International Journal of Psychosocial Rehabilitation, Vol. 24, Issue 03, 2020
ISSN: 1475-7192

Learning Style and Preferences of Students in Skills-Based Courses

Marie Ann Gladys G. Delos Angeles

Abstract--- *When teachers teach students with consideration of their preferred learning styles and recognize their unique qualities, then teachers are making a commitment to providing tools and opportunities needed for students to achieve success. The study was conducted to determine the preferred learning style of students enrolled in the skills-based courses of a state university in Cagayan Valley, Philippines. Differences in the preferred learning style across sex, courses, curriculum year, and GWA of the 480 students enrolled in four (4) undergraduate technology-based courses were described through the use of Computerized Assessment Program- Styles of Learning (CAPSOL). Results showed the learning style preferred include individual, written expression, sequential, and bodily-kinesthetic. When grouped according to sex, course, curriculum year and GWA, females are bodily-kinesthetic and individual learners, while, males show preference to visual-auditory and group learning. Among the four courses, students taking Accounting Technology are visual learners while those from the other courses were bodily-kinesthetic. Students in their sophomore year show preference to being sequential learners. In terms of GWA, those with lower tend to learn new materials with a group and those with higher prefer to study alone. Since differences in preferred learning styles were found, there is a need to expose students to varied learning tasks where they are best engaged and offer instructional materials responsive to their needs and learning styles.*

Keywords--- *CAPSOL, Learning Style, Learning Preference, Technology-based Courses.*

I. INTRODUCTION

Helping students become lifelong learners is one of the goals of education, and understanding students' various learning styles can help educators achieve this goal. Embracing the diversity of students and cultivating a classroom environment that makes use of a variety of instructional strategies celebrate and support this diversity.

Perna [1] describes an adapted classroom as those which include materials and methods that give chance to students to make use of their strengths and weaknesses in their learning environment. Understanding students' unique learning styles, preferences, and instructional needs can assist teachers in developing a more favorable view of all students' abilities and thereby stimulate the development and implementation of differentiated instructional practices and the provision of intentional and personalized intervention.

As with student preferences, the teachers may also favor certain styles of instruction. Some are more comfortable with large assemblies of students, while others prefer small groups. Some lean towards a highly structured instruction while others view themselves as facilitators of student-structured learning. As providers and facilitators of instruction, the role is not only to cater to individual preferences but to facilitate flexibility and help students realize that they can learn in a variety of fashions. Sensitivity to individual differences mandates varying the

Marie Ann Gladys G. Delos Angeles, Ph. D., Faculty, College of Industrial Technology, Cagayan State University, Philippines.
E-mail: gladysdelosangeles@csu.edu.ph

DOI: 10.37200/IJPR/V24I3/PR200969
Received: 20 Jan 2020 | Revised: 06 Feb 2020 | Accepted: 12 Feb 2020

teaching methods a teacher use so all students will be exposed to both preferred and less familiar modes of learning.

Utilizing the assessment findings will assist teachers in broadening their teaching methods to incorporate the variety of styles expressed by the students under their charge. Moreover, instructors can use an understanding of learning style characteristics to improve their instruction through the use of appropriate and relevant instructional materials and tools.

The study is aimed at identifying the preferred learning styles of the students enrolled in skills-based courses, more specifically students enrolled in technical courses. Differences in their learning preferences were sought in the end view of providing information as to what teaching strategies need to be employed and offer so as to realize optimum results from instruction. Likewise, in consonance with the university's research priorities along with higher education, this study shall contribute to the goals of providing the best education through the use of efficient and effective instructional materials.

II. METHODOLOGY

A. Respondents and Research Tools

The participants of this study were 480 students studying in four (4) undergraduate programs, namely: Industrial Technology, Information Technology, Accounting Technology, and Hotel Industry Management. The sample was determined using Disproportionate Stratified Random sampling. Disproportionate Stratified Random sampling is a stratified sampling procedure in which the number of elements sampled is not proportional to their representation in the total population. The Disproportionate allocation for within strata analyses was employed. Though it is not an *equal probability selection method* (EPSEM) [2], it is most appropriate to the purpose of the study considering that there is a stratum (department) with a very small sample size.

