Vermunt’ Learning Styles Model and Its Implication to Teaching-Learning Activities

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Abstract

Learners learn in various ways. Knowledge and understanding of the student’s learning preferences are essential in maximizing the learning process and identifying appropriate teaching-learning activities. This paper aims to describe the learner’s learning style using Vermunt’s Learning Style Model. It further analyses the learning styles on the learner’s gender. There were 342 college students who responded to Vermunt’s Inventory of Learning Styles. Learning styles were further described through the Focus Group discussions (FGD). Reproduction-directed and meaning-directed learning styles dominated among learners. However, gender differences were observed in the reproduction-directed learning styles. Notably, reproduction-directed learners were externally regulated. Improvement of learner’s study habit through the acquisition of self-regulating skills such as planning their learning activities, monitoring progress, diagnosis problems, could facilitate the development of process-oriented strategies of learning. The outcome of the study was used in designing the teaching-learning activities of the students. Classroom activities were used to allow students demonstrate and practice the skills that they have learned. Reproduction of learned behavior could facilitate the development of meaning-directed learning styles. A further implication of the study is on the appropriateness of teaching-learning activities and learning materials based on the learner’s learning style.

Introduction

Every profession, a grounded base of knowledge and an excellent articulation of the theories are important. All professionals acquire everything that they need to know to perform their profession properly while they are still students (Stern, 2009). To help students, studying the skills required for being an effective Occupational Therapist, the American Occupational Therapy Association (AOTA) (n.d., as cited in Simmons, Wilkomm, & Behling, 2010) has launched a “Centennial Vision.” The vision requires academic settings to examine and evaluate different modes of instruction for future Occupational Therapists. With an increasing awareness and enrollment for the profession, comes a more eclectic group of students. Therefore, the developers of the Centennial Vision stressed the importance of the need to identify the diversity and unique learning styles of the students. Through this, educators can produce practitioners that are ready to meet the challenges of the profession’s vision (Simmons et al., 2010). It is from this perspective that the study has been investigated.

American Heritage Dictionary of the English Language (2014) defined learning as “the act, process or experience of gaining knowledge or skill.” Multiple learning theories also have different meanings for learning. In the learning theory of behaviorism, Laliberte (2005) defined learning as the outward expression of new behaviors. In the context of behaviorism, learning
is said to be apparent when changes in behavior are observed, because, in behaviorism, the outward behavior is the key indicator of human learning. A process called conditioning brings these changes. If there is an absence of change in the individual’s behavior, learning has not happened (Pham, 2011).

Although behaviorism explains the outward behaviors of a person, it does not account for processes taking place in the mind that cannot be observed. Cognitivists believed that thinking plays a role in learning. They argued with behaviorists on how they thought that learning was simply a reaction to stimuli. Cognitivism, therein, grew in response to behaviorism to better understand the processes behind learning (Laliberte, 2005). Cognitivism then replaced behaviorism in the 1960’s as the dominant paradigm. Cognitive view learning as the study of mental processes involved in learning and memory (Dudley, 1999).

Before being known as cognitivism, it was first called information processing. Cognitivism emphasizes the mental structures as informational paths. From these paths, information then proceeds to their symbolic schematization to produce learning. Cognitive theories are influenced by the occurrences inside one’s head (cognitive processes) as they learn. In this perspective, the learners actively process information. With this strategy, as new information is being linked to old knowledge, concepts, and ideas, learning occurs. These cognitive learning strategies emphasize on the processing of information in meaningful ways (Pham, 2011).

Cognitivism is a theory that considers the influence of prior learning and an individual’s prior experiences. In cognitivism, learning and instruction is a sequence of phases, utilizing the cognitive steps of coding, storing, retrieving and transferring information. Cognitivism differs from behaviorists who do not consider these strategies as being important (Plotnik, 2006).

The concept of information processing, as associated with cognitive learning, has three aspects. First, the information is broken down into more manageable bits. It is said that the human mind can hold on to smaller pieces of information (Huitt, 2003). Thus, it is vital to find a balance when breaking down the task into much more functional parts to ensure that the learner can learn the information correctly.

