

**Solving the mystery about the factors conditioning Higher Education students’ assessment: Finland versus Spain.**

**Purpose** – The purpose of this paper is twofold: first, to compare the assessment in two subjects of the Business Administration Degree between Finland and Spain and, second, to test whether there are factors such as gender, age, subject, students’ motivation, or preferences that may have an impact on the assessment.

**Design/methodology/approach** – A survey was designed for students enrolled in Statistics and Financial Accounting subjects in the two universities, and multivariate statistical analysis was run.

**Findings** – First, coursework marks are higher than the final examination marks. In both universities and subjects, learning is enhanced by student involvement in coursework activities that are directly related to the learning outcomes. Second, there are differences in assessment by culture, gender, and type of subject. Finnish students are more used to work in teams and apply varied teaching resources than Spanish students.

**Research limitations/implications** – The sample size and the analyses are from two subjects in two universities. More similar studies are needed to generalize the findings.

**Practical implications** – There are several implications for Higher Education. First, university policymakers should design training courses on the good implementation of new assessment processes and criteria in order to align learning objectives and assessment criteria. Second, teachers from different countries should openly discuss their manner of assessment and promote creativity and innovation in their methodologies to assess learning outcomes. Third, students should engage with deeper learning and competence development in subjects. This will contribute to their future employability.

**Originality/value** – Our findings not only question the concept of assessment validity and the compulsory relationship between assessment and learning but also provide suggestions to improve assessment criteria.

**Keywords:** Assessment; EHEA; coursework; final examination; active learning.

## Introduction

University access rates are significantly higher all around the world, especially in Europe during the past decades (Eurostat, 2018). Internationalization and lifelong learning have become essential strategic elements for every university (Aurelia, 2012). Furthermore, the employability of graduates has become a crucial concern for university managers (Garcia and Rivero, 2017). In the European Higher Education Area (EHEA) there has been a shift from traditional teacher-centered approach to a student-centered approach where the students ‘are doing something besides passively listening’ (Ryan and Martens, 1989, p.20). However, these changes are difficult to implement because new creative learning approaches require the development of human resources, more research in education, new classroom infrastructures, new quality assessment systems, and smaller student-teacher ratios, implying more investments in Higher Education. This is the challenge of this paper, to re-think the new role of assessment performance in Higher Education, a key issue in the learning process.

Although there are many meanings, assessment can be defined as ‘the process of evidencing and evaluating the extent to which a candidate has met or made progress towards the assessment criteria’ (Cox *et al.*, 2008, p. 34). As Hand *et al.* (1996, p. 105) explain, ‘assessment is seen as a cost driver’ due to the involvement of the faculty in this time-consuming and complex process. At the same time, assessment is valued as a major influencer upon the quality of the learning process (Gibbs, 1992). Therefore, assessment is a strategic matter that provides information about student learning, student progress and teaching quality (Fletcher *et al.*, 2012). Indeed, as York *et al.* (2015, p. 1) highlight, ‘assessing the psychological and psychosocial processes of learning and development has always been complex’. Hence, the process of assessment entails a judgment of the teacher, which is variable (Taras, 2009).

Taking into account the change that has taken place in the learning approach from the concept of learning as memorizing to learning as seeking understanding and acquiring competences highlighted in the EHEA, the assessment of learning has become the central concern in the ‘innovative and creative’ process of students’ learning. In the EHEA,

subjects’ syllabus and contents are adapted to active learning methodologies. In addition, their schedules are adapted to the European Credit Transfer System (ECTS) to ensure that all universities within the EHEA offer comparable degrees.

Teachers of Statistics and Accounting from two universities in Spain and Finland, the Universidad Complutense de Madrid (UCM) and the JAMK University of Applied Sciences (JAMK), respectively, have been cooperating and exchanging experiences on applying new teaching methodologies for several years (see e.g. Akpınar *et al.* 2015). This cooperation with teaching visits in both countries within the Erasmus+ Program was the origin of this research, when the authors realized that they taught the same concepts in a very similar way but did not follow the same assessment criteria. Moreover, as Finland is one of the outstanding countries in European education (Grek, 2009), it could be an example to follow for other continental countries such as Spain, a country with a low performance in the PISA reports (Calo-Blanco and Villar, 2010; OECD, 2018).

