

Innovation and hi-tech tools in journalism education. The Wooclap case

Innovación y herramientas hi-tech en la docencia del periodismo. El caso de Wooclap



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Abstract:

Teaching methodologies that employ ICT in times of pandemic have been forced to grow and adapt to the online reality experienced by both professors and students during this period. The context was an additional challenge for educators, insofar as it demanded all the imagination they possessed as well as all the digital methodologies they had at their disposal, in order to capture the students' attention, which was generally dispersed, to invite their participation, and to assess the evolution of their training and the knowledge gained with regard to the content imparted. Given the situation, in this paper we

Resumen:

Las metodologías docentes con TIC en tiempos de pandemia han tenido que crecer y adaptarse a la realidad online en la que profesores y estudiantes vivieron durante ese período. Este contexto fue un reto más para el profesorado, en tanto en cuanto requerían de toda su imaginación y de las metodologías digitales a su alcance para captar la atención del alumnado (dispersa, en líneas generales), llamar a su participación y poder medir la evolución de su formación y conocimiento acerca de los contenidos impartidos. En este contexto, se presenta la experiencia de innovación en el proceso de enseñanza-aprendizaje en dos asignaturas

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present an example of innovation in the teaching-learning process in two subjects of the Bachelor's Degree in Journalism at University Rey Juan Carlos, Spain, in which a single innovative methodology has been used to monitor learning and evaluate the content learnt by students: Wooclap. In addition, a comparative analysis of the experiences observed among the students is presented herein, depending on the course. In general, students acknowledge more strengths than weaknesses in the use of this tool.

Keywords:

Wooclap; participation; interactive learning; educational innovation; Journalism.

del Grado de Periodismo de la Universidad Rey Juan Carlos (España), en las que se han empleado una misma metodología de innovación digital de seguimiento del aprendizaje y evaluación de los contenidos aprendidos por el alumnado: Wooclap. Además, se plantea una comparativa en función del curso sobre la experiencia detectada entre los alumnos. En términos generales, los estudiantes reconocen más fortalezas que debilidades en el manejo de esta herramienta.

Palabras clave:

Wooclap; participación; aprendizaje interactivo; innovación educativa; Periodismo.

1. Introduction

The scholarly literature available agrees that the sudden adaptation of teaching methods to digitisation, which is a result of COVID-19, has required students, but most of all teachers, to learn the functioning and application of online tools to the educational environment quickly (Abdula, Brint & Rae, 2021; Dhawan, 2020; Robles Balida & Encarnación, 2020, among others). Moreover, the pandemic has led to an exponential increase in the use of these tools, which according to Abdulla, Brint & Rae (2021) has made it necessary to become immersed in their inner workings with unprecedented speed.

In fact, until the virus forced professors to engage in online teaching, there was a certain animosity among a large sector of lecturers about changing traditional ways of teaching and applying e-learning tools, an attitude which stands in stark contrast to the ICT proficiency of students as digital natives (Verdezoto and Chavez, 2018).

However, the application of technology to learning has not been simply a question of improvisation in the face of an exceptional situation. For several years, nearly all universities worldwide have had so-called "Virtual Classrooms" with online tools for learning and communication between professors and students, although the features of these platforms have been used with varying degrees of intensity among faculty members.

This initial imbalance has had consequences, as the pandemic abruptly shifted the in-person nature of teaching to virtual, online instruction. Thus, the report issued by UNESCO (2020) regarding the impact of COVID on Higher Education states that the intensity of use of such virtual classrooms by professors in the past has influenced their ability to teach during crises.

As such, in this context it is necessary to train professors in the use of a growing number of tools which, as described by Petersson, Hatakka & Chatzipetrou (2020), enable active learning based on an inverted pedagogy. Such tools allow for the creation and integration of content that has resulted in significant improvement in university teaching (Mogollón de González & Saavedra, 2020), as well as collaborative learning (Dhari, Vighio & Dahri, 2019), and as a consequence, students are more qualified and informed (Dean & Lima, 2017). As a further argument, Verdezoto & Chavez (2018) assert that the under-utilisation of these tools complicates the understanding of content and prevents autonomous, flexible learning.

