

Student involvement and management of students' workload in formative assessment in higher education

Implicación y regulación del trabajo del alumnado en los sistemas de evaluación formativa en educación superior

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Resumen

El objetivo de este estudio es analizar cuál es la relación entre la utilización de sistemas de evaluación formativa en educación superior y la implicación y la organización y distribución del trabajo del alumnado a lo largo del cuatrimestre. La muestra utilizada es de 3.304 alumnos, correspondientes a 50 asignaturas de 16 universidades españolas. Se utiliza la Escala de Sistemas de Evaluación perteneciente al cuestionario sobre metodología y evaluación en la formación inicial del profesorado, en el que se plantean diferentes cuestiones relacionadas con la vía de evaluación formativa. Se ha empleado un análisis cuantitativo descriptivo (medias, DT y varianzas) e inferencial (tablas de contingencia y χ^2 , correlaciones y ANOVA). El alumnado valora positivamente este sistema de evaluación recibido, asumiendo la necesidad de implicarse desde el comienzo en la asignatura y de buscar estrategias para regular su trabajo. También se demuestra que el alumnado que más veces ha participado en estas vías de evaluación presenta un nivel de implicación mayor, algo que también sucede con el alumnado de cuarto curso. Sin embargo, el hecho de haberse matriculado una o más veces en la misma asignatura no muestra relación significativa con una mayor o menor implicación.

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Abstract

The aim of this study is to analyze what is the relationship between involvement and the organization and distribution of work that have university students in connection with formative assessment received. The sample is 3.304 students for 50 subjects in 16 Spanish universities. Scale Assessment Systems belonging to the questionnaire on the evaluation methodology and initial teacher is used, in which there are different issues about formative assessment. It has used a quantitative descriptive analysis (means, variances and DT) and inferential (contingency tables and χ^2 , correlation and ANOVA). Students welcome this evaluation system received, assuming the need to be involved from the beginning in the subject and find strategies to regulate their work. It also demonstrates that students who participated more often in these assessment processes present a higher level of involvement, which also happens to fourth grade students. However, the fact that he enrolled one or more times in the same subject does not show significance with greater or lesser involvement

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One of the key principles proposed by the Universities Act (LOU, 2001) is to identify strategies that lead to improvements in the quality of education, emphasising the key role that the assessment of learning has in this process. The intention is to respond to the challenges raised by the concept of continuing lifelong education (LOU, 2001: 49400-49401), establishing the extent to which students are able to transfer the knowledge that they gain during their formative years. It seems essential therefore, that students become increasingly involved in the teaching and learning process (Buscá, Pintor, Martínez & Peire, 2010; Gibbs, 2004). According to Cooper & Heinze (2007) this involvement of students and management of their workload can take the form of monitoring of individuals or groups that the tutor takes in the course of a module based on careful planning and structuring of the teaching. This process requires students to have a certain degree autonomy as well as receiving continuous advice on the work they produce. Sitzmann & Ely (2011) show that when students are allowed to manage their workload and participate in making decisions on how to guide and improve their learning, the end result is better. However, Lin & Lai (2013) warn that the tutor's role in this is critical, especially in the provision of guidelines and the effective delivery of feedback, which ensure greater retention and application of the learning generated.

To deliver this new approach it is necessary to develop open and participatory methodologies to modify processes focused solely on a "banking education" (Freire, 1990). Dochy, Segers & Dierick (2002) consider the kind of learning students acquire when results are entirely based on a final grade. It therefore seems appropriate to use the assessment process as something more than a way to obtain a purely numerical value.

In relation to this approach, different authors (Biggs, 2005; Bonsón & Benito, 2005; De Miguel, 2006; Huber, 2008; Meyer & Jones, 1993; Millis, 2010) suggest learning perspectives in which students have to be involved in their own learning process, leading

