

Motivating Users to Online Participation. A Practice-Based Comparison Between Moodle Forums and Telegram Groups*

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Moodle forums can be a great way to share course information, build community and allow students to easily share resources and ideas. However, students' day-to-day discussions are not happening in Moodle but in instant messaging applications' groups, such as WhatsApp or Telegram. This work explores how the students' motivation and engagement were affected by shifting the academic discussions from Moodle forums to Telegram groups, based on the results of 3 years of work, with two courses using forums and one using groups.

The results show that the students perceive the Telegram groups as much more dynamic, closer and faster than the forums; groups also allowed a greater interaction between students (cooperation in the development and solution of problems). Data also show a greater engagement and activity of the students who joined the Telegram group in contrast with those who used the Moodle forums. More than 90% of the students also indicated that they wish to continue to have Telegram class-groups in the future.

Keywords: Telegram groups; Moodle forums; digital communication

1. Introduction

The number of instant messaging (IM) users, more than 3000 million [1], surpassed by the end of 2015 the already gigantic number of users of social networks (Facebook, Twitter, Instagram, . . .). Among the most active IM (WhatsApp, Telegram, WeChat . . .) application users are those who are between the ages of 18 and 29 [2], that is, college-age students. Applications such as WhatsApp or Telegram, installed in ubiquitous smartphones, are used massively and continuously by students, constituting one of their main means of communication.

Despite the numbers and the huge penetration of the IM market, the integration of these applications in the university classroom as a means of communication is still a subject of study in the academic literature. This contrasts with the more comprehensive work on the use of online discussion tools—such as forums—in learning communities.

Online discussion has been identified as an essential ingredient of an effective online course [3], and an important tool for the collaborative construction of knowledge in learning communities [4]. Moodle offers a simple way to create asynchronous online discussions for a given topic as forums. Forums are thought to enhance students' ability to form social networks that could lead to community [5]. However, simply setting-up forums in Moodle does not necessarily facilitate interaction and community [6]. There is a need of a moderator or teacher role that

responds and creates posts regularly, encouraging new activities and discussions for the students to respond with enthusiasm and regular participation [7]. As students participating in a forum are learning by doing, teachers may also need ways and tools to evaluate the quantity and quality of the work done in them by students [8].

Online discussion forums and Telegram groups can function as a computer supported collaborative learning space. Collaborative learning can be defined as a gradual process in which all the members feel mutually committed to learning of others, generating a positive interdependence that does not involve competition. Collaborative learning has shown efficiency in overcoming negative attitudes, increasing motivation and self-confidence; on the other hand, the experiences of cooperative interaction foster the creation of stimulating and participatory environments, in which individuals feel support and confidence to consolidate their own learning style [9].

It is clear that there is a huge gap between the applications used by students to communicate outside the classroom, in their day to day, and the applications that the university puts at their disposal for the same purpose. Therefore, it seems necessary to know more about the potential advantages—and disadvantages—that the use of IM applications could contribute to the university educational environment to try to bridge this distance.

To this end, during the 2016/17 academic year,

the author decided to open a group in the Telegram application for a four-month subject of the 4th year of Computer Engineering Degree and to check its strengths and weaknesses compared to the traditional forums in Moodle, used in previous courses (2014/15, 2015/16). This work describes in detail the experience carried out, compares both communication systems, and provides ideas and suggestions on the integration of IM in the university classroom. This work also collects opinions about the Telegram experience expressed by the students. The ultimate goal is to help the university community—teachers, students, managers—to make a decision about the convenience of using IM applications in the classroom.

2. Related work

There are already some authors that have investigated the advantages of using IM applications in general and WhatsApp in particular in the educational environment. WhatsApp works in a very similar way to Telegram, reaching the point of having extremely similar user interfaces, so the general advantages (and disadvantages) of using one of them—WhatsApp—is also applicable to the other—Telegram—. However, only Telegram provides support for the integration of chatbots in conversations and this might play in its favour.

