Reviewer’s report

Title: THE RELATIONSHIP BETWEEN LEARNING STYLES AND ACADEMIC PERFORMANCE IN TURKISH PHYSIOTHERAPY STUDENTS

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Reviewer: Brian Mavis

Reviewer’s report:

This paper describes a cross-sectional study measuring learning styles and their association with academic performance. Learning styles were measured using the Grascha-Riechmann Learning Styles Scales (GRLSS). Academic performance was measured using cumulative GPA. The authors found all six learning styles measured by the GRLSS present in the respondents, varying from 5% to 35% of the respondents. "Participant" was the only learning style associated with academic performance, accounting for 16% of the variance. The authors conclude that instructors should incorporate teaching strategies that are consistent with the Participant learning style to increase academic performance overall.

The paper is well written and clearly organized. The authors provide an extensive overview of the literature although some content relevant to this study is not addressed. The research questions as well as a hypothesis are clearly stated. The authors indicate that they have human subjects review approval.

I am uncertain about the Discussion and conclusions the authors have drawn based on the data from their study. The Discussion lacks coherence. The authors suggest that "increasing in-class activities and discussions, which encourage participant-style learning, is needed to increase academic performance. Another approach would be to adapt teaching strategies according to characteristics of Collaboratives, as they represent the largest body of students." The Participants represented only 9% of the class; the collaboratives represent a third of the class; clearly there are more students outside of these types. Further the authors indicate that "The most important reason for determining learning style is to create a proper teaching strategy. However, there is no exact relationship between students' learning style and the curriculum of a program." This seems to negate their prior assertion that teaching to learning styles in important for student success. Common teaching practice encourages a variety of approaches to engage students and meet the needs of the diverse learning styles represented by students in a class and does not support focusing teaching styles to a subset of learning styles. The authors' conclusions are inconsistent and do not seem to add to our understanding of the value of learning styles assessment for curriculum or faculty development. The authors provide no context for their data. They provide no rationale for why students in Turkey would be different from students elsewhere, supporting their assertion that their report on Turkish students is important as the first report. Nor do they provide data that would show that these students are not different from students elsewhere.
While there are a number of ways in which the paper can be improved as far as clarity and readability. These are enumerated below.

1. The rationale for using the GRLSS as a learning styles measure is very limited… "some of these studies also suggested that learning styles should be investigated using different inventories. Therefore we opted to use the GRLSS." No information is provided about the extent to which the GRLSS has been used in prior studies or why this particular measure is the best choice for this study. No information is provided about how this measure compares conceptually or psychometrically to other more standard measures of learning styles. This limitation that should be addressed in the Introduction of the paper.

2. The numbers provided in the paper about study population, sample size and participation rate are confusing. In the second sentence of the Methods section, the authors indicate that 488 students comprise the study population. In the first sentence of the Results, the authors indicate that 217 students were invited to participate. Presumably the use of inclusion and exclusion criteria is what accounts for the difference in these numbers but that is never made explicit to readers. It would be helpful to readers to do so; this will also made clearer how the response rate was determined. It is not common practice to exclude respondents who refuse to participate from the sample when calculating response rate. Based on the available information. It appears the response rate for this study is 184/217=85%.

3. The authors provide two descriptive indicators about the study sample: gender and grade. It would be helpful to know the extent to which these indicators are represented within the subgroups defined by learning styles. Are the learning style groups comparable in terms of gender and grade?

4. The authors indicate that a five point Likert scale was used for respondents. For readers unfamiliar with the GRLSS, it would be helpful to provide an example of the response format used.

5. The authors indicate that the GRLSS was found to have good reliability. The reliability estimates based on this dataset are provided. No indication of how the current reliabilities compare to the published reliabilities. In fact, typically .70 is considered adequate reliability and three of the scale reliabilities reported in Table 3 are less than .70. It appears that scale reliability is a limitation of this study and should be included in the discussion of limitations.

6. The authors are inconsistent in how they refer to the learning style estimates: sometimes they are called scores and sometimes sub-scores. It would be less confusing to readers to use the same term throughout the paper.

7. In the Discussion, the authors write, "This could be the reason for the increased preference for Collaborative learning style." The use of the word "increased" suggests change over time, which is not appropriate for a cross-sectional study, where there is only measures at one point in time. A clearer term would be "greater" or "most preferred."
8. The authors indicate that the use of the GRLSS is a strength of the paper; no rationale is provided except that it is "the first time in the literature." This is a weak rationale and without more extensive information about the properties and prior use of the GRLSS, it should not be included as a strength of the paper. In the current form as written, it is a weakness of the study.

9. The reference list of the paper, while extensive, largely cites older research. There are only 13 of 39 references published in the last 10 years.

10. In Table 3 the total number of items listed is 10, but based on other information in the table it appears that 60 is the total number of items.

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

Yes

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

No

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