

SECTION E

Weekly Discussion Board Questions Relationship to Grades

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ABSTRACT

To encourage in-class participation with online students and simulate face-to-face class experiences the weekly Discussion Board questions have been developed and applied as an integrated part of online learning. This research has investigated the relationship between grades for Discussion Board work and student achievement within a course. In particular how these findings can be used to meet ERAU's *Ignite's* objectives are addressed.

Keywords: Discussion Board questions, on-line learning, statistical analysis, research and student results.

Introduction

Discussion Board (Db) exercises are set in each module for online courses as it was initially conceived to be a way in which to encourage student in-class participation and thus simulate the experience of conventional class based education. Students are asked erudite questions in each module to discuss and respond to others. This weekly exercise populates the course's Blackboard site, shows students the site is active each week. It further offers the chance for students to share experiences and views between themselves that would otherwise go unrecorded by the classmates. Current aviation, specific problems or issues are integrated into these weekly tasks to enlighten students and instructors experiences A student is in effect forced to become involved and comment on others and have their works reviewed by others. With this work being graded it counts towards their final grade and cannot be ignore. This is not arguing that it is wrong; it is in effect a unique way to uniform this modality of study.

Discussion Boards

These weekly Discussion Boards do not replicate in-class experiences of a student that is quiet, not interested in responding and takes a passive role. Likewise if a student has lots to say or contribute with suitable experiences there are upper limits. Instructors are required to police and ensure all students are following the guidelines. An assumption has probably been made that a quiet student is likely to underachieve; many might argue opposite. This would normally happen in lectures in classic settings where class sizes of 200 plus could be expected, (Saunders, Saunders, Lewis, & Thornhill, 2011). Individual instruction or tutorials are where interaction is needed to develop the thought process with students, (Atman et al., 2010). Discussion Board questions are, in effect, a one size fits all for this scope of study and therefore will bring

advantages and disadvantages to all students at various levels. It has been suggested we do not need to engage students when they are working successfully, (Mertens, 2009). On the practical side this creates a weekly task where the instructor has to ensure and respond to postings that are weak or inclusive, for example, "... good post and interesting". When an online class is full this may mean the total number of postings over the week could approach 100 given a post that is presented and then two responses later on this discussion. Over a nine week course this will be in excess of 800 items to be read, commented on, critiqued for accuracy to ensure students do not have incorrect data or knowledge. Likewise, when a student that has posted their comments early that week they may have to wait until sufficient postings later that week to select which ones to respond. This may be an ineffective use of an Instructors time when their capability could be directing students at a higher level.

Methods

To evaluate the role of Discussion Boards as an indicator of research skills and ability/effort it is needed to divide the results into the separate categories; this is done here by when it is submitted *ipso facto* then started. The hypothesis of this research is:

$H_o = \text{students that achieve high grades for Discussion Board work achieve a higher grade overall}$

$H_i = \text{students Discussion Board results are not indicators of final grades}$

In addition, the relationship between the time when submitted and the final grade will also be investigated:

$H_o = \text{students that submit their Discussion Board work early achieve higher overall grades}$

$H_i = \text{students submission of Discussion Board work is independent of final grade}$

These will be analysis with using the Pearson Correlation co-efficient and a simple comparison of means between individuals and between the groups to determine trends and establish if the research hypotheses are correct.

Results

In Figure 1, below, is a breakdown from the authors' on-line courses of a distribution of the days of a week when students post on Discussion Boards. This figure separates out undergraduate and graduate ones. The data is from 2008 until present as is from 8 undergraduate and 7 graduate courses.

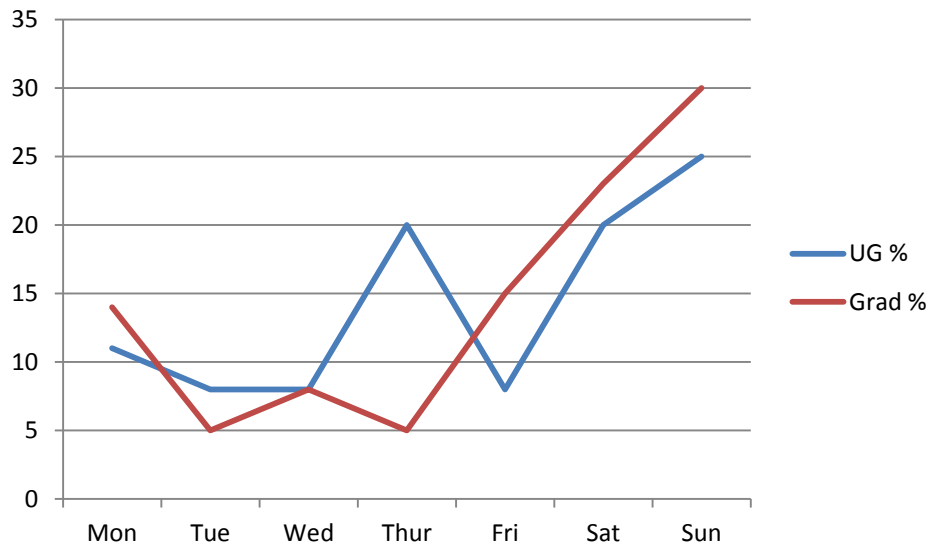


Figure 1. Percentage submission of work by day.