Among the advantages of using an IM application in the classroom—as opposed to traditional methods of communication—cited in the academic literature and analyzed in detail by [10] and [11], the following stand out: greater accessibility and ease of communication through messages in real time [12, 13]; an increase in the feeling of belonging to a group and establishing ties of sociability [14–16]; provides a place for informal communication about the subject among students [17]; offers a greater degree of enjoyment and entertainment [18] and a breakdown of social barriers between students and teachers [14], as well as the possibility of being able to share information more quickly [11].

The main disadvantages mentioned are the possibility that their use distracts the students and prevents them from completing the tasks—loss of focus and concentration in the subject of study—[13], relaxation of the rules of spelling and grammar [16], discomfort of teachers facing relaxed, non-academic discourse [14] or the possibility of provoking a sense of anxiety [11].

The use of IM applications among students is not new. In a cross-sectional study design with 154 university students, [19] reports that the use of WhatsApp was common among participants, using WhatsApp for personal and social purposes on a daily basis.

Also, [20] and [21] indicate that students consider WhatsApp a convenient tool for communication and coordination of the group, facilitating holding of work meetings, generating closer links and union between them. The attitudes of students toward the use of WhatsApp mobile learning activities, according to [22], show that the use of WhatsApp in learning processes facilitates learning, helps students find solutions to learning difficulties and easily construct and share knowledge.

Gon and Rawekar [23] highlight constant availability of facilitator and learning anytime anywhere as the top two reasons that made WhatsApp a new and convenient tool for teaching and learning activity. However, they also reported no significant difference between gain of knowledge from WhatsApp when compared with didactic lectures. This absence of statistically significant differences between treatment and control groups with regards to course achievement is also reported by [24]. Notwithstanding, their results indicate that students in the treatment groups had notably less class absences and missed assignments, which indicated better class behavior.

Bansai and Joshi's [25] students indicated that learning through WhatsApp increased student's social interactivity with their peers and teacher. They also reported a favorable attitude of the students towards WhatsApp learning.

However, to the best of our knowledge, this is the first work that compares, based on real-life experience, the benefits of IM apps (Telegram in particular) compared to the use of Moodle forums.

2.1 Context

The experiment was carried out in the online course Development of Rich Web Applications (DAWE), taught in the second semester of the 2016/17 course, to students in the 4th year of Computer Engineering and Information Systems in a university of northern of Spain. This course used the Moodle platform as the main means to offer exercises, tests, explanatory videos, notes, manage grades, collect programming practices and, during the years 14/15 and 15/16 also as a means of communication between teacher and students through the forums. These forums served to clarify doubts about the subject taught or the exercises presented. Participation was not compulsory but students were encouraged to get involved with the incentive to “round off” their grade (maximum 0.5 points).

During the course 16/17 the forum was maintained in Moodle but a public group in Telegram was also created from the first day. This instant messaging application allows to create unlimited groups, private or public, without having to ask the participants for their phone number. In the case of

DAWE, the link to take part in the Telegram group was shared by sending a message to the Moodle forum.

The choice of Telegram was based fundamentally on two aspects. On the one hand, Telegram has the option to add chatbots (bots or software agents) to a group. In addition, other issues related to non-functional features offered by Telegram and not available on WhatsApp were taken into account, such as the availability of the source code, having encrypted messaging (although WhatsApp now also offers it) and the option of using Telegram's support of minority languages (something very appreciated in universities of Catalonia and the Basque Country).

The design, content and evaluation methods of the course were the same during the three academic-years of the study. It was based on delivering online recorded videos of the topics involved (what are Rich Web Applications and how to program them), alongside complementary content (slides, exercises and practical labs). Four types of assessments were implemented: weekly quizzes, self-assessment exercises, peer assessment (for some of the practical labs) and a final exam.

2.2 Chatbots and telegram

During the course 16/17 the author started to use a chatbot integrated in the subject's Telegram group. The chatbot, named @euitibot, offers quizzes, help students to make appointments with the teacher and remind students about incoming deadlines. With respect to quizzes, the chatbot offers multiple choice question tests, classified by themes studied in the subject. Once a question is answered, the bot also offers additional information about the reasons of the correct and incorrect answers. It also keeps track of the number of tries and correct and incorrect answers. This information can be seen both by the student and the teacher, so he can intervene if the bot detects some difficulties. In fact, using @euitibot, the students can also check the availability of the teacher time-schedule for making an appointment.