to the acquisition of more authentic and transferable learning that is applicable to other areas of knowledge. In reference to this, Monereo (2013) says that today no one disputes that to meet the current challenges of the transfer of knowledge those "educators who base all their teaching on the oral presentation of content, expecting it to be subsequently reproduced by an audience of dedicated note-takers" must be eradicated. Fortunately, over the last twenty years it seems that university lecturers are becoming increasingly innovative in their teaching practice. Experiences in teacher education in Spanish universities that deliver objective and observable changes are becoming quite common (Fernández & Rekalde, 2011; Fernández Guisasola, Garmendia, Alkorta & Madinabeitia, 2013; Monereo, Weise & Alvarez, 2013). Some authors even insist that this significant change cannot take place unless those experiences are linked to strategies based on formative assessment (López-Pastor & Palacios, 2012; López-Palacios & Pastor, 2013). However, this breath of fresh air does not mean that, overall, assessment implemented by university lecturers is not still fundamentally traditional in nature (Gutiérrez-García, Pérez-Pueyo & Pérez-Gutiérrez, 2013). Therefore, as discussed by Arribas, Carabias & Monreal (2010), it seems necessary to amend this widespread practice where assignments are based principally on the memory function with no element of comprehension or reflection.

On this issue, several authors reflect on the importance of implementing these assessment processes in the classroom (Carless, Joughin, & Mok, 2006; De la Fuente, Martínez, Peralta & García, 2010; Lorente & Kirk, 2013), and endorse the intentions of the EHEA (Fraile, 2006; López-Pastor, 2009; Martínez, Martín, & Capllonch, 2009). It seems, therefore, that the key is to identify assessment systems that encourage direct student involvement in the learning process and develop self-regulation (Fraile López-Pastor, Castejón, & Romero, 2013). Numerous references can be found relating to experiments and studies on this type

of assessment which show how they improve student-tutor interaction as well as understanding, reflection and the students' involvement in the module (Fraile & Cornejo, 2012; López-Pastor, Pintor, Muros & Webb, 2013; Valles, Ureña & Ruiz, 2011).

Formative assessment represents the ideal system to achieve these aims and is defined by López-Pastor (2009) as "any assessment process whose main purpose is to improve the quality of teaching and learning that takes place" (p. 35) without simply intending to produce a mark, but rather, among other things, delivering opportunities to reassess objectives, review module plans, whole programmes, teaching methods and resources but, above all, creating pathways for students and for gaining feedback on the process itself. There are many other published examples that refer to the same themes of self-assessment (Fernández-Balboa, 2005, 2007; Fraile, 2010; Walls, 2013; Rivera, Trigueros, Moreno & De la Torre, 2012; Rodríguez Ibarra & Gómez, 2011) and peer assessment (Alvarez, 2008; Dochy, Segers & Sluijsmans, 1999; López-Pastor, 2009; Topping, 1998).

One of the fundamental factors that justify the implementation of formative and shared assessment processes is the clarity with which they must be presented to the students, with a defined set of initial criteria outlining their involvement and the way the process will be managed (Buscá, Rivera & Trigueros, 2012 ; Buscá, Pintor, Martínez, & Peire, 2010). If we consider the establishment of formative assessment systems in different educational institutions and the results they produce, Chen, Caldera, Klenowski & De mayo (2013) show how universities where formative assessment was used, regardless of the subject area, obtained higher satisfaction ratings from both staff and students. Other international experiences (Jones, 2014) applied to language learning during an academic year in schools showed that students who had participated in formative assessment processes acquired superior methodological and evaluative competences which they could implement in

the classroom whilst on their period of teaching practice.

In terms of students' perceptions of these issues, several studies reflect the importance of understanding how they value the experience because, as well as improving their future prospects, it also enables them to reflect on their teaching practice (Brosh, 1996; Buskist, Sikorski, Buckley, & Saville, 2002; Casillas, 2006; García-Valcárcel, 1992, Gargallo, Sánchez, Ros & Ferreras, 2010). It is equally interesting to analyse the extent to which the perceptions of students and teachers coincide about the assessment method used on a module, as it provides a valuable insight into the methodology used and helps to provide a rationale for it.

Analysis of the whole range of aspects that clearly identify how formative assessment is so valuable to the learning process, leads to the question as to what extent the students' prior experience of it affects the level of their involvement and the way they manage all of the different tasks required. Similarly, it is necessary to ask whether the student's year of study and the number of times they have enrolled on the module influence their level of commitment.

Objectives

- 1-To explore the relationship between the use of formative assessment systems in higher education and the involvement of students with the module, as well as the organization and distribution of their workload throughout the semester.
- 2-To analyse which different variables, such as the number of modules they take that use formative assessment, their year of study and the number of times they have enrolled on the same module, affect the level of commitment students have towards their studies.

