Use of audio and knowledge acquisition in the online classroom

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Abstract
It is known that 20% of the nursing students are not successful in passing the nursing course. Nurses are at the core of patient care and treatment and therefore must possess the knowledge of disease management, diagnosis, and treatment processes. Instructional designers are increasingly called upon to produce higher quality instructional programs using ever more efficient methodologies. The new paradigm of student centered learning has become the online classroom. Research is needed to understand the effectiveness of a weekly lesson recording as teaching-learning delivered in an online classroom. The purpose of study is to examine whether audio recorded lessons increase knowledge acquisition of nursing students. This study used a quantitative method using a true-experimental research design. The intervention that will be introduced will be the audio-recorded weekly lessons. Instead of only reading the lesson, the student is able to hear the lesson read to them. The study compared the knowledge acquisition of the undergraduate nursing students during period of prior to the audio component and the period after the audio component implementation. The data were in terms of the class grade distribution. These were the data during two time points, at the start of the online course and at the end of the online course. The sample included a minimum of 128 undergraduate Bachelor of Science in Nursing (BSN) students at a Nursing College. Data on their knowledge acquisition were collected through the examinations of students. A paired t-test of difference analysis was conducted to determine whether weekly audio recorded lessons increase the knowledge acquisition of the student nurse, as evidenced by increased scores in the class grade distribution and a decrease in attrition. The results of the paired t-test of difference analysis showed that there was no significant difference in knowledge acquisition by nursing students who have an audio recording of the weekly lesson and those who do not in their online course. Findings from this study may help instructional designers to produce higher quality instructional programs for the nursing discipline. Undergraduate nursing students require an effective teaching-learning delivery system to prepare them for the Registered Nurses (RN) National Council Licensure Examination (NCLEX). The purpose of this quantitative experimental study was to examine whether audio recorded lessons increase knowledge acquisition. An audio recording of the weekly lesson was added as an option for the student to learn. Instead of only reading the lesson, the student is able to hear the lesson read to them. A true-experimental design was conducted to compare the knowledge acquisition experience of undergraduate Bachelor of Science in Nursing (BSN) students at a Nursing College in the online classroom with and without audio recording. The grade distribution of the NURSING COURSE class with audio-recorded weekly lessons was contrasted to the NURSING COURSE, without audio recording.

Keywords: Nursing, audio-recording, online courses, lesson.

STATEMENT OF THE PROBLEM
As stated in the research of Roytek (2010), “instructional, designers are increasingly called upon to produce higher
quality instructional programs using ever more efficient methodologies” (p. 170). Imparting knowledge to students may entail using different instructional methods to achieve the best possible results. The reason is students may respond differently to styles of learning, particularly audio-recorded weekly lessons, increasing knowledge acquisition and decreasing attrition. The new paradigm of student centered learning has become the online classroom. The online classroom should be student-centered with interactive learning and, instead of reading; the students should have the option to listen to an audio-recorded weekly lesson. Best practice in teaching online recognizes the nursing education paradigm shift from a teacher centered approach to student centered approach. Research is needed to understand the effectiveness of a weekly lesson recording in an online classroom. To gain an understanding of the role of audio recording in an online classroom, research is required to foster student learning. The impetus of this study is the fact that 20% of the students are not successful in passing NURSING COURSE. The desire is a decrease in student attrition.

HYPOTHESIS AND RESEARCH QUESTIONS

This study has a single research question, which is:

RQ1. Does audio recording of the weekly lesson increase knowledge acquisition and decrease attrition?

H0: There is no difference in knowledge acquisition by nursing students who have an audio recording of the weekly lesson and those who do not in their online course.

H1: There is an increase in knowledge acquisition by nursing students who have an audio recording in the online classroom and decrease in attrition.

