

Students' perceptions of the use of traditional methods and active learning strategies in the classroom: findings from a case study

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Abstract

This paper reports on findings from a case study based on students' perceptions of the use of traditional methods and active learning in the context of a specific curricular unit in Higher Education. The high levels of absenteeism in class, the lack of interest by the students and the assessment results were some of the main reasons that lead the course lecturer to implement a set of changes in the curricular unit, in the following academic year. These changes included the use of traditional and non-traditional teaching and assessment practices in the classroom such as flipped classroom, team-based learning, brainstorming, lectures, demonstration, gallery walk, review of videos and case studies. To evaluate student satisfaction with these changes, feedback was collected from students, at the end of the semester, through a questionnaire with 26 questions on a five-level Likert scale. The topics addressed in the questionnaire included the following dimensions: teacher performance, teaching and assessment methods, competences development and overall satisfaction with the curricular unit. The participants in the study were 94 students enrolled in the curricular unit of "Management Information Systems", which is part of the 3rd year study plan of the Management degree programme at Portucalense University, Porto, Portugal. This curricular unit is mandatory and has more than one hundred students enrolled every year. The curricular unit has a weight of 5 ECTS and 45 contact hours. Findings from students' perceptions reveal a positive view of the changes implemented, as lectures were considered more interesting and there was more active engagement by the students. There was also found a positive relationship between students' opinion about the curricular unit and its importance for the development of student's skills and the application of knowledge in their future professional life.

Keywords: Higher Education, Active Learning, Management programme, students' perceptions

1 Introduction

In the current economic context, usually described as one of globalization, constant change, and sharp disruptions caused by information technologies, new forms of employment require that non-technical skills be developed. Several studies by different entities (Teach Trends, 2019; Allen, 2020; The World Bank, 2019; OCDE, 2019) point to the need for workers with skills that cannot be replaced by robots, namely cognitive and socio-behavioural skills. In addition to, of course, digital skills, since any worker, now and in the future, will interact more and more with information technologies in their day-to-day activities (Laar, Dijk, Deursen & Haan, 2020).

In the recent past, people often spoke with enthusiasm about skills such as entrepreneurial spirit and creativity. Today, business innovation entails the need for interdisciplinarity. Workers are also required to have skills in collaborative work, communication and negotiation, empathy, and leadership (OCDE, 2019). They should demonstrate their ability to adapt to change and to learn throughout life. Critical thinking and the ability to identify problems, proactively create solutions to these problems, and make decisions in contexts of uncertainty, minimizing risks, are also increasingly valued in the current job market (Abelha, Fernandes, Mesquita, Seabra, & Ferreira-Oliveira, 2020).

Recent reports on the trends of teaching and learning methods in Higher Education refer that there has been a modest shift from traditional teacher-centered methods to more active learning strategies, which are student centered (Gaebel, Zhang, & Bunesco, 2018). Traditional methods include mostly lecture classes, where the teacher usually focuses on the use of slides to deliver the course content, with hardly no interaction or active

engagement by the students. Meanwhile, active learning strategies focus on developing students' critical thinking, problem solving and teamwork skills by using a constructivist approach to teaching. Active learning strategies (Felder & Brent, 2006) can include a variety of methods and techniques, ranging from less complex techniques in terms of their duration and implementation, such as brainstorming, gallery walk, think-pair-share, video analysis, case solving, etc. to more complex and integrated approaches such as team-based learning, flipped classroom, project-based learning, etc (Fernandes, Flores, & Lima, 2012; Fernandes, Mesquita, Flores, & Lima, 2014; Lima et al., 2017). However, despite the intention for more student-active learning, teaching remains predominantly traditional and teacher-centred, with several barriers for active learning (Børte, Nesje, & Lillejord, 2020). For student active learning to succeed, Borte, Nesje and Lillejord (2020) identified the following prerequisites: (1) better alignment between research and teaching practices, (2) a supporting infrastructure for research and teaching, (3) staff professional development and learning designs.

