Critical review of reappraising cognitive styles

Science

This research is based on empirical user trial data and a sophisticated analysis. It tries to evaluate the validity of applying visual-verbal preferences to an adaptive web-based educational system (AWBES) by examining user trials of acase study. Previous researches are either focused on pragmatic applications or based on inadequate sample sizes.

This research goes beyond former ones by employing user trials to collect critical data and directly raising the core question of the effectiveness of the method. However, the flaws in method setting, data analysis, ambiguity in details and the claimed result put in doubt the conclusions suggested by the study. Method/Procedure In this research, students were firstly labeled as visual, verbal and bimodal learners through a computer test, and then put into groups with learning contents either matched, or deliberately mismatched, or neutral to their learning styles.

Then tudents'academicperformances were compared to see the significance of differences between groups. Questions were raised when the researchers excluded the verbal users from the statistical analysis due to the extremely small sample size (n= 11). The study is supposed to examine three cognitive styles (visual, verbal, bimodal); therefore without the data of the verbal group, the study is incomplete. The study method is further impaired by two questionable grouping methods. The first questionable method states, " Neutral students were given a mix of visual and verbal ontent, irrespective of their learning style" (p. 30). If a bimodal user is randomly placed in a neutral group and given mixed content, then he will actually receive content matching his learning style. Therefore, since he will end up in given content matching his learning style, it will be more appropriate tor the student to be

placed in the matched group. Furthermore, both the matched group and neutral group have the same bimodal users given neutral contents. This leads to a doubt: the study result which shows insignificant academic differences might be from the similarity of he group members rather than from the invalidity of the utilization.

The second questionable method states, " Mismatched students were given content that was contrary to their learning style" (p. 330). If bimodal users are placed in the mismatched group, what content should be provided to them? Neither visual nor verbal content would be appropriate since they are both partially matched and partially mismatched to a bimodal user; and the neutral content would be inappropriate either, since it matches the bimodal user's cognitive style and ends up eing against the definition of the mismatched group.

A table which illustrates the quantities of three cognitive-styled students distributed into matched/ mismatched/ neutral could help clarify the grouping method. The computer test which distributed students into cognitive groups should employ details and examples of the test and the scoring system to clarify the fairness of the test. As for sampling, the sample size should be adequately enlarged to include an effective verbal sample; the post-secondary students are a biased group which can't meet the variety of people.

The learning module should be studied to see whether it is biased to/against any group/learning style. The quantity of excluded seldom-participating student should be mentioned to allow an exact sample size in the study.

Experiment Results The insignificant mean differences in Table2 to Table6 reject hypothesises 1, 2 and 3. As for hypothesis 4, in order to reject it, the authors should clarity why one mean difference (67. 5-60. 0= 7. 5) is greater than half of the related standard deviation (1 1. 56112= 5. 78) in Table 7, which compares visual, neutral and verbal groups.

The explanation, " upon testing these statistically, there is actually no significance between them" (p. 333) is ambiguous. Thus, the mean differences are not unanimously consistent with the result claimed by the authors that neither the cognitive styles of students nor contents differentiated by the styles contribute to make significant differences instudents' academic performance. The p values from the statistical analysis (p=. 62, p=. 63, p=. 67) are substantially greater than the low p value (less than . 05; or better less than . 01).

The high p values raise the question that the sample selection might lack diversity, and may then further affected the result of the study. Discussion The authors' conclusion that matched/ mismatched learning materials don't contribute to students' learning effect, is not consistent with the aforeclaimed conclusion which concerns the effect of visual and bimodal styles of students and contents. The authors' psychological conclusion that cognitive styles per se are not a validate means of personalising thelearning experienceis not completely consistent ith the result which only concerns visual and bimodal styles.