Improving inventory learning style

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ABSTRACT

الأهداف : دراسة استبيان طرق التعلم لفيرمونت كمثال على غيرها من استبيانات طرق التعلم، والتعرف على طرق تعلم الطلاب، وما يمرون به عندما يجيبون على الاستبيانات المختلفة، ومعرفة ما إذا كانت هذه الاستبيانات قد ساعدتهم على التعرف على طرق تعلمهم وكيفية تطويرها. ويتلو ذلك مراجعة للدراسات بهذا الشأن وإعطاء النصائح الملائمة .

الطريقة : لائحة أسئلة عددية ومقابلات نوعية شبه مرتبة، تمت في قسم النساء والولادة في مدينة الملك عبد العزيز الطبية، مستشفى الملك فهد للحرس الوطني – الرياض – المملكة العربية السعودية، خلال الفترة من نوفمبر 2006م وحتى ديسمبر 2006م .

النتائج : لم يكن هناك فروق ذات قيمة إحصائية بين مختلف طرق تعلم الطلاب . خلال المقابلات كانت الأفكار الشائعة هي أن لائحة الاستبيان طويلة بتكرر 15/17، وتستغرق الكثير من الوقت بتكرر 15/17، ومملة 10/17، وكونها تتلاءم مع ما يظنون أنه طريقة تعلمهم بتكرر 12/17 .

خاتمة : بشكل عام فإن مختلف وسائل استبيان طرق التعلم مملة وتستغرق الكثير من الوقت. هذه الاستبيانات تتداخل فيما بينها وتحتوي على عدة مصطلحات تؤدي إلى نفس المعنى. هناك حاجة للعمل جنبا إلى جنب لتوحيد جميع المصطلحات، والتقليل من طول هذه الاستبيانات، مع الأخذ بعين الاعتبار استنهاض همة الطلاب، واختلاف بيئاتهم الاجتماعية، كذلك العوامل العاطفية. إن إجراء هذه التعديلات على الاستبيانات سيسمح بنتائج أكثر دقة، وتقديم استشارات مفيدة للطلاب، إضافتاً إلى ذلك، فإنه سوف يمكننا من القيام بالمراجعات المنهجية وإثراء الدراسات العلمية بمعلومات قيمة متجنبين إهدار الوقت و الجهد .

Objectives: To look into Vermunt learning style inventory as an example of other inventories, identify the students learning style, their experience when they answered the inventory, did it help them to identify their learning style, and how it can be improved.

Methods: Quantitative questionnaire, and qualitative semi structured interviews at King Abdulaziz Medical City, King Fahad National Guard Hospital, Department of Obstetrics and gynecology, from November to December 2006 were recorded.

Results: The quantitative comparison between the 17 studied students inventories revealed no significant difference between the students learning styles. In the interviews, the common themes were long questionnaire with frequency of 15/17, time consuming questionnaire 15/17, boring questionnaire 10/17, and agreement with the learning style identified 12/17.

Conclusion: Inventory learning style questionnaires are in general time-consuming and boring to the students. They are overlapping and using different terminologies for the same meaning. A collaborative work aiming to unify all the terms and reduce the length of the questionnaire is required. We should take into consideration motivation, cultural variations and emotional factors. This will allow more reliable results, better counselling to the students, perform systematic reviews, and enrich the literature with valuable information with avoidance of wasting time and efforts.

Motivation, assessment, teaching methods, mental models, and self regulation are variety of factors that affect the students approach to the process of learning and their study strategy. To identify the factors that influence the study process, and have the maximum effect on students' behavior toward education, a variety of self reported questionnaires have been developed. All those questionnaires use a similar format, however, they usually assess different measures. Over the years, educators in all fields became increasingly aware of the critical importance of understanding individual learning. Many theories were established accompanied by a method of measurement. For example, Witkin's

field-dependence/ field-independence, Kagan's Impulsivity- Reflexivity, Holzman, and Klien Leveller-Sharpner Style, and others.[1-4] Inventory learning style has been used partly as a research tool, to allow students to reflect on, and develop their ways of learning. Vermunt[4] derived the initial set of items from analysis of student's interviews, together with an examination of existing inventories.[5] Vermunt[4,6] uses the term "learning style" as a super-ordinate concept in which the cognitive and affective processing of subject matter, the meta-cognitive regulation of learning, conception of learning, and learning orientations are united. He developed his learning style inventory as a diagnostic tool for use in a higher education context, and the groupings of inventory items were refined through psychometric analysis. He identified 4 learning styles,[4,7] these are processing strategies, regulation strategies, learning orientation, and mental models of learning. The aim of this paper is to look into the Vermunt learning style inventory as an example of other commonly used inventories, identify the students learning style, and ask them about their experience when they have answered it, how much it helped them to identify their learning style, and what they think will be a better questionnaire for them.