E-learning tools in higher education have also been the subject of study in the most recent academic research. Applying such tools is the key to success for current academic programmes at the university level (Kumar, 2020). Along the same lines, studies

such as that of Macanchí, Orozco and Campoverde (2020) point to the indispensable contribution of the teaching staff, but also to the willingness of universities to develop a culture of innovation. Moreover, on this last point, Cano et al. (2021) have observed clear progress in recent years by university institutions in the application of new technological resources.

However, the inherent weaknesses that typify the full application of e-learning tools must also be considered. In this regard, Dhawan (2020) points to the difficulty of direct communication and physical contact. Furthermore, the time and space flexibility they provide is seen as a double-edged sword, because although it is considered a strength, it can also lead to a kind of relaxed attitude among some students. Regarding this issue, Abdulla, Brint & Rae (2021) have found that the young people they surveyed were more inclined to use pre-recorded rather than synchronous lessons. The authors consider this situation to be a consequence of the lack of flexibility that occurs in real-time classes, which makes it difficult to ask questions, with hardly any time for reflection on the knowledge shared by the professor. As such, the study by Khalil & Ebner (2017) acknowledges that synchronous tools tend to make discussion difficult and chaotic. By contrast, asynchronous tools are more effective for collaborative learning.

In the specific case of tools that can be used efficiently with the mobile phone, Kim (2019) highlights *Socrative*, the use of which by medical students improved interaction in the classroom and provided new ways of assessment that differed from traditional methods.

Likewise, Abdulla, Brint & Rae (2021) found a high level of engagement in classes taught on diverse platforms that involved communication (Zoom) and participation (Socrative). However, students preferred in-person classes on the grounds that with the platforms mentioned, they could not interact with each other.

The advantages of other e-learning applications have also been discussed in the academic literature. This is the case of VocabTrainerA1, designed for language study. As described by Berns et al. (2016), this application combines individual and collaborative learning, encouraging learner motivation and enhancing student interest in language learning. There are many examples of mobile learning applications (m-learning). Antonova & Bontchev (2020), among others, highlight *Udemy*, which allows one to download a wide range of courses; *Coursera* facilitates the monitoring of classes in both synchronous and asynchronous mode; finally, *edX* offers a wide range of different types of online tests and/or exams.

From this point onward, the question arises as to whether it is convenient to adapt e-learning tools to in-person learning or, by contrast, if it is more convenient to maintain traditional resources. In this regard, the academic literature is emphatic and highlights the need for these tools to be used by a generation that has adopted the Internet as their “natural space” (Yuste, 2015: 187). Moreover, the widespread availability of mobile phones among digital natives should be seen as an opportunity for the incorporation of technological solutions in online learning, as recommended in a report by UNESCO (2020).

Area & Adell (2009) defined e-learning as a classroom-like environment with interaction between learners and professors. Becoming familiar with the digital context and adjusting it to the in-person classroom is a major challenge for lecturers, who need to extend or integrate online tools into teaching (Abdulla, Brint & Rae, 2021). However, this acquisition of digital literacy is not enough to achieve the desired effectiveness of these tools. In this regard, Khan et al. (2017) argue that careful planning is needed, combined with teaching experience. These authors acknowledge that tools developed in the physical environment cannot be directly applied to those used in the online environment, as they must be adapted in order to remove or at least lessen the barriers implied by the lack of an in-person relationship with learners.

Studies such as that of Al-Labadi and Sant (2021) conclude that students do not generally show interest in replacing the traditional system with the use of technology in the classroom. However, the same authors suggest that the proper use of such technologies by professors far outweigh the benefits of conventional methods. It is therefore important to engage students in the proper use of these e-learning tools. Otherwise, in exceptional situations such as the one caused by COVID-19, they might become disengaged from the academic rhythm, thereby increasing the risk of dropping out (UNESCO, 2020). Thus, the ongoing renewal of learning-teaching activities is necessary (Mogollón de González, and Saavedra, 2020), which can be accomplished through the continuous sharing of experiences among faculty members (Khan et al., 2017).