Figure 1, above, you can clearly see the breakdown in percentages of submissions by day of the week. There are similar trends between undergraduate and graduate students that may be explained by several principal reasons; however, this is in general terms only. Those that are graduate students may have more demanding jobs with travel and commitment that inhibit work during the week and they leave all to the weekend when time is less constrictive. Undergraduate students show a spike on a Thursday, catching up before weekends start is a possibility.

Nevertheless, the exact reasons are of secondary value and the distribution itself is critical, (Minner, 2010). For example, if we consider a student that posts on a Monday, they will have started the weekly module on-time and clearly dedicate sufficient time or concentrated on this item to start. They can post on others that have submitted early if these are not already reviewed, as such, they might have to wait until later in the week to complete the work. Having students that have to complete their study at a pace dictated by other students is not ideal. It could be addressed by allowing a student to comment on others regardless of how many posted responses already posted; although this would mean later posted work not reviewed at all. It would also make available weak work to be defended as a student would say "... if no feedback how was I to know otherwise?" Whatever way we justify the needs and reasons for discussion board work there will be limitations that need addressing or that will have consequences, (Lunenburg & Ornstein, 2011).

Relationships between submission of discussion board work and final grades. A trend was observed between the consistencies of the students' grades when they submitted their Discussion Board work. Those that submitted early each week consistently did so throughout the 9 modules of each course. The later submissions were less predictable; although a general pattern was observed. For the ease of comparison the data does not include any that had extensions to deadline, (Barnett, 2012).

Below, in Figure 2 is the correlation of average day of submission to final grade achieved for the weekly exercise. The undergraduate class had a correlation of, $r = -0.848$ whilst the Graduate was, $r = -0.953$. This suggests that those who start work and submit early are more likely to review the exercise with rigor and enthusiasm and produce work that will have a higher

grade. Differences between the undergraduate and Graduate could be explained by chance as there is no significant evidence to suggest otherwise.

A simple answer to this scenario is to enforce early starts to the work, an option that would be difficult to oversee fairly, given online is marketed as flexible, (Astin & Antonio, 2012). Alternatives could be to reward those that do; however, again this tries to condense each module. A negative side effect is that those that submit early tend to comment on the same people each week and those that submit later also tend to have the same situation. Without instructor supervision there is a risk of posting over generous comments.

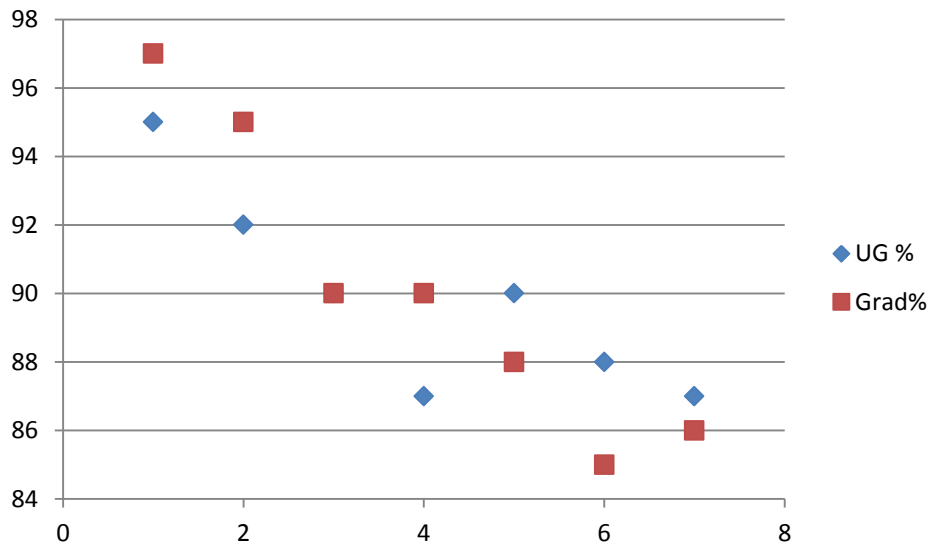


Figure 2. Relationship between grade and day of submission.

