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Providing exemplars to students. What impact does this have on the results achieved by students in a law unit of study?

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Abstract
This article reports on a six year longitudinal study designed to investigate whether providing exemplars to students during their course of study has an impact on their results. Over the course of six years in the same law unit of study undertaken at an Australia university, selected groups of students were provided with exemplars whilst others groups were not provided with exemplars. Changes to the results achieved in the final exam were observed and reported between these different groups. The findings of this study indicate very clearly that exemplars have a significant positive impact on the results achieved by students.

Keywords: exemplars, measuring changes, student results, learning

1. Introduction

That assessment and learning are inextricably linked is not in doubt. [1, 2] However students often find themselves drawn in to a world where expectations of their performance are not made sufficiently clear to them. [3, 4] That is, there is often a world of difference between assessment criteria and standards and the practical outcome expected of students by educators.

Over the past twenty to thirty years, exemplars have emerged as a real means by which specific characteristics can be practically represented to students. [5, 6, 7] That is, exemplars can be used to present aspects such as criteria and standards or skills in a real hands-on format. [8, 9] That students want exemplars appears to not be in much doubt [10, 11], but whether exemplars have an impact (either positive or negative) has not been so clear. [12, 13] This study was designed to measure the impact that providing exemplars to student has on their results.

Over a six year period (2009 to 2014) in the same law based unit at an Australian university students were taught the same content. They also completed the same assessment regime. However in some of those year (2009 and 2010) students were provided with exemplars. Whilst in other years (2011 to 2014) exemplars were not provided. Over the course of those six years changes to the results of the students were recorded and have been analysed to see if any change is evident.

2. Methodology

As part of a long term project, between the years 2009 and 2014 annotated exemplars were introduced to a law unit of study at an Australian university in order to measure the impact that they had on student results. The decision as to whether or not to use exemplars as part of the teaching strategy over those six years rested with the unit co-ordinator. Exemplars were provided to students in 2009 and 2010. Exemplars were not provided to students in the years 2011, 2012, 2013 and 2014.

The law unit had three elements of assessment which needed to be completed over the course of a semester. These being an online multiple choice quiz, a take home assignment and a final formal written examination. In the period 2009 to 2010, the online quiz was worth a total of 20 marks, the take home assignment was worth a total of 20 marks and the final examination was worth a total of 60 marks. In the period 2011 to 2014 the weighting of assessment items changed, so that the online quiz was worth a total of 20 marks, the take home assignment was worth a total of 20 marks and the final examination was worth a total of 50 marks.

During the period prior to the introduction of exemplars in 2009 it had been noted that students of the unit had been performing very poorly in the final examination. This was particularly the case in related to the high number of fail grades awarded for the final examination. After examining relevant literature available at the time, a decision to implement exemplars was made by the unit co-ordinator. This decision was partly in response to the perceived value for exemplars from students as well as from the belief by some of the teaching staff at the time that exemplars could be useful in helping to demonstrate to current students exactly what was expected of them in the final examination. [14]

Exemplars were constructed for first use in 2009 from the completed examination papers of students from the 2008 undertaking of the unit. The only exemplars ever provided to students were from those final examinations completed by fellow students who had competed the same unit of study. It was believed that by providing these types of exemplars what was being represented to students were achievable realistic examples. If teacher constructed exemplars had been provided to students this may have been perceived by students as representing unrealistic examples of what they could achieve.

This method of constructing exemplars, rather than teacher constructed exemplars, was chosen as it was a method which had received widespread support in the existing literature. [15, 16, 17] Exemplars which reflected each available grade level were constructed and annotated with comments by the teaching staff. These annotated comments were designed to reflect those particular aspects that were or were not demonstrated in each of the annotated exemplars and were directly linked to the published assessment criteria for the unit. The purpose of this was so that particular skills that were expected to be demonstrated by students could be explicitly illustrated.

