JURE ERJAVEC
University of Ljubljana, Faculty of Economics, Slovenia

THE IMPACT OF DIFFERENT TYPES OF EXTERNAL LECTURERS IN HIGHER EDUCATION ON STUDENT LEARNING OUTCOMES

Abstract:

Universities often need outside assistance when teaching large classes. This is in the form of teaching assistants coming from the senior or graduate students, and professionals working part time at the university. This study addresses the issue of student outcomes in regard to the type and the number of the lecturers. The study includes 1343 students that attended the same course during three consecutive years. Half of the entire course was taught by different lecturers: undergraduate teaching assistants, graduate teaching assistants, professional experts and internal faculty staff. The student outcomes are measured by different criteria. The results of the research show that there is a statistically significant difference between student outcomes in regard to the number and type of lecturers.

Keywords:

lecturer type, number of lecturers, higher education, cost optimization, independent-samples t-test, one-way ANOVA

JEL Classification: I29

1 Introduction

Due to large numbers of students universities often need to employ outside lecturers that complement the faculty staff. Outside help comes in different forms. The most common and recognized are graduate teaching assistants (Park, 2004), however the lecturers can also be undergraduate, or they can be professionals working part time at the university. Lecturers that participate in the implementation of the entire course and are not the part of the faculty are most often utilized in courses in lower years of college.

There are different factors that can impact students' learning and outcomes. The biggest impact on student learning comes from the teachers (Horsburgh, 1999).

The focus is usually on the connection between research and teaching and intrapersonal skills (Kane, Sandretto and Heath, 2004).

However, there is no research found that would compare different types of outside lecturers by their primary occupational dimension. Therefore this paper presents a study on how different lecturer types by occupation affect student outcomes. The lecturers are separated in four different groups with one of them being faculty and three being outside lecturer types. The student outcomes are measured by three different measures.

One of the specifics of the studied example is that there is a need for two lecturers in one class because of the specifics of the course material. Therefore the comparison also includes the difference between one or two lecturers and all the combinations of different types.

2 Methodology

The sample includes 1343 undergraduate students in their first year of studies. The sample includes students from three consecutive study years: 2011/12, 2012/13 and 2013/14. The course selected is Business informatics at the Faculty of Economics, University of Ljubljana. One part of the course is computer labs. Students need to attend and actively participate in the computer labs. At the end of the semester students need to pass a final test directly related to computer labs.

Students in computer labs are assigned into two types of groups. First type of group has one lecturer and has 12 students on average. The second type of group has two lecturers and 18 students on average.

Due to a large amount of students the entire learning process cannot be supported only by faculty. External lecturers need to be utilized. There are four different types of lecturers.

First lecturer type is an undergraduate teaching assistant (UTA). They are undergraduate students in their senior year who have attended the class that they teach in previous years (in this case Business informatics). The UTAs are selected at the end of their first

year of studies and undergo one year of training during their second year of studies. During their third and subsequent years of studies they teach the selected course.

The second type of lecturer is a graduate teaching assistant (GTA). They are graduate students which attended Faculty of Economics as undergraduate students. Most of the GTAs were UTAs before becoming GTAs.

The third type of lecturer is a professional expert from practice (EXP). Professional experts include former students that attended the class tauggh that are now employed in different industries. Most of the EXPs were formerly UTAs or GTAs.

The fourth types of lecturer are faculty members (AMR). The faculty members consist of lecturers.

Work in all groups in computers labs is the same. The lecturers are given the same exact instructions on how to implement specific lesson. The courseware and textbook are the same for all students, regardless of the group.

We used three different types of measures.

First measure is the grade for in-class participation throughout the semester. The in-class participation grade (ICG) reflects the student's level of involvement during each lesson such as actively participating in discussions, working in teams, actively solving problems etc. Therefore the students with high level of participation get higher grades than the students with lower participation levels. The maximum amount of points that can be achieved by participation is ten points.

The second measure is the grade for the final test at the end of semester (FTG). The final test is taken by each student and is intended to examine the level of knowledge of each student. Students have to take the test individually. The maximum score that can be achieved on the final test is ten points.

The third measure is the attendance level of each student (ATL). It measures the amount of lessons attended during the semester. The maximum number of lessons is ten.

3 Results

3.1 The number of lecturers per group

Firstly we compare how the number of lecturers in the group affects the student outcomes. We compare the students from groups with one lecturer in comparison to the students in groups with two lecturers. There are 14 different possible combinations (4 single and 10 with two lecturers). We use all three measures: ICG, FTG and ATL. An independent-samples t-test was conducted to compare all three measures between groups with one and two lecturers.

When comparing ICGs for two groups the Levene's test for equality of variances shows that variances are assumed equal ($p>0.05$). Mean for group with one lecturer is 8.5297

with standard deviation 1.71676, while mean for group with two lecturers is 8.2348 with standard deviation 1.89770. The t-test ($t(1341) = 2.569$, $p = 0.010$) shows significant difference between group means. Based on these results we can conclude that based on an independent-samples t-test the students in groups with one lecturer had statistically significantly higher ICG (8.53 ± 1.72) than the students in groups with two lecturers (8.23 ± 1.90).

When comparing FTGs for two groups the Levene's test for equality of variances shows that variances are assumed equal ($p>0.05$). Mean for group with one lecturer is 5.4314 with standard deviation 2.51376, while mean for group with two lecturers is 5.3447 with standard deviation 2.76038. The t-test ($t(1152) = 0.469$, $p = 0.639$) shows no significant difference between group means. Based on these results we can conclude that based on an independent-samples t-test the difference in FTG means are not statistically significant.