METHODS

Nurses are at the core of patient care and treatment and therefore must possess the knowledge of disease management, diagnosis, and treatment processes. This process begins in the classroom as student nurses with acquisition of knowledge and the development of a nursing foundation rich in knowledge. Education is very important in the process of becoming a Registered Nurse. The purpose of this quantitative experimental study is to examine whether weekly audio recorded lessons increase the knowledge acquisition of the student nurse, as evidenced by increased scores in the class grade distribution and a decrease in attrition. A quantitative two-group experimental research design was utilized to determine whether the use of weekly audio recorded lessons increased the knowledge acquisition of the student nurse based on class grade distribution and attrition (Riley, McKeivitt, Shriver, & Allen, 2011). A two-group experimental design is a research design used extensively in an experimental research considering behavior and applied behavior analysis of human or non-human participants. In the case of this study, the focus is on the knowledge acquisition of nursing students after using audio recording in their online class.

The first group considered in this study will be those who used a weekly audio recording of the lesson while the second group will be those who did not use a weekly audio recording of the lesson. A baseline score will be measured for both groups prior to using the intervention in their online class. A post score for grades and attrition will also be collected after using the intervention.

Quantitative approaches are employed when the focus of the study is to determine relationships or differences between two or more variables (Babbie, 2012). Quantitative approaches make use of objective measures through numerical representations of the constructs considered in the study.

For the purpose of this study, the dependent variables will be the scores of the participants in the class grade distribution and attrition. The independent variable will be the time the data collected includes observations without changes includes observations after using the weekly audio recording in the online class.

As opposed to a quantitative approach, the qualitative approach is focused on establishing “the meaning of a phenomenon from the views of participants” (Cozby, 2009, p. 20). A qualitative approach was considered for this research, but was found to be misaligned with the objective of the current study because qualitative studies are not focused on comparing numerical scores of participants given an independent variable (Marshall and Rossman, 2008). Thus, a mathematical result is necessary in this research to properly test the research question. To achieve that mathematical result, a quantitative research design will be considered for this study.

Two strategies for quantitative research were considered for this study. These two strategies involve the experimental and non-experimental designs (Bryman, 2012). Experimental research involves controlling the environment through manipulating the independent variable and identifying both a treatment and a control group (Bryman, 2012).

On the other hand, a non-experimental research involves an environment that is not controlled by the researcher and the variables are measured as they occur in practice (Bryman, 2012). Cozby (2009) asserted that non-experimental studies are appropriate when study participants are not subject to manipulation. However, for the purpose of this study, the participants were subject to an intervention such as the weekly audio recording of lessons. Thus, this is considered as an experimental study.
**Table 1. Descriptive Statistics Result of Class Grade Distributions during the Two Periods**

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency (Prior)</td>
<td>31.20</td>
<td>5</td>
<td>27.64</td>
<td>12.36</td>
</tr>
<tr>
<td>Frequency (After)</td>
<td>14.00</td>
<td>5</td>
<td>16.93</td>
<td>7.57</td>
</tr>
</tbody>
</table>

**Instrument**

The instrument used in this study is the class grade distribution and the attendance of nursing students in the online course. The weekly report of students will be used to assess their knowledge acquisition in terms of their performance in class as well as their attendance. The grades and attendance of students will be measured during the start and at the end of the online course. The scores will be compared to determine whether the use of weekly audio recordings increases grades and decreases student attrition.

**Participant Samples**

The target participants for this study will be online nursing students. Specifically, the samples will be nursing students taking online courses. A convenience sampling technique will be utilized to recruit participants for the study. A convenience sampling technique is a non-probability sampling method which is based on the willingness and the availability of the potential participants to participate in the study (Leedy & Ormrod, 2010). All prospective participants are provided with an invitation to participate in the study. However, only those who agree to participate in the study will be considered in the data collection phase (Leedy & Ormrod, 2010). Based on the calculation using G*Power, it is necessary to gather at least 128 nursing student participants for this study (Faul et al., 2009). The calculation was based on several factors. These factors include the type of analysis used for the study. For the purpose of this study, an independent samples t-test will be employed to examine the difference in the class grade distribution and attrition of nursing students who had weekly audio tape recordings of lessons and those who did not. The data on attrition will be based on the grades the participants will receive for the period of the survey.

Another factor considered for sample size calculation is the power of the statistical analysis. The power provides a measure of the probability of rejecting a false null hypothesis. Based on standards, the minimum power that should be employed is at 80% (Cozby, 2009). Another important factor in calculating the minimum sample size is the effect size. The effect size provides a measure of the strength of the relationship between the independent and the dependent variables (Cohen, 1988). For the purpose of this study, a medium effect size will be used to ensure that the analysis will not be too strict or too lenient in assessing relationships between the variables.

