Internal and External Validity

Name

Institution

ARTICLE #1 Stansbury & Munro (2013)

1. **Briefly describe the purpose of the research (including a description of the levels of each independent variable and the primary dependent variable) and the relevant results**

Technological advancements have not only revolutionized the human life but also the ways through which he acquires information and learns new things. This article attempted to explore the extent to which utilization of video gaming is effective for educational purpose. For that matter, a group of students (both male and female) were first passed through pre-test condition e.g., learning factorial designs with traditional instructional technology. Their pre-test scores were determined through video game scores. In the post test condition, they were introduced to relatively non-traditional innovative teaching method i.e., video games for teaching factorial design. Their post test score were obtained based on the same video game score. Single sample t-test was used for finding the mean differences between pre and post test score which revealed that their scores were improved after using video game as a teaching aid (Stansbury & Munro, 2013).

1. **Evaluation of first validity, beginning with topic sentence stating your assessment of that validity**

The first type of validity that I would embrace discussion is external validity. External validity is referred to as the ability of study results to be generalized on the general population outside the experimental conditions. In my view this study has generalizibility issues because it used a very limited sample size with controlled conditions. Moreover, it addressed only “factorial designs” to verify the effectiveness of video games which can never be generalized to other subjects and topics. It can be concluded that this study has limited external validity for two reasons; one is its limited sample size and second is its specific academic topic i.e., factorial design. Similarly, students with learning disability disorder or attention deficit hyperactivity disorder might not benefit from this type of teaching method because gaming is all about intellectual effort and concentration. Moreover, this innovation might be effective for practical subjects but not for the conceptual ones i.e., mathematics, biology and chemistry.

1. **Evaluation of second validity, beginning with topic sentence stating your assessment of that validity**

The second type of validity that I picked for discussion is internal validity. Internal validity is referred to as the ability of study result to be “error free” and “just right” in a sense that change in dependent variable is solely due to the alteration in independent variable. In my view, this study has weak internal validity as well because of two prominent reasons; gaming scores and study design.

This study used gaming scores for determining students’ level of learning. Some students innately possess excellent gaming skills whereas some do not. Their scores might be affected due to their versatile or poor gaming skills, not due to the level of learning they acquired. It is equally possible that students benefited from the novel teaching methodology but they innately possessed poor gaming skills or felt difficulty in handling computer technology whereas other did not pay much attention to the core concepts but their gaming skills led them to score higher and demonstrate “effectual learning” about factorial designs.

The second threat to internal validity is the study design itself. Since this study utilized repeated measures experimental design in which two conditions were applied to the same population in before and after manner, practice effect might hinder the generation of valid results. For example, when students were asked to participate in the experiment, probably they might be overwhelmed by confusion because they were going to be the part of “systematic scrutiny” by the researcher or they might have paid extra attention to demonstrate “excellent” performance during pre-test evaluation. During the post test phase, confusion might be replaced with the ease as they became experienced after first trial. Moreover, students who could not perform well during the pre-test phase might get motivation to demonstrate compensatory performance in the next trial. These reasons might affect their learning activity and scores; not the video gaming itself. All of these conditions threaten the internal validity of study and no considerable attention was centralized to address these issues or we can say that such confounding variables can never be controlled or eliminated.

**ARTICLE#2 (Ciarocco, Lewandowski & Van Volkom, 2013)**

1. **Briefly describe the purpose of the research (including a description of the levels of the independent variable and the primary dependent variable) and the relevant results**

Psychology is concerned with the study of mental processes and behaviors however psychology students are taught statistics and research methods as required subjects which they often find prosaic and tedious. This study attempted to replace student’s monotony associated with research and statistics with the conductive learning environment provided by the distinctive teaching methodology—the multifaceted approach. Total of 70 psychology students were selected through random sampling technique and underwent repeated measure design; same as the above study did. In the pre-test condition, they were taught APA referencing and writing styles and utilization of research and statistics in practice using conventional lecture method. In the post test trial, multifaceted method i.e., scaffolding and active learning methodologies were employed to teach the same skills. Their scores were obtained on the similar topics. Single sample t-test indicated that there was a significant mean difference between their pre and post test scores. Their post test scores were higher than that of pre test. Moreover, they demonstrated positive attitude towards research and statistics and perceived these subjects highly useful in practice (Ciarocco, Lewandowski & Van Volkom, 2013).

1. **Evaluation of first validity, beginning with topic sentence stating your assessment of that validity**

External validity of this study is quite satisfactory because of the large sample size i.e., 70. Large sample size ensures that findings of the laboratory study under controlled conditions can be applied to the real life population as sample becomes true representative of its population. This study addressed psychology students hence, its satisfactory external validity suggests that all the psychology students must be taught using multifaceted teaching approach because it has the potential to change students’ attitude towards research and statistics methods and their recognition as practically relevant subjects. In other words, enough students were allowed to participate in the experimental study hence their behavior is the identical reflection of large pool of psychology students.

1. **Evaluation of second validity, beginning with topic sentence stating your assessment of that validity**

Internal validity of this study is also satisfactory because this study utilized multifaceted approach to teach research methods and statistics to the psychology students. Based on the Darwin’s theory of individual difference, this study can be said to have theoretical grounds because each student is unique and different from others; multifaceted approach may benefit students with different intellectual and perceptual tendencies. Some students might benefit from some forms of scaffolding whereas some may find active learning matching their learning potential.

Hence, this approach nurtures the individual differences of students in terms of academic learning. However, it cannot be differentiated what approach was more effective for students. The study might get slight threat to internal validity when we talk about “students’ attitudes and perceptions” because what they reported is entirely subjective in nature however, this threat can be ignored because human being is the only source of data when we talk about psychology. Repeated measure design is another threat but is uncontrollable.

**For each of the two validities, a brief explanation of which study had stronger validity and why.**

The second study (Ciarocco, Lewandowski & Van Volkom, 2013) had stronger external and internal validity because potential threats to external validity (sample size) and internal validity (extraneous variables) were eliminated. However, the threat caused by repeated measure design remained constant in both the studies.

References

Ciarocco, N. J., Van Volkom, M., & Lewandowski, G. W. (2013). The impact of a multifaceted approach to teaching research methods on students’ attitudes.*Teaching of Psychology,* 40(1), 20-25.

Stansbury, J. A., & Munro, G. D. (2013). Gaming in the classroom: An innovative way to teach factorial designs. *Teaching of Psychology*, 40(2), 148-152.