The fundamentals of our study are based on the view that assessment influences the way students approach their learning because learning will be conditioned by what is being assessed (Gibbs, 1992). Broadly-speaking, students will learn what teachers require of them to pass the course. Our research embraces Vygotsky’s social constructivist theory, which suggests that we should focus on the process instead of on the product to understand learning. In doing that, the process of learning and the process of dynamic assessment is equally important (Yıldırım, 2008). To avoid bad practical implementations of the social constructivist approach, in the assessment process the teacher and students should be aligned, with a common understanding of the assessment criteria (Rust *et al.*, 2005). There is a need to align the learning demands of teachers and the understanding of students of such demands, in order to focus not only on the outcome of learning (passing) but more on the process of that learning (assimilating the necessary content little by little to end up acquiring knowledge), in line with the theory mentioned before. Assessment criteria should bring together what students actually understand as required and what knowledge teachers actually require, both tacit and explicit (O’Donovan *et al.*, 2004). Moreover, the understanding of assessment processes, criteria, and standards needs active engagement and participation from both students and teachers.

Bearing these in mind, the objective of this paper is twofold: first, to compare assessment results in two subjects between Finland and Spain; and second, to find out whether there are different factors such as gender, age, subject, students' motivation, and preferences that could have an impact on the assessment of students from the two countries. The results of this paper show that there are differences between Finland and Spain, depending on the students' perception and gender, as well as the type of course. Moreover, this study highlights the implications for policymakers, teachers, and students to improve the assessment criteria.

The rest of the paper is organized as follows: first, the literature review focuses on the role of assessment in the learning process, focusing. Then, the academic context in which this study took place, the sample selection, and the used methodology are described. Finally, the results of the proposed hypotheses are presented, and the paper ends with conclusions and discussion.

### **Assessment in Higher Education: Background and Research Questions**

A trend that has arisen in Education research during the past few years is to identify the variables influencing students' performance in Higher Education, especially by using data mining methods. This field is usually identified as educational data mining (EDM) (Abu Saa *et al.*, 2019). The motivation behind this is to identify difficulties in students' learning performance, which aligns with the EHEA goals of providing high-quality education. Also, EDM is becoming an important field of research due to its ability to extract new knowledge from a huge amount of students' data. EDM techniques can provide educational policymakers with data-based models essential for supporting its goals to enhance efficiency and quality of teaching and learning (Aldowah *et al.*, 2019). EDM methodologies (e.g., using the number of times students enter the virtual learning environment or update the exercises) can also be used for teachers' assessment (Chamizo-Gonzalez *et al.*, 2015), but in most cases, the problem is that assessment is still not homogeneous.

Additionally, the role of assessment in the learning process has been a topic of discussion in the educational community during the last decade (Al-Kadri, 2015; Baeten

*et al.*, 2008; Fletcher *et al.*, 2012; Garside *et al.*, 2009; Gibbs and Simpson, 2004-05; James and Fleming, 2004; McLean, 2018; Rust, O'Donovan and Price, 2005; Yorke *et al.*, 2000). However, scarce research has been carried out on assessment and published in the non-Anglo Saxon education environment (Aliaga and Orellana, 1999; Lopez-Pastor and Pérez-Pueyo, 2017).

Nowadays, the active learning methodology is applied in many Higher Education Institutions. However, this methodology should go together with a modern and dynamic assessment system that reinforces the teacher's methodology and motivates the student in the learning process (Hand *et al.*, 1996). The traditional learning process had a teacher-centered focus where the lectures were given without any student participation, and the final examination was exclusively about the contents of the lectures and accounted for 100% of the final grade. Conventional summative assessment is not a solution when preparing students for the dynamic work environment. Pedagogy and assessment should be integrated and aligned to assure deep learning (McLean, 2018). Embedded in a sociocultural construct (Rust *et al.*, 2018), assessment and learning embody a cohesive design of key activities with learners' active and continued engagement with rich feedback from teachers.

New teaching methodologies utilize new teaching tools in higher education such as simulations, problem-based learning, project-based learning, and multimedia materials. This demands also the readjustment of all the elements of the learning process, including the syllabus, methodology, resources and the assessment criteria. The EHEA has already integrated some of these in the ECTS, but the assessment is still pending (Karran, 2005; Yorke, 2010, 2011).

There are also some problems related to the assessment process and criteria in Higher Education. First, the assessment should not be a separate activity at the end of the term, but it should be integrated into the learning process (Segers *et al.*, 2003; Tynjälä, 1998). However, it is not always easy to find the right type of assessment to be implemented. For example, there is evidence showing that some students, who are knowledgeable, cannot solve complex problems in their daily work (Dochy *et al.*, 2005;

Tynjälä, 1998). Additionally, there is a general recognition of the negative or limiting impact of exams on the students' learning process (Muldoon, 2012). Currently, the final grade is a weighted average of marks from the coursework and the final examination. Since the cognitive and transversal skills developed by each subject are essential, the assessment of learning outcomes, which has several definitions (see Prøitz, 2010 for more detail about this problem), is the focus of this research.

