

The impact of Discussion Classes on ODL Learners in Basic Statistics

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Abstract

Open distance learning institutions, like the University of South Africa, are tasked with producing policies and procedures that will accommodate the ever-growing student numbers; at the same time they face pressure for better service delivery. Aspects of learner support such as academic counselling, tutoring, the use of the *myUnisa* (University of South Africa student's website) discussion forum, *myStatLab* (online test bank for Statistics) lectures and discussion classes have been singled out for attention in this regard. In this study we investigate the impact of one of these aspects, namely, discussion classes, on the academic achievements of Statistics 1 (STA191Q) students at the University of South Africa in terms of knowledge, understanding and application of teaching skills. Quantitative approaches, such as one sample t-tests, analysis of variance and log-linear analysis were used to assess the impact of discussion classes on learner performance. The results show that there is a significant difference in performance between students who did not attend, those who attended one session and those who attended both discussion class sessions.

Keywords: Statistics, discussion classes, learner support, performance, open distance learning

INTRODUCTION

Open distance learning (ODL) as used by the University of South Africa (Unisa) has witnessed expansion in the recent past. It is now recognised as a proven means of extending access to educational provisions to a large number of aspirants at tertiary levels in most countries of the world. Since its inception a century ago, ODL has transformed itself from correspondence education to virtual education. ODL programmes are being offered with the help of a plethora of interactive media-printed material, audio-video conferencing, internet, academic counselling, assignments, discussion classes, project work, practical work and much more. However, these

technologies may influence learning in unanticipated ways if used without understanding their implications for student learning (Maher 2003).

ODL currently experiences immense growth in new applications of interactive technologies, but we have no guarantees that, without critical reflection on the impact of discussion classes in ODL initiatives, these will produce the intended results. The present study is an attempt to assess the impact of discussion classes on the academic achievement of ODL students of Unisa, a case study of the basic Statistics module, Statistics 1 (STA191Q).

STA191Q is a service module offered to students from different disciplines and with varying background knowledge. It is offered to students in their first year of study, that is, students at National Qualification Framework (NQF) level 5. The purpose of this module is to introduce students to the most important basic statistical concepts. On completion of the module, students should have an informed understanding of various visual descriptions of data, including graphical and tabular techniques, measures of central location, dispersion and association. Accordingly, they are able to use probability as a tool to create discrete and continuous probability distributions (used extensively in statistical inference), determine confidence intervals, perform hypothesis tests involving sample means and proportions, apply different forms of the chi-squared test and understand simple linear regression and correlation. STA191Q, therefore, differs from the more conceptual Statistics modules offered to students majoring in Statistics at Unisa. It is a stand-alone module, as it is not a prerequisite for any second- or third-level Statistics modules.

The Department of Statistics has for long been concerned about the low pass rates in STA191Q. Many explanations have been given for this, including the absence of Statistics as a subject in the school curriculum, insufficient mathematical background owing to the lack of properly trained teachers in Mathematics at school level, students not being used to studying on their own and, as a result, lacking the know-how to pace their progress in Statistics as a subject (Dash 2003).

The existing instructional components of tuition in STA191Q are self-learning materials, study guides, academic counselling, assignments, audio-video

programmes, teleconferences and discussion classes. The Statistics department offers two discussion classes (Part I and Part II) per semester where lecturers visit some Unisa learning centres and present five-hour classes on two consecutive days. Various topics are covered on each day. These classes are advertised in the students' tutorial letters and on *myUnisa* (the Unisa students' website), and reminder text messages are sent out a week prior to each class. In addition, the Statistics Department has recently expanded its learner support measures through the increased use of *myUnisa* discussion forums, podcasts, vodcasts, drop boxes and the introduction of online *myStatslab* lectures. Although the Department of Statistics at Unisa assumes that each of these instructional components has an impact on learner achievement in the ODL environment, there is very little empirical evidence in support of such an assumption, because no formal research has ever been carried out to assess their impact on student performance in STA191Q.