The second aspect of information processing is concerned with gathering, encoding, retaining and retrieving the information. It is a recurring process that results in the individual being able to use the new information, skills and knowledge (Huitt, 2003). With this new information, the individual will be able to listen, think, remember, and apply what they have learned. The third and last aspect are how one uses environmental stimuli with the information already stored in memory. This dynamic process relies on a two-way flow of information to help individuals give meaning to the world around us (Huitt, 2003).

Information processing in this study is further investigated using the framework of Jan Vermunt, a Dutch psychologist, and professor at Utrecht University in the Netherlands. In 1992, Vermunt published a dissertation about how students learn in higher education. He took into consideration the metacognitive, cognitive and affective functions that were involved in learning (Crutcher, 2010). He then proposed four different learning styles that he now calls learning patterns and developed a questionnaire to measure them (Vermunt & Vermelten, 2004).

Vermunt (2005) conceptualizes professional learning as developing a way of thinking and acting that characterizes the culture of a professional community. He sees learning as an active process wherein learners construct, modify, and utilize mental conceptions of a subject and interpret situations within a specific domain. He claims that learning patterns or styles are results of the interaction between the students’ personal characteristics and the context of the learning environment. As such, learning patterns differ with influence from various contexts, situations, and domains. Some of these influences are the academic discipline or domain itself, prior education, age, gender, and personal influences.
Vermunt (2005) identified four (4) learning styles which are: meaning-directed, reproduction-directed, application-directed, and undirected. Each of these styles incorporates four domains of learning. Processing strategies describe how students think about and process information; they can be labeled as deep, stepwise or concrete. Regulation strategies use metacognitive activities that the students use to plan, monitor and control their learning; they are labeled as self-regulation, external-regulation, or lack of regulation. Mental models of learning are when what the students think about the learning process; they are labeled as construction, intake, use, stimulating education or cooperation. Learning orientations include the students’ personal intentions feelings and motivations that they experience throughout the learning process; they are labeled as personally interested, certificate-directed, self-test directed, vocation-directed or ambivalent (Vermunt, 2005).

With these learning domains, he characterized each of the styles. Meaning-directed learner tends to manifest the following characteristics: relating, structuring and processing the subject matter critically, self-regulation of learning processes and contents, construction of knowledge and personal interest. Students use a deep processing approach to their studies. They look for relationships between parts of the subject matter and try to bring structure into these connections. They are critical to what they hear and read, and use logical arguments to check whether the conclusions follow the facts on which they are based. They are self-regulated to a high degree. They can set their goals, monitor the progress well, recognized difficulties and identify their causes, and consult other sources other than the prescribed material. By studying out of their personal interest, they view learning as constructing their knowledge and insights. They also believe that they are responsible for their success in learning (Vermunt, 2005).

Reproduction-directed learning is characterized as memorizing and rehearsing, analyzing, external regulation, self-test directed learning orientation and viewing the learning process as the intake of existing knowledge. Students with a reproduction-directed learning style learn by heart. They go through the subject matter in a stepwise fashion and study the material thoroughly, analytically, and in detail. They can reduce the issue effectively to an amount that can be remembered. In the regulation of their learning, they are strongly directed by external sources such as their teachers, their classmates and the directions in the study materials. They view learning as externally present from experts (teachers, books, and the internet) that should be transferred to their head. Vermunt (2005) also pointed out that learners with reproduction-directed learning styles do well in achievement or periodical tests. However, this learning style negatively correlates to life-long learning.

Concrete processing, vocational learning orientation, and importance on the use of knowledge characterize application-directed learning. In contrast, students who learn through application-directed pattern mainly pay attention to relationships between the subject matter and their surrounding world. Students process the issue concretely by forming actual images with the abstract material and think about how it can be applied in practice. In this pattern, both self- and external regulation occurs. They attach importance in learning and use what they had learned later. The underlying learning orientation is often vocational in that students want to prepare themselves for a future profession or want to improve themselves in their current profession (Vermunt, 2005).