Exemplars were placed onto the online portal that students could

access throughout the semester. This portal was accessed by students regularly as it contained copies of lecture notes, the unit outline, tutorial questions and other relevant materials needed to successfully complete the unit including details of assessment items required to be completed. The online portal also contained a student discussion board, so it was a resource that was accessed regularly by the majority of the student cohort. Whilst a record of how many times the exemplar documents were downloaded was kept, it is submitted that this figure is not particularly relevant as the downloading of the document does not reflect whether students actually read or used that document. It could also be the case that one student may have downloaded the same document multiple times to read, instead of saving a copy the first time and using that copy for study purposes on subsequent occasions or it could be that one student downloaded the document and then sent copies to fifty of their friends who also studied the same unit.

It should be noted that in the years 2009 and 2010 when exemplars were used the final examination was worth a total of 60 marks whereas in the years 2011 to 2014 when exemplars were not utilised the final examination was worth a total of 50 marks. As these weightings differed all scores recorded were converted to percentages to ensure the homogeneity of the reported data.

3. Results

In consultation with mathematic professionals and in order to determine the significance of using exemplars, a decision was made to record four mathematical measures over the six year period of the study. Those measures being the average (mean), median, mode and range. These measures were chosen as they represented the most likely method to observe relevant change and in particular significant change if it was to occur.

The following table lists these four mathematical measures as recorded for the results from the six year period of this study:

Table 1: Results for final exam by year (exemplar and no exemplar)

	2009 (Exemplar)	2010 (Exemplar)	2011 (No Exemplar)	2012 (No Exemplar)	2013 (No Exemplar)	2014 (No Exemplar)
Number of results	95	130	994	945	866	708
Average	60.2%	62.7%	52.8%	24%	35.6%	42.1%
Median	61.7%	63.2%	57%	25%	24%	22%
Mode	60.1%	61.6%	53.2%	24.9%	25.4%	28.9%
Range	98	99	89	86	83	80

A number of features of the results indicated in this table should be directly apparent. The first matter that should be noted is that the number of results that is the number of students who completed the final examination, in each of the six years is not the same. This is a matter which is beyond the control of this study. It is apparent that the numbers of students who completed the final examination in each of the years is different and could be stated as being significantly different. Could this have an impact on the results presented in this paper? The answer must be yes. But it could also be argued that a material difference could be present because more males than females sat the examination in one particular year or that the students who sat the examination in one particular year had an average age which was greater than those that sat in another year. Clearly there are many variables beyond the control of this study. No attempt to hide these variables is made. The results reported are as they were found.

It is also noted that none of the reported scores for any of the criteria remained static for the entire six year period of this study. In fact, in a number of the criteria, substantial change is evident. What follows is a more detailed examination of each of these mathematical measures.

3.1 Changes to the average score

As can be seen in the following bar graph, noteworthy changes have occurred with the average scores achieved in the final reported during the six years of the study.