The Computerized Assessment Program- Styles of Learning (CAPSOL©), created by Henderson and Conrath [3] was the main instrument used in this study. It is an instrument intended for assessing a learner's strengths (high preferences) and weaknesses (low preferences) to enhance the learner's understanding ranging from primary school-aged children to adult education and corporate training. CAPSOL© Form B is intended for adults. This assessment is a 45-item questionnaire answered on a Likert scale and uses nine preferred learning styles to determine how an individual learns. The nine learning preferences assessed in this questionnaire are Visual, Auditory, Bodily-Kinesthetic, Individual, Group, Oral Expressive, Written Expressive, Sequential, and Global.

The reliability of CAPSOL was established by administering the student version to 960 fifths to tenth-grade students using a test-retest set-up where a Pearson's r mean value of 0.74 was calculated [3]. The correlation coefficient of the 45-items ranges from 0.52 to 0.93. The following is a brief description of the type of learner with each learning preference: *Visual learners* comprehend information through reading, observing models, maps, graphic organizers, charts, and demonstrations and internalizes the information elicited from the material by internalizing through their own perspective [4]. *Auditory learners* show a preference for listening, understanding spoken directions, following a logic that is explained verbally and addressing background sounds-whether supportive or disruptive. *Bodily-kinesthetic* learners are learners with a preference for understanding by actively

DOI: 10.37200/IJPR/V24I3/PR200969
Received: 20 Jan 2020 | Revised: 06 Feb 2020 | Accepted: 12 Feb 2020

touching, manipulating, arranging, acting, showing, and experimenting with various physical approaches by experimenting first-hand. Felder and Silverman [5] conjured that kinesthetic learning involves information processing that is learners tend to move, relate, doing something active while learning. They use all the senses, especially touch, to gain new information. Addressing the acquisition of knowledge from an individual perspective describes an *Individual learner*. They tend to compare new information with previous experience and reflecting understanding through their own opinions and modes of perception. *Group learners*, on the other hand, are those with a preference for collaboration with one or more other students in planning, discussing, sharing responsibility, organizing, listening, and supporting a point of view leading to a product. *Oral expressive learners* learn through speaking situations, their understanding and insights are expressed through spoken description or through questioning of ideas, concepts or facts. While w*ritten expressive learners* enjoy doing written work. Learners express their understanding and insight through written descriptions, questioning, word processing, and drawing conclusions. *Sequential learners* show preference for information and procedures that are based on logic, timeliness, ordering, prioritizing and inferencing. Sequential learners need a step by step processing of their ideas. Whereas, *Global learners* have the preference for addressing information from whole to part. They want to know how particular information can be applied in real-life situations.

III. Results and Discussion

A. Respondents' Demographics

The demographic profile of the 480 students who participated in the study includes third-year students comprising 56.9% of the total respondents. Sixty percent (60%) are female, 73.3% belong to the age group of 18 – 20, which is the regular age of junior-senior undergraduate students and 58.4% are with a grade point average ranging from 85 to 90.

B. Dominant Learning Style of the Students in Skills-based Courses

The Learning style and preferences in this study are grouped into four preferences, namely: Category 1: The Perceptual Learning elements (Verbal-Auditory-Bodily Kinesthetic); Category 2: Sociological Preferences (Individual or Group); Category 3: Expressive language tendencies (Oral or Written); and Category 4: Processing Style elements (Sequential or Global).

As shown in Table 1, the general dominant learning styles of the students enrolled in the four courses were bodily-kinesthetic, individual, written expressive and sequential. The students of these skills-based courses tend to prefer to use all their senses, more so the sense of touch to gain new information. They tend to prefer to study alone (Individual learners) and enjoy doing written work. Moreover, the respondents are sequential learners, that is they need to learn new material in a step-by-step process.