A comparison of discussion board grades against final grades is summarized below in Table 1. Again, it can be clearly identified that there is a strong correlation between the earlier postings and an overall reported grade at the end of the course. This may of course highlight that higher achieving students have more time free to concentrate on their discussion board work, (Punch, 2009). This would be at odds with graduate students that can be argued to have achieved higher levels within their profession and certainly a greater commitment to time working. In

addition, given these results cover different courses, undergraduate and graduate, over an extended time period this suggests a trend that is validated further with the statistical results presented in Figures 1 and 2 above. Table 1 further goes to support that there is a link in the effort applied for discussion boards and final grades, regardless of day submitted; although this is indeed influential too.

Table 1

Percentage comparisons of grades.

Course	Early submission (Average)	Late submission (Average)	Pearson correlation coefficient between early and final	Pearson correlation coefficient between late and final
Undergraduate Discussion Board %	95	84	0.87	0.74
Undergraduate Grade %	94	88	0.84	0.78
Graduate Discussion Board %	97	82	0.89	0.81
Graduate Grade %	94	86	0.70	0.78

Table 1 shows the relationship between the time of submission each week for their discussion board and final grade for both undergraduate and graduate classes. Of particular importance is the Pearson product correlation showing not only a consistency of the relationship but a across both levels. The lowest level of correlation is from the graduate link of final grade compared to early submission of discussion board work. Clearly, this is demonstrating that there is a possible strong link between the enthusiasm for this type of work and commitment to research a problem. It can be counter argued that it is just students that starts early are more likely to have the time management skills to fully achieve higher grades. This view, of course possible, is not supported if you compare the consistency of grades within the groups and between the groups at both undergraduate and graduate level.

Discussion Board Questions as Research

If we consider the Discussion Board questions each week are an attempt to direct the students to address and review current or new developments then this is an area of consistency in research that need to be formulated and brought in-line with the *Ignite*. Research Learning Outcomes are at the center of all education within the Worldwide set of delivery modes. Given that in this represented sample of results showing the input we could argue that the Discussion Board aspect needs to be revised from its classic format to something more in line with research of a larger scale. Those, highlighted above, that not only focus on research activities but achieve consistent results, need to be supported in expanding and developing their research skills. In addition, those that are not so committed or struggling with this aspect need to be supported.

It cannot be left to RSCH 202 to be the seminal and principal driver of research that students undertake throughout their studies. ERAU Worldwide is committed to expanding the research skills of students at Undergraduate and graduate level, not just in the gaining of a degree but also as a life-long experience whilst working within their chosen career field. The Discussion Board exercises could be expanded to: make this part a larger contributor towards the final grade, increase the depth and complexity each week or combine these weekly exercises into a larger task.

Conclusion and Recommendations

What this paper and its analysis have demonstrated is that there is a significant link between the success and effort of working on the Discussion Board work to final grade. If it is universally accepted that Discussion Board work each week is an indicator of research skills then it must be questioned if this allotted work in each module is of significant benefit to maximize a student's potential. Further work is suggested to explore how this section of online can be

brought in-line with those of *Ignite* and improve the student's research skills. Furthermore, it is proposed that the expanding the tasks and depths of the research in discussion board work is undertaken. For example, do these results hold true for all their studies? If the link can be shown to be true for Discussion Boards and success based on research then the research aspect of Discussion Boards needs reviewing and a full and critical review of how we can integrate research into all courses.

References

- Astin, A. W., & Antonio, A. L. (2012). *Assessment for excellence: The philosophy and practice of assessment and evaluation in higher education*. Rowman & Littlefield.
- Atman, C. J., Sheppard, S. D., Turns, J., Adams, R. S., Fleming, L. N., Stevens, R., & Lund, D. (2010). *Enabling Engineering Student Success: The Final Report for the Center for the Advancement of Engineering Education*. CAEE-TR-10-02. *Center for the Advancement of Engineering Education*.
- Barnett, R. (2012). Learning for an unknown future. *Higher Education Research & Development, 31*(1), 65-77.
- Lunenburg, F. C., & Ornstein, A. C. (2011). *Educational administration: Concepts and practices*. Wadsworth Publishing Company.
- Mertens, D. M. (2009). *Research and evaluation in education and psychology: Integrating diversity with quantitative, qualitative, and mixed methods*. SAGE Publications, Incorporated.
- Minner, D. D., Levy, A. J., & Century, J. (2010). Inquiry-based science instruction—what is it and does it matter? Results from a research synthesis years 1984 to 2002. *Journal of Research in Science Teaching, 47*(4), 474-496.
- Punch, K. F. (2009). *Introduction to research methods in education*. SAGE Publications Limited.
- Saunders, M.K., Saunders, M., Lewis, P., Thornhill, A (2011). *Research methods for Business Students*, Pearson, India.