Methods. Inventory learning style is a questionnaire designed to identify students' learning style, and be able to advise, and guide them through the process of their learning. Vermunt learning style is composed of a total of 120 questions. These are divided into 4 main domains. 1) Processing strategies (27 items). The scales of this domain are Deep processing (11 items), Scale stepwise processing (11 items), Scale concrete processing (5 items); each of these scales have its own subscales. 2) The second domain is Regulation strategies (28 items). Its scales are, scale self-regulation (11 items), Scale external regulation (11 items), scale lack of regulation (6 items), each of these scales has its own subscales. 3) The third domain is learning orientations (25 items). Its scales are scale personally interested (5 items), scale certificate directed (5 items), scale self-test directed (5 items), Scale vocation directed (5 items), scale ambivalent (5 items); each of these scales carries its subscales. 4) The last domain is the mental models of learning (40 items). Its scales are scale construction of knowledge (9 items), scale intake of knowledge (9 items), scale use of knowledge (6 items), scale stimulating education (8 items), and scale co-operation (8 items); each of these scales has its own subscales. Seventeen medical students who were rotating in the Department of Obstetrics and Gynecology, and agreed to complete the questionnaire were recruited for this research. The selection of the student was random and based on their agreement and cooperation. The sample was purposeful. A quantitative study was initially performed, and 17 medical school students between third and fourth year in King Saud University who were rotating in our Department and agreed to fill up the anonymous Vermunt inventory learning style forms. The students were given an open time to complete the form based on their time availability. The time required was with variable duration ranging between 40-90 minutes. Categorical replies on each of the questions addressed in the questionnaires were compared against each other using a chi-squared test, whereas continuous score on each questionnaire were compared between different subgroups using a student's t-test. Following that, the students had a semi-structured interview aiming to identify their perception towards the inventory they have completed, if it helped them to identify their learning style, and if they think it reflects their learning style. They were then asked to give their recommendations. These interviews were performed by the main investigator who had no pre-determined idea on the students comment. An administrative assistant attended, and taking notes on the students' answers. The interviews' notes were reviewed immediately, and the main themes were identified. We continued the interviews until no further new themes were identified, and we reached saturation.

Results. When we looked into the quantitative data, and analyzed the total score of each domain, it was found that the mean score of the students in the processing strategies was 76±18.1 ranging between 29-114. The mean student score in the regulation strategies was 72.9±19.9 ranging between 24 and 101. Their mean score in the learning orientation was 93±9.9 ranging between 71-109. Finally, they scored 102±9.9 in the mental model of learning ranging between 81 and 117.

Domain I processing strategies. In deep processing, students scored a mean of 17.1±4.3 in the relating and structuring compared with 11.1±3.6 in the critical processing item. In step wise processing, students scored a mean of 17.6±5.3 in the memorizing and rehearsal compared with 16.6±6.3 in the analyzing item. By comparing the 3 categories in domain I, there were no significant differences in the students' scores.

Domain II regulation strategies. In self regulation, students scored 17.1±6.6 in the self regulation of learning processing and results, and 11.5±6.2 in the self regulation of learning content. Students scored 15.3±3.9 in the external regulation of learning processing and 17.0±4.9 in the external regulation of learning results. By comparing the 3 groups in the third domain, there were no significant differences between the 3 groups.

Domain III learning orientation. Students scored 17.4±2.8 in personally oriented, 18.0±3.6 in the

certificate directed, 21.9±2.9 in the self-test directed, 21.5±3.5 in the vocation directed, and 15.9±4.6 in the ambivalent directed. By comparing the results, there were no significant differences between the groups.

Domain IV mental model of learning. In construction of knowledge, they scored 20.3±2.5, 20.5±3.3 in the intake of knowledge, 21.2±3.1 in the use of knowledge, and 19.7±1.9 in the co-operation. There were no significant differences between the groups. In the interview, the common themes were long questionnaire with a frequency of 15/17, time consuming questionnaire 15/17, boring questionnaire 10/17, and agreement with the learning style identified 12/17.