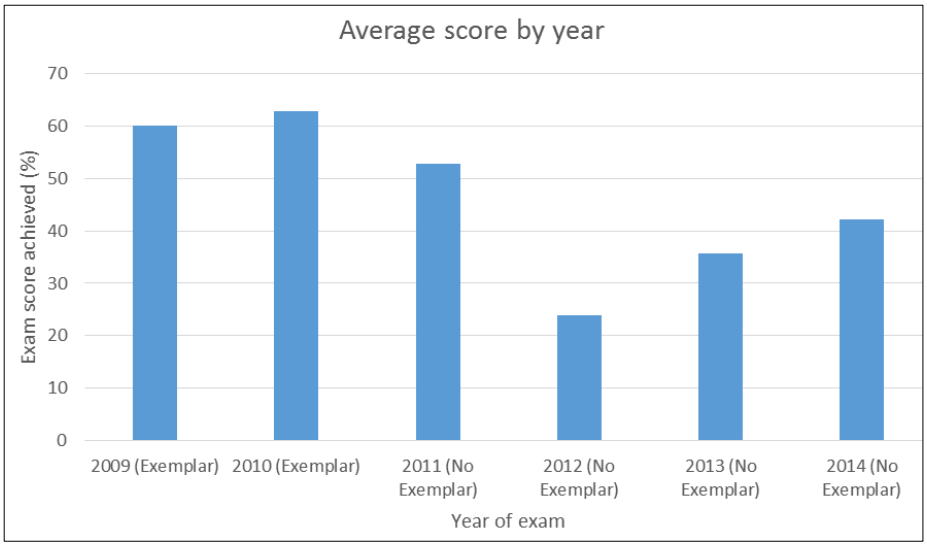

Fig 1

Average scores when exemplars were used in 2009 and 2010 were 60.2% and 62.7% respectively. This means that most students passed the unit. When exemplars were withdrawn in 2011 the average immediately dropped to 52.8%. Whilst this might still be considered an 'acceptable' average for law unit, the average score reduced in the subsequent years. In 2012 the average dropped to a very low 24%. Then in 2013 it was 35.6% before increasing to 42.1% in 2014. So whilst there was only a small decrease in average from 2010 to 2011 the average dropped quite considerably in 2012. This may be due, in part, to a possibility that in 2010 those students who had been provided with exemplars as part of the research project either passing them onto the 2011 cohort or using them again themselves in the possible situation that they failed the unit in 2010 and were repeating the unit in 2011. In the subsequent years of the operation of this unit this possibility reduced.

It should be noted very carefully that the average scores for the final examination were higher in every year that exemplars were used. In fact the average scores were significantly higher in those years where exemplars were used. If we take the lowest average score from 2012 (24%) and compare it with the highest average score in 2010 (62.7), we can see that the difference is 38.4. On this basis there can be little doubt as to the impact that exemplars have on students results in the final examination. Students that are provided with exemplars have a much higher average score.

3.2 Changes to the median score

Clearly an average score and a median score are not the same mathematical measurements. Whilst the average or mean score often represents the typical way in which many understand their performance to be graded against other students in the same unit, it is perhaps the median score which better represents a students' performance. The median score represents the middle score in a set of numbers. That is, half the numbers are above the median and half are below in a particular data set.

As can be seen in the following graph and as was the case following an examination of the average scores, significant changes have occurred with the median scores reported during the six years of the study.

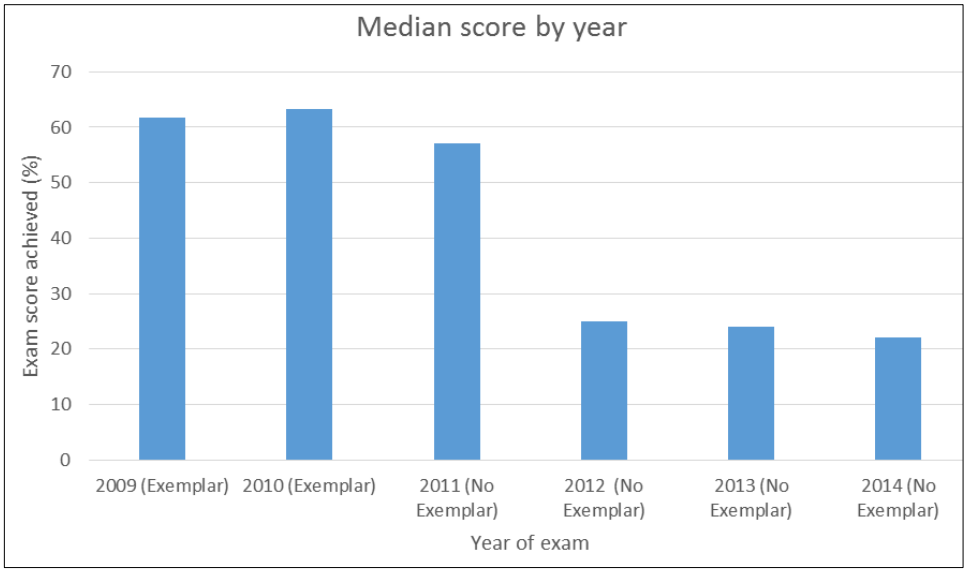

Fig 2

Attention is drawn to those years in which exemplars were provided in 2009 and 2010. Median scores in those years were 60.2% and 63.2% respectively. When exemplars were removed the median scores were 57% in 2011, 25% in 2012, 24% in 2013 and 22% in 2014.

Categorically there is a reported difference in the median scores in those years where exemplars were provided as directly compared against those years where exemplars were not provided. In every year that exemplars were provided to students the median score was higher than those years in which exemplars were not provided. A high of 63.2% is evident when exemplars were provided and a low of 22% is evident when exemplars were not provided. It is clear therefore that students who were provided with exemplars achieved higher median scores.

