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STUDENTS' LEARNING STYLES VIS-A-VIS THEIR PREFERRED INSTRUCTIONAL METHODOLOGIES: INPUTS FOR RESPONSIVE TEACHING APPROACHES

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BACKGROUND

Students have different levels of motivation, attitudes on learning, and responses to specific classroom environments and instructional practices. The more thoroughly teachers understand the differences, the better chance they have of meeting the diverse learning needs of their students.

Students take in and process information in different ways: through seeing and hearing, reflecting and acting, reasoning logically and intuitively, analyzing and visualizing. On the other hand, teaching methods vary. Some instructors lecture, others demonstrate or lead students to self-discovery; some focus on principles and others on applications; and some emphasize memory and others understanding.

Learning style was first coined by Helen Thelen in 1954. The current literature shows that learning style's origin lies in individual's psychodynamic history rather than in academic contexts. Grasha (1996) defines learning styles as "personal qualities" that influence a student's ability to acquire information, to interact with peers and the teachers, and to participate in learning experiences. People learn and process information in different ways. This idea gives teachers a clear view on how students learn best.

According to Silver, et al. (2000), every person develops and uses a mixture of learning styles throughout life, usually flexing and adopting styles to fit various contexts and to meet a variety of learning

demands. Yet, most people favor one or two styles over the others. Hence, the identification of learning styles is imperative to educators.

The identification of learning styles may indeed help teachers to classify students, to optimize the match between the teaching strategies and the type of students. Noteworthy along this line were the findings of Felder et al. in 1995. Felder found out that the closer the match between each student's learning style and the teacher style, the higher the grade point average (GPA) was.

Tenedero (2000) cited in his article that identifying learning styles of students and accommodating these through complementary educational, instructional, and counseling interventions result in increased academic achievement. He also noted that students have four types of perceptual strengths: auditory (hearing), visual (seeing), tactile (touching) and kinesthetic (doing). This means that some students learn new information best when it is presented to them through their ears, eyes, hands, or through bodily movements.

Diaz and Cartnal (1999) found out that there is a big difference between the learning styles of students enrolled in distance education program and their counterparts in on-campus. Hence, they strongly recommended that teaching preparation and instructional methodologies be altered to suit such a big difference.

Several models have evolved to identify learning styles of children and adults. The Myers-Briggs Type Indicator, which is anchored on the psychoanalytic theory of Carl Jung, classifies the learner as extraverts, sensors, thinkers and judgers. David Kolb's model, on the other hand, is based on the experiential learning theory. He classifies learners into four types: concrete, reflective; abstract, reflective; abstract, active; and concrete, active. Peter Honey and Alan Mumford attempted to adapt Kolb's experiential model to fit the learning styles of adult in the corporate world.

The Felder-Silverman model classifies students as sensing learners, visual learners, inductive learners, active learners and sequential learners. The Anthony Gregorc's model is based on the existence of perceptions which is assumed to be the foundation of specific learning strengths or learning styles. In this model, there are two perceptual qualities: the concrete and the abstract; and two ordering abilities: the random and the sequential.

To date, the most common and widely-used categorization of various learning styles is Fleming's VARK (sometimes VAK) model. Fleming postulated that visual learners have a preference for seeing (think in pictures; visual aids such as overhead slides, diagrams, handouts, etc.). Auditory learners learn best through listening (lectures, discussions, tapes, etc.). Tactile/kinesthetic learners prefer to learn via experience—moving, touching, and doing (active exploration of the world; science projects; experiments, etc.). In pedagogy, this learning styles model allows teachers to prepare classes that address each of the learning areas. Students can also use the model to identify their learning styles and to maximize their educational experience by focusing on what benefits them the most.

Among the learning styles models available to date, the researcher finds the Fleming's model as the most appropriate for the study.