Methodology

Participants

Data for this study were obtained from 3,304 students studying 50 different modules

at 16 Spanish universities. Of the participants 57.3% are men and 43.7% women. All experienced some form of shared or formative assessment during the 2013-2014 academic

year. After performing the Shapiro-Wilk test it was found that the sample was normal ($p = .218$). Table 1 shows the data relating to the participants.

Table 1. Sample used in the study (University, number of modules, ECTS credits and students)

University	Number of modules	Avg. ECTS Credits	Avg. number students
La Laguna (Tenerife)	2	7.5	106.5
Barcelona	3	4.3	133.2
Valladolid	9	8.5	724.4
Vic (Barcelona)	3	5.6	175.4
Madrid Autonomous Uni	4	8	223.1
Leon	2	6.5	152.5
Burgos	3	7	214.7
Coruña	1	6	95
Zaragoza	2	9	142.5
Lleida	4	5.5	271.5
Alcalá	4	7	234.5
Barcelona Autonomous Uni.	3	6	182.8
Murcia	2	4.5	140.2
Salamanca	2	7.5	116.5
Castilla la Mancha	4	6.5	231.7
Granada	2	6	159.5
TOTAL	50	105.4	3,304

Data collection instruments

Two main data collection instruments were used.

1. An anonymous questionnaire was applied to students to indicate how they rate the assessment methodology used on the module. It has a total of 18 items, with a Likert scale of 5 levels: 1 (None), 2 (A little), 3 (Some), 4 (Quite a lot) and 5 (A lot). Specifically, it used the Scale of Assessment Systems developed for the questionnaire on methodology and assessment used in initial teacher training courses (Castejón, Santos & Palacios, 2013), adapted to each subject area. With regard to its validity, the pilot test of the questionnaire confirms the anticipated significance of the variables that are to be measured by confirming the practical utility of the instrument. For internal

consistency (reliability calculation) of the questionnaire Cronbach's alpha coefficient was used, obtaining for the items $r = 0.842$, higher than the lower limit that, according Corbetta (2007), is accepted as reliable. A confidence level of 95% applies.

The questionnaire covers a variety of approaches to assessment systems, marking, perception and student participation in formative assessment processes. It was developed based on a review of literature concerned with assessment in HE and was validated by a group of experts in the subject. Once the predicted variables of the questionnaire were identified each of the items that comprise the questionnaire were then defined to ensure they related to the objectives of this research study. In the questionnaire validation process a factor analysis was undertaken, showing four

Factors: (1) Involvement in the learning process (7 items): these items relate to the way in which the students are involved in the module; (2) Regulation of work (5 items): these items relate to the way in which students organise and spread their workload throughout the course; (3) Time management (4 items): these items relate to individual student or group time management for performing the required tasks; (4) Assessment based on attendance (2 items): This Factor evaluates continuity and compulsory attendance as part of the learning and assessment system.

2. A structured report was produced on each of the 50 cases studied by every tutor in relation to their module to collect data from the questionnaires. This report is the same for all participating tutors and it collates a wide range of variables covering the whole process: the context of the trial, number of students, module type, activities carried out, advantages and disadvantages of implementing formative assessment, workload and calculation of hours of work/study.

Design

All modules are taught in the first or second semester. Students complete the individual questionnaires at the end of the module, having previously had training on the formative assessment process. Anonymity and confidentiality of data is ensured, so that students answer as honestly as possible. Although the objectives, content and assessment procedures and marking for each module may differ, all modules meet the same

requirements set out in the report, which are key features of formative assessment: establishing initial criteria for the module, knowledge of the assessment system and deadlines for submission of each assignment and the establishment of a feedback schedule between teacher and student throughout the process.

Analysis

A quantitative analysis study was undertaken from two perspectives, using the SPSS 20.0 statistical package. First, a descriptive analysis of averages and standard deviation (SD) of each of the four Factors was completed, to identify the perception of each of the groups regarding their involvement in the process of formative assessment. Also an inferential statistical analysis of different types was undertaken: a) a correlational analysis (Pearson) between each of the 4 Factors to determine the degree of significance achieved in the answers concerning involvement and management of the workload; b) Contingency tables and χ^2 determining the relationship between items related to the work completed by students; c) ANOVA, in order to observe the degree of influence of the number of times that the student has experienced formative assessment and has enrolled on the module and the year of study they are in.

