

PERCEPTION OF STUDENTS ON THE USE OF ICTs: A CASE STUDY

M.I. López Rodríguez^{1*}, D. G. Palací², J. Palací³

¹Prof. Universitat de València (SPAIN)

²PhD student Universitat Politècnica de València (SPAIN)

³Dr. Valencia (SPAIN)

*Corresponding author

Abstract

The increasing use of Information and Communication Technologies (ICTs) in university classrooms for the development of the teaching-learning process has led to the analysis of their impact on students' performance by many researchers.

However, little works can be found in the literature focused on how students perceive their use. Thus, the objective here is to assess students' perception in a degree offered by the University of Valencia in a subject of quantitative nature in which a new pedagogical tool in university teaching, an electronic voting system (EVS), was used throughout the course.

To do this, data provided through an ad-hoc questionnaire addressed to these students is used. It consists of 10 questions, 6 of which are Likert scale type with five levels of response, 2 respond to the obtaining of information about the students' profile, 1 to the assessment that the student makes of the use of the pedagogical tool, and 1 is an open question.

The results obtained reflect that the students' perception is more than satisfactory, with around 80% of them perceiving them as having a favorable impact in terms of allowing more dynamic lessons and improving the assimilation of concepts, and 40% indicating that they improved their continuous evaluation qualification. Finally, the mean score provided on a scale of 0 to 10 on the use of EVS is greater than 7.

Keywords: survey, likert scale, perception, ICT, electronic voting system (EVS).

1 INTRODUCTION

The Bologna Plan, with the consequent change in the curricula of Spanish universities, has been fundamentally characterized by:

- A reduction of the years that make up the degree, since it has passed from the 5 years that constituted the

“licenciatura” to the 4 years destined to the degree.

- Less presence of the students in the classrooms, with an increase of their autonomous work.
- A change in the role of teaching staff, which has become more a guiding agent of students in their own teaching-learning process than the unique source of knowledge and on which the full weight of the process in the classroom fell.

All this has meant that, in order to alleviate the decrease in teaching hours and encourage student participation, the use of Information and Communication Technologies (ICTs) has become widespread.

Although their use has generally yielded good results (Agudo et al, 2014, Bezanilla et al., 2014, Esteban et al., 2009, Palací et al., 2012), there are studies that show reduced performance for students of the Bologna plan when compared to its predecessor (López and al. 2016).

It is worth mentioning, among the ICTs used, the "clickers", an open source electronic voting system (EVS) (Derek, 2009; Barac and Pardo-García, 2015; Martyn, 2007) that allow both teachers and students to have immediate feedback on the concepts that have been understood by the students correctly and those that deserve special attention. This survey can be done at the end of each face-to-face session or, according to the needs of the subject and attending to the subjective criteria of the teaching staff, spacing its use for a greater use of the tool.

Some studies carried out, with the purpose of studying the repercussion of its use, provide very good results, both in degree (López and al., 2015 to; Palací and al., 2013) and master studies (López and al., 2015 b; López and al. 2017).

On the other hand, the majority of research carried out with the purpose of analyzing the goodness detected in the use of this and other ITC's have not taken into account the point of view of the students about the repercussion that the use of the same has in their learning process.

Therefore, the objective of the work that is presented is to cover, to the extent possible, this gap. Specifically, information has been collected from students, from a degree offered by the University of Valencia for those enrolled in a quantitative subject who has used clickers, on issues related to the following blocks:

- Students' perception of the use of clickers both in the classroom and in the preparation of the tests that make up the continuous evaluation and the final test of the subject.
- Assessment (on a scale of 0 to 10) that the student surveyed provides to the use of the tool.
- Student profile.

For this purpose a questionnaire was prepared, consisting of the following questions:

- Has the use of clickers helped you to better understand the concepts of the subject? (Helps in concepts understanding).
- Did the use of clickers help make the class better? (Increases performance in the classroom).
- Does using the clickers make the class more enjoyable? (Makes lessons friendlier).
- Does using clickers make the class more participatory? (Increases motivation to take part in class).
- Has the use of clickers helped you prepare for the exams? (Clickers are good practice before exams).
- Has the use of clickers contributed to improving your continuous assessment grade in the subject? (Improves continuous evaluation grades).
- Evaluate, on a scale of 0 to 10, your experience with the use of clickers (Assessment in the use of clickers).
- Gender
- Class attendance group
- Write below any comments you consider appropriate about the use of clickers

The first 6 follow a Likert scale with the following 5 levels: "Not at all", "Just a little bit", "Indifferent", "Remove a bit" and "Absolutely" and the last one is an open response.