On the study variable that is focused on the preferred instructional methodologies, the two local studies done by Ochave and Suatengco (2005 and 2006) at the Philippine Normal University stressed the need to match the instructional methodologies preferred by students with the instructional methodologies employed by professors. One notable objective of this study was the identification of the methodologies unique to a subject area. Findings on this particular aspect (specific to professional education courses) guided the researcher in the construction of the checklist for this study. Among the

recommendations of this study was the inclusion in the design of future researches the learning styles of student vis-à-vis their preference in instructional methodologies.

Brown (2003), in her review of the myths and realities about teaching style and learning style, noted that much of the researches support the view that when students' learning preferences match with their instructors' teaching styles, student motivation and achievement usually improve.

Taking off from these literature and studies surrounding learning styles and instructional methodologies in the context of college education, this study aims to heed the call for becoming more responsive to the needs of the students. According to Spoon and Schell (1998), teachers who desire to be more responsive in teaching approaches must be aware of the kinds of learning experiences that students most value, as those may differ depending on the learners' particular stages of development.

Edwards (2001:37) stressed the value of a more student-centered teaching: "Placing learners at the heart of learning process and meeting their needs is taken to a progressive step in which learner-centered approaches mean that persons are able to learn what is relevant for them in ways that are appropriate."

Tan (2000) mentioned in her paper presented in Bangkok, Thailand that one of the emerging trends in basic education is the shift in pedagogy—the shift from traditional approaches where the teachers are the major authority in knowledge construction and transmission to approaches that focus more on learner-centered education that enhances students' ability to think critically and creatively. Learner-centered education according to Tan (2000) helps students arrive at their own truth, thereby, contributing to knowledge generation and construction.

PURPOSE

The study explored the learning styles of third year BEED students of PNU vis-a-vis their preferred instructional methodologies in professional education courses in school year 2009-2010. The specific objectives of the study are as follows:

1. Describe the learning styles of the students according to Fleming's VAK model;
2. Describe the instructional methodologies in professional education courses preferred by the students according to the categorization in the Ochave and Suatengco's study;
3. Describe the typical preferences on instructional methodologies of each group when grouped according to learning styles; and
4. Describe the instructional methodologies that are most preferred across the three types of learners.

METHODOLOGY

Quantitative in nature, this study used the 14-item questionnaire on learning style adopted from the book of Corpus et al. (2001) to describe the learning styles of the respondents. The questionnaire categorized the students as visual, auditory and tactile/kinesthetic learners. A checklist was developed and content validated to elicit the students' preferred instructional methodologies in professional education courses guided by the categorization made by Ochave and Suatengco (2006).

The research population comprised all the junior BEED students (a total of 134) in school year 2009-2010. The researcher (also the instructor in Professional Education 3 and Professional Education 8)

administered the two research instruments after a class session. All the data in the accomplished forms were tabulated and analyzed using the SPSS, a data processing program.

RESULTS AND DISCUSSION

A. Learning styles of the respondents according to Fleming's VAK model

Table 1 presents the classification of the respondents according to their learning styles. Majority or 76% of them were visual while about 13.4% were auditory and only about 9% were kinesthetic/tactile learners.

Table 1. Classification of the Respondents according to Learning Styles

Learning Style	Frequency	Percentage
Visual	103	76.90
Auditory	18	13.40
Kinesthetic/tactile	13	9.70
Total	134	100.00

B. Instructional methodologies preferred by the respondents

In discerning the preferred teaching methodologies of the respondents, the researcher used the categorization made by Ochave and Suatengco (2006). Based on their findings, the professors teaching professional education courses utilized instructional methodologies under three main themes: passive, interactive and reflective. The extent of the students' participation determined the categorization.

According to Ochave and Suatengco (2006), the passive category refers to instructional methodologies that require receptive

and observation skills and there is a limited physical and social interaction. In these teaching methodologies, professors either stand in front of the class or stay at the back to observe the class.

Table 2 presents the respondents' preference of the passive type of teaching methods like demonstration, peer teaching, reporting, project, lecture, reading and individual activities.