Telegram chatbots can initiate a conversation with the users, sending (pushing) a message when

a scheduled condition is triggered. In the case of @euitibot, this ability was used for sending messages when a quiz deadline was approaching.

Finally, it is worth mentioning that a Telegram group administrator can also invite external chatbots for performing auxiliary functions. In this course, we invited @PollBot, a bot for creating simple inline polls in a group. Using this feature, we were able to schedule online meetings—without needing to use any other external application outside the Telegram group—were the teacher was available via online videoconferencing for group mentorship.

3. Description

The activity of the Moodle forums as well as the Telegram group was monitored and recorded in a database. In the case of the Moodle forums, the dump of that database was requested to the Virtual Campus office of the university and a local copy was installed to do the analysis. In the case of the Telegram group, a copy of the messages was obtained using a backup application (telegram-history-dump). The backup, in JSON format, was imported into a local database to perform the comparison. With these data, we made a quantitative analysis to find out the usage level of both systems (forums vs. Telegram group). At the end of the semester, students were sent a link to an anonymous, online survey, requesting their opinion about the experiment. With the results of the survey we built an analysis of the degree of user-satisfaction.

4. Results

Table 1 summarizes the data extracted from the activity analysis of the students in the forums (courses 14/15, 15/16) and the Telegram group (course 16/17). The first thing that draws attention is the high number of messages in the course in which Telegram was used (253) compared to the courses where only the forums were used (79, 150). Logically, in the first course (14/15) this difference may be due to the lower number of students (24)

Table 1. Analytical summary of the activity of the students

	Course 14/15 (Moodle Forum)	Course 15/16 (Moodle Forum)	Course 16/17 (Telegram group)
Total messages	79	150	253
Days without messages	97	78	82
Days with messages	56	74	70
Number of students	24	39	34
Maximum messages/day	8	10	38
Number and % of students that have intervened	15 (62.5%)	26 (66.6%)	32 (94%)
Number of messages from the teacher	47	49	61

compared to the 16/17 course (34), but this reasoning does not hold up if we compare it with the course 15/16 (39 students, 5 more than in the 16/17 academic year).

The number of days with messages (or without them) could also give us a measure of the degree of ease that students find in one or another tool. However, in this case the numbers are very similar (especially in the courses with the same or equivalent number of students, 15/16 and 16/17).

Another fact that helps to understand the degree of involvement of students in one or another tool is the percentage of students who have participated: 94% of students enrolled have sent at least one message to the Telegram group, compared to 66.6% or 62.5% of participation in the forums.

It is also worth highlighting the indicator referring to the maximum number of messages per day, where once again the Telegram group stands out with a peak of 38 messages in a single day, which compared to the forums (8 or 10 of maximum in a day) gives an idea of the degree of students' involvement promoted by IM applications. Fig. 1 shows an activity histogram (messages/day) of the Moodle forums (second semester of the 2014/15 and 2015/16 courses) compared to the activity of the messages in the Telegram group. The scale of the Y axis has been maintained at (0–40) to clearly reflect the difference in activity. Grey scales indicate different students' activity.

This greater degree of involvement in using instant messaging instead of forums, not only affected the students but also the teacher, who also shows a greater involvement (61 Telegram messages versus 47 and 49 in forums).

Although the course 16/17 also included a forum to be able to communicate with the students, the data in Table 1 only takes into account messages to the Telegram group. The number of messages to the forum of the course 16/17 was 21 messages, but only two of them were written by students (the rest were from the teacher). The goal of having an open forum in addition to a group on Telegram was twofold. On the one hand, it serves to send the first initial message (where the link to the Telegram group was included) to all the students. On the other hand, it serves to be able to share messages longer than normal (for example, those that include code), where the use of Telegram is not the most suitable due to the restrictions of the smartphones screen where it is usually used.

