey. The participants' names were not required in the questionnaire; they were given options if they would write or not. The questionnaires with actual data, transcriptions, pictures, and recordings were kept secured by the researcher. Moreover, upon its completion, the study's results will be available for future endeavors like presentation during research forums and publication in online journals.

Justice. Purposive and cluster sampling was employed so that groups or sections of respondents were chosen and informed for the study. The researcher ensured that the number of target participants involved in the study was appropriate, considering the collaborative suggestions of the research technical panel members.

Transparency. The result of this study will be presented to the respondents as they are the direct beneficiaries of the research outcome. Hence, the researcher assured the participants that the results should be conveyed accurately and in full scope.

Qualification of the Researcher. The researcher responsible for the research endeavor ensures that he/she possesses the qualities needed for his/her to conduct the study, such as moral fortitude, scientific competence, social awareness, cultural sensitivity, intellectual humility, vigilance, and preparedness in safety issues. To compensate for whatever skills he/she lacks and those needed for the successful conduct of the study, he/she seeks assistance from the adviser and the pool of experts available in the College.

Adequacy of Facilities. The researcher had done all means of the availability and accessibility of resources needed in this study. Books, online journals, and unpublished dissertations were available for further readings and references, which provided varied

literature and studies that supported the association of the variables used in the study. Besides, audio recorders, cameras, and other materials were available during the research.

Community Involvement. Prior to the interview and survey of the target participants, the researcher wrote a letter to the Deans/Department Heads/Program Coordinators of the participating schools to seek necessary permission. The letter's content will include "the extent of time, the potential impact, and the outcomes of the research" (Creswell, 2014). During the study, the researcher was meticulous in showing his/her respect for the research site by interrupting the participants as little time as possible.

RESULT AND DISCUSSIONS

Based on the study's outcome, the results, findings, and discussions are presented below.

Below are tables and corresponding presentations and discussions for the preferred learning style of the respondents in four dimensions.

Table 1. **Frequency and Percentage of the Demographic Profiles**

Demographic Profiles' Statistics		
Gender	Frequency	Percentage
Male	24	36.9
Female	41	63.1
Total	**65**	**100.0**
Age		
18-25	56	86.2
26-32	7	10.8
33-39	1	1.5
46 and above	1	1.5
Total	**65**	**100.0**
Enrolled Courses		
Senior High	3	4.6
Education	18	27.7
Criminal Justice System	6	9.2
Business Education	18	27.7
Information Technology	7	10.8
Psychology	3	4.6
Social Work	1	1.5
Engineering	8	12.3
Medtech	1	1.5
Total	**65**	**100.0**
Physical and Learning Disability		
No	53	81.5
Yes, I have one or more physical disabilities that require accessible or adaptive technologies	6	9.2

Yes, I have one or more learning disabilities that require accessible or adaptive technologies	2	3.1
Prefer not to answer	4	6.2
Total	**65**	**100.0**
Mode of Learning		
Traditional face-to-face	7	10.8
Completely online	44	67.7
Blended, where some components of the study are done online	14	21.5
Total	**65**	**100.0**

Table 1 above presents the frequencies and percentages of the demographic profiles of the respondents in terms of Gender, male (f = 24, % = 36.9) and female (f = 41, % = 63.1); age bracket of 18-25 (f = 56, % = 86.2), bracket 26-32 (f = 7, % = 10.8), bracket 33-39 (f = 1, % = 1.5) and bracket 46 and above (f = 1, % = 1.5). For the courses enrolled by the respondents, the Education and the Business programs have an equal frequency (f = 18, % = 27.7), and the rest have had a minimal number of respondents. The physical and learning disability profile for No (f = 56, % = 81.5) and the rest of the frequencies and percentages also have fewer disabilities; some preferred not to mention them. Finally, the mode of learning shows that completely online (f = 44, % = 67.7) engaged most by the respondents.