Table 2. Passive Type Instructional Methodologies Preferred by Respondents

Method of Teaching	I prefer this method all the time		I prefer this method most of the time		I prefer this method sometimes		I do not prefer this method	
	f	%	f	%	f	%	f	%
Demonstration	37	27.61	**64**	**47.76**	30	22.39	3	2.24
Peer-Teaching	10	7.46	47	35.07	**73**	**54.48**	4	2.99
Reporting	23	17.16	42	31.34	53	39.55	16	11.94
Project	11	8.21	39	29.10	**67**	**50.00**	16	11.94
Lecture	**46**	**34.33**	53	39.55	27	20.15	7	5.22
Reading	25	18.66	**55**	**41.04**	42	31.34	11	8.21
Individual Activities	30	22.39	50	37.31	46	34.33	7	5.22

Considering the frequency and percentage distribution reflected in Table 2, it shows that most of the respondents (46) or 34.33% preferred lecture all the time. Demonstration was preferred most of the time by about 64 (or 47.76%) of the respondents followed by reading of 55 or 41.04% respondents. Seventy-three (73) or 54.48% sometimes preferred peer teaching followed by 67 (or 50%) who sometimes preferred doing projects.

The students' preference of the teaching methods classified interactive is shown in Table 3. Interactive teaching methods include role playing, group activities, small group discussion, simulations, cooperative learning, tell-and-do, and brainstorming.

Table 3. Interactive Type Instructional Methodologies Preferred by Respondents

Method of Teaching	I prefer this method all the time		I prefer this method most of the time		I prefer this method sometimes		I do not prefer this method	
	f	%	f	%	f	%	f	%
Role Playing	25	18.66	57	42.54	**48**	**35.82**	7	5.22
Group Activities	**46**	**34.33**	**74**	**55.22**	14	10.45	0	0.00
Small Group Discussion	24	17.91	**64**	**47.76**	43	32.09	1	0.75
Simulations	19	14.18	58	43.28	**49**	**36.57**	4	2.99
Cooperative Learning	39	29.10	**65**	**48.51**	28	20.90	1	0.75
Tell-and-do	26	19.40	**54**	**40.30**	48	35.82	5	3.73
Brainstorming	34	25.37	**67**	**50.00**	33	24.63	0	0.00

The interactive methodologies facilitate a spontaneous exchange of ideas, thoughts, and experiences among students. In this category, active involvement of the students, both mentally and physically, is necessary in accomplishing a task. Here, the professor's role is to set the tone and atmosphere for a free-flowing and open interaction (Ochave & Suatengco, 2006).

Based on the frequency and percentage distribution exhibited in Table 3, it appears that group activities ranked first when the students were given the chance to be interactive inside the classroom. This is

apparent among the 34.33% of the respondents who preferred this method all the time and among the 55.22% of the respondents who preferred this method most of the time. Other teaching strategies preferred by the respondents most of the time were small group discussion (47.76%), cooperative learning (48.51%), tell and do (40.30%) and brainstorming (50%).

The last category of instructional methodologies is reflective. According to Ochave and Suatengco (2006), this category pertains to methods that enable students to become field-independent. These methods of teaching are more focused on developing the analytical and critical thinking skills of students as they perform activities without direct or indirect intervention of their professors.

Table 4 presents the data gathered to classify the respondents according to their preferred instructional methodologies under the reflective category.

Table 4. Reflective Type Instructional Methodologies Preferred by Respondents

Method of Teaching	I prefer this method all the time		I prefer this method most of the time		I prefer this method sometimes		I do not prefer this method	
	f	%	f	%	f	%	f	%
Reflective Essay	23	17.16	36	26.87	**64**	**47.76**	10	7.46
Inductive	17	12.69	**61**	**45.52**	49	36.57	7	5.22
Situational Questions	**46**	**34.33**	**61**	**45.52**	23	17.16	4	2.99
Research	13	9.70	50	37.31	**56**	**41.79**	15	11.19
Film Analysis	29	21.64	47	35.07	47	35.07	11	8.21

It is evident that among the methodologies under the reflective category, situational questioning was preferred all the time by about 34.33% of the respondents. The inductive (45.52%) as well as the situational questions (45.52%) were most of the time preferred by the respondents. Reflective essay (47.76%) and research (41.79%) were sometimes preferred by nearly a half of the respondents.