Fig. 2 shows an histogram of the length of the messages sent to Moodle forums and the Telegram group. The mean length of the messages posted to Moodle forums (467 and 442 characters, in 2014/15 and 2015/16 respectively) is greater than the mean of the messages sent to the Telegram group in 2017 (122 characters). This is an expected value because, as explained before, Telegram groups are usually accessed via smartphone and therefore, the length of

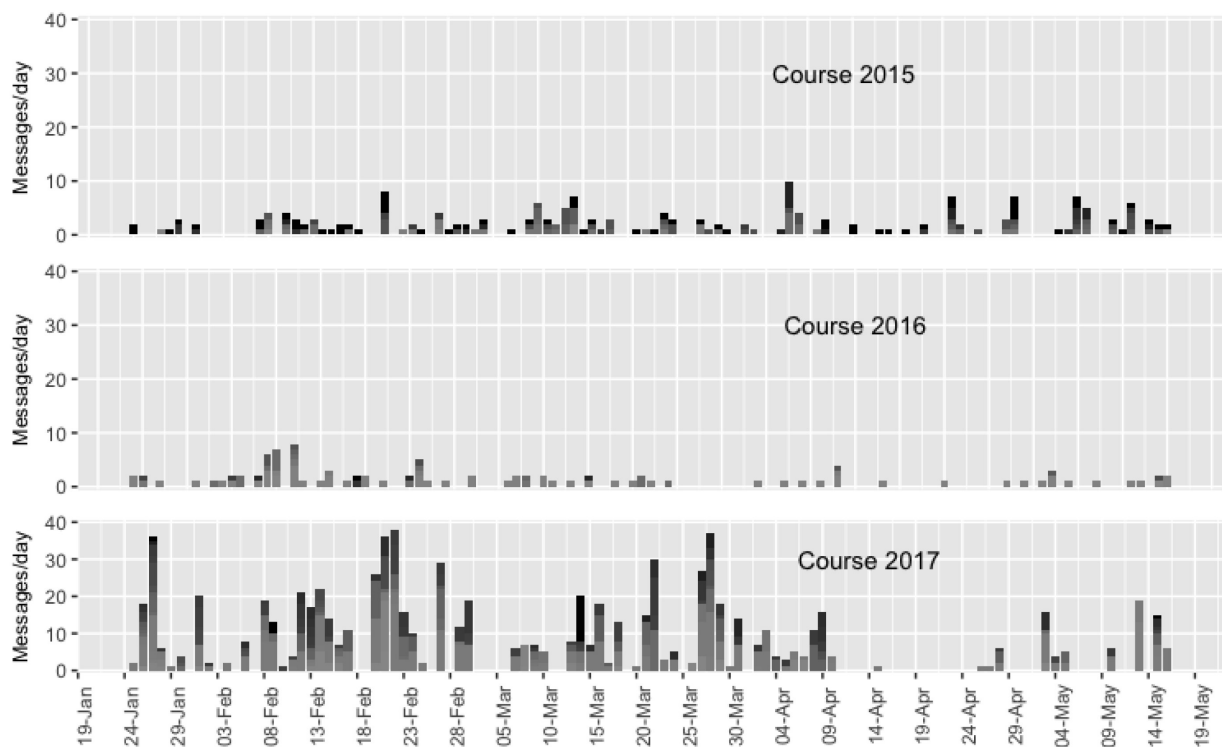


Fig. 1. Activity histogram (messages / day) of the Moodle forums compared with the activity of Telegram group.

