



University of KwaZulu-Natal  
College of Law and Management Studies  
School of Accounting, Economics & Finance

# **Students' Perceptions of Teaching and Learning Practices: A Principal Component Approach**

**Sophia Mukorera**

**and**

**Phocenah Nyatanga**

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## **Students' Perceptions of Teaching and Learning Practices:**

### **A Principal Component Approach**

Sophia Mukorera and Phocenah Nyatanga

(University of KwaZulu-Natal)

#### Author Note:

Correspondence concerning this article should be addressed to Sophia Mukorera, School of Accounting, Economics and Finance, University of KwaZulu-Natal, Pietermaritzburg campus, Golf Rd, Scottsville, 3201.

Email: [mukorera@ukzn.ac.za](mailto:mukorera@ukzn.ac.za)

### **Abstract**

Students' attendance and engagement with teaching and learning practices is perceived as a critical element for academic success. Even with stipulated attendance policies, students still choose not to engage. The study employed principal component analysis to analyse first- and second-year students' perceptions of the importance of the 12 teaching and learning practices used in the Economics modules. The results showed that first-year students perceive lecturer consultation, consultation with an Academic Development Officer and revision classes as the most beneficial practices for their academic success. Second-year students recognize interactive group learning practices as most beneficial for their academic success as they perceive weekly tutorials, PowerPoint lectures, small group tutorials and revision classes as contributing the most to academic success. Self-study and e-learning are perceived as the least beneficial by both streams of students. The main conclusion from this study was that first-year students are more solitary learners and prefer teaching and learning practices that involve one-on-one interaction with the instructor. On the other hand, second-year students are more social learners and prefer teaching and learning practices that are in a group setup. This conclusion provides a possible explanation as to why students do not attend or engage with some teaching and learning practices.

Keywords: teaching and learning practices, students' perceptions, student attendance, academic success,

High dropout rates due to poor academic performance continue to be a daunting factor in the bid to increase throughput. According to the Minister of Higher Education and Training in South Africa, the dropout rate in 2015 stood at 55% and it was projected to continue increasing (2<sup>nd</sup> National Higher Education Summit, 2015). Closely linked to this problem of poor student performance and low throughput is poor student engagement with teaching and learning practices such as face-to-face lectures, tutorials or lecturer consultation. There is evidence that shows that class sizes shrink immensely as a semester progresses. The students who perform well are those who record more lecture attendance hours (a proxy for motivation) despite having all learning materials online (Romer, 1993; Stanca, 2006; Thatcher et al., 2007; Arulampalam et al., 2012, Andrietti, 2014).

Teaching and learning activities are two processes that are highly correlated. As such, different teaching practices and active learning engagement in undergraduate curricula are highly recommended for students' academic success (Murphy et al., 2004; Owston et al., 2011, Ganyaupfu, 2013). Consistently, students' poor academic performance is linked to poor lecture attendance, which in turn is linked to ineffective teaching and learning methods/practices, poor teachers' personality and ability, or poor curriculum, among others (Zulfiqar & Zamir, 2015; Adunola, 2011). Alternative teaching and learning practices, such as online-learning and one-on-one consultations with the lecturer or tutor or an Academic Development Officer (ADO), are often used to complement lectures but students still fail to engage with these practices. The question then is, why do students choose not to engage with these teaching practices? The aim of this study was to investigate if first-year and second-year students at a South African university are motivated to engage with the teaching and learning practices used for Economics modules by analyzing their perceptions of these practices. The research questions that the study investigated were:

1. Which teaching and learning practices do first- and second-year Economics students perceive as contributing the most or/and the least to their academic success?
2. Do first-year and second-year Economics students have similar perceptions of the importance of the teaching and learning practices on their academic performance?