C. Instructional methodology preference of respondents grouped according to learning styles

In presenting the results under this aspect of the study, the researcher used the computed mean for each of the instructional methodologies that the respondents rated from the four-point scale that ranged from: "I do not prefer this method"; "I prefer this method sometimes"; "I prefer this method most of the time"; to "I prefer this method all the time." In doing this, the range of preference was deduced into what was common among the sample of the study. The following interpretation for each computed mean were employed:

4.00 – 3.51 - The group prefers the method all the time
3.50 – 2.51 - The group prefers the method most of the time
2.50 – 1.51 - The group prefers the method sometimes
1.50 - 1.00 - The group do not prefer the method

Table 5 shows that the auditory learners preferred most of the time the demonstration method (mean=2.89) and lecture method (mean=2.83). By sometimes using the methods, the respondents further expressed that peer teaching, reporting, project, reading and individual activities could supplement the teaching–learning process.

Table 5. Passive Type Instructional Methodologies Preferred by Respondents Categorized as Auditory Learners (n= 18)

Method of Teaching	Computed Mean	Interpretation
Demonstration	2.89	The group prefers the method most of the time
Peer-Teaching	2.39	The group prefers the method sometimes
Reporting	2.33	The group prefers the method sometimes
Project	2.50	The group prefers the method sometimes
Lecture	2.83	The group prefers the method most of the time
Reading	2.28	The group prefers the method sometimes
Individual Activities	2.50	The group prefers the method sometimes

These findings confirm what the Fleming's VARK model theorized—auditory learners learn best when passively listening to lectures and discussions.

Table 6 reveals that the seven methods of teaching of interactive type had an equal footing as regards auditory learners' typical preferences. The mean scores show that auditory learners preferred these methods most of the time. Interactive type of teaching has been practically practiced to complement the more common passive type of teaching styles as discussed in Table 5.

Table 6. Interactive Type Instructional Methodologies Preferred by Respondents Categorized as Auditory Learners (n= 18)

Method of Teaching	Computed Mean	Interpretation
Role Playing	2.61	The group prefers the method most of the time
Group Activities	3.06	The group prefers the method most of the time
Small Group Discussion	2.72	The group prefers the method most of the time
Simulations	2.61	The group prefers the method most of the time
Cooperative Learning	2.76	The group prefers the method most of the time
Tell-and-do	3.00	The group prefers the method most of the time
Brainstorming	3.11	The group prefers the method most of the time

The 18 respondents classified as auditory learners preferred most of the time the reflective essay, inductive, situational questions and film analysis (Table 7).

Table 7. Reflective Type Instructional Methodologies Preferred by Respondents Categorized as Auditory Learners (n= 18)

Method of Teaching	Computed Mean	Interpretation
Reflective Essay	2.62	The group prefers the method most of the time
Inductive	2.54	The group prefers the method most of the time
Situational Questions	3.15	The group prefers the method most of the time
Research	2.23	The group prefers the method sometimes
Film Analysis	2.92	The group prefers the method most of the time

The mean scores presented in Table 8 show that kinesthetic learners differed from the auditory learners only in "individual activities" as instructional methodology (Table 5). Typically, auditory learners preferred this method sometimes, whereas kinesthetic learners preferred this method most of the time. In the light of the Fleming's theory, it can be inferred that kinesthetic learners are inclined to prefer activities which they themselves do, giving them freedom to strategize things toward completion. Whereas, the auditory learners learn best though their sense of hearing.