Student assessment also differs in each one of these approaches, as the main curriculum elements (course contents, learning outcomes and assessment methods) are aligned with the pedagogical philosophy followed by the teacher (Brown & Hirschfeld, 2008; Segers & Dochy, 2006). Traditional teaching environments, on the one hand, focus on final examinations, that occur usually at the end of semester, with very few opportunities for feedback and discussion of the work developed by students. Active learning, on the other hand, promotes assessment for learning (Earl & Katz, 2006), where the purpose of assessment is mainly formative and aimed at improving student learning, by creating several opportunities for student feedback (from teachers, peers or external agents) and for monitoring student learning, providing students with a learning environment favourable to the development of critical thinking, teamwork and self-evaluation competences (Fernandes, Alves, & Uebe-Mansur, 2021; Flores et al., 2020; Pereira, Assunção Flores, & Barros, 2017).

This study aims to analyse a case study that took place in a curricular unit from a Management degree programme at Portucalense University (UPT), Portugal. It is private university located in Porto, Portugal, which already had these pedagogical and curricular assumptions in mind when, in 2015, the study plans of the 1st cycle in Management were reformulated. Some of these changes included the inclusion of an internship curricular unit, necessarily in a workplace context, in the 3rd year, of the 2nd semester; an Entrepreneurship course unit in the 3rd year, 1st semester; and also, two courses in the information and technology systems area: the Information and Knowledge Society course, in the 1st year, 1st semester and the Information Systems for Management course in the 3rd year, 1st semester.

For the purpose of this study, the pedagogical methods (traditional and active learning strategies) used by the teacher of the curricular unit of "Management Information Systems", in the academic year of 2018/2019, will be analysed and discussed according to students' perceptions.

2 Context of the study

The context of the study takes place in the "Information Systems for Management" curricular unit (CU), which is part of the 3rd year study plan of the Management degree programme at Portucalense University, Porto, Portugal. This CU has more than one hundred students enrolled annually, divided into 6 classes of about 24 students each. It has a weight of 5 ECTS and requires 45 contact hours.

Due to some lack of interest in a large percentage of students (around 60%), which was revealed either in the absenteeism from classes or in poor final evaluation results, it was decided, at the end of the 2017-2018 academic school year, that this course should be adjusted. Bearing in mind that the students who attended this curricular unit belonged to a different generation previous cohort (generation Z), the teaching and learning methods and the assessment instruments, as well as the behavioural skills that were intended to be developed by students, were reviewed. Starting from the contribution of this course to the professional profile of students and the nature and objectives of this course in the study plan, the socio-behavioural skills to be developed were readjusted. Skills such as leadership and the capacity for self-criticism and self-assessment started to be developed, instead of skills related to the concern with quality and the ability to organize, plan and manage. Other skills, namely critical and evaluation skills, ability to apply theoretical knowledge in practice, communication and teamwork continue to be developed and evaluated. And, considering the characteristics

of the students, a set of active methods was used in the teaching-learning process that had not been used before. These teaching and learning methods used in the development of different skills, both technical and behavioural, are summarized in table 1. In all classes, different class closing activities were used to solidify concepts and the mental map of the concepts explored in the course was gradually constructed.

Table 1. Teaching and learning methods for each skill to be developed

Skills		Methods/ resources		Flipped Classroom	Team Based learning	Brainstorming	Lecture	Demonstration	Gallery walk	Video analysis	Case study and article analysis	
Technical Skills	Describing the concept of information system					X						
	Identifying the role of the information and technology systems (ITS)				X				X			
	Knowing the impact of ITS				X	X			X	X		
	Knowing and characterising types of ITS		X	X	X	X				X	X	
	Identifying best practices to increase ITS impact		X					X				X
	Using ERP (Primavera), Excel and BI (Qlickview)								X			
Socio-behavioural Skills	Analysis and synthesis		X						X	X	X	
	Capacity for criticism and evaluation		X	X	X							
	Leadership				X							
	Ability to apply theoretical knowledge in practice							X	X	X	X	
	Capacity for self-criticism and self-evaluation				X							
	Written and oral communication		X			X			X			
	Teamwork				X	X						X

The assessment was continuous and included 5 elements, as shown in Table 2: 1) an interdisciplinary work, with the Strategic Management unit; 2) a written test; 3) participation during classes; 4) an individual practical test, using Excel; and 5) a group test, with Enterprise Resource Planning (ERP) and Business Intelligence (BI) types of software. The assessment through interdisciplinary work included a weighting resulting from peer review.