A lot of research has been done on the importance of student attendance for academic success. A literature search revealed that a number of these studies are mainly centred on lecture attendance or tutorial attendance without much being reported on other important teaching and learning components such as one-on-one consultations or revision classes (Stanca, 2006; Credé et al, 2010; Bati et al, 2013; Ganyaupfu, 2013). It is possible to assume that the reported low attendance at lectures and tutorials is because students are engaging more with other teaching and learning practices, hence substituting the lectures and tutorials with these other practices. However, this assertion can only be made if all teaching and learning practices are analyzed collectively. This study fills this gap.

Focus of teaching and learning is the knowledge we want our students to acquire and how to help them achieve that. The teaching and learning process requires the interaction of an instructor and a student with an overall goal of imparting knowledge and graduating them as the destination. Teaching practices and learning activities are all means to the destination with assessments being used as check points (evaluation) measuring student academic performance. Zulfiqar and Zamir (2015) and Adunola (2011) argues that it is important that teachers be acquainted with numerous teaching practices/strategies in order to ensure students' academic achievement.

Jarnin in Andala and Ng'umbi (2016) identified three clusters of teaching methods that can be used individually or in combination, these being traditional lecture methods, interactive methods and group discussion methods. The traditional lecture is the commonly used teaching

method where students sit in front of a teacher and listen as the teacher gives a lecture. One advantage of using this method is that it works well in disseminating firsthand information or as a didactic presentation of information and also when working with a large group of students (Andala & Ng'umbi, 2016). However, the traditional lecture method is problematic in that it fails to promote significant learning. Traditional lectures fail to engage students or motivate them to be accountable for their learning.

The traditional lecture method can be improved by combining it with interactive methods such as the use of PowerPoint slides, flash cards or demonstrations (Andala & Ng'umbi, 2016). Interactive lectures are believed to increase conceptual understanding and enhance critical thinking skills coupled with promoting higher knowledge retention (Armstrong, 2009; Cortright et al., 2005). In interactive lectures students are allowed to explore, process, refine and present information (Armstrong, 2009).

Interactive methods can be improved further by complementing them with group discussion. Group discussion is defined as a form of group communication in which the participants share ideas and exchange information on a common topic (Andala & Ng'umbi, 2016). The main advantages of group discussion are that it facilitates exchange of ideas, develops leadership, teamwork, communication and collaboration skills, helps participants explore existing knowledge and promotes a high level of thinking (Smith et al., 2009; Wehrli and Nyquist, 2003). Although highly recommended, group discussions have the potential to degenerate into social conversations or interpersonal conflicts may arise, hence they require a high degree of self-discipline from the students (Wehrli and Nyquist, 2003). Interactive and group discussion methods of teaching work well for students with a social learning style. Social learners prefer learning in groups or classes and prefer social activities and group studying, rather than doing things individually (Pritchard, 2013).

In addition to the three clusters of teaching methods there is online learning as well as one-on-one consultations. The 21<sup>st</sup> century has seen a move from traditional methods of teaching, such as the use of chalk and board, to a more technological-based approach that utilizes laptops and overhead projectors. Online learning and e-learning have also come into play, offering the convenience and flexibility of anytime and anywhere access to resources, although in some instances they are perceived as replacing face-to-face lectures (Van Der Merwe, ; Billings-Gagliardi and Mazor, 2007). These teaching methods work best for students with a solitary learning style. Solitary learners prefer to spend time alone and learn alone. They think independently, self-study, spend time with a teacher clarifying information, and dislike learning in groups (Pritchard, 2013)

To accomplish student academic achievement it is important to combine academic input with student input (Stanca, 2006). Student input combines factors that are directly linked to the student as well as individual heterogeneity such as cognitive traits. How well a student links the two inputs through attendance will be captured in their academic performance. It is for this reason that lecture and tutorial attendance are made compulsory or a minimum attendance is stipulated in some institutions to ensure that students receive the academic input. However, the stipulation does not guarantee good student performance as in most cases attendance will still vary depending on unobservable student traits such as ability, effort, students' learning style and motivation (Andrietti, 2014; Stanca, 2006).