Undirected learning is characterized by a lack of regulation, an ambivalent learning orientation that results to doubt in one’s ability and uncertainty regarding one’s goals, which leads to desiring a stimulating education. Students with an undirected learning pattern mostly have trouble distinguishing more and less important parts of the subject matter. They find everything equally important and are unable to reduce the study material enough for them to cope with it. Therefore, they hardly get to the processing of the subject matter. They have less regulation in their study habits and do not know well how to do better. Often they continued
these learning patterns from secondary education. These types of students attach much value to being stimulated by teachers and other students in hopes that others can ease the study problems they experience (Vermunt & Vermetten, 2004).

Vermunt and Vermetten (2004), further point out that the four learning styles interplay with each other in everyone. A dominant learning style then emerges depending on different factors such as personal and contextual factors, cultural background, age, sex, and field of study. Examining the diversity of the students’ learning styles to ensure the development of a functional academic training program.

Mayhew and Ford (1974, as cited in Coppard & Dickerson 2007), said that professional education is a means to educate students with theoretical knowledge and practice skill competencies to practice a profession. That it must be directed toward important objectives, including professional competence, understanding of society, ethical behavior, and scholarly concern. Professional education is often ensured as higher education institution prepare the instructional program aligned with the expected competencies of the students.

An instructional program refers to “basic factors, variables, and such, that a teacher must consider, systematize, and implement to teach a particular skill and lesson” (Williams, Brown, & Certo, 2001). Brown and York (1974) model as cited by Williams et al. (2001) identified a four (4) component model of an instructional program involving: (1) what to teach (content); (2) how to teach (method); (3) how does one assess whether one has taught (measurement); and (4) the instructional materials required. However, Williams et al. (2001) found in their study that the model was not enough to aid the teaching of specific skills needed by the student. Therefore, the “four (4) component model” was expanded and is presented in the table below.

<table>
<thead>
<tr>
<th>Table 1.0</th>
<th>Basic Components of an Instructional Program (Williams et al., 2001)</th>
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<tbody>
<tr>
<td>I</td>
<td>What skill or knowledge does a teacher intend for the student to perform (What does a teacher intend to teach the student)?</td>
</tr>
<tr>
<td>II</td>
<td>Why does a teacher want the student to perform a specific skill or learn a specific theory?</td>
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<tr>
<td>III</td>
<td>How does a teacher intend to teach the student theory or to perform a skill?</td>
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<tr>
<td>IV</td>
<td>How can a teacher empirically verify that the skill or theory of concern is being or has been taught?</td>
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<tr>
<td>V</td>
<td>Can the student perform the skill or apply theory at a situationally acceptable rate?</td>
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<tr>
<td>VI</td>
<td>What does a teacher intend to use as vehicles (instructional materials) for the skill or knowledge to be acquired and performed?</td>
</tr>
<tr>
<td>VII</td>
<td>Can the student perform the skill or apply the knowledge across: a. Persons b. Places c. Instructional Materials d. Language Cues</td>
</tr>
<tr>
<td>VIII</td>
<td>Can the student perform without directions to do so from persons in authority?</td>
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</table>

Within the classroom, many teacher-student dynamics and teaching approaches have been explored by different theorists. As a cognitivist, Vermunt (2007) not only made a model of learning but also made a model of instruction that fosters self-directed learning called
process-oriented instruction. He explored different approaches to teaching that had varied levels of regulation, ranging from a dominantly external type of regulation to self-regulation.

In Vermunt’s (2007) paper, approaches were explored such as traditional teaching, assignment-based teaching, problem-based learning, project-centered learning, self-directed learning of specialized subjects, competency-based teaching, and work-based learning.

Traditional teaching was used in the traditional classroom settings throughout the previous century. It is the form of teaching where teachers use textbooks as their guide and make set lesson plans for their classes. After the completion of these lessons, a comprehensive exam of the covered topics is given to the students. In this approach to learning, the subject matter, learning objectives, study resources, criteria for the learning outcomes, assessment and feedback were all completely in the hands of the teacher (Vermunt, 2007).