2. Hi-tech tools in the classroom: Wooclap

We must not lose sight of the fact that thanks to interactive tools (both in the classroom and online), it has been possible in recent years to implement new classroom dynamics that have fostered student learning and had a positive impact in this regard. The new generations are familiar with the digital environment, a factor that facilitates the implementation of tools that encourage participation in the classroom through interactive, participatory formats (*Universia*, 2018). Specifically, Wooclap is one of the participatory tools that is beginning to have a greater presence in the virtual classrooms of educational centres. In the university world, the subjects in which this learning tool has been implemented have been highly diverse, ranging from Medicine (Grzych & Schraen-Maschke, 2019), Pharmacology, and Immunology (Sanz-Álvarez, Vicente-Romero, & Prieto-Martín, 2020), to the teaching of foreign languages (Boostani et al., 2020; Oulaich, 2020).

Sébastien Lebbe (CEO) and Jonathan Alzetta (CTO) are the creators of Wooclap. As both of these people are engineering graduates from l'Ecole Polytechnique Brussels, in addition to being passionate about education and technology, they also acknowledge the difficulty encountered by professors in capturing the attention of their students. This is where the idea of using smartphones originated. Leaving aside the preconception of considering such devices a mere distraction, these developers believed that smartphones could play an important role in e-learning, as they enhance and motivate interactivity between students and professors (Wooclap, 2021).

In terms of student attention toward the classes, Feo (2010) suggests the need to encourage their autonomy so they can focus more on the solution rather than the result itself. Along these lines, Alonzo et al. (2015) consider it essential for educators to be aware of any variable that might occur in class in order to avoid distraction, and to know how to manage it as well. The lack of the *in-person* factor poses a great challenge for educators as they cannot control the environment in which the student circulates when they are not in class. In this regard, applying Wooclap to the classroom lowers the student's focus on other situations outside of class.

Since Wooclap was created, Lebbe and Alzetta have surrounded themselves with neuroscience researchers, pedagogical professors, and engineers in order to develop functions that improve students' memorisation and comprehension. Wooclap (Wooclap PLC, Brussels, Belgium) is one of several participatory tools that can be used directly in a web interface or with mobile phone messages (Grzych & Schraen-Maschke, 2019). The tool does not require an application to be installed on the phone, and its use is very easy (Marcello et al., 2019). Students can answer the questions directly at the moment considered best by the instructor: at the beginning of the lesson, to capture the student's attention; at the end of the lecture, in order to know if they have understood the explanations; or at any other time. The system registers the people who have responded within the set time

period and their answers, identifying them by their university student email account. The student can also report live if he or she becomes confused during the class through an emoticon that appears directly on the presentation slide, which informs the professor of the situation so he or she can adapt the explanation to the class.

The instructor creates an activity that includes a series of questions with multiple-choice answers, open-ended question matching, word clouds, gap-fills, and many other options that make it easier for the instructor to assess the student. Nevertheless, assessment is not the only purpose of this tool. In fact, the use of these tools has demonstrated greater understanding of the content and more active participation by the students in the classroom (Grzych & Schraen-Maschke, 2019). For these authors, the use of Wooclap greatly enhances student participation.

In short, this teaching model integrates the smartphone into educational sequences in the classroom by means of an interactive learning tool that aims to change the way of teaching by making students the protagonists of their own learning (García, Martínez and Del Hoyo, 2021). In fact, Wooclap is one of the tools that takes into consideration the four pillars of learning described by Stanislas Dehaene (2018:205): attention, engagement, feedback on learning, and error/consolidation.

3. Objectives and methodology

The aim of this paper is to present the use of the Wooclap learning tool in the university context, specifically in Journalism studies. Regarding specific objectives, the research aims to analyse how Wooclap has facilitated student participation in the virtual classroom in a synchronous way, and how it has impacted students' direct involvement in their learning in an unprecedented teaching context. The hypothesis is focused on verifying whether the use of platforms such as Wooclap, which incorporate the use of mobile telephony into the virtual classroom, encourage student attention, participation, and interactivity, thereby overcoming the difficulties of imparting classes that do not take place in-person. In addition, by comparing the first and third-year students, a second hypothesis to be verified is whether the novelty of this new university system is having an impact on the adaptation to e-learning platforms and tools.