Assessment criteria have changed within the EHEA environment to a more holistic system embodying both the student's daily effort and the final examination. Therefore, following active methodologies, the final grade of a subject, also called 'summative assessment', is the weighted mean of the coursework and the final examination marks. Final examination refers to the traditional assessment in the form of a time-constrained closed-book written essay or test. Coursework refers to the alternative assessment of different activities that the student must perform during the learning process. These activities include for example group projects, essays, oral presentations, and simulations (Camacho-Miñano *et al.*, 2016). Concretely, in this research, the authors demonstrate that multimedia resources, such as videos or films joined to business professionals' interviews, can increase students' motivation, satisfaction, and perception of utility for their learning in Accounting.

The logical hypothesis is that students with higher grades in coursework will have higher grades in the final examination because they are engaged in their learning and they have done much more practice, enhancing the real understanding of the subject. However, several empirical studies show the opposite (see, for example, Yorke *et al.*, 1996; Tian, 2007). In Spain, a prior study justifies that many students have a higher mark in the final examination than in the coursework (Pascual Ezama *et al.*, 2011). Another study by Fuertes *et al.* (2015) suggests that performance in the daily activities is not positively and significantly related to performance in the final examination, except for the group of students who pass the final examination. As the results are not conclusive, the present study aims to explore this issue further. Although Spanish university teachers use a greater variety and number of assessment instruments than did their counterparts of decades ago, "the final examination mark is still the highest-weighted source of

assessment for the final grade” (Panadero *et al.*, 2019, p. 379).

Many authors suggest that coursework marks are higher than the final examination marks (see Bridges *et al.*, 2002; Dalziel, 1998; Downs, 2006; Gibbs and Simpson, 2004-05; James and Fleming, 2005; Murdan, 2005; Simonite, 2003; Tian, 2007; Yorke *et al.*, 1996, 2000). However, it is observed that it depends on the subject whether that difference between the coursework mark and the final examination mark is wider or narrower. In quantitative subjects, coursework marks are significantly higher than final examination marks, whereas in qualitative subjects the difference between the coursework mark and the final examination mark is not so wide (Bridges *et al.*, 2002; Murdan, 2005; Simonite, 2003). This could be due to the higher difficulty of quantitative subjects, which is better reflected in the final examination. Tian (2007) argues that while ‘deep learning’ is acquired with coursework ‘surface learning’ is acquired with an only final examination. Although there are some attempts to justify the differences between coursework and final examination, the results are not conclusive (Payne and Brown, 2011). Nevertheless, there is empirical evidence that different tools of assessment have an impact on students’ learning and academic outcomes (Gibbs and Simpson, 2004-05; Tynjälä, 1998).

Previous studies suggest that students prefer continuous evaluation to participation in examinations (Furnham *et al.*, 2011), but that they are rather neutral to new tools of assessment. One problem could be that there are differences in assessment culture (Baeten *et al.*, 2008) that should be researched. Another problem may be that there is a variety of assessment tools like portfolios, self-evaluation and peer-evaluation (Sanders, 2010), but it is doubtful whether these tools measure learning in the same way. The introduction of assessment options benefits an enhanced student-centered approach (Lai, 2010), but not all the studies show benefits empirically (Garside *et al.*, 2009), and it has a disadvantage that it is a very time-consuming activity for teachers (Craddock and Mathias, 2009).

It is essential to highlight that assessment has a significant impact on students’ behavior and consequently on learning outcomes (Smith, 2011). For example, Michael

(1991) argues that assessment is the only powerful tool available to the teacher to maintain class attendance. There is also empirical evidence that when students really know the assessment criteria, they perform better (Payne and Brown, 2011). This can be also due to the students' perception that doing well is visible in the short term while learning well is only visible in the long term (Smith, 2011). Finally, some studies suggest that age and gender also have an impact on students' preferences (Kniveton, 1996). Based on this discussion, this research aims to answer the following two research questions.

*Research question 1 (RQ1): Are there any differences in the assessment criteria between Spain and Finland?*

*Research question 2 (RQ2): What sociodemographic and perception factors have an impact on the Spanish and Finish students' assessment?*

### **Sample Data and Method**

The sample consisted of 117 freshmen (40% female, 60% male) who were enrolled in Statistics and Financial Accounting subjects in the Business Administration undergraduate degree at the Universidad Complutense de Madrid (61 students in Madrid, Spain) and the JAMK University of Applied Sciences (56 students in Jyväskylä, Finland). The analyzed research variable is the final grade in Statistics and Financial Accounting subjects at both universities. Grades range from 0 to 10, where 0 is the worst and 10 the best result. The grades between 0 and 4.9 mean failure and grades between 5 and 10 mean success.