3.3 Changes to the mode

The mode is the most frequent value in a set of numbers. In terms of providing for valued statistical movements in data it is not frequently used. The average and median scores are more commonly used. It could be argued that it is the only measure of centre appropriate for nominal data, so may not be the most relevant mathematical measure to be used to demonstrate the impact that exemplars have on student performance. However, mode is often part of the suite of mathematical measures used to determine change in value sets, it has therefore been included here along with average, median and range to indicate a full picture of the impact of exemplars.

As can be seen in the following graph, pronounced changes have occurred with the recorded mode over the six years of the study in students who completed the final exam.

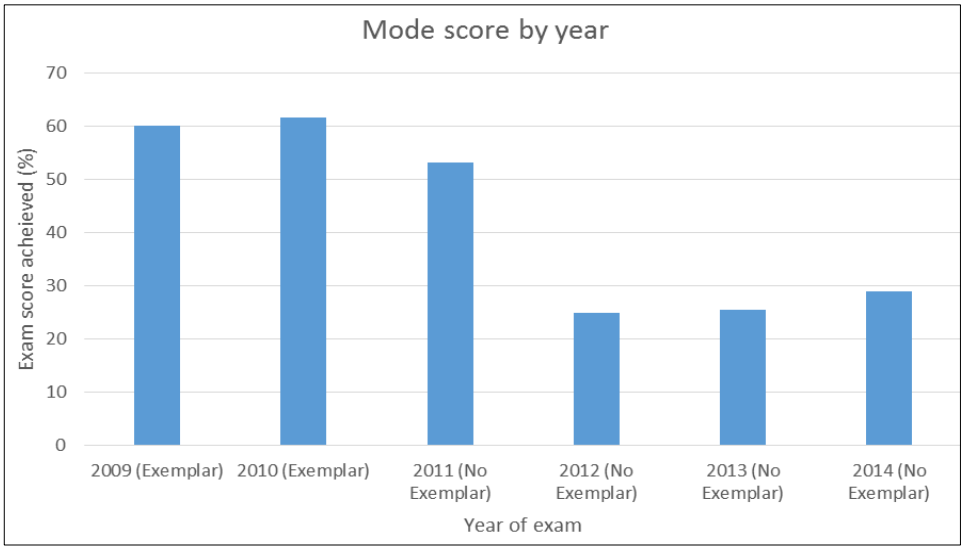

Fig 3

There is certainly a difference evident in the mode in the years that exemplars were provided to students as compared against those years when exemplars were not used. When exemplars were provided in 2009 the mode was 60.1%. In 2010, again when exemplars were provided, the mode was 61.6%. When exemplars were not provided in 2011 the mode dropped to 53.2%. It dropped again to 24.9% in 2012, a year in which exemplars were not provided. In 2013 the mode was 25.4% and in 2014 the mode was 28.9%.

It does not take a very sophisticated analysis of the available data to see the visible difference in the mode in those years where exemplars were provided as compared to those years where exemplars were withheld. Plainly in every year that exemplars were provided the mode was higher than in those years where exemplars were withheld.

3.4 Changes to the range

The range represents the difference between the highest and lowest scores in a set of values. It is offered as a measurement in this study as it reflects the span between the highest and lowest grades awarded in the final exam. The changes in range represented over the six years of this study are displayed in the following graph.