When comparing ATLs for two groups the Levene's test for equality of variances shows that variances are not assumed equal ($p<0.05$). Mean for group with one lecturer is 8.8810 with standard deviation 1.69977, while mean for group with two lecturers is 8.5646 with standard deviation 1.89709. The t-test ($t(686) = 2.910$, $p = 0.004$) shows significant difference between group means. Based on these results we can conclude that based on an independent-samples t-test the students in groups with one lecturer had statistically significantly higher ATL (8.88 ± 1.70) than the students in groups with two lecturers (8.56 ± 1.90).

3.2 Differences between types of lecturers

In this part we compare the student outcome between groups with different types of lecturers. A one-way between groups ANOVA was conducted to compare the effect of different types of lecturers and their combinations in groups with two lecturers on the student outcome (ICG, FTG and ATL.).

The mean for ICG is 8.31 ± 1.86. For the ICG the groups with the highest mean (9.01 ± 1.23) is the group that has two lecturers: one UTA and one GTA. The ICG groups with the lowest mean (7.63 ± 2.29) is the group with two lecturers, both EXPs. The mean for FTG is 5.37 ± 2.70. For the FTG the groups with the highest mean (6.23 ± 2.55) is the group that has one lecturer (UTA). The FTG groups with the lowest mean (4.90 ± 2.70) is the group with two lecturers, both EXPs. The mean for ATL is 8.65 ± 1.85. For the ATL the groups with the highest mean (9.15 ± 1.13) is the group that has two lecturers: one UTA and one GTA. The ATL groups with the lowest mean (7.95 ± 2.36) is the group with two lecturers, both EXPs.

A one-way between groups ANOVA was conducted to compare the effect of the type of lecturer or combination of two lecturers on the IPG. There was a significant effect of the type of lecturer or combination of two lecturers on the IPG [$F(13,1329) = 2.782$, $p =$

0.001]. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the IPG in the group with one AMR was significantly different for the group with two lecturers (AMR and GTA). However, other means between different types if lecturer or combination of two lecturers were not statistically different.

A one-way between groups ANOVA was conducted to compare the effect of the type of lecturer or combination of two lecturers on the FTG. There was no significant effect of the type of lecturer or combination of two lecturers on the FTG [F(13,1140) = 1.209 , p = 0.266].

A one-way between groups ANOVA was conducted to compare the effect of the type of lecturer or combination of two lecturers on the ATL. There was a significant effect of the type of lecturer or combination of two lecturers on the ATL [F(13,1329) = 2.984 , p = 0.000]. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the ATL in the group with one AMR was significantly different for the group with AMR and GTA, and for the group with two EXP. However, other means between different types if lecturer or combination of two lecturers were not statistically different.

Follow these steps:

1. Please paste only body of your article and use the defined styles!
2. Save your paper on your computer
3. Upload the file to the registration form (link of registration form you find in e-mail of approval of your presentation or you do not hesitate to contact us: iises@iises.net for resending of the edit link)

4 Conclusion

The choice between one or two lecturers per group and subsequently the size of the group is firstly analyzed by comparing the groups with one lecturer and the groups with two lecturers. The results show that there is a significant difference between group means when comparing student outcomes measured by their in-class participation grade, and attendance level. However, there is no significant difference between group means when comparing student outcomes measured by their final test at the end of semester.

Based on the above we can conclude that the groups with one lecturer are more appealing to the students since they attend those classes more frequently. However, there is no hard evidence for the reasons for this extra appeal, therefore this is a topic that needs to be addressed in further research. Based on the higher frequency of their attendance their in-class participation grades also result in higher means than the ones from the groups with two lecturers. From the faculty point of view the groups with one lecturer have 12 students per lecturer on average, while the groups with two lecturers have 9 students per lecturer on average. Therefore in this case it should be in the interest

of the faculty to promote groups with one lecturer and fewer students per group since the costs of lecturers would be lower. However, due to the large size of student population and the available classroom space this is not always possible. Therefore, there is a trade-off between the number of lecturers versus the amount of available space.

However, there is no significant difference between group means when comparing final test grades. This shows that students achieve the same level of knowledge regardless of the number of lecturers teaching in their class.

The number of lecturers is not the only factor that affects the student outcomes. Another important factor is also the type of lecturer. In this research we analyze four different types of lecturers. Another dimension that adds to the complexity of comparison is the different pairs of lecturer types in the groups with two lecturers. Therefore we use one-way between group ANOVA with post hoc analysis to compare the differences in student outcomes in regard to the type of the lecturer or combination of lecturers in their group.

The results show that there is a significant difference between groups when in-class participation grades and attendance level are discussed, with no significant difference between groups when final test scores are discussed. However, post hoc comparisons show that the statistical difference is only between small numbers of groups. Students get better in-class participation grades and attend classes more frequently when there is only one AMR teaching in comparison to AMR having a GTA as an assistant. One AMR teaching is also more appealing to students than two EXPs.

5 References

HORSBURGH, M. (1999) Quality monitoring in higher education: the impact on student learning. *Quality in higher education*, 5(1), pp. 9-25.

KANE, R., SANDRETTO, S., & HEATH, C. (2004) An investigation into excellent tertiary teaching: Emphasising reflective practice. *Higher Education*, 47(3), pp. 283-310.

PARK, C. (2004) The graduate teaching assistant (GTA): lessons from North American experience. *Teaching in Higher Education*, 9(3), pp. 349-361.