With the EHEA approach, the final examination should not be the only component of the final grade, so currently, many universities calculate the final grade as a weighted average of final examination and coursework. The final examination (FE) consists of an invigilated closed-book time-constrained examination. It has a weight of 60% of the final grade at UCM and 70% of the final grade at JAMK. The remaining 40% and 30% of the final grade, respectively, comes from coursework (CW), which is composed of active participation, assignments (e.g., exercises, cases, videos of real-world companies, business professionals interviews, simulations, and real-world problems) and



interim class tests (Camacho-Miñano *et al.*, 2016; Heywood, 2000). Coursework activities in the two universities were not exactly the same throughout the semester, but they were very similar. Final examinations were also of similar difficulty, although they were not identical. Moreover, there was an exchange of teachers from both universities through the Erasmus+ Staff Mobility for Teaching Program, which contributed to achieving comparable results.

The students were asked to fill in a survey of 20 questions, designed and validated by professionals. The survey had three sections: demographic data (age, gender, nationality and working status), background data (university access exam grade, degree position in university application, previous knowledge of subjects or math score) and learning strategies (preferred ways of study, preferred type of evaluation, team working preferences). Out of the 117 enrolled students, only 111 participated in the survey. Response rates were different for each question, as some of the students did not answer all of the questions. The response rates were higher at JAMK for all 20 questions, and the missing data was not considered. The sample was quite homogeneous across the two universities except in working status. 77% of the students at JAMK were working vs. 33% at UCM.

The variable  $\text{Diff} = \text{CW} - \text{FE}$  is defined to study the difference between coursework and final examination. Diff is a measure of ‘deviation’ between the progressive assessment and the final examination mark of each student. If it is positive, it shows that the work of the student is consistent throughout the semester. If it is negative, it means that the student is more focused on the final examination.

Finally, regression and variance analyses were carried out (non-tabulated results) to analyze the influence of sociodemographic and perception factors on assessment. The coursework and the final examination marks, as well as the difference between them, were used as dependent variables. The final grade, number of calls<sup>1</sup>, preferred evaluation type, university access examination, math grade, gender, the motive for electing the

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<sup>1</sup> Number of calls is the number of times a student has previously sat for the final examination (from zero to four times in our sample).

degree, degree position in the university application, type of subject, type of teacher, study method, learning style, and teamwork preferences were used as explanatory variables.

## Results

Analyzing the differences between the coursework and final examination assessments, it can be seen in Figure 1 that for 58% of the students the coursework mark (CW) is bigger than the final examination mark (FE), as the median value (represented with the though line that divides the box into two parts) is over zero. However, the difference between coursework and final examination marks ( $\text{Diff} = \text{CW} - \text{FE}$ ) is higher for JAMK students. A variance analysis confirms that the differences in the Diff variable are statistically significant.

[Figure 1 near here]

Figure 1 also shows that the three distributions are quite symmetrical. The mean (represented with a red cross inside the box) and the median (represented with the though line that divides the box into two parts) are very similar to the whiskers, which are also of similar length. The distribution for JAMK, however, is a little right-skewed, as the length of the upper whisker is longer and the mean is higher than the median. That indicates that there are more JAMK students with a greater difference between the coursework mark and the final examination mark.

It can be also seen in Figure 2, where students' coursework marks are represented across their respective final grades, that a majority of points are below the diagonal (representing the equality of both marks,  $\text{CW} = \text{FE}$ ), meaning that the coursework mark is higher than the final examination mark. As it was mentioned before, 58% of the students have higher coursework marks than final examination marks, but the percentages are quite different by the university. Whereas only 47% of students at UCM have higher coursework marks than final examination marks, the ratio is 74% at JAMK.

[Figure 2 near here]

The median values of both the coursework and the final grades (represented by the horizontal line through each box in Figure 3a and Figure 3b), as well as first and third quartiles (lower and upper bound, respectively, of each box in Figure 3a and Figure 3b) are significantly higher at JAMK. Moreover, both box plots for JAMK are comparatively short suggesting that JAMK students' marks are more similar to each other, despite the outliers (extreme values below the whiskers).

[Figure 3a and 3b near here]

As can be seen in Figure 4a and Figure 4b, students have on average higher marks in both the coursework and the final examination in Statistics than in Accounting. The difference is especially visible for the final examination, where the Statistics box plot is higher. However, Coursework marks are left-skewed as both boxes and whiskers are much longer in lower values. Hence, the data for Coursework is not normally distributed.

[Figure 4a and 4b near here]

The results from the non-tabulated regressions show that only gender, type of subject, and students' preferences have a significant impact on students' assessment of coursework (CW), final examination (FE), and difference (Diff). The final grade, number of calls, university access examination, math grade, the motive for electing the degree, degree position in the university application, type of teacher, study method, and learning style do not have a significant impact.