This study is presented in five sections. The introduction and literature review make up the first two sections, section three presents the methodology, section four gives the data analysis, and section five gives the conclusions and recommendations.

Literature review

Please see full paper

METHODOLOGY

A quantitative approach was used to gather information. The quantitative design is a true-experimental design ***post-test-only control group design***. This was chosen because true experimental designs have greater refinement and greater control of validity. They also have the highest level of control among three single-variable experimental designs because the subjects within the groups are randomly assigned from each group. Such random assignment guarantees that any differences between the groups are probably quite small and, in any case, are due entirely to chance. When subjects are randomly assigned, there is higher control of internal as well as external validity. Moreover, there is always a control group to compare the results of the subjects within the experiment with other subjects of similar status that have not been exposed to treatments (Montgomery 2009). In this study, randomness is found

in attending or not attending discussion classes. This is because students attend discussion classes randomly. This means that each student was free to attend or not attend the discussion class without restrictions on the number of sessions.

For more on this section please see full paper

VARIABLES

The results for Statistics 1 (STA191Q) for the second semester of the year 2009 were used in this analysis. Since this data set is large enough (2 825 students), there is no need to test for normality, and parametric tests like the *t*-test and analysis of variance can be used to determine whether differences exist in the variables under study (Keller 2009). In the case(s) where variables are categorical, the chi-squared test of association is used and log-linear analysis is used as a tool for investigating possible interactions for cases where the hypotheses of independence or no association is rejected.

Since attendance is a control factor in this analysis, four types of attendance were designed as follows:

Attendance1: 0 if a student did not attend the first session
 1 if a student attended the first session

Attendance1 refers to first session attendance; that is, students who attended Part I only

Attendance2: 0 if a student did not attend the second session
 1 if a student attended the second session

Attendance2 refers to second session attendance; that is, students who attended Part II only

Attendance3: 0 if a student did not attend either session
 1 if a student attended only one session
 2 if a student attended both sessions

Attendance3 refers to attendance of both sessions; that is, students who attended both Part I and Part II

Attendance4: 0 if a student did not attend both sessions
 1 if a student attended the first session only
 2 if a student attended second session only
 3 if a student attended both sessions

Attendance4 refers to overall attendance

ANALYSIS OF RESULTS

Demographics

For more on this section please see full paper

CONCLUSION AND RECOMMENDATIONS

The results of this study show that discussion classes have a positive impact on student performance. It can be concluded that students who attend discussion classes perform on average better than those who do not attend.

Students who do not attend discussion classes perform poorly on average compared to those who attend either one or both sessions. It is further noticed that students who attended one session of the discussion class performed relatively worse than those who attended both sessions. Although there was a slight improvement in the performance of students who attended the second session only compared to those who attended the first session, this study found that Part I and Part II of the discussion classes had almost the same impact on performance. This means that the first and the second session have the same weight with regard to student performance. The largest contributing interaction effect in performance is that of students who did not attend any discussion classes and failed. The main effect affecting student performance is not attending any discussion classes, which leads to poor pass rates in Statistics 1, STA191Q.

This study further found that the attendance of discussion classes, especially the first session, is not satisfactory. There were low attendance rates at the first session, although the number did increase for the second session. This is not desirable, as it affects the department's resource planning.

RECOMMENDATIONS

It is advised that the department needs to come up with strategies that will improve student attendance at discussion classes, especially the first session, as in the period under study, only 13.2% (286) of the total population attended this session. One strategy that could be used is to offer discussion classes over weekends.

Since face-to-face contact has proved to be a definite benefit for Statistics students, more study groups should be formed where students can work together with the help of tutors and other student support mechanisms in place.

It is also recommended that the number of discussion classes offered in a semester be increased to at least four, as two classes offered on two consecutive days per semester to discuss fifteen chapters of the text are simply not enough.