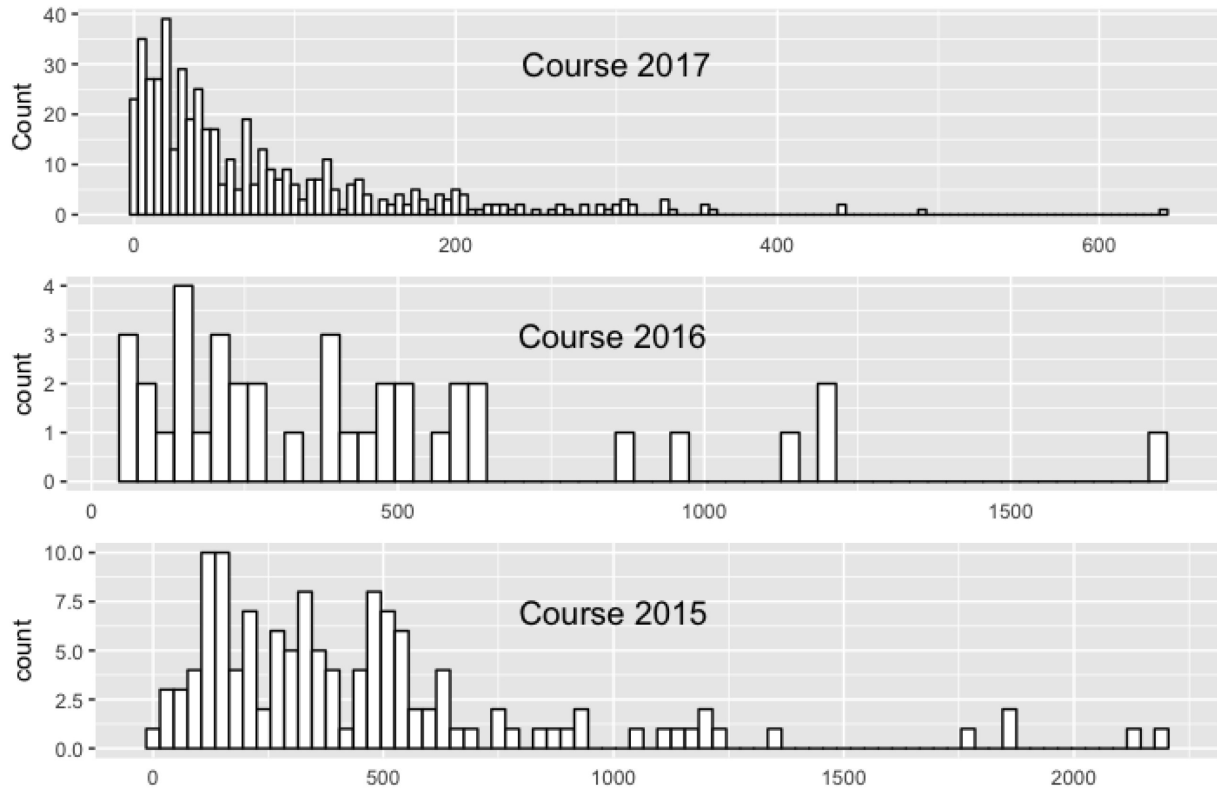


Fig. 2. Histogram of the length of the students’ answers, measured in number of characters, for each course (Moodle forums in 2015, 2016, and Telegram group in 2017).

the messages is usually constrained by the difficulty to type long messages with a small on-screen keyboard. Moreover, Moodle forums are more suitable to discuss large snippets of source code because it is easier to copy&paste large portions as messages in the forum (prepared to be viewed in a desktop computer) than in Telegram groups, with a smaller view widget in the user interface, usually accessed from a smartphone.

The histogram of the course 2017 (Telegram group)—Fig. 2—also shows a high number of messages with a big cluster of small messages (in length measured as number of characters). There are even messages of a single character, usually representing emojis used by the students to show their appreciation for the previous answer—an OK or thumb-up emoji.

4.1 Surveys

At the end of the semester of course 16/17, a survey distributed among the students was answered by 20 people. Among the proposed questions, two of them were directly related to the experience of having used a Telegram group as a support for the communication of messages, doubts and queries of the subject:

Had you ever used Telegram officially in any other subject? Do you think it is appropriate to use a

*Telegram group—as we have done—to communicate with the teacher and other students?
Had you ever used Telegram officially in any other subject?*

All (100%) of the students’ state that they had never used Telegram in any subject before as an official tool. This figure reaffirms the need to explore its potential benefit in university subjects.

Do you think it is appropriate to use a Telegram group—as we have done—to communicate with the teacher and other students?

As shown in Fig. 3, an overwhelming majority (95%) is very (20%) or totally in agreement (75%) with the use of Telegram as a communicative support in the classroom. It is noteworthy that 5% (2 students out of 20) did not agree with its use. One of the two students explained his reasons for not using Telegram:

“I stopped using it because I received many messages. I’m barely attentive to the mobile and it drove me crazy with so much message. Besides, I do not think it’s worth scoring.”