There is a wide array of research on the contribution of ability to student performance. In some studies, ability is proxied by a high school grade, or grade point average (GPA), or aptitude test results, which are commonly used when selecting students into university (Win and Miller, 2005; Bugge and Wikan, 2013). The literature suggests a positive relationship between ability and academic performance. A positive relationship between effort and academic performance is also predicted (Stewart, 2008; Nonis and Hudson, 2010; Bugge and

Wikan, 2013). In these studies effort is proxied by average number of study hours or by study skills, which are both difficult to quantify as they are self-reported and depend on how honest the student is.

Studies that have analysed the role of motivation have centred more on extrinsic motivation and less on intrinsic motivation mainly because of the absence of a universally agreed measure of the latter (Akessa and Dhufera, 2015). Intrinsic motivation is defined as the will to succeed, and extrinsic motivation is the external source of motivation including socialization and rewards (Goodman et al., 2011). Previous studies have used subject evaluation, teacher evaluation, social integration and career orientation as measures of extrinsic motivation, and these measures are very subjective. To measure intrinsic motivation, the proxies used are student engagement, student perceptions, self-efficacy, interest and effort beliefs (Goodman et al., 2011; Bakker et al., 2015; Ferrell & Barbera, 2015).

Students' perceptions can contribute to students' intrinsic motivation, which feeds into their level of effort. According to Goodman et al. (2011) individual perception of the reward and task has a greater impact on the effort exerted in achieving academic performance. Thus students' perception of the lectures, tutorials or any other teaching and learning practice used can influence the level of effort they put in when engaging with the activity or task. Goodman et al. (2011) and Richardson and Swan (2003) argue that for an individual to be intrinsically motivated he/she needs to experience interest and enjoyment in his/her task, or have positive perceptions of learning as well as satisfaction with the instructor. Highly intrinsically motivated students will then attend classes regularly leading to better performance in tests and examinations (Sikhwari, 2007; Bakker et al., 2015; Ferrell & Barbera, 2015).

**Overview of the Teaching and Learning Practices for First- and Second-Year  
Economics Students in this Study**

The study reviewed the teaching and learning practises used in the first-year Microeconomics class and the second-year Macroeconomics class. These two modules were chosen for analysis because the same lecturers teach the two streams using the same teaching and learning practices. The use of the same teachers across the two streams allows for teachers' personality and quality to be assumed constant in this analysis. Both modules were taught by more than one instructor due to the large class sizes. At the beginning of the semester, the students were given a course outline with details of topics to be covered as well as the core textbooks for the course. Test and tutorial dates were included in the course outline as well as the Dual Performance (DP) requirements and lecture timetable. Lectures were the main teaching tool and were administered in two 45-minute sessions and one 90-minute session every week. To complement the lectures, the students had to attend a 90-minute large group tutorial session every other week, and small group Supplemental Instructor (SI) revision sessions before tests. The students could also have one-on-one consultation sessions with the lecturer by appointment, or the Academic Development Officers anytime during the week. Towards the end of the semester, students were given a one-week study break. All the lecture notes, past tests and examination papers, tutorial material and other additional resources were made available on Moodle and students had 24-hour access to it. Moodle is an online service, also known as e-learning, which is used by the lecturers to communicate with the students. The students also had access to the library and a computer local area network (LAN) where they could do self-studying.

### **Data and Methodology**

The target population for the study was 630 first-year Microeconomics and 360 second-year Macroeconomics students. The study was explained to the students who then signed a consent form to acknowledge willingness to participate.

#### **Students' perceptions of the teaching and learning methods**

A questionnaire was administered to students, with the help of enumerators, during a number of randomly selected lectures to try to capture as many students as possible. Of the 630 students enrolled for the first-year module, 206 participated but 60 were not included in the analysis because of incomplete information. The analysis then worked with a sample of 149 first-year respondents and 100 out of 360 second-year respondents. The questionnaire had a five-point Likert scaled question which assessed 12 teaching and learning practices. The students had to indicate the extent to which they consider the 12 teaching and learning practices to be helpful or not helpful for their academic achievement.