Table 2. Elements included in Student Assessment

Skills		Methods/ resources	Interdisciplinary teamwork	Written test	Class participation	Individual practical test (Excel)	Group practical test (ERP and BI)
Technical Skills	Describing the concept of information system			X	X		
	Identifying the role of information and technology systems (ITS)		X		X		
	Knowing the impact of ITS		X	X	X		
	Knowing and characterising types of ITS		X	X	X		
	Identifying best practices to increase ITS impact			X	X		
	Using ERP (Primavera), Excel and BI (Qlickview)					X	X
Socio-behavioural Skills	Analysis and synthesis		X	X	X		
	Leadership		X				
	Ability to apply theoretical knowledge in practice		X	X	X	X	X
	Capacity for self-criticism and self-evaluation		X				
	Written and oral communication		X	X			

3 Methodology

The aim of this study is to analyse students' perceptions about the impact of the use of pedagogical methods (traditional and active learning strategies) inside and outside the classroom. The study sample consisted of 94 students enrolled in this curricular unit of "Management Information Systems".

For data collection, the study followed a quantitative methodology, based on the application of a questionnaire to students enrolled in the course. This approach is justified by the need to collect the opinions of the students i.e. the study was descriptive in nature and statistical techniques were used for the collection and analysis of data. The questionnaire was organized in four main sections, including a total of 26 questions that addressed the following topics: teacher performance (Dimension I), teaching and assessment methods (Dimension II), skills development (Dimension III) and overall satisfaction with the curricular unit (Dimension IV). All the questions were close-ended type and used a five-point Likert scale ranging from: 1-Not at all, 2- Very Little,

3-More or less, 4- A lot and 5-Very Much. Data collected were analysed and treated by using IBM SPSS Statistics 26.0.

4 Analysis and discussion of results

This section presents and discusses the most relevant results obtained according to each of the four dimensions of the questionnaire: teacher performance (Dimension I), teaching and assessment methods (Dimension II), skills development and overall satisfaction with the curricular unit (Dimension III / IV).

4.1 Teacher performance

In order to assess the teaching performance of the teacher, the following criteria were included in the questionnaire: commitment, motivation, scientific preparation, clarity in explaining the contents, interaction with students and clarity in clarifying doubts. The results obtained in this dimension were all classified above level 4, which shows a very positive opinion of students about the teacher's performance. This very positive opinion of students could also be understood as a result of their own observation and experience in the classroom, this is, applying new teaching methods by the teacher led to the development of new cognitive and socio-behavioral skills, in addition to the digital skills (information technologies) so necessary in their future professional life.

4.2 Teaching and assessment methods

In this dimension, students evaluated their degree of satisfaction with the 10 conventional and unconventional teaching methods used (see table 1). One issue that should be highlighted is the high number of missing values in relation to the evaluation of teaching methods that involve the direct and more active participation of students (such as Flipped classroom, Walk Gallery, etc ...). For all methods, we found that at least half of the students assign a rating of 4 or more on the scale used, that is, most of them appreciated the use of all these methods a lot or very much. It is also interesting to mention that, for students, the method that was least evaluated by them was the use of the expository method / Slides (conventional teaching method). Regarding the average of the assessment of the methods (Figure 1) and their dispersion, we conclude that the mean degrees are all above 3.5 (which is quite high) with reduced dispersion (coefficients of variation less than 30%). In particular, it is interesting to note that the methods that receive the lowest rating are those with the highest dispersion (such as Flipped classroom, Gallery Walk, Case study and paper analysis in classroom and Slides). That is, the students' opinion is less consistent for those methods.