The calculation of sample size is also based on the significance level used in the statistical procedure. As a standard, the level of significance is set at 5%. Therefore, a 5% significance level will be employed for all statistical tests considered in this study (Cozby, 2009). Based on the factors considered, G*Power determined that at least 128 participants should be collected for the study. Thus, at least 200 nursing students will be invited to participate in the study to ensure that at least 128 participants have complete data that will be used in this study.

**Data Analysis Procedures**

After data collection, the data gathered from the participants will be imported to SPSS 19.0. SPSS 19.0 will be utilized for the statistical analyses that will be conducted in this study. Descriptive statistics will be used to describe the participants gathered in this study. Moreover, measures of central tendencies such as mean, standard deviation, and range values will be used to describe the constructs considered in this study. In order to test the hypotheses posed in this study, paired samples t-tests will be conducted to assess the difference between the grades and attrition of nursing students who used audio recordings of lessons and those who did not use audio recordings of lessons. Paired samples t-test is used when the focus of the study is to determine significant differences in scores of two independent groups. The p-values will be assessed to determine whether significant differences exist. If the p-values is less than .05, it can be concluded that there is a significance difference between the two groups. Therefore, there is sufficient evidence to reject the null hypotheses posed in this study.

**RESULTS**

A paired sample t-test is conducted to determine whether weekly audio recorded lessons increase the knowledge acquisition of the student nurse, as evidenced by increased scores in the class grade distribution and a decrease in attrition. A comparison of the means of the class grade distribution between the periods of prior to the audio component and after audio component was conducted using the paired t-test. Paired t-test was conducted to have a pairwise comparison of each of the
class grade categories of A, B, C, F, and W during the two time periods. A level of significance of 0.05 was used in the paired t-test. There is a significant difference in the class grade distribution or the knowledge acquisition of the student nurse if the p value of the paired t-test result is less than or equal to the level of significance value of 0.05. If they were significantly different, then this result would suggest whether there is an increase in knowledge acquisition by nursing students who have an audio recording in the online classroom and decrease in attrition or not. On the other hand, a non-significant difference would indicate that there is no difference in knowledge acquisition by nursing students who have an audio recording of the weekly lesson and those who do not in their online course.

First, Table 1 showed the group descriptive statistics of the class grade distribution during periods of prior to the audio component and after audio component. Upon comparing the mean class grade distributions between the two groups of data, it was observed that the class grade distribution during the period of prior to audio recording (M = 31.20) were greater than the class grade distribution during the period after the audio recording (M = 14.00). However, the difference of the mean will be validated if they are significant through the paired t-test results.

Second, Table 2 showed the t-test results of the paired differences in the class grade distribution between the period prior to audio recording and the period after the grade distribution. Analysis of the paired sample t-test results revealed that the paired difference in the class grade distribution between the two data groups (t (4) = 2.54; p = 0.06) were not statistically significantly different because the p-value was greater than the level of significance value of 0.05. Thus, this implied that there is no difference in knowledge acquisition by nursing students who have an audio recording of the weekly lesson and those who do not in their online course.

**SUMMARY**

A quantitative experimental research design was utilized to investigate whether the use of audio recordings of lessons during the online courses of nursing students increases knowledge acquisition. A quantitative two-group experimental study was deemed to be appropriate because of the involvement of participants in an intervention program. The focus is on assessing whether the use of audio recordings of lessons during the online courses of nursing students increases knowledge acquisition based on grades and attrition. The population considered in this study is online nursing students in the NURSING COURSE Health and Wellness course. At least 128 participants were collected in this study to ensure statistical power and validity. Data was collected during two time points, at the start of the online course and at the end of the online course. Data was collected through the exam results of students. These data were used to conduct statistical analysis, which determined whether there is evidence to reject the hypotheses posed in this study. Paired samples t-tests were conducted to address the research questions posed in this study. A significance level of .05 was used throughout the statistical analyses. The results of the paired t-test showed that there is no difference in knowledge acquisition by nursing students who have an audio recording of the weekly lesson and those who do not in their online course.

**REFERENCES**