Discussion. From the results presented we notice that almost no significant difference was found between the studied learning styles. However, they scored the highest in the mental model of learning (102±9.9) to be followed by learning orientation with a score of 93±9.9. This lack of strong differences could be a result of the small sample. Students' overall performance is known to be improved by their ability, furthermore, the effect of style on their performance is contingent on the nature of the task.[8] Vermunt used the term mental model to describe how students think about the nature of learning. He described categories in terms of intake of knowledge, use of knowledge, construction of knowledge, simulating education, and cooperative learning. In this group of students, there was no difference found between the various models, however, they scored the highest in the mental model. Some authors have found that mental model is an important element of learning style and subsequent work on conception of learning has suggested additional higher categories, such as changing as a person,[9] and additional qualitative variants intended to take account of cultural variations.[10] As for learning orientations, Vermunt has described 5 learning orientations in his inventory learning style. His target was to explore students' aims and goals in relation to higher education. Applying this on the 17 students who answered the questionnaire, we did not find a significant difference between the different learning orientations explored. However, strong papers have shown differences in student's reasons for taking courses.[11,12] Regarding regulatory aspects in Vermunt inventory learning style, it was found that the main distinguishing dimension was internal versus external control of learning processing. The 3 main strategies were self regulation in which students perform most regulation activities by themselves; external regulation in which students let their learning process be regulated by teachers; and the lack of regulation manifested when students are not only unable to regulate their

learning processes by themselves, however, they experience insufficient support from the external regulation provided by the teachers and general learning environment.[13] We did not identify a significant difference similar to what has been identified by others.[4] Students must believe that with sufficient effort and appropriate strategies, they can learn and understand challenging material. Strategy instructions must give the students a sense of self efficacy on their ability to learn the classroom material.[14] Vermunt[4,6] investigated how students employed their activities in their normal studying behavior, and how such use was related to internal and external sources. The processing strategies of Vermunt, including deep processing which combines the learning activities "relating," "structuring," and "critical processing," stepwise processing consisting of learning activities "analyzing," and "memorizing," and concrete processing with "concreting" and "applying" major learning activities. We did not find a significant difference between those 3 processing strategies in our studied students. Looking back into Vermunt inventory learning style questionnaire, we noticed that there was a lot of overlap with the other questionnaires that were created for the same purpose. Not only this, but the observer will notice different meaning given to the same term between the questionnaires.[5] All the researcher's conceptualization depended on previous academic training and experience, which lead to particular choice of terminology. The increasing number of terminologies, made selection and analysis of different inventories impractical.

Inventory learning style by Vermunt lacks the achievement dimension however, the application directed style represents a potentially valuable addition to the lexicon and conceptualization of study strategies by suggesting a more practical way of thinking, linked to the vocational and certificate orientation.[5] Vermunt inventory learning style did not take into account the cultural variation, and as all other inventories it lacks the emphasis of emotion in learning. It is a very long questionnaire that takes a long time and effort to be answered. During the interviews the common theme was that it was long. Some of them asked for extra time to hand back the filled form while others (7 students) just excused themselves and did not complete the questionnaire, hence, they were excluded from the study. The process of filling the questionnaire was boring to them. It is known that the longer the inventory, the less care students take in completing it and the less likely the staff to use it. However, how long is suitable and how many dimensions are needed? One of the extensive reviews of 6 inventories has left a strong impression that at least 3 dimensions are required to cover the main element[15] In the British context, the

maximum acceptable length is generally around 75 items, however, 50 items is more manageable, taking approximately 15 minutes to complete.[5] The majority of the students who completed the questionnaire have agreed with the result of their learning style analysis, however, they reflected the recommendation to create a shorter questionnaire or even to give it to them in parts. Inventory learning style questionnaires are very time consuming to answer, boring to the students to the extent that they might lose their concentration and start to just tick the answers to satisfy their seniors. They are overlapping and using different terms for the same meaning. It is recommended to start a collaborative work aiming to unify all the terms that are used, reduce the length of the questionnaire, taking into consideration motivation, cultural variations, emotional factors. Doing this will allow the research to obtain more reliable results, better counselling to the students on how to improve their learning style, perform systematic reviews and enrich the literature with valuable information avoiding wasting time and efforts.

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