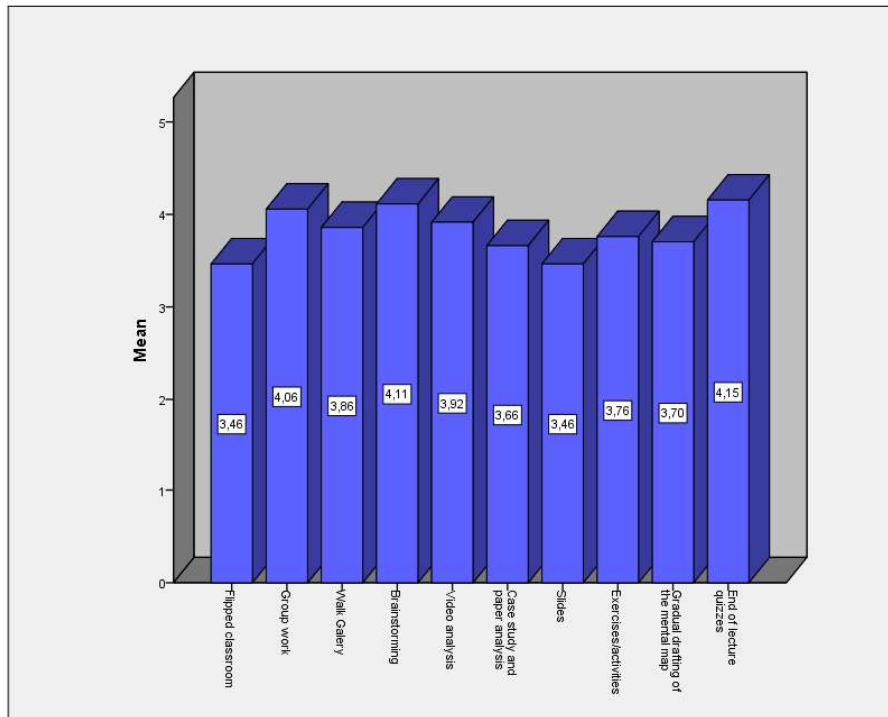


Figure 1. Evaluation of teaching methods by students (mean).

In order to check if there are any differences in student evaluations regarding the application of less conventional methodologies, we built boxplot clusters (Figure 2). We can conclude immediately that, the teaching methods "Brainstorming" and "Quizzes" have identical evaluations by students and it is for them that the students' evaluation is most positive. For the "Case study and paper analysis" and "Mental map" methodologies, it is also found that the students' opinion is identical. In contrast, "Flipped classroom" is the unconventional method with less favourable opinion (perhaps due to being the only one that is applied outside the classroom). In this analysis, it is also worth mentioning that the "Gallery Walk" is the method that presents greater variability, that is, greater dispersion in the evaluations. However, this is the only unconventional method that has no outliers. It should be noted that all the others have moderate outliers (unfavourable opinion's).

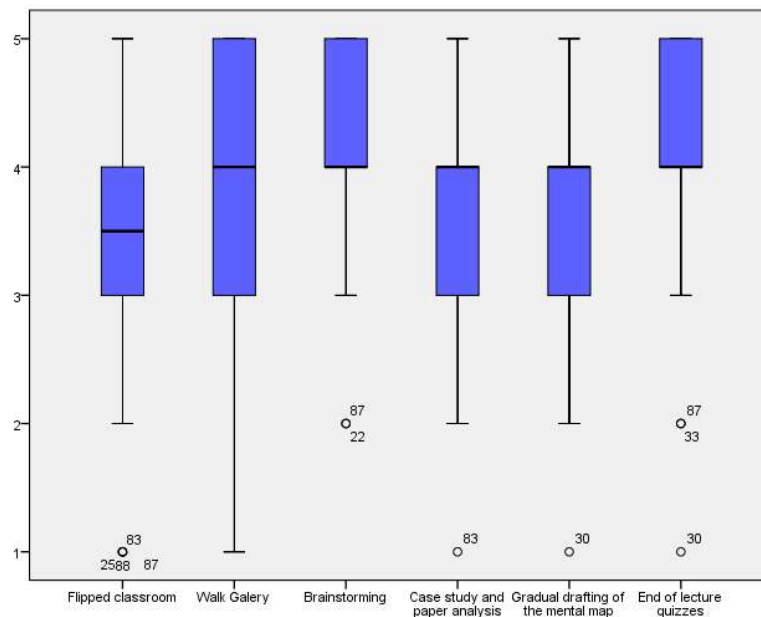


Figure 2. Boxplot clusters for unconventional methods.