Descriptive analysis and factor/principal component analysis were used to examine the data and reduce the 12 teaching and learning practices into smaller manageable clusters. Prior to undertaking the factor analysis, the Kaiser-Meyer- Olkin (KMO) test of sampling adequacy was applied to determine the suitability of the data for such analysis. As a rule of thumb, if the KMO test result is 0.5 or higher, then the data is suitable for factor analysis (Field, 2013). [Insert tables 2 and 4 about here] In this case, first-year data indicated a KMO test statistic of 0.596, whilst second-year data indicated 0.699, making both data sets suitable for factor analysis. The Bartlett test of sphericity was also applied to investigate whether there are relationships between the teaching and learning practices. The Bartlett test for the appropriateness of principal component analysis should be statistically significant at a p-value less than 0.05 for factor analysis to be appropriate (Pallant, 2013). The Barlett test values were

statistically significant with a p-value of 0.000 (Chi-Square=179.77 and df=66 for first-year data and Chi-Square=303.462 and df=66 for second-year data), indicating that both data sets were suitable for factor analysis. The Cronbach test of reliability was considered for both data sets, but due to the nature of the measures, the test was not informative in some instances. Cronbach Alpha is a statistic used as a measure of internal consistency, how closely related a set of items are as a group, and reliability. The questions on the Likert scale were formative measures showing alternative teaching and learning practices, which are not interchangeable, hence recorded low Cronbach Alpha values. According to Diamantopoulos and Sigauw (2006), low Cronbach Alpha values do not necessarily mean low reliability, but low internal consistency and a "high" value for alpha does not imply that the measure is one-dimensional. Diamantopoulos and Sigauw (2006) recommend the reliability evaluation for formative constructs to be based on the assessment of the assumption of no multicollinearity. In this regard the VIF statistics were less than 1.8 suggesting no multicollinearity.

The indexes generated from factor analysis were further analysed in a correlation matrix to ascertain whether these perceptions were related to lecture attendance and students' performance.

## **Results**

### **Descriptive Analysis of student perceptions**

Figure 1 summarizes the data from first-year respondents and shows that a strong response for "helpful" (above 80%) was recorded for revision classes, 45-minute lectures, PowerPoint lectures and small group tutorials. [Insert Figure 1 about here] Of the four, the revision classes (89%) were perceived as the most helpful. Lecturer consultation (72%), weekly tutorials (71%) and self-study (74%) also recorded a high helpful response. Most students were not sure about whether fortnightly tutorials were helpful or not as most of the students recorded

a “neutral” response (about 43%). Further analysis of these teaching and learning practices was done using principal component analysis and results are reported in the next section.

Second-year respondents reported a very strong response for “helpful” (above 80%), for revision classes (96%), PowerPoint lectures (92%), Moodle (82%) and small group tutorials (80%). [Insert Figure 2 about here] Self-study (75%), and ADO (66%) and lecturer (71%) consultations also recorded high “helpful” response rates. Of the 12 practices investigated, fortnightly tutorials recorded the lowest appreciation with only 38% of the respondents finding them helpful.

### **Principal Component Analysis of first-year students' perceptions**

Using Kaiser's criterion, a set of five components with Eigen values greater than one emerged from the principal component analysis. [Insert tables 1 and 3 about here] The five components account for 59,342% of the total variance. The first component has an Eigen value of 2.281 and explains 19.006% of the total variance. The component consists of three items, namely, lecturer consultation (factor loading 0.781), ADO consultations (0.774) and revision classes (0.685). This component is labelled “one-on-one”. First-year students are highly motivated to go for one-on-one consultations as they perceived lecturer consultations, ADO consultations and revision classes to be most helpful to their performance. The second component has an Eigen value of 1.548 and explains 12.9% of the total variance. The component consists of three items, namely, 45-minute lectures (0.683), PowerPoint lectures (0.62) and self-study (0.59). The second component is labelled “short-concentration interactive”. The third component, explaining 9.748% of total variance, had three items namely, 90minute lectures (0.674), small group tutorials (0.609) and weekly tutorials (0.567). The component is labelled “long concentration interactive”. The fourth component comprises two items, fortnightly tutorials (0.807) and chalk-and-talk lectures (0.691), explaining 8.948%