As part of the teaching innovation project, the Wooclap platform was used in two subjects of the Bachelor's Degree in Journalism at Rey Juan Carlos University (Madrid): one of the subjects, Audience Research, is part of the third year of the degree, and is primarily theoretical; another subject, Journalistic Writing, is taught in the first quarter of the first year of the Bachelor's Degree in Journalism, and is more practical. In both cases, the professors of each subject encouraged the use of the Wooclap tool during the classes, which were taught entirely online due to the state of alarm that had been decreed by the Spanish government in March of 2020. With a fairly intuitive interface, Wooclap was implemented in all the sessions as a tool for student participation, as well as a resource that allowed and encouraged students to engage in debates. Finally, it allowed students to measure the knowledge acquired in the classes.

In order to collect data regarding students' experience with this tool, an online survey was sent to all students in both courses. Based on the work of Cantalapiedra et al. (2011), in which they measured results with a questionnaire given to students, in addition to a study carried out by Lacalle and Puyol (2019), most of the research on innovation in journalistic education has resorted to the survey as a technique for collecting quantitative data that allow student experiences to be evaluated (García Galera, Martínez Nicolás and Del Hoyo Hurtado, 2021).

The universe under study consisted of 112 students, of whom 90 belonged to the Audience Research subject, and 22 to the Journalistic Writing subject. It was not considered significant that the groups analysed were not quantitatively homogeneous, as the purpose was to find out how the teaching innovation tools have contributed to student learning as part of their training as journalists, and to confirm the usefulness of this platform, regardless of the number of students in the group.

Apart from the question regarding the course to which they belong, which has been used as an independent variable for the purpose of comparison, the questionnaire consisted of 13 questions designed on the basis of the academic literature and the lecturers' own experience. The first two questions addressed general aspects regarding the use of Wooclap in the classroom, both of which were measured on a Likert scale from 1 to 5, with "Not at all" and "Completely" at the extremes. On the one hand, we wanted to know whether the interviewees found the tool easy-to-use and intuitive. On the other hand, we wanted to determine the degree of help they had received from the professor in using the tool.

The remaining questions were divided into two clearly differentiated thematic categories: strengths, and weaknesses, as a result of having implemented Wooclap in the classroom. The former category was measured on a Likert scale of 1-5 to establish the level of agreement or disagreement with the statements that follow. The level of reliability (Cronbach's α) recorded for these items was 0.747: (1) Wooclap facilitated my participation in class; (2) When using Wooclap, the classes were more entertaining; (3) Thanks to the use of Wooclap, I understood the professor's explanation better; (4) When using Wooclap, I was more focused on the classes; (5) With Wooclap, I remembered what I had learned in class better; and (6) I think Wooclap should also be applied to in-person classes.

The weaknesses identified were related to difficulties they had experienced in using the application (Cronbach's $\alpha = .902$). Thus, we used an ordinal variable to ask them to indicate how often they had encountered obstacles in gaining access to the application (Never, Almost Never, Sometimes, Almost always, and Always): (1) I could not connect to the site; (2) I did not have enough mobile data/Wi-Fi to connect properly; (3) As I followed my classes with my mobile phone, it was difficult to participate in the sessions with Wooclap; (4) I could not see the QR or link to connect; and (5) I was not able to send the answers.

The questionnaire was designed with the Google Forms tool and distributed in April and May of 2021 through the email service available in the Virtual Classroom of Rey Juan Carlos University. Students were previously informed that their answers were completely confidential in accordance with the Organic Law on Data Protection 3/2018 of 5 December, as well as EU Regulation 2016/679. A total of 74 responses were obtained. For the comparative analysis, two responses (2.7%) were disregarded, as they had left the course field unanswered. Therefore, the final sample was set at $n=72$. The information collected was filtered for subsequent coding into a database, which was refined and reviewed for statistical processing using SPSS Statistics 22.00. The level of statistical validity was set at $\chi^2 < 0.05$.