In this study, the methodologies used were also evaluated as a whole, concluding that they made the classes much more interesting and allowed the student to behave more actively in the classroom (means above 4). Furthermore, evaluating the benefits of the methodologies used (more interesting lectures and more active engagement) in adapting to the objectives of the CU, we found that there is a moderate positive association which is significant at the level of 1%, that is, for example, the more the students find that the methods make the lessons more interesting the more they consider that they are suitable to the objectives of the course (Table 3).

Table 3. Spearman's correlation coefficient between the adequacy of teaching methods and the benefits of methodologies.

			Correlations		
			The teaching methods were appropriate to the aims of the course	The adopted methodologies made the lectures more interesting	The adopted methodologies allowed a more active engagement by students
Spearman's rho	The teaching methods were appropriate to the aims of the course	Correlation Coefficient	1,000	,592**	,468**
		Sig. (2-tailed)	.	,000	,000
		N	93	93	93

** . Correlation is significant at the 0.01 level (2-tailed).

4.3 Skills development / Overall satisfaction with the curricular unit

Regarding students' evaluation about the skills developed in the CU, we found that the more students consider that the CU was important in the development of their skills, the better they relate the acquired knowledge with the application to future professional life ($r_s=0,52$).

Finally, to evaluate the impact of the application of these teaching methods, the students' opinions were analysed regarding some parameters of interest (namely the balance between theory / practice and the resources made available) that interfere in the global evaluation of the CU. According to the results obtained, we can conclude that at least half of the students gave a very positive overall assessment. Furthermore, it was found that the greater the balance between theory / practice, the more positive the student's evaluation of the CU and, more adequate are the resources available for the application of the methods, the more positive the student's evaluation is (Table 4).

Table 4- Spearman's correlation coefficient between the parameters that affect the CU evaluation

			Correlations		
			The course met the expectations	The balance between theory and practice was appropriate	The resources made available were appropriate
Spearman's rho	The course met the expectations	Correlation Coefficient	1,000	,606**	,483**
		Sig. (2-tailed)	-----	,000	,000
	The balance between theory and practice was appropriate	Correlation Coefficient	-----	1,000	,507**
		Sig. (2-tailed)	-----	-----	,000
	The resources made available were appropriate	Correlation Coefficient	-----	-----	1,000
		Sig. (2-tailed)	-----	-----	-----

** . Correlation is significant at the 0.01 level (2-tailed).

As expected, we also found that the more positive the students' opinion was about the CU, the more they think it is important in the development of their skills ($r_s = 0.53$), as well as, the more they consider that the knowledge acquired in the CU may have more application in your future professional life ($r_s = 0.50$).

As a curiosity, students when asked about the availability of slides in Moodle after class, most of them revealed not to be in agreement or to be slightly in agreement.

5 Conclusions and Final Remarks

This paper aimed to analyse and discuss students' perceptions about the use of traditional methods and active learning strategies in the classroom. In general, it is possible to conclude that at least half of the students who participated in this study revealed a positive perception (classification above 4, in a Likert scale) in regard to the active learning strategies implemented in the classroom by the teacher. Students also showed a very positive opinion about the teacher's performance. Students considered the classes to be more interesting and engaging with the use of these active learning strategies, as opposed to the more traditional lectures, for example, when using presentations with slides.

Another interesting conclusion is that the more students consider the teaching methods make the classes more interesting, the more they believe that the methods are adequate to develop the course's learning outcomes. It was also noticed that the more positive students' opinion is about the curricular unit, the more they believe that the curricular unit is important for the development of their cognitive knowledge in the field and also the social and interpersonal competences required for their professional practice. This is also related to a greater awareness, by students, of the importance of the learning outcomes developed in the curricular unit which will have more application in their future professional practice.

In sum, this study provides evidence of the positive impact, perceived by students, of the curricular and pedagogical changes in teaching and assessment methods used in the classroom, which is aligned with the purposes and demands of the development of the education skills for the 21st century (World Economic Forum, 2016).

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