Table 2. **Frequency and Percentage of the Learning Styles**

Learning Style's Statistics		
Active-Reflective	Frequency	Percentage
Strong Reflective	50	76.9
Moderate Active	8	12.3
Moderate Reflective	5	7.7
Well-Balanced	2	3.1
Total	**65**	**100.0**
Sensing-Intuitive		
Strong Sensing	5	7.7
Strong Intuitive	1	1.5
Moderate Sensing	21	32.3
Moderate Intuitive	5	7.7
Well-Balanced	33	50.8
Total	**65**	**100.0**
Visual-Verbal		
Strong Visual	7	10.8
Strong Verbal	1	1.5
Moderate Visual	11	16.9
Moderate Verbal	9	13.8
Well-Balanced	37	56.9
Moderate Visual	11	16.9
Total	**65**	**100.0**
Sequential-Global		
Strong Sequential	3	4.6

Strong Global	2	3.1
Moderate Sequential	15	23.1
Moderate Global	8	12.3
Well-Balanced	37	56.9
Total	**65**	**100.0**

Table 2 above presents the frequencies and percentages of the learning styles of the respondents in terms of **Active-Reflective**, and strong reflective (f = 50, % = 76.9) as the most preferred learning style under this dimension. For the **Sensing-Intuitive**, well-balanced (f = 33, % = 50.8) followed by moderate sensing (f = 21, % = 32.3); the rest of the frequencies and percentages have received fewer frequencies. The **Visual-Verbal**, well-balanced (f = 37, % = 56.9) has had some preferences under the dimension. Finally, the **Sequential-Global** shows that the respondents in this dimension prefer well-balanced (f = 37, % = 56.9).

Table 3. Summarized Categorical Mean of Learning Technology

Learning Technology				
	N	Mean	Std. Deviation	Description
Gadget/Device used	65	2.04	0.723	**Seldom**
Location of Access	65	2.08	.675	**Seldom**
Internet Access	65	2.90	1.06	**Sometimes**
Use of ICTs	65	2.63	1.20	**Sometimes**
Overall Mean	**65**	2.41	0.915	**Seldom**

Table 3 above is the summarized categorical means of learning technology. There were four (4) dimensions under this variable. The **gadget/device used** has a mean of (M = 2.04, SD = .723) described as **Seldom** and interpreted as *almost never use of learning technology.* The **location of access** has a mean of **(M = 2.08, SD = .675),** described as **Seldom** and interpreted as *almost never use of learning technology.* **Internet access (M = 2.90, SD = 1.06)** is described as **Sometimes** and interpreted *as occasional as the use of learning technology.* The **use of ICTs** has a mean of **(M = 2.63, SD = 1.20)**, described as **Sometimes** and interpreted as *the occasional use of learning technology.* The learning technology variable has an **Overall mean** of **(M = 2.41, SD = .915)**, described as **Seldom** and interpreted as *almost never use of learning technology.*

Table 4. **Level of the Learning Technology of the Respondents**

Learning Technology				
	N	**Mean**	**Std. Deviation**	**Description**
Gadget/Device used				
Desktop Computer	65	2.16	.87	Seldom
Laptop	65	1.65	.79	Never
Smartphone	65	2.82	.50	Sometimes
iPad	65	1.52	.73	Never
Categorical Mean		***2.04***	***0.723***	**Seldom**

Location of Access				
Home	65	2.22	.84	Seldom
Office	65	2.45	.50	Seldom
Cybercafe	65	1.94	.63	Seldom
Do not have access	65	1.69	.73	Never
Categorical Mean		***2.08***	***.675***	**Seldom**
Internet Access				
Internet access location in the school/home/locality	65	1.49	.83	Never
Access to Internet	65	4.48	1.01	Almost always
Device utilization	65	2.14	1.39	Seldom
Broadband Connectivity	65	3.17	1.29	Sometimes
School Broadband	65	2.74	1.48	Sometimes
Home Wifi	65	1.62	.49	Never
Time use of internet in a week	65	4.42	1.13	Almost always
Time use of internet in a day	65	3.15	.91	Sometimes
Categorical Mean		***2.90***	***1.06***	**Sometimes**
Use of ICTs				
Word processor	65	3.20	1.34	Sometimes
Spreadsheet	65	2.72	1.17	Sometimes
Email	65	3.66	1.12	Often
Search engines	65	3.08	1.34	Sometimes
Databases	65	2.45	1.24	Seldom
Multimedia authoring	65	2.42	1.13	Seldom
Graphic editing	65	2.09	1.14	Seldom
Digital audio	65	2.25	1.17	Seldom
Web page design	65	2.08	1.02	Seldom
Learning management system	65	2.46	1.25	Seldom
Web 2.0 tools(wikis, blogs, social networking and sharing tools)	65	2.51	1.28	Seldom
Categorical Mean		***2.63***	***1.20***	**Sometimes**
Overall	**65**	**2.41**	**0.915**	**Seldom**