Results

Descriptive analysis

Table 2 shows data collated for each of the four Factors incorporated in the questionnaire (Scale 1-5).

Table 2. Descriptive analysis of each of the Factors used in the study

	N	Avge.	Std Dev.	Var.
Factor 1 Involvement in the process	3304	4.65	.521	.271
Factor 2 Management of workload	3304	3.85	.926	.857
Factor 3 Time management	3304	4.12	.625	.390
Factor 4 Assessment based on attendance	3304	4.52	.303	.091

All 4 Factors obtained very high values. Factor 1, concerning involvement in the process, gets the highest average score, followed closely by Factor 4 on the continuity of attendance, which also shows the lowest Standard Deviation, reflecting a greater consistency in the responses. On the other hand, Factor 2, relating to the management of workload, is the one with the lowest average score and highest SD, indicating greater

divergence of opinions among students. Factor 3 on time management gets an average of 4.12.

Inferential analysis

Correlations

Table 3 presents the results obtained after calculating the Pearson correlation between the 4 Factors, taken in pairs.

Table 3. Pearson correlations between all of the Factors used

Correlations between Factors	N	Pearson correlation	Sig. (2-tailed)
Factor 1 / Factor 2	3304	.037	.834
Factor 1 / Factor 3	3304	.135	.125
Factor 1 / Factor 4	3304	.620	.003
Factor 2 / Factor 3	3304	.091	.665
Factor 2 / Factor 4	3304	.146	.321
Factor 3 / Factor 4	3304	.135	.215

The only significant correlation is between Factor 1 and Factor 4 ($_{3304} r = .620, p < .003$), indicating that students perceive a high degree of correlation between involvement in the process and the continuous attendance and workload required by formative assessment systems.

Contingency tables and χ^2

Next the level of significance is measured in items relating to involvement in the process and the management of the workload throughout the module. The items are extracted from each of the four Factors in the study. In order to check the degree of correlation they have been paired, selecting those that specifically address the involvement of students in the module and the way they organize their workload and distribute their time, either individually or in groups. In order to select the items of each Factor that

contribute most to the two variables in the study (student involvement and management of workload) a multiple regression analysis was performed. Thus, contrasting items Factor 1 "Student involvement in the process", "Time spent working on each task is recorded," "There are more alternative learning opportunities", "There is more individualized monitoring" and "The work focuses on the process" indicate an R2 of 0.741 for the relevant Factor. The item used in Factor 2 "Management of the tasks" has an R2 of 0.541 in relation to it. Both items used in Factor 3 "There are connections between the tasks" and "Roles are defined within the group" reflect an R2 of 0.651 while the item used in Factor 4 has an R2 of 0.693.

Table 4 shows the level of significance between the items.

Table 4. Relationship between items related to student involvement in the process and the management and organization of workload throughout the module

	χ^2	sd	<i>p</i>
Student involvement in the process (F1) * / management of workload (F2)	111.12	11	.005
Roles are defined within the group (F3) / time spent working on each task is recorded (F1)	121.12	13	131
The work focuses on the process (F1) / compulsory and active attendance (F4)	72.45	10	.012
There is more individualized monitoring (F1) / Continuity is required (F4)	103.21	12	.032
There are more alternative learning opportunities (F1) / There are connections between the tasks (F3)	96.42	13	.235

* The Factor corresponding to each of the paired items is given

This statistical analysis shows a significant correlation in three pairs of items. The first indicates that students that indicate greater involvement in the learning process also manage their workload more throughout the module ($\chi^2_{(3304)} = 111.12$ $p = .005$). Similarly, the Factor 4 items relating to the attendance and continuity have a significant relationship with the management of the workload throughout the process ($\chi^2_{(3304)} = 72.45$ $p = .012$) and with the individual monitoring during the module ($\chi^2_{(3304)} = 103.21$ $p = .032$).