In assignment-based teaching, the main idea for learning is a guided self-study. The students are given instructions on their assignments, and the results of these assignments were discussed in learning groups. Regulation for the students to study still lie heavily on the teachers but compared to traditional teaching, the students have more freedom and responsibility (Vermunt, 2007).

Problem-based learning (PBL) also allows the students to work in groups. However, instead of an assignment-based learning, the students start with a problem that they should gain knowledge. PBL is carefully planned to work through seven steps: (1) clarifying terms and concepts not readily understood; (2) defining the problem; (3) analyzing the problem; (4) summarizing the various explanations of the problem into a coherent model; (5) formulating learning objectives; (6) individual study activities outside the group and (7) report and synthesize the newly acquired information (Vermunt, 2007). In this teaching approach, the students have most of the responsibility as the teacher acts as a facilitator. The student’s regulation is still external like that of problem-based learning (Vermunt, 2007).

Self-directed learning of specific subjects is usually observed during the most advanced years of studies in higher education. They usually take for of research papers and dissertations. At this point, “students have acquired the essential knowledge based on the discipline and specialize in certain aspects” that are most interesting to them. The teachers in this approach act as supervisors. In self-directed learning, student’s regulation to learning is more self-directed. They are personally interested in learning (Vermunt, 2007).

Competency-based teaching extensively integrates “knowledge, insights, skills and attitudes.” Because of its demanding drive, students are often steered to self-regulate in their learning. Through self-evaluations, students can make their personal development plan (PDP). These plans will help the students discern where they can improve on whether it be skills or knowledge. At the end of their training, the students are assessed to see if they have reached their target learning goals. The teacher in this approach acts as a ‘study career coach.’ They play a major role, not in regulation, but in coaching and providing support to the students (Vermunt 2007).

In work-based learning, the students learn through experience and learn the skills necessary for their profession, which is different from autodidactic learning. In the last teaching approach, the students themselves act as their teachers. This is because they can
decide on all the aspects of their learning processing: the problems addressed, the learning objectives, the learning activities, the resources to be consulted, the learning outcomes, and assessment and feedback (Vermunt, 2007).

Simmons (1997, as cited in Vermunt & Vermetten, 2004) pointed out that process-oriented instruction intends to integrate teaching of domain-specific knowledge on the one hand, and learning and thinking strategies on the other. It is an educational approach that promotes ‘learning to learn.’ Vermunt and Vermetten (2004) mentioned that this is done by inhibiting undirected and reproduction-directed learning styles and promoting meaning- and application-directed learning.

Vermunt and Vermetten (2004) emphasized that process-oriented instruction is the slow transfer of the student’s “learning processes from the teacher and other instructional agents to the students.” When Vermunt (1995, as cited in Vermunt & Vermetten, 2004) implemented process-oriented instruction, he found that the undirected and reproduction-directed learners changed their learning conceptions in a constructive direction. While meaning and application-directed learners gained better integration and usability of the constructive learning conceptions.

In the current classroom setting, the instructors or educators are responsible for defining and outlining what goes on inside the classroom, how performance is measured and the outcomes that are expected from the students. Pham’s (2011) said that teachers are using a behavioral type of teaching approach which Vermunt’s (2005) model says that having heavy external regulation from the teachers facilitates the students’ tendency to become reproduction-directed learners.

Vermunt (2007) pointed that the main issue of how the student learns and its quality may be promoted throughout a curriculum. He expressed that the goal of higher education is the preparation of students for self-regulated, cooperative and work-based learning later in life. Crucial qualities of a powerful teaching-learning environments from this point of view would be on how the students are prepared for lifelong learning, foster high-quality student learning, change of teaching methods to respond to the increasing metacognitive functioning, development of the self-regulatory skills, and the complexity of the real-life problems used as an impetus for learning gradually and systemically.

Aiming to foster a specific learning style to emerge from the instructional program may be helped by incorporating an Outcomes Based Education (OBE) in the instructional program. OBE changes the role of the teacher as a transmitter of knowledge to a facilitator of learning (Griffin, 1998; Donney, 2007). Furthermore, students’ awareness of their learning styles would allow them to recognize their strengths, and acknowledge weakness. Awareness, in turn, would help them to work more efficiently given the opportunity to self-direct and develop more effective collaborative relationships with others (Robertson, Smellie, Wilson & Cox, 2011).