Table 8. Passive Type Instructional Methodologies Preferred by Respondents Categorized as Kinesthetic Learners (n= 13)

Method of Teaching	Computed Mean	Interpretation
Demonstration	3.00	The group prefers the method most of the time
Peer-Teaching	2.38	The group prefers the method sometimes
Reporting	2.23	The group prefers the method sometimes
Project	2.38	The group prefers the method sometimes
Lecture	2.62	The group prefers the method most of the time
Reading	2.42	The group prefers the method sometimes
Individual Activities	2.77	The group prefers the method most of the time

As reflected in Table 9, kinesthetic learners preferred most of the time all the teaching methods utilized in professional education courses. As revealed by the mean scores, it seems that both the auditory learners (Table 6) and the kinesthetic learners preferred interactive way of learning. Such findings imply that auditory and the kinesthetic learners enjoy learning experiences gained through interactive method of teaching.

Table 9. Interactive Type Instructional Methodologies Preferred by Respondents Categorized as Kinesthetic Learners (n=13)

Method of Teaching	Computed Mean	Interpretation
Role Playing	2.62	The group prefers the method most of the time
Group Activities	3.23	The group prefers the method most of the time
Small Group Discussion	2.78	The group prefers the method most of the time
Simulations	2.54	The group prefers the method most of the time
Cooperative Learning	3.15	The group prefers the method most of the time
Tell-and-do	2.77	The group prefers the method most of the time
Brainstorming	2.85	The group prefers the method most of the time

Seemingly, all methods of teaching under the reflective type such as reflective essay, inductive, situational questions, research and film analysis were sometimes preferred by the kinesthetic learners.

The computed mean scores in Table 10 confirm that most of the methodologies of reflective type which did not involve much of doing and touching things, seemed to be less appealing to kinesthetic learners.

Table 10. Reflective Type Instructional Methodologies Preferred by Respondents Categorized as Kinesthetic Learners (n=13)

Method of Teaching	Computed Mean	Interpretation
Reflective Essay	2.22	The group prefers the method sometimes
Inductive	2.50	The group prefers the method sometimes
Situational Questions	3.15	The group prefers the method most of the time
Research	2.23	The group prefers the method sometimes
Film Analysis	2.22	The group prefers the method sometimes

Table 11 shows that the visual learners' group preferred most of the time the demonstration, reporting, lecture, reading and individual activities. They sometimes preferred peer-teaching and projects.

Table 11. Passive Type Instructional Methodologies Preferred by Respondents Categorized as Visual Learners (n=103)

Method of Teaching	Computed Mean	Interpretation
Demonstration	3.03	The group prefers the method most of the time
Peer-Teaching	2.50	The group prefers the method sometimes
Reporting	2.61	The group prefers the method most of the time
Project	2.30	The group prefers the method sometimes
Lecture	3.13	The group prefers the method most of the time
Reading	2.82	The group prefers the method most of the time
Individual Activities	2.81	The group prefers the method most of the time

The data presented in Table 12 confirms the analyses on auditory learners (Table 6) and on kinesthetic learners (Table 9). This shows that, regardless of their learning styles, the respondents prefer most of the time all the interactive type methods of teaching to be utilized in professional education courses.

The experiences gained through the interactive type methods of teaching appear to boost the students' enthusiasm to learn. Also, the level of involvement of each student in these methods of teaching shows the need for active participation to produce better outputs.

Table 12. Interactive Type Instructional Methodologies Preferred by Respondents Categorized as Visual Learners (n=103)

Method of Teaching	Computed Mean	Interpretation
Role Playing	2.82	The group prefers the method most of the time
Group Activities	3.27	The group prefers the method most of the time
Small Group Discussion	2.87	The group prefers the method most of the time
Simulations	2.70	The group prefers the method most of the time
Cooperative Learning	3.11	The group prefers the method most of the time
Tell-and-do	2.72	The group prefers the method most of the time
Brainstorming	3.01	The group prefers the method most of the time

Under the reflective type of instructional methodologies, the visual learners' group preferred most of the time situational questions and film analysis. On the other hand, they sometimes preferred reflective essay, inductive, and research methodologies.