ANOVA

Using the items linked to the involvement of students in the process a scale variable was created in order to link it with the following independent variables. The first is the number of times the student has experienced formative

assessment throughout their degree course, divided into 1 "once"; 2- "twice"; 3- "more than twice". The second relates to the year of their course the students are in: 1. "1st year"; 2- "2nd year", 3 "3rd year", 4 "4th year". The third and last variable concerns the number of times the student has enrolled on the module: 1- "once"; 2- "twice"; 3- "more than twice". In addition a post hoc was added to indicate which groups showed the most significant difference between them. These results can be seen in Table 5. It is important to clarify that the distribution of observations by levels has been analysed, confirming that there are no problems with constant variance that might alter the assumption of normality. Similarly, the assumption of independence is also fulfilled between the variables used.

Table 5. ANOVA Bonferroni adjustment between involvement in the learning process and the independent variables studied

LEVEL OF STUDENT INVOLVEMENT	<i>F</i>	<i>df</i>	<i>p</i>
Number of times they have experienced formative assessment systems	121.14	1	.014 *
Number of times the student has enrolled on the module	93.12	2	.145
Year of course the student is in	66.14	1	.002 **

* $P < .05$ between "once" (average 3.12) and "more than twice" (average 4.33)

** $P < .05$ between "first year" (average 3.23) and "fourth year" (average 4.41)

The data show that there are significant differences between student involvement in the process and the number of times they have experienced this type of assessment process ($F = 121.14$, $p < .018$). In this case, these differences are between students who have participated only once and those who have done so more than twice. There are also significant differences in relation to the year of the course the student is in ($F = 66.14$, $p < .002$) with those in their 4th year indicating the highest level of involvement with this assessment method. Moreover, the number of times the student has enrolled in the same module shows no significant differences in their level of involvement ($F = 93.12$, $p < .145$).

Discussion

Students are positive about the assessment system in relation to each of the four Factors studied, reflecting the relationship between involvement in the learning process and the management of the workload throughout the module (López-Pastor, 2008; López Pastor & Palacios, 2012; Lorente & Kirk, 2013; Martínez, Martín & Capllonch, 2009). Thus, students in the later years of their courses and those that have participated more often in formative assessment processes indicate a greater involvement (Buscá, Rivera & Trigueros, 2012; López-Pastor, 2009).

It has been shown that the items belonging Factor 1 on the involvement of students in the process, obtained the highest average ratings, with similar levels to Factor 4, concerning attendance. Moreover, these two factors correlate significantly. Carless, Joughin & Mok (2006) identify the correlation between these two aspects, whether the attendance is in person or online. What really matters here is that students can control their learning process and decide what, how and when their work is done. In this sense, Sitzmann & Ely (2011) show how when students are allowed to manage their workload and participate in making decisions on how to steer it and improve it then the end result of their learning is greater. However, the fact of forcing

students to attend classes does not mean that learning and workload are greater, or that they will absorb more feedback on the tasks they complete, even with the existence of formative assessment processes (Escudero, Pino, & Rodríguez, 2010). One of the keys is that students recognise and appreciate the need to maintain a consistent approach throughout the module (Fraile, 2010). On the other hand, Factor 2 on management of workload, despite having a value of 3.85, delivers the lowest average of all 4 Factors. Valles, Ureña & Ruiz (2011) indicate that despite the fact that all assessment systems should ensure that students are able to manage the required tasks, in many instances, when the assessment method used is not familiar or not explained clearly, it means students do not deal with it well.

Similarly, students are very positive about the need for continuity in their work, the distribution of tasks throughout the process and monitoring by the subject tutor, allowing them to maintain regular contact and to keep enhancing their learning. Similar results can be found elsewhere (Fraile, López-Pastor, Castejón, & Romero, 2013; López-Pastor, 2008). In addition, the study shows that greater the involvement of students in the learning process, the greater is their ability to spread and manage their tasks; findings that are again consistent with other studies (Weurlander, Söderberg, Scheja, Hult & Wernerson, 2012). Continuity in their studies also has direct relevance to their management of the workload, indicating that completion of the required tasks results in better distribution and organization over time. Along these lines, Gutiérrez-García, Pérez-Pueyo & Pérez-Gutiérrez (2013) reflect the importance of the organizational factor for students, which directly affects their acquisition of greater autonomy. The study results show that the high continuity perceived by students correlated with more individualized monitoring throughout the module. Various experiments show that the providing guidance for students throughout the process is essential for learning to occur and, consequently, the

feedback from the tutor and their peers is a key element (Emery, Kramer, & Tian, 2003; Schaeffer, Epting, Zinn & Buskist, 2003). In this regard, Lin & Lai (2013) indicate that the role of tutors is fundamental to guide the process and the delivery of effective feedback, as it ensures greater retention and application of the learning generated.