4. Results

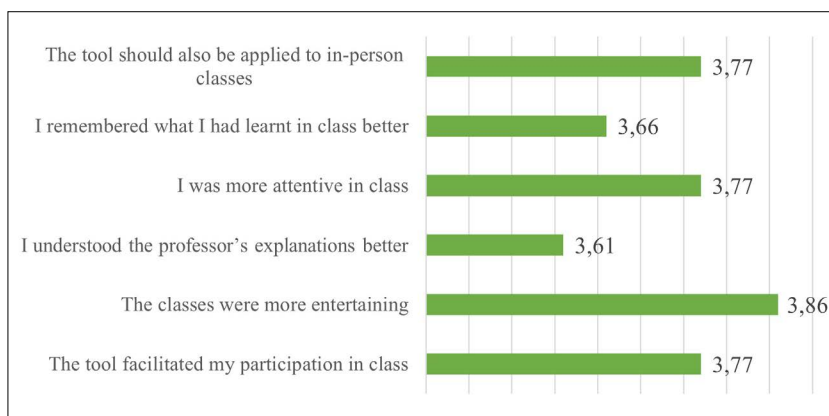
By and large, students find Wooclap easy-to-use and intuitive in the classroom. The average score was 4.56 out of 5, with 63.9% giving the highest score, while the lowest score was 3, which was only given by 8.3% of the respondents. In the comparison of the two groups analysed, statistically significant differences were established ($\chi^2=.006$), and a significantly better adaptation by third-year students was observed, probably due to greater knowledge of the tools, which at that time had already been applied to the

virtual learning environment at the university. In this regard, a large proportion of students gave a rating of 5 (74.1%), while the trend among first-year students was 4 (55.6%).

The help they received from the professor in using Wooclap was also rated very highly ($\bar{X}=4.33$). There were only two cases (2.8%) in which a rating of 2 out of 5 was given for the instruction provided by the professor on how to use Wooclap. Most respondents (52.8%) gave a score of 5 for this aspect –the remaining percentages were distributed between 3 (13.9%) and 4 (30.6%). In this case, we also find relevant differences according to Pearson's chi-square ($\chi^2=.025$), with a slightly higher increase among third-year students ($\bar{X}=4.4$ compared to $\bar{X}=4$ recorded for first-year students).

Among the proposed strengths of Wooclap, the most valued is the enjoyment it provides in the classroom (i.e., the classes are more entertaining when the application is used) ($\bar{X}=3.86$), although the remaining perceptions show similar values, which in all cases exceed the average of 3 out of 5 (Graph 1). This similarity in the results is positively associated with the respondents' interest in the fact that the tool can also be applied to in-person classes ($\bar{X}=3.77$), thereby confirming the importance of introducing these digital platforms into the conventional in-person learning environment.

Graph 1. Strengths perceived by students in using Wooclap. Mean values on the Likert scale of 1-5



Source: prepared by the authors

In the comparative study, only two items achieve chi-square values greater than 0.05: "It facilitated my participation in class" ($\chi^2=.290$); and "I understood the lecturer's explanation better" ($\chi^2=.109$). For the rest, the bilateral asymptotic significance did indeed register the necessary score that allowed the course to be associated with the established strengths (Table 1).

