Student Learning Styles and their Impact on Performance in the Study of Human Anatomy

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1. INTRODUCTION

The VARK inventory assesses a student’s learning style that reflects how a student absorbs and retains information. The VARK inventory was initially developed by Fleming and was later adapted by Millis. Through this study, research was conducted to see if there was a relationship between the learning styles and whether these styles could be used to guide students to the best practices of studying for them.

METHODS

This study was IRB approved. Complete class data was available for 151 students enrolled in the class, 152 students (median age 23), 127 females (84%), 34 males (21%), and 4 students (3%) who did not report their gender. VARK inventory results were available for 148 students (97% of the student population). Of the 22 students that did not have VARK data available, 16 were not able to complete the survey and 6 did not have the results returned. The number of students that have data available for each VARK subtype was as follows: 37 ARK (26%), 58 VA (40%), 41 VR (28%), 12 VK (9%).

RESULTS: Of the 82 female and 69 male students (median age 23), 71% are multimodal (ARK or VAR), 25% are unimodal (VA or VR), 3% are bi-modal (VA and VR, or VA and ARK), and 1% are trinodal (VA, VR, and ARK). These subtypes are used within the study to determine if there is a relationship between the student's learning style and their performance on the written, laboratory, and radiology exams. As the number of learning modalities increase (from unimodal to quadmodal), the students’ performance on the exams in each of these categories improve. The written exams have the largest impact on the student’s grade. As the number of learning modalities increase (from unimodal to quadmodal), the students’ performance on the written exams improves. Students that have unimodal learning preference outperform other students on all exams. Among those that have quadmodal (ARK or VAR) learning preferences, 71% are female and 29% are male. Students that have unimodal learning preference outperform other students on all exams. Among those that have quadmodal (ARK or VAR) learning preferences, 71% are female and 29% are male.

CONCLUSIONS: Learning styles are not significantly impacted by gender or major, although females are more likely to have multimodal (ARK or VAR) preferences (71%) compared to males (29%). These results support the efficacy of the VARK inventory as a tool to use when determining a student’s learning style.

2. METHODS

Institutional review board (IRb) approval was obtained for this study and permission to contact the students was approved by the institutional review board. The students were enrolled in the Human Anatomy course in the Graduate Integrated Curriculum at the University of Wisconsin, Madison. The course objectives were to familiarize students with basic anatomical structures and functions, while integrating methods of investigation, and to develop a foundation for more advanced work in the study of human anatomy. The course evaluates whether student performance is influenced by the learning style and whether a VARK inventory can be used to determine if a student is a good fit for the course. In this study, the learning style questionnaire was used to determine if there is a relationship between the learning style and the performance on the course exams.

RESULTS: The VARK inventory was used to identify students with a learning style that might enable a person’s ability to learn (Student Learning Styles). The VARK inventory is a diagnostic tool designed to assist a student in identifying their learning style that might be most effective. The questionnaire includes four sensory modalities: Visual (V), Auditory (A), Reading/writing (R), and Kinesthetic (K). The questionnaire consists of 16 questions, each of which asks how well the student prefers to learn, and each question is scored on a 5-point scale. The score for each of the four sensory modalities is calculated, and the student is classified into one of the four VARK subtypes. These subtypes can then be grouped into 4 categories: audiokinesthetic (AK), visuokinesthetic (VK), visualreadkinesthetic (VR), and visualauditorykinesthetic (VA).

RESULTS: Of the 152 students enrolled in the class, 71% are multimodal (ARK or VAR), 25% are unimodal (VA or VR), 3% are bi-modal (VA and VR, or VA and ARK), and 1% are trinodal (VA, VR, and ARK). These subtypes are used within the study to determine if there is a relationship between the student’s learning style and their performance on the written, laboratory, and radiology exams. As the number of learning modalities increase (from unimodal to quadmodal), the students’ performance on the written exams improves. Students that have unimodal learning preference outperform other students on all exams. Among those that have quadmodal (ARK or VAR) learning preferences, 71% are female and 29% are male.

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3. RESULTS & DISCUSSION

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