**Methodology**

Participants of the study were 342 Occupational Therapy students of a private para-medical institution, Cebu Doctors’ University. The population is composed of 67 males and 275 female Occupational Therapy students. Year level distribution was as follows - first (63), second (103), third (133), fourth (25) and fifth (18).

Data collection of the study was done using Vermunt’s Learning Styles Inventory (LSI). Focus group discussion was also done to provide narrative experiences of the students learning styles.

Vermunt’s Inventory of Learning Styles (ILS) was used to measure several components of student learning (Vermunt & Vermetten, 2004). It was based on the analyses of interviews.
with higher education students (at least 16 years of age) on their way and ideas of learning, studying and teaching, and their motives, concerns and personal goals in their education. It consisted of 120 statements that covered four (4) learning components: cognitive processing strategies, metacognitive regulation strategies, conceptions of learning, and learning orientations. Vermunt’s (2005) inventory used subscales to measure the characteristics of each of the four (4) domains. Cognitive processing strategies subscales are as follows - deep processing, stepwise processing and concrete processing; regulation strategies - self-regulation, external regulation and lack of regulation; conceptions of learning - construction of knowledge, intake of knowledge, use of knowledge, stimulating education and cooperative learning; and learning orientations - personally interested, certificate oriented, self-test oriented, vocation-oriented and ambivalent.

Test-retest correlations for each of the four areas were 0.4-0.8 over three to six months (Crutcher, 2010). Busato et al. (1999, as cited in Crutcher, 2010) also reported good internal consistency for the various scales of the tool with alpha coefficients between 0.68 and 0.93. Coffield et al. (2004) found the tool (as cited in Crutcher, 2010) to have good predictor validity for examination performance for one of the four learning styles in the model, namely, the meaning-directed style, and it was positively associated with academic success. Vermunt (1996, as cited in Crutcher, 2010) also reported that his studies showed alphas of 0.70 or higher in 33 of 40 cases.

Focus Group Discussion (FGD) was also done with the participants after their learning styles were measured. Participants were grouped in the FGD to their respective learning styles, gender and year level. The outcome of the FGD gave further illustration of the participants perceived learning styles.

Learning styles profile were summarized in frequency distribution and percentage. Analysis of the differences in the learning styles with regards to gender was done through Independent Sample t-test at 0.05 alpha level.

Ethical review approval was given to the study by the Institutional Review Committee before the data collection was done.

Results

Examining the learning styles of the students using Vermunt’s Learning Style Inventory (LSI), the result shows that reproduction-directed and meaning-directed significantly were observed from the population. Though, the majority (310, 90%) of the students have reproduction-directed learning styles. In the Focus Group Discussion with these students, it was commonly narrated that they greatly valued external regulation from their teachers and classmates regarding reminders, cues, notices, and feedbacks. Also, memorization of learning materials is done through verbalizing, visualizing, and self-test. Meaning-directed learning style was observed to the minority (32, 10%) of the students who participated the study. Students with meaning-directed learning styles expressed in the FGD that they would prefer to be given freedom in brainstorming and integrating ideas. Their creativity is more expressed in a problem-based learning activity where one is given the opportunity to freely expressed their thoughts. They learn more as they can relate ideas on their previous learnings.

Independent sample t-test has been used to analyzed the differences in the students’ learning styles by gender.
Results of t-test and Descriptive Statistics of Learning Styles by Gender

As shown in the table above, the t-test analysis shows that there is no significant difference on the students’ gender and the three (3) learning styles, meaning-directed ($t = -1.637, p = 0.103$), application-directed ($t = -1.744, p = 0.082$) and undirected ($t = -1.465, p = 0.144$). The computed p values of the three (3) learning styles is greater than the alpha level of 0.05. Significant difference was observed in the reproduction-directed learning styles ($t= -2.223, p = 0.027$).