Table 1. Chi-square (χ^2) values achieved in the course-strengths contingency

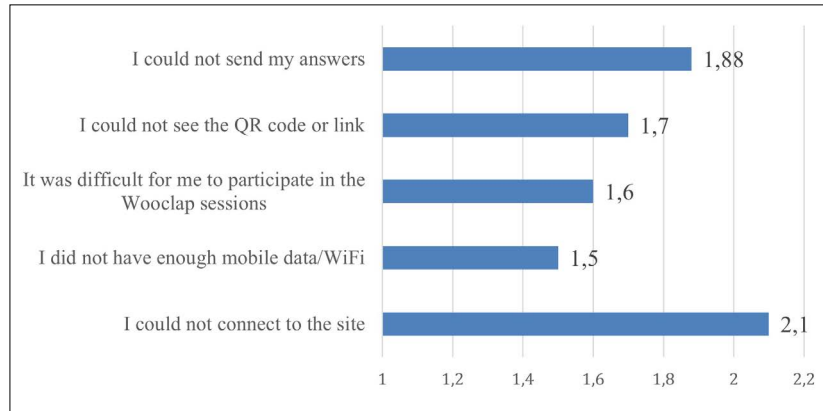
	Value	df	Asymptotic significance (bilateral)
Wooclap facilitated my participation in class	3.746	3	.290
When Wooclap was used, the classes were more entertaining	12.848	3	.005
Thanks to the use of Wooclap, I understood the professor's explanations even better	6.061	3	.109
When using Wooclap, I was more attentive during the lectures	15.585	4	.004
I remembered what I had learnt in class better thanks to Wooclap	8.021	3	.046
I think Wooclap should also be applied to in-person classes	10.334	4	.035

Source: prepared by the authors

With regard to the items that show statistically significant differences, the higher-level items have a higher average rating. In terms of “The lessons were more entertaining”, the third-year students are close to “Strongly agree” (\bar{X} =3.9), compared to first-year students, who are somewhat more conservative (\bar{X} =3.55). Similarly, those in the third year consider that they were more attentive to the lessons when the tool was used (\bar{X} =3.88 compared to \bar{X} =3.44 detected in the first year). The chi-square value is very close to the value of 0.05 in relation to a better recall of what was learnt in class. Consequently, there are hardly any statistical differences, the results of which is an equal arithmetic mean for both courses (\bar{X} =3.66). However, also in this case, it is the third-year students who agree or strongly agree the most (62.9%), more than 18 points above first-year students (44.4%).

The result of this is a significantly higher willingness of third-year students to use Wooclap for in-person classes as well (=3.9 vs. =3.3). These data suggest a more well-established adaptation of e-learning to higher levels of education compared to compulsory secondary education, the latter being the place from which first-year university students proceed, who presumably have not yet adapted sufficiently to these types of digital tools in the classroom.

Finally, the weaknesses perceived by students do not achieve very high levels. The most serious problem they encountered was difficulty in logging on to the site, with an average of 2.1 (a slightly higher frequency than “hardly ever”). The rest of the values do not achieve 2 among any of the items (Graph 2). It is true that total effectiveness of this type of tool during its application in class would be desirable, since any problem that might arise would hinder an adequate rhythm in professor-student communication. However, considering the very recent incorporation of Wooclap into teaching, the results achieved can be seen as very positive, without ignoring the fact that the tool can be improved.

Graph 2. Problems (or weaknesses) in the use of Wooclap by students. Mean values on the Likert scale of 1-5

Source: prepared by the authors

In the comparison of the two courses, no significant statistical differences ($\chi^2 > 0.05$) were observed in two of the items considered, as shown in Table 2. The differences registered in the remaining three items allow us to deduce that the difficulties they encountered originated from Wooclap's own inherent weaknesses, or resulted from the device used itself ("As I followed my classes with my mobile phone, it was difficult for me to participate in the Wooclap sessions"), or from the source through which they connected to the Internet ("I did not have enough mobile data/WiFi"), which are not associated with the independent variable of the academic year.

Table 2. Chi-square (χ^2) values reached in the course-weakness contingency (problems)

	Value	df	Asymptotic significance (bilateral)
I could not connect to the site	7.754	2	.021
I did not have enough mobile data/Wi-Fi	.889	2	.641
As I followed my classes on my mobile phone, it was difficult for me to participate in the Wooclap sessions	1.328	3	.723
I could not see the QR code or link	15.111	3	.002
I could not send my answers	12.999	3	.005

Source: prepared by the authors

For items with χ^2 values greater than 0.05 it is the first-year students who recognise that this affected them most frequently. Specifically, “I could not connect to the page”, and “I could not see the QR code or link”, averaged 2.44 for this group, while the inability to send answers was 2.33. In the third year, only the inability to log on to the website came close to an occasional frequency ($\bar{X}=2.11$). In contrast, the other two weaknesses reported affected them only occasionally ($\bar{X}=1.55$ and $\bar{X}=1.74$). In any event, the average values are in the range of “Never” (1) and “Sometimes” (3, although none of the results achieve this value). In other words, the difficulties encountered in the use of Wooclap are rather exceptional and are therefore largely overshadowed by the students’ perceived strengths of its application to the classroom.