**Discussion and Conclusion**

The aim of this paper was twofold: (1) to compare the coursework and final examination between Finland and Spain to understand if there are differences in assessment methodologies; (2) to test what factors have an impact on the assessment of students from the two countries. Our findings question the concept of assessment validity in line with Yorke *et al.* (2000) and the relationship between assessment and learning in line with Furnham *et al.* (2011) and Warner *et al.* (2012). First, coursework marks are higher than the examination ones as in Murdan (2005), and there are differences by gender as also argued by Woodfield *et al.* (2005) and Simonite (2003). In general, in both universities

and for both subjects learning is enhanced by student involvement in the learning process, activities, and environment that are more directly related to the learning outcomes (Alauddin and Khan, 2010; Struyen *et al.*, 2008). Second, there are differences in students' assessment between Finland and Spain depending on gender, type of subject, and students' preferences. These differences may be due to cultural factors (Baeten *et al.*, 2008; Harris *et al.*, 2018). Finnish students are more used to work in teams and use more varied teaching resources than Spanish students. Moreover, Finnish teachers are more used to give immediate feedback to students (Rust, O'Donovan and Price, 2005) and more focused on the process of learning than on the final product, aligned with the social constructivist theory of learning. Both UCM and JAMK use test quizzes, problem-based learning exercises, case studies, and short exams. However, JAMK also uses role-playing, puzzles, and other gamification resources which engage students more towards learning and assessment, and less final exams which avoids students' pressure and stress. Indeed, taking a look at the evaluation criteria of all the student guides of UCM vs. JAMK courses, the weight of a final exam in UCM subjects is sometimes more than the double of the equivalent JAMK subjects, if that final exam exists at all in JAMK. There are also more international students and teachers at JAMK than at UCM, with different academic backgrounds that might, for example, enrich the learning processes with different perspectives of a same issue. Another explanation could be that Spanish teachers are not assessing intended skills and competences correctly because they have less experience in active learning process methodologies and assessing them across the curriculum is still a challenge (Pepper, 2011). Furthermore, JAMK has a professional board where CEOs of different local companies advise on skills and competences they need from graduates. This makes JAMK much more dynamic and closer to the real business world, engaging students in their learning process.

The implications of this study are diverse. University policymakers should promote training courses for teachers to achieve a good implementation of a new assessment process and criteria. Discussions among teachers on their assessment processes and experiences should be encouraged between universities to promote more creativity and innovation. A proposal could be to mix the variety of evaluation methods

in order to balance out non-systematic errors and avoid subjectivity. Our results are in line with Adachi *et al.* (2018) who strongly believe in the power of formative assessment, opposite to past literature which focused on the accuracy of students' marking. Additionally, teachers and students who participate in international exchange programs should take into consideration differences in assessment criteria in different countries and universities. They should prefer those that have similar assessment criteria. Another proposal may be to have external evaluators for the final examination. Future employers could also be asked about the acquired knowledge, competences, and skills that they value more in graduates at the workplace. This study shows that assessment is an important and challenging task which every teacher and university should rethink because assessment does condition the learning process. Also, teachers should make more use of Information Technologies and apply different Educational Data mining techniques to assess the students' learning performance in other ways in line with Aldowah *et al.* (2019), among others. As teachers involved in this study we already believe that we have improved our assessment criteria thanks to the collaboration, aiming to achieve a better deep learning process. We hope that this paper could be a starting-point for in-depth discussions between university teachers to reflect more upon their assessment procedures. The mere idea of thinking about the concept of assessment is in itself a good outcome for higher education research.

In summary, there are three main implications for higher education actors. University policymakers should promote training courses for a good implementation of new assessment criteria. Teachers should openly discuss their assessment processes with local and international colleagues and seek creativity and innovation in their assessment methodologies. Finally, assessment improvement should aim for higher student engagement and deeper learning, developing competences for future employability.

This study has some limitations which offer possibilities for future research. The sample size is small, and it is from only two subjects from two universities. As such, more similar studies are needed to generalize the present findings. Our future research will aim to increase the sample size with more students, more subjects, and more universities. We also plan to monitor the same students for 5 years after graduation to

observe their development in the business world and to inquire about their perception of what they learned in the university. Finally, it might be interesting as well to explore the use of EDM techniques to analyze the student's database, along with the impact of a change in the assessment process.