Thus, based on the information provided by the questionnaire, a study will be carried out at the descriptive level of the data collected, which will provide information on students' perception of the use of this ICT.

The tools used to carry out this study will be:

- graphical type (pie charts and bar charts)
- reduction measures: both position (average, median, mode, minimum and maximum) and dispersion (typical deviation and coefficient of variation)

2 ANALYSIS OF THE RESULTS

On the basis of the above, the first six questions (likert scale) in table 1 show the percentages corresponding to each level of this scale, by issue, and in sector graphs (fig. 1 to 6) the graphical representation of said percentages.

Table 1. Share percentages scale likert

	QUESTIONS					
	Helps in concepts understanding	Increases performance in the classroom	Makes lessons friendlier	Increases motivation to take part in class	Clickers are good practice before exams	Improves continuous evaluation grades
Not at all	4,88%	4,88%	0,00%	0,00%	9,76%	4,88%
Just a little bit	7,32%	7,32%	0,00%	4,88%	12,20%	19,51%
Indifferent	19,51%	17,07%	7,32%	7,32%	29,27%	36,59%
Quite a bit	58,54%	51,22%	39,02%	31,71%	39,02%	31,71%
Absolutely	9,76%	19,51%	53,66%	56,10%	9,76%	7,32%

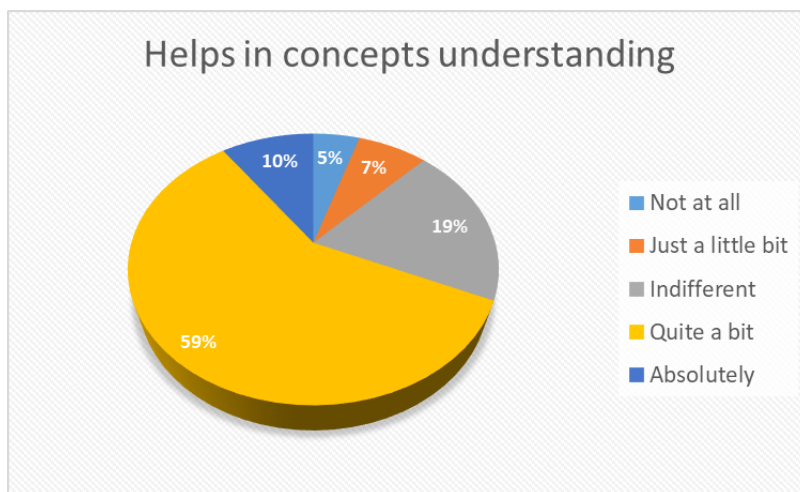


Fig. 1 Responses to the question "Helps in concepts understanding"

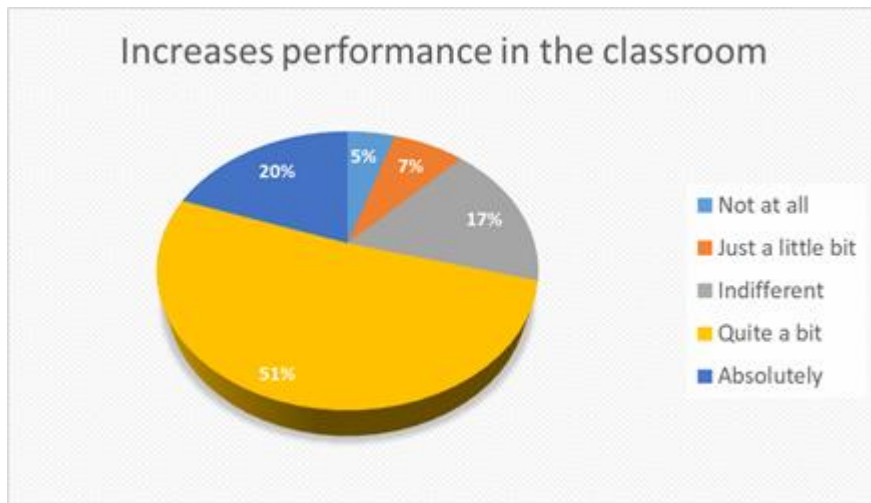


Fig. 2 Responses to the question "Increases performance in the classroom"