Table 4 above shows the various means and standard deviations of the learning technologies and their four dimensions. First was the **Gadget/device used** in the learning process. The highest mean among the learning technologies listed was the *Smartphone* (M = 2.82, SD = .50), described as **Sometimes** and interpreted as *the occasional use of learning technology.* Moreover, the lowest mean was the iPad/tablet (M = 1.52, SD = .73), described as **Never** and interpreted as *having no use or access to learning technology.* These findings confirmed the study of Julianingsih et al. (2021) that the essence and the strength of the relationship and interaction between humans and technology had become things like basic needs and need at any time, one example of human attachment to technology which is currently growing and becoming a competitive world not only for education but also for companies and technology developers, one of which is gadget/device technology utilization. It was also elucidated in the study of Ally et al. (2017) that the project reportedly boosted the learner's knowledge of using tablets for studying, according to both students and parents. The mobile learning project, according

to parents, enhanced their kids' interest in academics. Teachers also remarked that pupils focused on their tablets while studying and showed more enthusiasm for what they were learning in class. Students were put to the test both before and after receiving content on their iPads. The post-test results were noticeably better than the pre-test results, proving that using the tablets for learning impacted the students' performance.

Second was the **location of access** to technology. The highest mean was the *Office* (M =2.45, SD = .50), described as Seldom and interpreted as *almost never use of learning technology.* Furthermore, the lowest mean was the *Do not have access* (M = 1.69, SD = .73), described as **Never** and interpreted as *having no use or access to learning technology.*

This finding was supported by the study of Teng et al. (2021) that it is crucial to learn the precise location of the data during class instruction for most applications that require internet connectivity in different locations. However, most sensor devices on the Internet of Things (IoT) system face a complex problem because positioning equipment is hard to outfit sensor devices with due to cost considerations for physical location discovery on wireless sensor networks, a vital element of the IoT system in a smart city, technological systems on mobile vehicles and crewless aerial vehicles (UAVs) are used.

Third was **Internet access** in the learning process. The highest mean was Access to the Internet, with a mean of (M = 4.48, SD = 1.01), described as **Almost always** interpreted as *frequent use of learning technology.* Moreover, the lowest mean was the *school/home/locality* (M = 1.49, SD = .83), described as **Never** and interpreted as *no use or access to learning technology.* Based on the study of Kho et al. (2019), internet access has a moderate, positive short-run impact on school-average standardized math scores, but this effect significantly grows over time. It proved that schools require time to adapt to internet access by hiring teachers with computer training and that this process takes time to complete.

Finally, the fourth was the **Use of ICTs** in the learning process. The highest mean was *Email* with a mean of (M = 3.66, SD = 1.12), described as **Often** interpreted as *almost every time use of learning technology.* Furthermore, the lowest mean was the *web page design* (M = 2.08, SD = 1.02), described as **Seldom** and interpreted as *almost never use or access of learning technology.* These findings were pointed out by Alkamel & Chouthaiwale (2018) that by opening a free personal email account with a provider like Gmail, Yahoo, or Hotmail, students can use Email to communicate with native speakers of the target language. The pupils can mail their homework to the relevant teachers for correction.

Additionally, the teacher can send each piece of work back with edits, comments, and ideas. Moreover, web-based education, also known as technology-based education, distance education, online education, and e-learning, is a proliferating field. It offers the

chance to develop an effective, learner-centered, low-cost, interactive, official, and adaptable e-learning environment.

Table 5 below shows the level of scholastic performance of the respondents.