1) The Preferred Perceptual Learning Modality

Bodily-kinesthetic learners were described earlier as those who learn best through a hands-on approach. That is, they actively explore the physical world around them and may find it hard to sit still for long periods. They have a strong tendency to become distracted by their need for activity and exploration. These results mean that the students

DOI: 10.37200/IJPR/V24I3/PR200969
Received: 20 Jan 2020 | Revised: 06 Feb 2020 | Accepted: 12 Feb 2020

enrolled in the undergraduate courses of the Information Technology, Industrial Technology, Hotel Industry Management, and Accounting Technology prefer to process information actively through engagement in physical activity or discussion. This learning modality describes learners as those that are able to assimilate new knowledge best when they are able to touch and manipulate objects [6]. In addition, they enjoy building and repairing things, physical games and role-playing. This characteristic of a learner may run similar in some aspects with the active learner described by Felder and Silverman [5]. An "active learner" is one who is better at active experimentation rather than reflective observation. It involves doing something in the external world with the information, either discussing it or explaining it or testing it in some way. There are likewise indicators that curricular programs that develop technical skills among its students like engineering education are likely to be active learners. Thus, the result of the study is consistent with Felder and Silverman [5]

Table 1: Preferred Learning Style

Learning Style	*Frequency*	*Percent (%)*
Perceptual Learning Modality		
Verbal	151	31.46
Auditory	58	12.08
Bodily-Kinesthetic	271	56.46
Total	480	100
Sociological Learning Preference		
Individual	311	64.79
Group	169	35.21
Total	480	100
Expressive Language Tendency		
Oral Expression	149	68.96
Written Expression	331	31.04
Total	480	100
Preferred Processing Style		
Sequential	357	74.38
Global	103	25.62
Total	480	100

2) The Sociological Learning Preferences

Table 1 also displays that the sociological learning preference of the students is *individual,* which describes learner's tendency to work on new materials alone. Typically, students who have introverted tendencies prefer to work individually on any learning task. They focus on intrapersonal ideas and thoughts [7]. As to the comparison with other learning style model, an individual learner has similar characteristics with a *reflective* learner [1]. Reflective learners according to Felder [5] are introspective processors and opt to think about information and manipulate it internally before they apply it. They tend to work alone or in pairs. Opposite the active learners, which tend to jump into action and try things out and test them the soonest.

3) Expressive Language Tendency of the Students

Table 1 likewise shows the learning preference of the students in the skills-based courses. It shows that the dominant expressive language tendency is the *oral expression.* Students who prefer oral expression tend to utilize spoken language for learning tasks and favor verbal interaction and responses [3]. These findings reflect the

DOI: 10.37200/IJPR/V24I3/PR200969
Received: 20 Jan 2020 | Revised: 06 Feb 2020 | Accepted: 12 Feb 2020

student's likelihood of going through their academic tasks through speaking and their preference for doing course work through oral presentation. It is indeed observable in the university in all the curricular programs involved in the study that students are required to present oral reports and presentations. Thus, this explains the predominance of oral expression as their expressive language tendency.

4) The Students' Preferred Processing Style

Processing style elements include preferences for learning sequentially or globally [3], [5]. The preferred processing style of the students in the study is *sequential*. Students with sequential, or analytic processing preferences have a linear thinking process and learn in a progressive sequence. They learn in small connected chunks [1]. They are good at understanding the process. In solving problems, sequential learners usually have solutions that are easy for others to follow. They are good at understanding and applying the details of a topic, but they may miss out the broad picture and connections to other classes and disciplines [5]. Felder insists that most of our education is sequential [1], from courses to textbooks to lecture.