of the total variance. This component is labelled "traditional". The last component has one element, Moodle (0.827), and explains 8.74% of the total variance and is labelled "online".

### **Principal Component Analysis of second-year students' perceptions**

Using Kaiser's criterion, a set of four components with Eigen values greater than one emerged from the principal component analysis. [Insert table 4 and 6 about here] The four components account for 62.533% of the total variance. The first component, explaining 30.1% of total variance, has an Eigen value of 3.615. The component consists of four items, namely, weekly tutorials (0.787), PowerPoint lectures (0.675), small group tutorials (0.642) and revision classes (0.641). This component is labelled "short concentration interactive". The second component has an Eigen value of 1.484 and explains 12.4% of the total variance. The component consists of three items, namely, fortnightly tutorials (0.828), chalk-and-talk lectures (0.738), and 90-minutes (0.463). The second component is labelled "long-concentration traditional". The third component, explaining 10.7% of total variance, has two items, namely, lecturer consultation (0.916) and ADO consultation (0.758). The component is labelled "one-on-one". The fourth component comprising three items, these being self-study (0.767), Moodle (0.681) and 45-minute lectures (0.597), explained 9.3% of the total variance. This component is labelled "mixed".

### **Discussion**

Ramsden (1992) argues that effective teaching needs a teacher to use a variety of teaching methods and techniques for effective motivation of the students. The choice of method to use should be guided by intended learning outcomes as well as the behaviour of the students. The results presented above show that both first- and second-year students have a high appreciation of all teaching and learning practices used and perceive them as important elements for their academic success, although some are more preferred than others. Secondly, the perceptions of the two streams of students are different, hence their teaching requirements

should also differ to ensure motivation for attendance and engagement with the teaching and learning practices.

The results of the descriptive analysis show that both first- and second-year respondents have a high degree of appreciation for almost all teaching and learning practices used, except for fortnightly tutorials. In both streams, revision classes received the highest percentage of students indicating "helpful". The result suggests that the students could possibly be using revision classes to compensate for not attending lectures or that they rely more on test and examination "spotting" for their academic performance. On the same note, both streams also indicated a high preference for PowerPoint slides and 45-minute lectures. The PowerPoint slides provide visual summarized material, and students obviously prefer these presentations more than self-studying (74% for first-year students and 75% for second-year students), that is self-studying material from the textbook and making their own notes, or chalk-and-talk lectures (51% for first-year students and 61% for second-year students). This preference could suggest lack of studying skills among the students or some degree of laziness.

The high response for 45-minute lectures suggests that the students know the importance of lecture attendance for their academic performance although they prefer it in short sessions, possibly because they have a short concentration span. Small group tutorials also recorded a high preference from both streams. Conflicting results were recorded for Moodle (e-learning), with 69% "helpful" response from first-year students and 82% "helpful" response from second-year students. The high preference for Moodle by second-year students could be an indication of maturity and an increase in the degree of independent learning. Lastly, both first-year and second-year students have a disregard for the fortnightly tutorials and long lectures (90-minute lecture).