Two aspects to highlight: sometimes increasing participation (as it is the case) can have negative side effects in some students. However, it should be clarified that the messages can be silenced so that Telegram does not constantly notify the student.

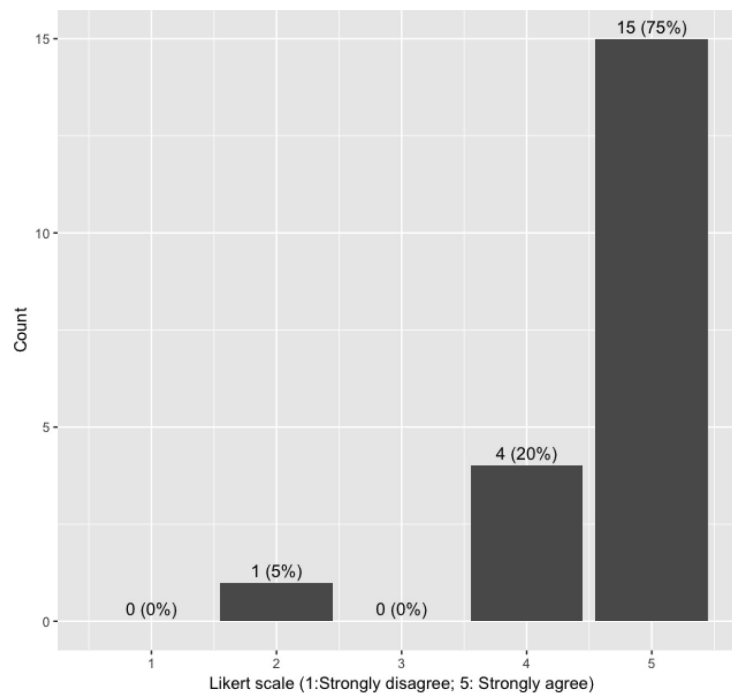


Fig. 3. Bar chart of answers to the question “Do you think it is appropriate to use a Telegram group—as we have done—to communicate with the teacher and other students?”.

This is a point to improve in the future (to train, even briefly, in some aspects of configuration, without assuming that students already know them). On the other hand, as mentioned, the score that students received for participating in the forums or in Telegram is rather symbolic.

Finally, there are also two messages that abound in the reasons why they consider the use of Telegram positively:

“I would encourage its use among all the students from the beginning and I would like that the classmates do it too, since there are people who have not entered the group, either because they do not know or because they have not wanted.”

“Despite being totally avant-garde, it has gone surprisingly well. It only remains that, over time, students become accustomed to this new form of communication and participate more openly.”

Interestingly, in a survey question not related to Telegram (“What is your favorite thing about the subject?”), these two answers were received:

“The Telegram group (constant attention and help between classmates and teacher) and the complete explanation of the entire syllabus, with videos and complete examples.”

“The use of Telegram to solve doubts at the spot.”

In both cases the appreciation of the students is shown by the immediacy provided by the IM tools and collaborative support, encouraging peer support and providing a sense of belonging to a group that helps each other.

Table 2 summarizes the main advantages and disadvantages of using a Telegram group versus the use of forums in Moodle in the university classroom, drawn from the responses of the students to the survey, and the teacher’s opinion. These advantages match with the opinions expressed in previous investigations and reflected in the state of the art section. The quantitative data of this work, comparing the activity of messages in the Telegram group versus the activity in the Moodle forums, seem to indicate that the advantages of the use of instant

Table 2. Main advantages and disadvantages of the use of Telegram groups with respect to the use of forums in Moodle

Pros	Cons
Immediacy	Difficulty typing long messages
Peer support	It is possible that someone feels overwhelmed when the group engages in conversations with a high number of messages
Closeness (in language)	The teacher may feel overwhelmed by the supposition of having to be constantly aware
Sense of belonging to a group	

messaging groups clearly outweigh the disadvantages. Among the latter, an initial psychological barrier stands out. Some teachers fear that in case of deploying an IM group in the classroom, they should be constantly on the phone. The experience of the author of this article is that thanks to Telegram the students have helped each other with more assiduity than they did in the forums (which has been reflected in the higher number of messages sent in comparison). In addition, the author considers it a good practice to let some time pass before responding directly to give students the opportunity to intervene. This way, the teacher can check the degree of comprehension of the subject, the difficulties they face and/or possible misunderstandings, and intervene accordingly in the discussion. These two aspects (collaborative work and leaving a prudential time before intervening) could help to diffuminate that potential psychological barrier.