5. Discussion and conclusion

As mentioned above, the technology that has promoted digital development in many different aspects of our personal, social, and professional lives also seems to be playing an important role in the evolution of a more interactive educational model. While there is nothing new about speaking of interactive tools and digital platforms as factors that motivate students and facilitate their learning, the situation experienced during the COVID-19 pandemic has encouraged the rapid development of innovative teaching techniques in which technologies are implemented as an indispensable component in the education of university students.

In order to make it easier for university students to acquire and retain knowledge that will be useful in their professional lives, a variety of innovative teaching-learning experiences have emerged (Centre for Educational Research and Innovation, 2016; Ramírez-Ramírez; Ramírez-Montoya, 2018). One such experience has been addressed in this paper, in which we have tried to highlight the role of Wooclap in the development of university classes in the Bachelor’s Degree of Journalism. This paper has analysed the growing importance of these tools in both online and in-person classrooms, and how platforms such as Wooclap, which incorporate smartphones into the classroom, have made it possible (in one specific academic experience) to improve student attention in class and allow them to understand the lecturers’ explanations more clearly. In addition to the systematic observation carried out by lecturers in the classroom, the evaluation conducted among the students shows that the use of Wooclap makes it possible to maintain a certain degree of student participation in class, thereby resulting in more attentiveness toward the content being taught. This resource allowed for assessment/self-assessment of the knowledge acquired during the lessons, and it was useful in capturing students’ attention, encouraging debate, and inducing collective reflection.

The findings confirm the hypothesis initially set forth, as the students indicated that they were more attentive in class due to the use of this platform, which also induced their participation and, above all, made the classes more interesting. The results achieved with regard to strengths were much higher than those of weaknesses, as reported by the students. Moreover, the weaknesses were confined to purely technical issues, such as problems with the wireless network or the Internet connection. To a large extent, these future graduates of journalism even consider that its implementation should not be limited exclusively to the e-learning environment, as they advocate its application to in-person classes as well.

In addition, the comparison between two courses provides more data on the usefulness of this tool. Indeed, third-year students have a better perspective than those who have just entered university. The average values achieved in the category of strengths among third-year students are higher, while the lowest values are found in the area of weaknesses. This finding might be associated

with more experience with such tools in previous university courses, as well as the age and individual digital experience of the students.

Nowadays, the teaching-learning process is not unidirectional, but rather collaborative, as indicated by Hayden (2021), and platforms such as Wooclap make it easier for a student to avoid being simply a passive figure in the learning process, which would indicate failure on the part of the lecturer and would be contrary to the guidelines established by the European Higher Education Area (EHEA). The implementation of digitisation in the classroom, whether in-person or online, should be undertaken by university professors as part of their daily classroom routine, since technologies are already incorporated into personal routines, and professors should accept the responsibility of preparing students for a professional as well as digital life. University education cannot remain on the fringes of digitisation, nor on the sidelines of incorporating tools that might contribute to greater student involvement and participation in their education.

Finally, based on the study herein regarding the use of digital tools such as Wooclap in the classroom, which is a topic that has not yet been widely disseminated in the literature (even though it is very useful for both professors and students), the concept of the need to share teaching innovation experiences that take place in the classroom, which can serve as a guide for many other professors, has been strengthened, thereby reinforcing the idea of ongoing renewal in learning-teaching tasks (Mogollón de González, and Saavedra, 2020), and the continual reporting to the community of the experiences shared among the professors (Khan et al., 2017).

The limitation of this study with regard to sample suitability offers the opportunity to open new lines of research into this tool which, according to the results obtained, has had an effective impact on online learning. The recent incorporation of Wooclap into the e-learning environment may give rise to other studies for the purpose of addressing different variables such as gender, or other socio-demographic factors that may offer new data on its implementation in the university educational setting.

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