Table 13. Reflective Type Instructional Methodologies Preferred by Respondents Categorized as Visual Learners (n=103)

Method of Teaching	Computed Mean	Interpretation
Reflective Essay	2.50	The group prefers the method sometimes
Inductive	2.20	The group prefers the method sometimes
Situational Questions	3.11	The group prefers the method most of the time
Research	2.48	The group prefers the method sometimes
Film Analysis	2.68	The group prefers the method most of the time

D. Most preferred instructional methodologies across the three types of learners

Cognizant of the discussion in section C, Table 14 summarizes the instructional methodologies preferred most of the time by learners across the three categories. The methodologies under the three themes were ranked according to the computed mean scores. Only those methodologies classified as preferred "most of the time" were included in the ranking.

Instructional methodologies classified interactive seemed to have greater appeal to all types of learners. This can be confirmed by the interpretation of the computed mean scores (the group preferred most of the time) in section C (Tables 6, 9 and 12). Table 14 further shows that all types of learners preferred most of the time brainstorming and group activities.

This particular result of the study confirms the observation (cited by Tan, 2000) that one of the emerging trends in pedagogy is

geared toward learner-centered education that provides rich experiences to students through more interactive methods and lesser of the traditional approaches where teachers transmit knowledge with all of their authorities inside the classroom.

Under the reflective type of teaching methods, situational questioning employed by professors appealed to all types of learners. Unlike kinesthetic learners, auditory and visual learners preferred most of the time film analysis. Only the auditory learners expressed preference for reflective essays most of the time.

Table 14. Most Preferred Instructional Methodologies by Learners of Different Learning Styles

	Passive	**Interactive**	**Reflective**
Auditory	1. Demonstration 2. Lecture	1. Brainstorming 2. Group Activities 3. Tell-and-do	1. Situational Questions 2. Film Analysis 3. Reflective Essay
Kinesthetic	1. Demonstration 2. Individual Activities	1. Cooperative Learning 2. Group Activities 3. Brainstorming	1. Situational Questions
Visual	1. Lecture 2. Demonstration 3. Reading	1. Group Activities 2. Cooperative Learning 3. Brainstorming	1. Situational Questions 2. Film Analysis

Comparing further the typical preference of the respondents on the general types of instructional methodologies, Table 15 shows that,

with the mean score of 2.74, visual learners generally preferred passive type of instructional methodologies. With the mean score of 2.84, auditory and kinesthetic learners both typically preferred interactive type of methodologies.

Table 15. Type of Instructional Methodologies vis-a-vis the Three Categories of Learning Styles

Type/Learner	Visual	Auditory	Kinesthetic
Passive type	**2.74**	2.53	2.54
Interactive type	2.54	**2.84**	**2.84**
Reflective type	2.59	2.70	2.46

CONCLUSIONS

Responsiveness to teaching methodologies calls for the rudiments of knowing the nature and peculiarities of students. This is evidently suggested by the findings of the study. Further, the researcher arrived at the following conclusions:

1. The majority of the third year BEED major students are considered visual learners thus, they learn best when taught with the aid of slides, diagrams and handouts, etc.

2. When classified according to the respondents' preferences for teaching methodologies, instructional methodologies of interactive type has a greater appeal across all learning styles. Hence, in teaching professional education courses, there is a felt need for more employment of interactive type of instructional methodologies like role playing, group

activities, small group discussion, simulations, cooperative learning, tell-and-do and brainstorming. Giving situational questions during recitation, on the other hand, complements the interactive activities, thereby fostering critical thinking among the students. However, the utilization of the traditional lecture-type of teaching is still well-appreciated.

3. The preference for "demonstration" as a teaching method across all types of learners is crucial since this method is very relevant in honing the respondents' presentation skills as future teachers.

RECOMMENDATIONS

1. Assessment of entry behavior of a class can include the identification of their learning styles so that they can become more responsive to the teaching approaches.

2. Employment of interactive activities in different professional education courses fosters learning as interactive activities were found to be well appreciated across all learning styles of third year PNU BEED students.

3. The skills of the PNU students for the "demonstration" type of teaching methodology be further strengthened to help them become more effective in oral presentation.

4. Conduct of researches that focus more on variables that deal with exposing learners to learning activities that mismatch their learning style could provide a different slant or new dimension in learning styles researches in education.

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