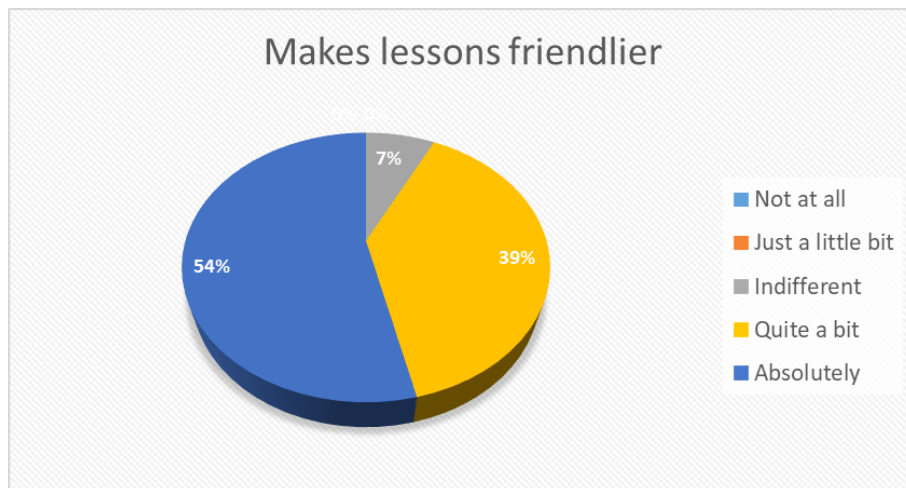


Fig. 3 Responses to the question "Makes lessons friendlier"

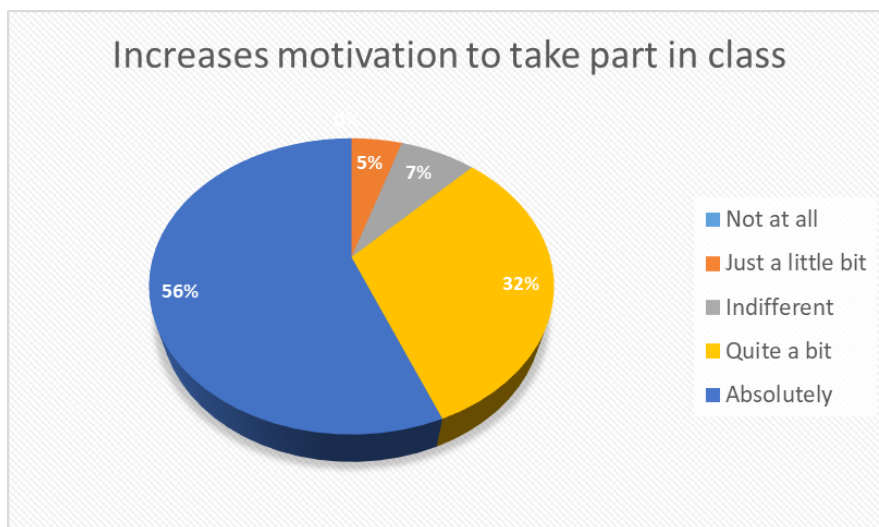


Fig. 4 Responses to the question "Increases motivation to take part in class"



Fig. 5 Responses to the question "Clickers are good practice before exams"