From the descriptive analysis, the main finding is that as much as the second-year students might believe in spotting for academic success, they have a higher appreciation of

mixed methods of teaching and learning compared to first-year students. This finding is consistent with the results from the principle component analysis. [Insert table 7 about here] The first cluster for second-year students' labelled "short concentration interactive" combines different teaching practices, namely, revision classes, PowerPoint lectures, small group tutorials and weekly tutorials, which is a mixture of teaching practices that are usually conducted in a group setting. On the contrary, the first cluster for first-year students perceive one-on-one Teaching & Learning practises (lecturer consultation, ADO consultation and revision classes) associated with solitary learning style, as contributing the most.

Also, from the principal component analysis it emerged that first-year students perceive teaching and learning practices associated with social learning as contributing the least to their academic success, these being, Moodle, fortnightly tutorials and chalk-and-talk lectures. On the contrary second-year students are least motivated to engage in solitary learning as they perceive lecturer consultation, ADO consultation and self-studying as least helpful for their academic success. This is the opposite of first-year student perceptions, and possibly an indication of growth and maturity.

### **Conclusion**

Both first-year and second-year students acknowledge and appreciate the importance of the 12 teaching and learning practices currently being used for Economics modules but rank their importance for academic success differently. First-year students perceive one-on-one learning as the most helpful to their academic performance and prefer practices that require a short concentration span. They perceive lecturer consultation, ADO consultation and revision classes as the most beneficial practices for their academic success. Online learning is perceived as least helpful. Second-year students recognize interactive group learning practices as most beneficial for their academic success. They perceive weekly tutorials, PowerPoint lectures, small group

tutorials and revision classes as contributing the most to academic performance. Self-study, Moodle and 45-minute lectures are perceived as the least beneficial by both streams of students. The main conclusion that can be drawn from this study is that first-year students are more solitary learners and prefer teaching and learning practices that involve one-on-one interaction with the instructor. On the other hand, second-year students are more social learners and prefer teaching and learning practices that are in a group setup.

**Endnote**

<sup>1</sup> Throughput is generally defined as the number of students who complete their degree in the minimum required time as a fraction of the total initial enrolment.

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**Table 1: Total Variance Explained for first year students**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cum %	Total	% of Variance	Cum %	Total	% of Variance	Cum %
1	2.281	19.006	19.006	2.281	19.006	19.006	1.811	15.096	15.096
2	1.548	12.9	31.906	1.548	12.9	31.906	1.564	13.034	28.13
3	1.17	9.748	41.654	1.17	9.748	41.654	1.336	11.131	39.261
4	1.074	8.948	50.602	1.074	8.948	50.602	1.269	10.578	49.838
5	1.049	8.74	59.342	1.049	8.74	59.342	1.14	9.504	59.342
6	0.966	8.054	67.396						
7	0.942	7.85	75.246						
8	0.762	6.35	81.596						
9	0.657	5.472	87.068						
10	0.598	4.981	92.048						
11	0.528	4.403	96.452						
12	0.426	3.548	100						

Extraction Method: Principal Component Analysis.

**Table 2: KMO and Bartlett's Test for contributors to academic performance for first year students**

KMO and Bartlett's Test		
KMO Measure of Sampling Adequacy.		0.596
Bartlett's Test of Sphericity	Approx. Chi-Square	179.77
	df	66
	Sig.	0.000

**Table 3: Rotated Component Matrix for first year students**

	Component				
	1	2	3	4	5
Lecturer Consultation	0.781				
ADO consultations	0.774				
Revision Classes	0.685				
45-minute lecture		0.683			
PowerPoint lecture		0.62			
Self-study		0.59			
90-minute lecture			0.674		
Small group tutorials			0.609		
Weekly tutorials			0.567		
Fortnightly tutorials				0.807	
Chalk Talk lecture				0.691	
Moodle					0.827
Cronbach Alpha	0.632	0.404	0.32	0.434	

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a Rotation converged in 7 iterations.