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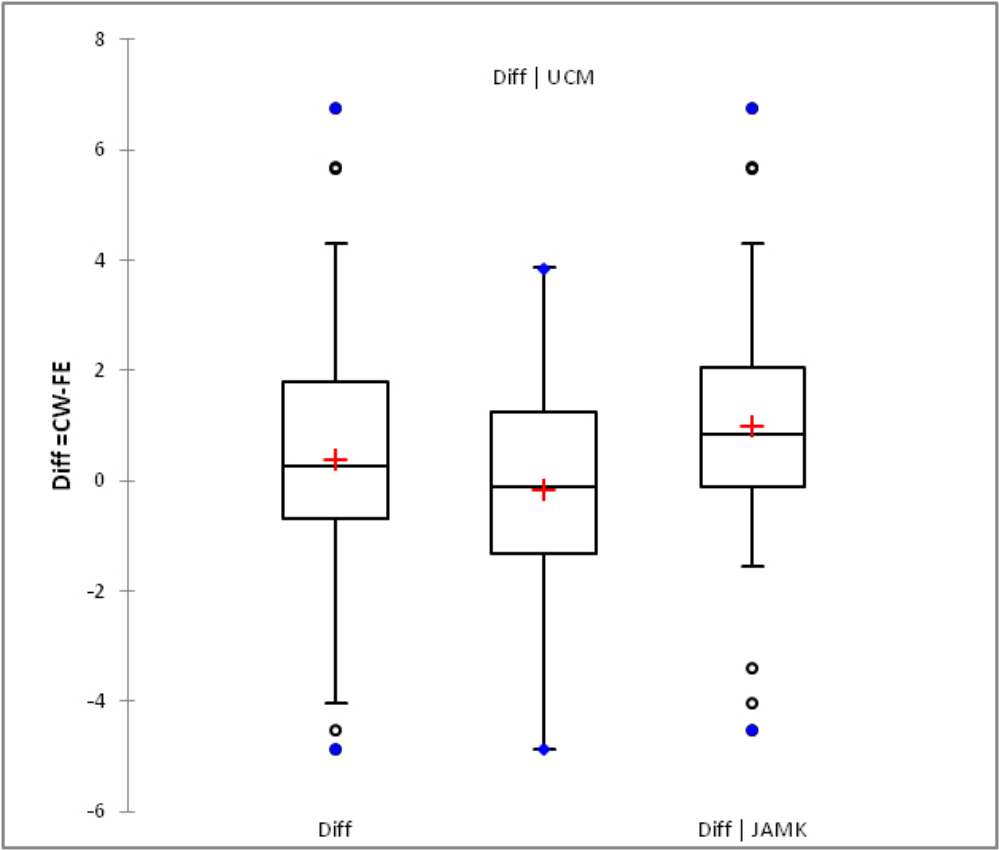


Figure 1. Diff variable box plots

221x188mm (72 x 72 DPI)

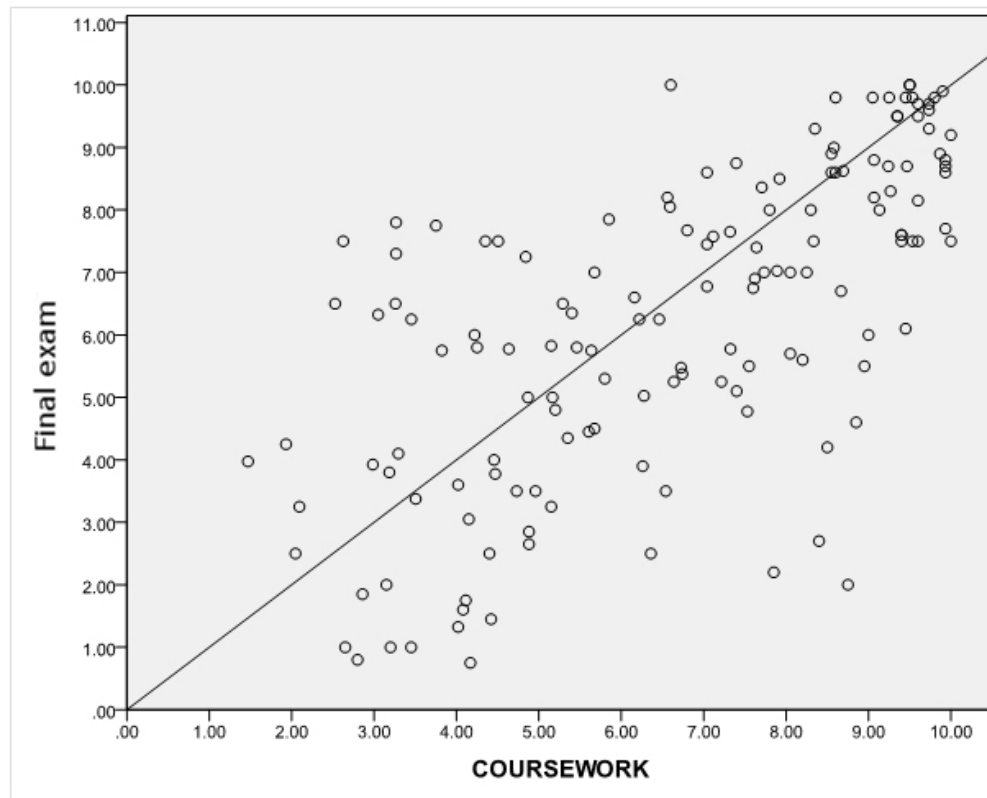


Figure 2. Coursework mark against final examination mark scatterplot

215x172mm (72 x 72 DPI)