C. Differences in Learning Style When Grouped According to the Students Profile

1) Learning Style Preference and Sex

On the question of whether there is a significant difference in the preferred perceptual learning mode, Table 2 reflects the findings. A significant difference exists between learning preference and sex (p = .008), where male respondents tend to be a bodily-kinesthetic type of learners, while female respondents tend to display preference to the combination of being Visual-Bodily Kinesthetic mode. These results were consistent with the findings conducted by Abdallah, A.R., et.al, in which female research methodology students showed more preference to multimodal type of learning [8]. This is consistent too to the findings that students remember 20% of what is read, 30% of what is heard, 40% of what is seen, 50% of what is said, and 60% of what is done. This percent increases to 90% for information they read, say, hear, see and do [10]. On the basis of the second category- sociological learning preference, there is a significant difference in the preference of the students when grouped according to sex (p = .042), female respondents tend to study alone while male respondents prefer to study with a group.

Table 2: ANOVA Result between Preferred Learning Style and Sex

		Sum of Squares	*df*	*Mean Square*	*F*	*Sig.*
V=1,A=2,BK=3	Between Groups	20.503	1	20.503	7.079	.008
	Within Groups	1384.495	478	2.896		
	Total	1404.998	479			
I=1, GR=2	Between Groups	2.335	1	2.335	4.170	.042
	Within Groups	267.632	478	.560		
	Total	269.967	479			
OE=1, WE=2	Between Groups	.556	1	.556	1.431	.232
	Within Groups	185.569	478	.388		
	Total	186.125	479			
S=1 , GL=2,	Between Groups	1.437	1	1.437	2.875	.091
	Within Groups	238.363	477	.500		
	Total	239.800	478			

DOI: 10.37200/IJPR/V24I3/PR200969
Received: 20 Jan 2020 | Revised: 06 Feb 2020 | Accepted: 12 Feb 2020

2) Learning Style Preference and Program Course

When grouped according to the program course, the students differ only in the preferred perceptual learning mode (p = .012), Table 3 reflects this result. Among the four programs, students taking Accounting Technology are visual learners while all the others are bodily-kinesthetic types. It is the expectations of the researcher that students enrolled in accounting technology programs are *visual* types of learners. Since the researcher used to teach in the department, the observation on the majority of the classes of the students points to these characteristics. As defined earlier, visual learners remember best what they see through pictures, diagrams, flow charts, time lines, films, demonstrations and the like. The kind of instruction provided by the professors would likewise explain these findings. Researchers have observed that people of college-age and older are visual, and most college teaching is verbal [10], [5]. The information presented is predominantly lecturing or a visual representation of auditory information (words and mathematical symbols written in texts and handouts, on transparencies, or on a chalkboard).

On the other hand, students enrolled in Information Technology, Industrial Technology and Hotel Management showed a preference for Bodily-Kinesthetic learning. Again, this is an expected finding, considering that learning tasks in most of the major courses in these departments require manipulations of objects, gadgets, machines and the like.

Table 3: ANOVA result for Learning Style and Program Course

		Sum of Squares	*df*	*Mean Square*	*F*	*Sig.*
V=1,A=2,BK=3	Between Groups	32.155	3	10.718	3.716	.012
	Within Groups	1372.843	476	2.884		
	Total	1404.998	479			
I=1, GR=2	Between Groups	1.792	3	.597	1.060	.366
	Within Groups	268.175	476	.563		
	Total	269.967	479			
OE=1, WE=2	Between Groups	.013	3	.004	.011	.998
	Within Groups	186.112	476	.391		
	Total	186.125	479			
S=1 , GL=2	Between Groups	2.979	3	.993	1.992	.114
	Within Groups	236.820	475	.499		
	Total	239.800	478			

3) Learning Style and Curriculum Year

Table 4 shows the ANOVA result reflecting that the students differ in preferred processing style when grouped according to curriculum year (p=.017). Students in the second year of their respective programs tend to be more of sequential learners. Defined earlier, a sequential learner understands new learning materials in a logically ordered manner. They need a step by step processing of their ideas, mastering the material more or less as it is presented. They are analytical learners [5] and are good at understanding and applying the details of a topic, but they miss out the broad picture and connections to other classes and disciplines. Since these students are in the early stages of their residence in their respective departments, this preference is a carry-over from their exposure to their high school academic experiences. A similar result was reported in a Czech study [11]. Blanka Zajacová [11] found out that Czech students are sequential than global learners and this preference is more pronounced among students of technical high schools.