**Discussion**

Based on the results, among the four (4) Vermunt learning styles, reproduction-directed and meaning-directed were observed among the students. Significantly, reproduction-directed learning styles dominated in the population. Students with this type of learning style learn more of the material by heart. They went through the topics in a stepwise manner and studied the material thoroughly, analytically, and in detail. The name of the learning style comes from the tendency that the learner must reproduce the subject matter as efficiently as they can. The propensity to reproduce the material originates from the view of the learner that learning is externally present from experts (teachers, books, and the internet). This propensity also means that reproduction-directed learners are guided by external sources such as their teachers (Vermunt, 2005).

Reproduction-directed learning style is observed in courses such as economic, law and natural sciences. These are courses whose subject matter mostly needs memorization of various
concepts and facts while the active participation of the students is given few incentives (Vermunt, 2005). In the case of the Occupational Therapy students, learning the theoretical frameworks may provide the foundation, however, its application is necessary to the practice of the profession. As students at the higher education level, they are expectedly put meaning on the concepts learn and apply such in the simulation activities that the training provides.

Deeper analysis of the result could imply that the dominance of the reproduction-directed learning style among the students could be attributed to the instructional program given, specifically on the content, method, assessment and instructional materials required (Brown & York, 1974; William et al., 2001). As observed in the instructional program of Occupational Therapy, acquisition of the course content through lecture-based teaching method has been practice. The assessment and instructional materials given were aligned with the primary teaching method used. UNESCO (2014) pointed out that among the countries of Asia, lecture-based teaching method has been continually used in acquiring knowledge. Experience may have been used to develop critical thinking skills. However, teachers must provide an environment for the students to take an active role in learning. Re-designing the teaching-learning activities into process-oriented instruction would hopefully facilitate the development of the meaning-directed and application-directed learning styles among the students.

Shifting to a process-oriented instruction would hopefully improve the distribution of the meaning-directed learning styles that is the minimally observe from the study population. Developing this learning style would mean having students who use deep processing approach to their education. Learning to focus on relationships and structures within the subject matter and would be more critical and use logical arguments on facts to check conclusions. These learners are self-regulated, not needing the prodding of others during studying and can set their goals, monitor their progress well, recognize difficulties and identify their causes, and consult other sources other than the prescribed material (Vermunt, 2007).

Given that students would be able to develop meaning-directed learning style, this would ultimately facilitate them of becoming application-directed learners. The students’ ability to consider the relationships of the concepts could lead them to test these and finding out what could happen in doing so.

Further analysis of the result also shows that there is a significant difference in the reproduction-directed learning styles regarding the students’ gender. Result validates the claim of Vermunt and Vermetten (2004) that female students tend to use more reproduction-directed learning style compare to the males. Female students tend to be more relational in learning, while, males would prefer to learn independently (Magolda, 1998; Crutcher, 2010). However, female students dominated the males in the study. The male population size may have contributed the significant difference of the learning styles regarding gender.

**Implication**

It is evident from the result that reproduction-directed learning styles are observed among the students. They have externally regulated learners. As students in higher education, learning must be intrinsically motivated. This is important in one’s academic training in the practice of their chosen profession. Thus, the result implies the need to improve the reproduction-directed learners’ study habits through the acquisition of self-regulating skills such as planning their learning activities, monitoring progress, and diagnosing problems could facilitate the development of process-oriented strategies of learning. Process-oriented instruction is the gradual transfer of a learner’s regulation from external regulation to self-regulation. Through this gradual transfer, students may increase their tendency from being
reproduction directed to becoming more meaning-directed and application-directed learners (Vermunt & Vermetten, 2004).

Furthermore, the implementation of Outcomes-Based Education (OBE) in the higher education could greatly facilitate in designing the teaching-learning activities to provide more opportunities for active student learning. Classroom activities such as cooperative learning, hands-on, simulation, and experiential learning could be included to allow students demonstrate and practice the skills that they are learned conceptually.

In conclusion, assessing the students’ learning styles in designing the instructional program would significantly contribute in appropriately identifying the teaching-learning activities and materials that could heighten learning.

References


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