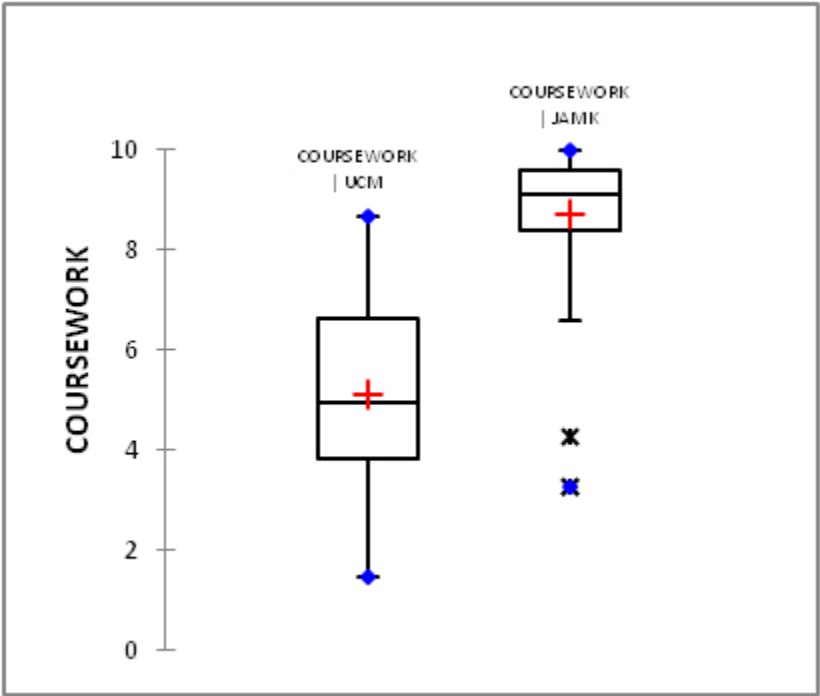


Figure 3a. Coursework box plots by university

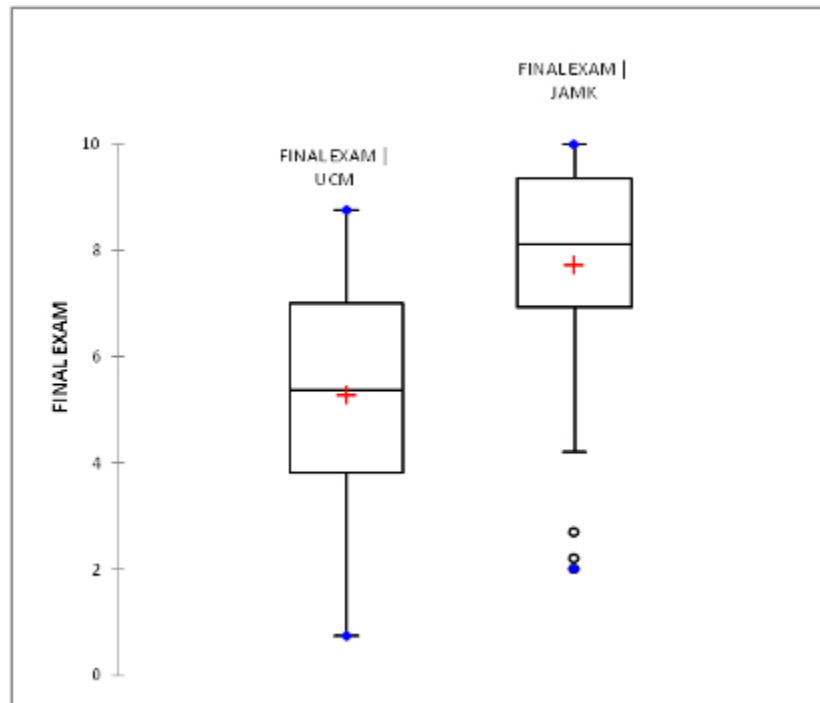


Figure 3b. Final exam box plots by university