Table 5. **Level of the Scholastic Performance**

Scholastic Performance				
	N	Mean	Std. Deviation	Description
Scholastic Performance	**65**	**2.72**	**0.960**	**Moderate**

having a mean of (M = 2.72, SD = .960), which was described as **Moderate** and interpreted as an *Acceptable achievement*.

Table 6 below shows the Pearson correlation and p-value between learning technology and scholastic performance. The p-value or the computed value is 0.293 and greater than 0.05 of the alpha significance level.

Hence, the null hypothesis is accepted that no significant relationship exists between learning technology and scholastic performance. It shows a very weak positive monotonic association between learning technology and scholastic performance, considering the correlational coefficient value of Pearson r, which is .132.

Table 6. **Learning Technology VS Scholastic Performance**

Correlation			
Learning Technology VS Scholastic Performance		Technology	GPA
Learning Technology	Pearson Correlation	1	.132
	Sig. (2-tailed)		.293
	N	65	65
GPA	Pearson Correlation	.132	1
	Sig. (2-tailed)	.293	
	N	65	65
Decision:		**Not Significant**	

It means that learning technology is not significantly related to scholastic performance. It implies that utilizing these Information Communication Technologies (ICTs) does not guarantee that it would significantly affect scholastic performance.

In Table 7 below, we used the one-way ANOVA to test the significant difference in scholastic performance for the predictor variables of demographic profiles. The ANOVA between groups, since the Sig values (Age =.131, Course Enrolled = .185, Learning

Modality = .827, Leaning Disability = .172) are all greater than the .05 alpha level of significance. They showed that the null hypotheses are accepted and that no significant difference exists between scholastic performance and demographic profiles. Furthermore, there is no need for a post hoc test because of no significant difference in the outcome in the One-way ANOVA test.

Table 7. **ANOVA Between Scholastic Performance and Demographic Profiles**

Demographic Groups	Sum of Squares	df	Mean Square	F	Sig	Remarks
Age	4.573	3	1.524	1.951	.131	Not Significant
Course enrolled	3.945	3	1.315	1.662	.185	Not Significant
Learning Modality	.319	2	.160	.191	.827	Not Significant
Learning Disability	4.080	3	1.360	1.724	.172	Not Significant

In Table 8 below, we used the one-way ANOVA to test the significant difference in the scholastic performance for the predictor variables of the learning styles. The ANOVA between groups, since the Sig values (Active-Reflective =.247, Sensing-Intuitive = .335, Visual-Verbal = .633, Sequential-Global = .586) are all greater than the .05 alpha level of significance. They showed that the null hypotheses are accepted and that no significant difference exists between scholastic performance and learning styles. Furthermore, there is no need for a post hoc test because of no significant difference in the outcome in the One-way ANOVA test.

Table 8. ANOVA Between Scholastic Performance and Learning Style

Dimensions	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig**	**Remarks**
Active-Reflective	3.395	3	1.132	1.414	.247	Not Significant
Sensing-Intuitive	3.767	4	.942	1.166	.335	Not Significant
Visual-Verbal	2.150	4	.538	.644	.633	Not Significant
Sequential-Global	2.371	4	.593	.714	.586	Not Significant

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Conclusions derived from the above results and findings are as follows:

1. There are more female than male respondents, most of the respondents belong to the age bracket from 18-35, and an equal number of students are enrolled in the College of Teacher Education and Business Education. Most respondents have no physical or learning disability, and a completely online platform for the delivery of classes is conducted.

2. Most of the respondents belong to the Active-Reflective index learning style.

3. Learning technology utilization is seldom and almost never used in the learning process.

4. The scholastic performance is a moderate and acceptable achievement.

5. Learning technology is not significantly related to scholastic performance.

6. The demographic profiles do not significantly differ from the scholastic performance.

7. The learning style does not significantly differ from the scholastic performance.

Recommendations

The following recommendations of the study are forwarded.

1. The learning style index must be identified and established to serve as a guide to teaching pedagogy.

2. The learning style index must be recognized and used in the instruction and management of the learning process.

3. The provision or acquisition of gadgets/devices, notably iPad or laptops, must be prioritized.

4. The provisions of internet accessibility in the school/home/locality must be considered primarily.

5. Training on web-based instruction (web page design, graphic editing, and digital audio) must be provided.

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