Finally, it is worth mentioning three more advantages that, though not been explicitly named by the students, the teacher has seen remarkable: the possibility of the Telegram groups to allow sharing any multimedia element (images, videos, audio) in a very simple way—allowing, for example, to record a video or take a photograph of the computer screen where the problem is seen—; the possibility that at the end of the course, students who wish may continue in the group, actively participating or simply as spectators or as a source of consultation—unlike the Moodle forums, where students cannot return once they have passed the course; the possibility of integrating bots or chatbots in the group—allowing to monitor conversations autonomously, answer the most frequent questions, show links related to what is being discussed at that moment in the group, manage quick surveys to gather the opinion of the students on a certain subject, etc.

5. Discussion

The results shown seem to indicate that students are comfortable with this new tool. The high degree of participation 94% indicates that, at least, they were curious about participating in the experiment. And the high number of messages in relation to previous years highlights the fact that it was not only the novelty that motivated them to participate initially but that participation was maintained over time. On the other hand, the professor (author of this article) also noticed a greater facility when interacting with the students. Unlike the Moodle forums, where in order to post something, the student must open the computer (since in the mobile phone it is not seen correctly), identify themselves, access the forum in particular, find the specific question and answer it,

in the case of Telegram, all the process is much easier. They simply need to open the mobile notification and answer it. Indeed, it is not necessary to authenticate themselves, nor to look for the forum or the question.

In comparison to the Moodle forums, Telegram offers the option to respond in a short way without being perceived as a rude response (in a forum it might seem so), facilitating the communication. It also allows the users to easily add emojis (small graphic icons that add a more human character to the conversations), an element that has been used by both the students and the teacher.

Unlike what might seem initially, students take care of the spelling and grammar in Telegram messages as well. At first glance, there were no significant differences in this aspect compared to the messages of the forums, being messages with a correct structure in both cases.

6. Limitations and future work

The analysis of students' activity in Telegram is a technically complex task. For that aim we developed some ad-hoc scripts for extracting and graphically visualizing users' interactions. In the future, it is intended to create online tools that facilitate this task to the interested stakeholders. Moreover, Telegram groups are not integrated into Moodle's gradebook. Teachers must introduce manually the grades obtained by participants in the Telegram group. This problem might be avoided by means of a Moodle add-on that tracks Telegram usage and save the grades in Moodle's gradebook. Finally, students can register themselves in Telegram using nicknames without any relationship with their real name or email. This issue can pose problems related to user identification. To solve it, we could consider using a bot that asks unidentified users to establish a relationship between their Telegram nickname and their real name.

7. Conclusions

We have shown a detailed explanation of both the advantages and disadvantages of the use of groups in Telegram compared to forums in an LMS system such as Moodle for communication with students. Likewise, the activity data of the same subject have been compared for three consecutive years, the first two using Moodle forums and the last one using a Telegram group, with a similar number of students in all of them. The data show that students are much more involved when using a Telegram group, showing their satisfaction especially for the immediacy of the answers, the degree of help between peers and the simplicity of access. The teacher also shows his

satisfaction both for the results obtained and for having shown that, far from becoming a tool that can attract attention 24 hours a day, it has proved that students are more than capable of solving their doubts among peers.

In future iterations of the course it is intended to add new functionalities to the bot of the group so that, through language processing techniques, it can automatically answer similar questions that have already been posted in the past, offer informative web links each time a certain technology is named in the conversation, engage in private conversations with students offering them personalized test questions or allow the group's opinion to be gathered through surveys.

Although the data show that the use of groups in Telegram offers many advantages over the use of forums in Moodle (or another LMS) nothing prevents integrating both tools in our courses. The advantages of one tool can cover the shortcomings of the other.

The question, therefore, is not to choose between Moodle forums or Telegram groups, but to know their advantages and disadvantages and to know how to use both where needed, for which the ideas and data of this work may be useful as a starting point.

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