DOI: 10.37200/IJPR/V24I3/PR200969
Received: 20 Jan 2020 | Revised: 06 Feb 2020 | Accepted: 12 Feb 2020

Table 4: ANOVA Result for Learning Style and Curriculum Year

		Sum of Squares	df	Mean Square	F	Sig.
V=1,A=2,BK=3	Between Groups	.907	2	.454	.154	.857
	Within Groups	1404.091	477	2.944		
	Total	1404.998	479			
I=1, GR=2	Between Groups	1.923	2	.961	1.711	.182
	Within Groups	268.044	477	.562		
	Total	269.967	479			
OE=1, WE=2	Between Groups	.185	2	.092	.237	.789
	Within Groups	185.940	477	.390		
	Total	186.125	479			
S=1 , GL=2	Between Groups	4.071	2	2.035	4.110	.017
	Within Groups	235.729	476	.495		
	Total	239.800	478			

4) Learning Style and GPA

The ANOVA result is shown below (Table 5) reflects the statistical difference between learning style and General Weighted Average (GWA). It shows that students differ in their *sociological* learning preference (p = .016) where students with GWA lower than 85 tend to prefer learning new materials in-group while those with higher GWA (90 – above), prefer to learn and study alone.

It was described earlier that students who prefer to learn in a group are those who learn new materials through collaborating with one or more other students. They plan, discuss, share responsibility and support a point of view leading to a product. Interesting to note from these results are students with preference to *grou*p learning are those with lower GWA. This may suggest that possibly these students did not benefit much from the kind of instruction provided to them in their earlier schooling.

A possible mismatch between students learning style preference and teachers' teaching preference. Researches concluded that mismatch between students' learning preferences and teachers' instructional strategies lead to poor academic performance [7],[12] and professorial frustrations, among others [13],[14]. On the other hand, researches concluded that students showed a positive attitude and higher academic attainment when their teachers accommodated their needs and preferences [15].

Table 5: ANOVA Result for Learning Style and GPA

		Sum of Squares	df	Mean Square	F	Sig.
V=1,A=2,BK=3	Between Groups	57.755	15	3.850	1.326	.182
	Within Groups	1347.243	464	2.904		
	Total	1404.998	479			
I=1, GR=2	Between Groups	16.164	15	1.078	1.970	.016
	Within Groups	253.802	464	.547		
	Total	269.967	479			
OE=1, WE=2	Between Groups	8.973	15	.598	1.567	.079
	Within Groups	177.152	464	.382		
	Total	186.125	479			
S=1 , GL=2	Between Groups	4.234	15	.282	.555	.908
	Within Groups	235.566	463	.509		
	Total	239.800	478			

DOI: 10.37200/IJPR/V24I3/PR200969
Received: 20 Jan 2020 | Revised: 06 Feb 2020 | Accepted: 12 Feb 2020

IV. CONCLUSION

Learning styles play a dynamic role in the lives of learners. When learners could identify their respective learning styles, they may integrate it into their own learning process. Thus, the results of this study provided information on the most preferred learning styles for acquiring new intellectual information for skills-based students. Bodily-kinesthetic, sequential, individual, and written expressive were overall the most preferred learning styles with other preferred learning styles varying in comparison with sex, program course, curriculum year and GWA.

Classifying students in skills-based courses based on their learning modalities can help professor's structure lessons to meet different needs in a diverse classroom. Students may not always fall into just one category, so planning the appropriate multiple teaching strategies may be necessary. Taking the time to determine students' learning preferences and tailoring lessons so that they speak to every student can meet their needs on a deeper level.