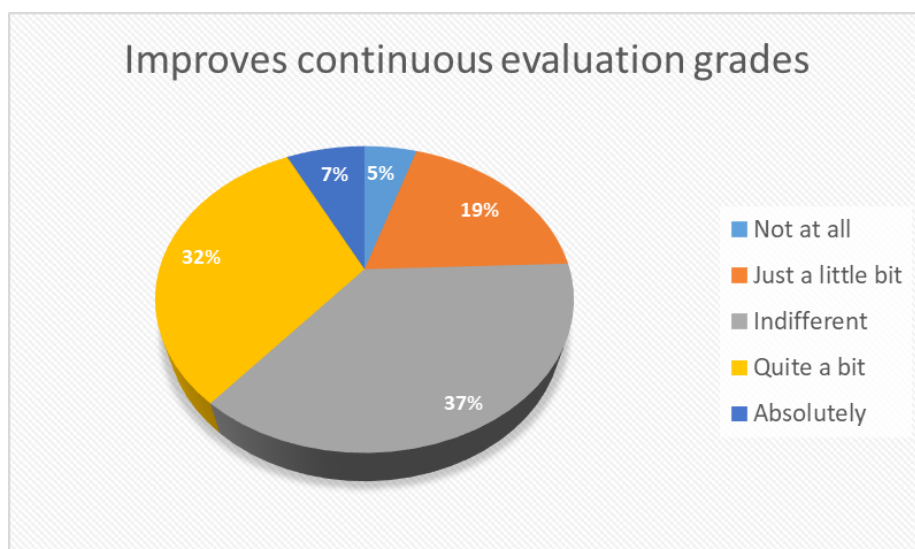


Fig. 6 Responses to the question "Improves continuous evaluation grades"

From the observation of the same it follows that:

- If we consider the questions related to students' perception of the use of clickers in the classroom: "Helps in concepts understanding", "Increases performance in the classroom", "Makes lessons friendlier" and "Increases motivation to take part in ", the percentage of respondents who show good consideration ("Absolute" or "Bit by bit") are 68.29%, 70.73%, 92.68% and 87.80%, respectively.

- Regarding the issues that make reference to the impact that the use of the clickers in the classrooms has for the student in the preparation of the tests that compose the continuous evaluation and the final test of the subject ("Clickers are good practice before exams "and" Improves continuous evaluation ") the percentages that consider that the level of the Likert scale is at least "Bit by bit" are 48.78% and 39.02% respectively.

That is, they value the usefulness of the clickers in the dynamization of the class and the help that these suppose in the understanding of the exposed concepts, that the repercussion that these have in the preparation of the evaluation of the matter. But in any case, it should not be forgotten that the smallest of the

percentages is approximately 40% and that two of them exceed 80%, so that the use of this ICT can be considered to be very well received by part of the students.

It should also be noted that in the case of the "Makes lessons friendlier" and "Increases motivation to take part in class" questions, none of the respondents selected the "Not at all" option and that more than 50% they have selected the most favorable option ("Absolutely"), namely 53.66% for the first and 56.10% for the second. This reinforces the good disposition that the students show towards the use of the clickers.

As for the question of the evaluation (scale from 0 to 10) that the student provides to the use of the pedagogical tool, table 2 shows the possible values of Grade as well as the absolute and relative frequencies, ordinary and accumulated data obtained. The bar diagram (Figure 7) corresponds to the graphic representation of the absolute frequencies

Table 2. Frequency table of assessment (AS)

Grade	ni	fi	Ni	Fi
0	0	0,00%	0	0
1	0	0,00%	0	0,00%
2	0	0,00%	0	0,00%
3	4	9,76%	4	9,76%
4	0	0,00%	4	9,76%
5	3	7,32%	7	17,07%
6	3	7,32%	10	24,39%
7	9	21,95%	19	46,34%
8	11	26,83%	30	73,17%
9	9	21,95%	39	95,12%
10	2	4,88%	41	100,00%