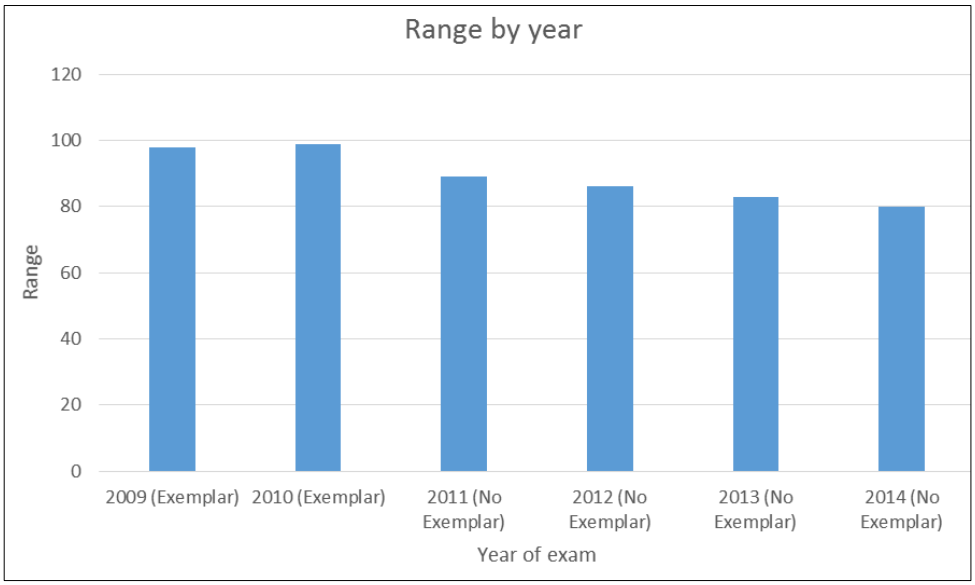

Fig 4

Initially it may seem that the change in values reflected in the above 'range by year' graph does not appear to be as significant as the changes in values for the average, median and mode values already discussed in this article. This may be because the range represents something very different to average, median and mode. What we see in the range is the difference between the highest and lowest scores available to students in the final exam. The highest possible grade is 100. The lowest possible grade is 0. So the highest possible range would be 100.

In the years in which exemplars were provided in 2009 and 2010 the range was 98 and 99 respectively. In the years where exemplars were not provided in 2011, 2012, 2013 and 2014, the range was 89, 86, 83 and 80. This means that in every year that exemplars were provided the range was higher than in every year that exemplars where not provided. As a consequence this means that there was a greater span in the results awarded in those years

where exemplars were used. Meaning that it is probable that some students achieved higher grades in those years when exemplars were provided. In those years where exemplars were not provided, students were confined to a smaller set of available grades.

However it should be noted that there could also be other interpretations given to the range scores reported here, such that a lower range could be a desired result. Take for example a situation where the reported range may have been just 40. It is possible that this range of 40 could have been indicated in a situation where scores ranged from 100 to 60. In this situation the range would have been highly desirable, as all students passed the unit. Although a range of 40 could have also occurred where all students scored between 0 and 40. Clearly this is a less desirable result as all students failed the unit. It is therefore submitted that range is potentially not a very good method of determining the impact of change on student results if used in isolation. Range is used in this article as just one of the four mathematical measures on offer. It is clear, though, that in this study the range was highest in those years in which exemplars were used.

4. Conclusion

This article has reported on a six year period in which it was aimed to examine the value that exemplars have in a law based unit offered at an Australian university. Whilst the issue of using exemplars to clearly communicate criteria and standards or skills or competencies is a separate matter, the purpose of this study was to measure the changes to student's results by providing exemplars as directly compared to not providing exemplars. Clearly it is very difficult to gain an accurate measurement of the provision of exemplars on student marks given the myriad of variables that exist. However this study aimed as much as possible to measure those changes in a closed data set.

What should be directly communicated without any prevarication is that providing exemplars has a positive impact on student's results in a final examination in a law based unit. Definite and significant changes have been noted with regards to the average scores achieved by students. Average scores increased meaningfully in those years where exemplars were provided to students. Average scores were higher in every year that exemplars were provided.

Striking improvements to students' median scores were also noted. Median scores were always higher in those years where exemplars were provided. The same comment can be made with regard to the reported mode. Mode scores were always lower in those years where exemplars were not provided. The mode was greater in those years where exemplars were provided. Additionally range was also greater in those years where exemplars were provided, indicating that students were able to access higher grade levels.

All teachers, educators, unit co-ordinators and other providers of educational courses should be given a clear message as a result of this study. That message is that exemplars help to improve student results. Unequivocally students achieve better results if provided with exemplars. If educators are not currently using exemplars they should give very serious consideration to immediately integrating them into their courses of study. If educators are not currently using exemplars students have every right to make enquiries as to why this is not occurring and to strongly suggest that they will benefit if exemplars are provided to them.

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