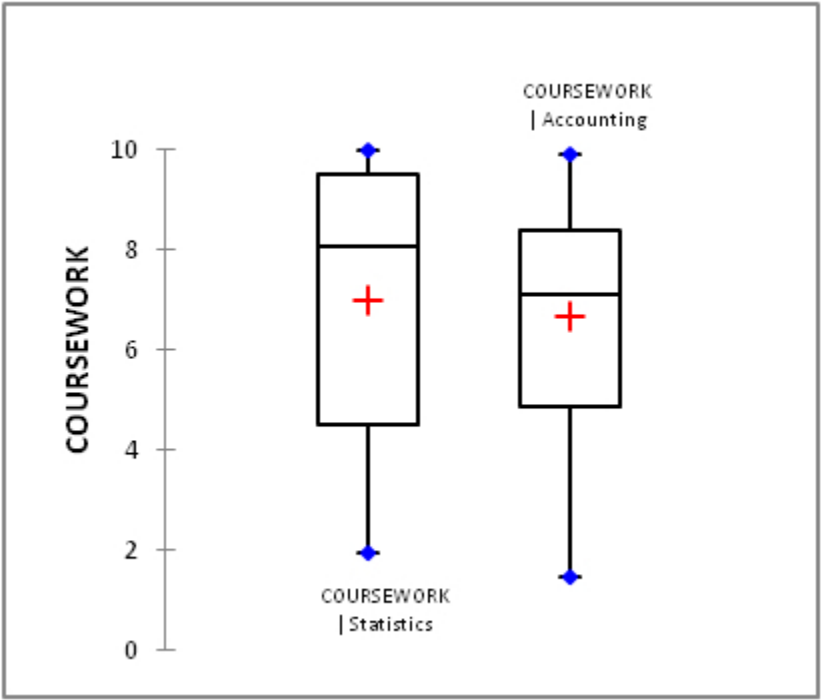


Figure 4a. Coursework box plots by subject

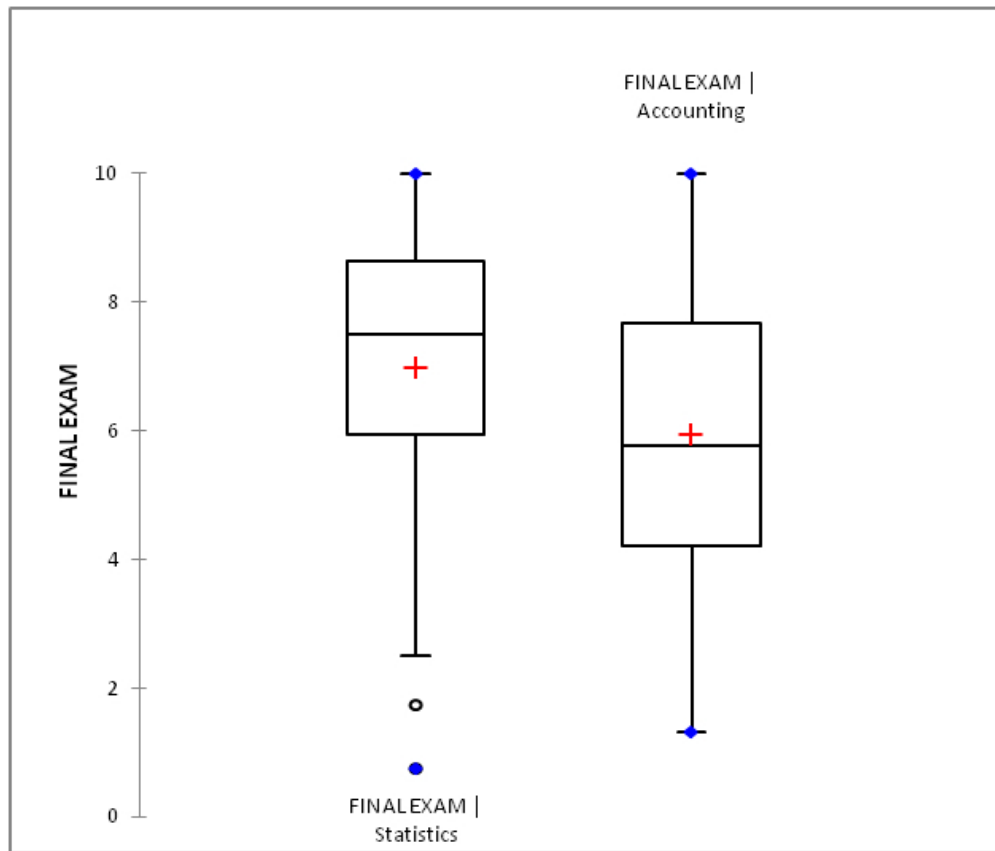


Figure 4b. Final exam box plots by subject