It should be acknowledged that these results are applicable only to modules where tutors implement formative assessment systems, which ensure feedback and improvement in the quality of the work, as in the 50 cases considered in this study.

Furthermore, the results indicate that students' previous experience of formative assessment systems seems directly to influence their involvement in the learning process, particularly for those who have experienced these systems more than twice. One possible interpretation of this result is that previous experience of formative assessment provides students with a greater degree of security, understanding of the process and what they need to do, all of which helps them have a greater personal involvement in their learning. Gargallo, Sánchez, Ros & Ferreras (2010) argue that the use of similar assessment methods by tutors on the same course and / or institution enables students to assimilate the processes more deeply, resulting in better results from their learning. The importance of establishing a process to coordinate assessment systems among tutors on a particular course is promoted by several authors (Alverno College, 1994, 2005, Salinas, 2002; Watts & García-Carbonell, 2006). Another possible explanation could be that having previous experience of this type of assessment system enables students to realize that there are ways of working that generate more learning and therefore increase their involvement and help them develop better teaching skills (Feixas, Fernández, Lagos, Quesada, & Sabaté, 2013; Park & Lee, 2006).

The results also show significant differences in their involvement in the process in relation to the year of their course in which students are enrolled. Significant differences are found

between students in their 1st and 4th year, the highest averages being seen with students in Year 4. The explanation for this finding may be based on the previous result. Logically, the longer the students are on the course, the more probable it is that they accumulate experiences of formative assessment systems, although this clearly depends on each institution or degree course. Other published studies show that good results are generated using formative assessment with students in their final year (López-Pastor, 2008, 2009; Shishavan & Sadeghi, 2009). The data indicate that this seems to be a variable that explains significant differences in students' level of involvement in their learning. In this regard, the involvement of students in the process is related to greater management of their workload, which seems essential for the transfer of knowledge to everyday life (Vu & Dall'Alba, 2014). Furthermore, Robinson, Myran, Strauss & Reed (2014) indicate that, if we truly want students to get involved in what they have to learn on a course, several actions are essential: (a) define clear criteria in advance; (b) ensure regular monitoring by the tutor; and (c) provide constant motivation for the tasks to be carried out. They showed how tutors who structured their modules based on these methodological guidelines achieved a rating by students about their learning that was 19% higher than in previous years. Consequently, formative assessment systems represent one of the ideal means to achieve this as long as they meet the basic criteria for learning to improve performance (Asghar, 2012). In this regard, Boud & Falchikov (2007) establish the importance of tutors reflecting on the consequences that assessment system used will have on student learning. These same authors also indicate that students become more involved in assessment when they see evidence of their learning, when they can make judgments about their work, when the process is transparent and flexible, when there is a structure and progression to the learning achieved and the tasks set are adapted to a specific context.

Conclusions

The results of this study suggest that students perceive that the use of formative assessment systems. One of the key principles proposed by the Universities Act (LOU, 2001) is to identify strategies that lead to improvements in the quality of education, emphasising the key role that the assessment of learning has in this process. The intention is to respond to the challenges raised by the concept of continuing lifelong education (LOU, 2001: 49400-49401), establishing the extent to which students are able to transfer the knowledge that they gain during their formative years. It seems essential therefore, that students become increasingly involved in the teaching and learning process (Buscá, Pintor, Martínez & Peire, 2010; Gibbs, 2004). According to Cooper & Heinze (2007) this involvement of students and management of their workload can take the form of monitoring of individuals or groups that the tutor takes in the course of a module based on careful planning and structuring of the teaching. This process requires students to have a certain degree of autonomy as well as receiving continuous advice on the work they produce. Sitzmann & Ely (2011) show that when students are allowed to manage their workload and participate in making decisions on how to guide and improve their learning, the end result is better. However, Lin & Lai (2013) warn that the tutor's role in this is critical, especially in the provision of guidelines and the effective delivery of feedback, which ensure greater retention and application of the learning generated. Therefore, research could be done to contrast any differences in levels of student involvement and management and spreading of workloads among cohorts that have used different assessment systems.

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