**Table 4: Total Variance Explained for second year students**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cum %	Total	% of Variance	Cum %	Total	Variance	Cum %
1	3.615	30.126	30.126	3.615	30.126	30.126	2.337	19.476	19.476
2	1.484	12.363	42.490	1.484	12.363	42.490	1.869	15.574	35.050
3	1.287	10.726	53.216	1.287	10.726	53.216	1.722	14.347	49.397
4	1.118	9.317	62.533	1.118	9.317	62.533	1.576	13.136	62.533
5	0.987	8.227	70.760						
6	0.741	6.176	76.936						
7	0.659	5.494	82.431						
8	0.607	5.059	87.489						
9	0.463	3.861	91.350						
10	0.417	3.471	94.821						
11	0.383	3.190	98.011						
12	0.239	1.989	100.000						

Extraction Method: Principal Component Analysis.

**Table 5: KMO and Bartlett's Test for contributors to academic performance for second year students**

KMO and Bartlett's Test		
KMO Measure of Sampling Adequacy.		0.699
Bartlett's Test of Sphericity	Approx. Chi-Square	303.462
	df	66
	Sig.	0.000

**Table 6: Rotated Component Matrix for second year students**

	Component			
	1	2	3	4
Weekly tutorials	.787			
PowerPoint lecture	.675			
Small group tutorials	.642			
Revision classes	.641			
Fortnightly tutorials		.828		
Chalk & talk lecture		.738		
90-minute lecture		.463		
Lecturer consultation			.916	
ADO consultation			.758	
Self-study				.767
Moodle				.681
45-minute lecture				.597
Cronbach's Alpha	0.692	0.617	0.765	0.534

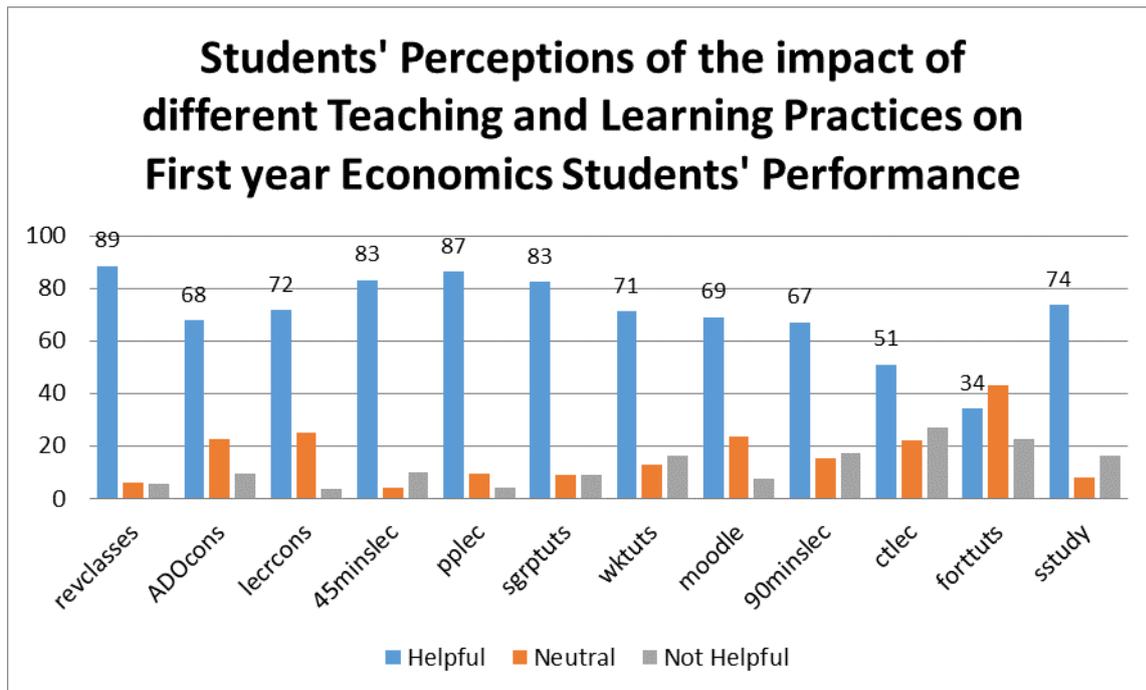
Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