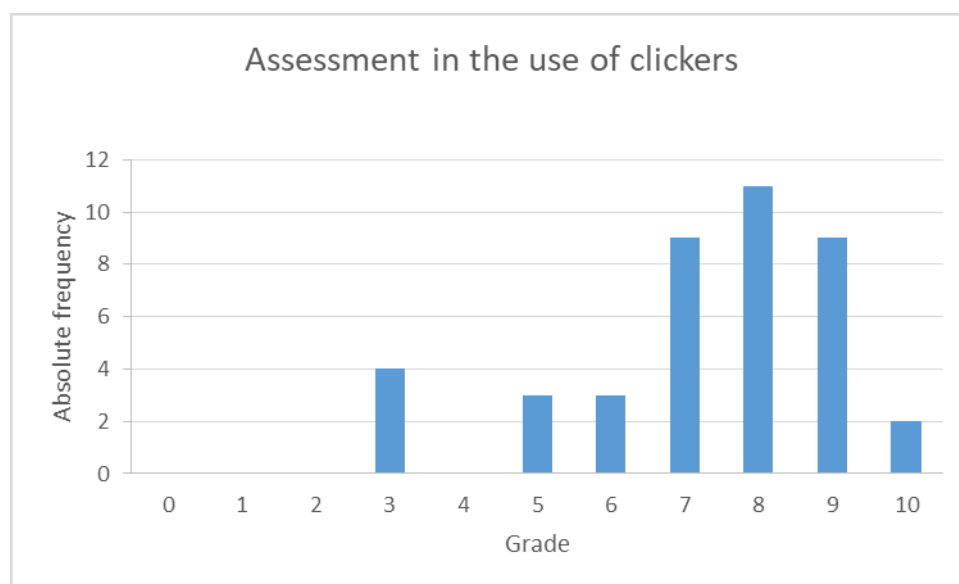


Fig. 7 Grade bar diagram

From the observation of both it is concluded that:

- 26.83% give a value greater than or equal to 9 to the use of clickers.
- 53.66% give a value greater than or equal to 8 to the use of clickers
- 75.61% give a value greater than or equal to 7 to the use of clickers.

That is, more than three-quarters of the students award a remarkable one, which happens to be a remarkable high for more than half of the respondents and just over a quarter of them qualify with an outstanding.

And the most frequent evaluations are (in descending order of their frequencies): 8, 7 and 9. On the other hand, table 3 collects the most relevant position and dipment measurements of the data represented numerically and graphically previously.

Table 3. Parameters of assessment (AS)

PARAMETERS	AS
Average	7,24
Typical deviation	1,881
Coefficient of variation	0,26
Median	8
Mode	8
Minimum	3
Maximum	10

Note that:

- The average score is 7.24
- This mean is representative, having a coefficient of variation of Pearson of 0,26.
- The minimum value of grade is a 3, that is, none of the respondents gives a value less than or equal to 2 to the use of this ICT.

It can therefore be concluded from the results obtained in the analysis of the responses to the 6 questions of likert scale and the only one with a quantitative response (from 0 to 10), that students perceive the use of clickers as very beneficial for their learning process. This is corroborated by some of the answers to the open response question ("Write down any comments you feel about using clickers below"). By way of example, and with the intention of not not being too exhaustive, here are some of them:

- "They are very practical".
- "It makes the class more dynamic."
- "They make classes much more enjoyable".
- "It is a good tool to assimilate concepts of the subject".

3 CONCLUSIONS

The aim of the present work is to capture students' perception of the use of clickers, an ICT that is increasingly used in university classrooms.

To do this, within a degree offered by the Universitat de València, a quantitative subject in which the tool was used and an ad-hoc questionnaire was elaborated, which was completed by a promotion of students who had studied this subject.

Using descriptive tools (frequency tables, graphs, position measurements of central and non-central tendency, as well as dispersion measures) after the analysis of the information obtained, we can conclude that:

- The students surveyed valued both the usefulness of the clickers in the dynamization of the class and the help they could provide for the preparation of the tests that make up both the continuous evaluation and the final exam of the subject. Specifically, the percentage of them that in the Likert scale questions at 5 levels showed good consideration ("Quite a bit" or "Absolutely") oscillated around 80% as in terms of the dynamization of the class and the understanding of the concepts worked and around 40% regarding the improvement that the impact that its use had on the qualification obtained in the continuous evaluation. Moreover, in two of the questions raised to analyze the benefits of the use of this ICT in class development, there was no case in which the student chose the most unfavorable option ("Not at all") and more than 50 % of respondents selected the most favorable ("Absolutely").

- In order to quantify the students' perception, a question was included in the questionnaire asking them to value (from 0 to 10) their experience with the use of clickers. Thus, the most frequent evaluations were: 7, 8 and 9. By average the rating was of 7.24, with a coefficient of variation of Pearson of 0.26, which allows to qualify the average as representative of the data. On the other hand, the minimum valuation granted was of a 3, giving this only in 4 answers. In addition, more than 75% of the students awarded a notable (or equal to 7) to their experience with the use of clickers, percentage that happened to be something more than 25% if one considered those who provided an outstanding rating (greater than or equal to 9).

These data, together with most of the favorable statements given by the students in the single open question of the questionnaire ("Write below any comments that you consider opportune about the use of the clickers") allows to conclude that, in general, the students' respondents perceive the use of clickers as "very beneficial" in their learning process.

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