ACKNOWLEDGMENT

The author acknowledges the support of Cagayan State University at Aparri, Philippines

REFERENCES

[1] Perna, Jennifer, "Learning Styles and Their Effect on Student Learning" (2011). *Senior Honors Theses.* 270. http://commons.emich.edu/honors/270

[2] "Choosing the type of Probability Sampling", Chapter 5, retrieved from https://www.sagepub.com/sites/default/files/upm-binaries/40803_5.pdf (on-line) Retrieved on October 23, 2019

[3] CAPSOL® Styles of Learning. (n.d.). CAP-SOL Styles of Learning. Retrieved from http://www.stylesoflearning.com/styles.html

[4] Roberta Ross. "CAPSOL Style of Learning Assessment" retrieved from https://docplayer.net/30616530-Capsol-style-of-learning-assessment.html (on-line) Retrieved on July 28, 2017

[5] Felder, R. and Silverman, L. (1998), "Learning and Teaching Styles in Engineering Education. *Engineering Education*, Vol. 78 No. 7, 674-681. Retrieved from https://www.engr.ncsu.edu/wp-content/uploads, Retrieved October 19, 2019.

[6] "Learning Modalities: Understanding the learning styles of all students. Retrieved from https://www.iccb.org/iccb/wp-content/pdfs/adulted/tdl_bridge_curriculum/tdl_post-sec_ed/C2_TDL_Post-Sec_Ed_Resources.pdf, retrieved October 19, 2019.

[7] Wilson, Mary Lynne (2011). Students' learning style preferences and teachers' instructional strategies: correlations between matched styles and academic achievement, Dissertation, retrieved http://digitalcommons.liberty.edu/cgi/viewcontent.cgi

[8] Abdallah, Ayat R. et, al (2013). Preferred learning styles among prospective research methodology course students at Taibah University, Saudi Arabia. *Journal of the Egyptian Public Health Association* 2013, 88:3–7. DOI: 10.1097/01.EPX.0000427506. 57924.c1. Retrieved October 19, 2019.

[9] Barbe, WB. and M.N. Milone, "What We Know About Modality Strengths," Educational Leadership, Feb. 1981, pp. 378-380. Cited in "Learning and Teaching Styles in Engineering Education. *Engineering Education* Vol. 78 No. 7, 674-681.

[10] The University of Newcastle. Study Skills Guide. Available at: http://www.ncl.ac.uk/students/wellbeing/assets/documents/StudySkillsGuide.pdf. Retrieved October 19, 2019.

[11] Zajacová, Blanka (2016). Research of Learning Styles – Getting to Know Students' Individualities. Anthropologist, 24(1): 35-42 (2016). Retrieved October 19, 2019.

[12] Gantasala, P.V. and Gantasala, S.B (2009). Influence of Learning Styles. International Journal of Learning. January 2009 DOI: 10.18848/1447-9494. Retrieved from www.researchgate.com. Retrieved October 19, 2019.

[13] Awla, H.A. (2014). Learning styles and their relation to teaching styles. *International Journal of Language and Linguistics* 2014; 2(3): 241-245 Published online June 20, 2014 (http://www.sciencepublishinggroup.com/j/ijll) doi: 10.11648/j.ijll.20140203.23. Retrieved from www.researchgate.com on October 19, 2019.

[14] Tuan.L.T. (2011) Matching and Stretching Learners' Learning Styles. *Journal of Language Teaching and Research,* 2(2), 285-294. Retrieved from www.researchgate.com on October 19, 2019.

[15] Naimie, Z., Siraj, S., Shagholi, R., Abuzaid, R.A. (2010). Did you cook your lesson based on the right recipe? (Accommodating the Students Preferences in Class) *Social Behavioral Sciences,* 2, 383-387. Retrieved (on-line) October 19, 2019.

DOI: 10.37200/IJPR/V24I3/PR200969
Received: 20 Jan 2020 | Revised: 06 Feb 2020 | Accepted: 12 Feb 2020