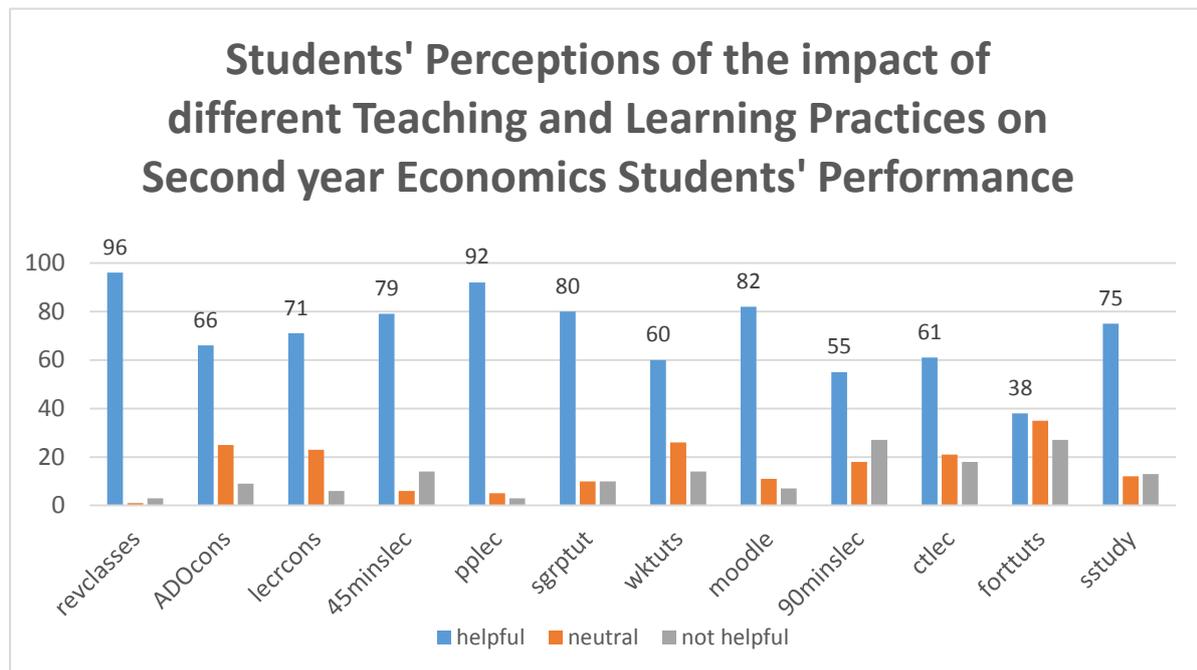
a. Rotation converged in 5 iterations.

**Table 7: Classification of the components**

<b>Component</b>	<b>T&amp;L mode</b>	<b>Teaching style label</b>	<b>learning style label</b>
<b>First-year students</b>			
1	lecturer consultation ADO consultation Revision classes	One-on-one	solitary learners
2	45-minute lectures PowerPoint lectures self-study	short concentration interactive	solitary learners
3	90-minute lectures small group tutorials weekly tutorials	long concentration interactive	social learners
4	fortnightly tutorials chalk and talk lectures	traditional	social learners
5	Moodle	online	solitary learners
<b>Second-year students</b>			
1	weekly tutorials PowerPoint lectures small group tutorials revision classes	short concentration interactive	social learner
2	fortnightly tutorials 90-minute lectures chalk and talk lectures	long concentration traditional	social learner
3	lecturer consultation ADO consultation self-study	One-on-one	solitary learner
4	Moodle 45-minute lecture	mixed	solitary learner



**Figure 1: first year students' perceptions of the teaching and learning practices as a percentage of the students who participated in the study**



**Figure 2: second year students' perceptions of the teaching and learning practices as a percentage of the students who participated in the study**