Understanding participants motivational factors for the design of a teacher community platform

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***Abstract*—Online communities (OC) offer teachers a context for mutual inspiration, collaboration, and professional development. Yet, despite there being several studies analyzing teachers' motivations to participate in these communities, it is still unclear how these motivations relate with the supporting collaborative platforms and how they can serve as an input for defining and prioritizing design requirements. A survey study was conducted with the participants of an open online and a face-to-face training course in the different phases of a 'Maker' educational activity, which were introduced to a supporting platform for sharing, exploring, and co-creating learning designs. Information about 170 teachers' self-reported motivations to participate in a collaborative environment and their perceptions about the usefulness of the implemented features was gathered. Findings show that participants' main motivations are not only to gain knowledge, but also include to have fun or to collaborate with the community development. Regarding their perception about the supporting platform, more than the 30% of the participants acknowledged the usefulness of the features implemented and identified the lack of resources and training as the main limitations to participate. Results provide evidence of the importance of the participants motivations to determine design requirements for a platform to enhance collaboration within an OC of teachers.**

Keywords—online communities, teacher communities, collaborative learning, motivation, learning design.

I. INTRODUCTION

Online Communities (OC) foster the collaborative learning through social interactions and by sharing information and learning experiences. In the context of education, OCs of teachers provide a source of continuous professional development for teachers as they are able to deliver authentic and personalized opportunities for learning [1]. Furthermore, there is a strong correlation between collaboration and the sense of community in collaborative learning environments. In the context of Cs, collaboration is associated to active participation within the community, and to understand how and why users participate in an OC, several theories and frameworks have been developed, and it has been proven that the willingness to participate in a certain type of activity within an OC is highly related to the users' motivations [2]. The motivations of teachers to participate in different communities have been widely studied [3]–[5], but it is still necessary to understand how these motivations relate with the supporting platforms designed for promoting collaboration among community participants.

For OC's designers, participants' motivations give insights about the incentive mechanisms that should be implemented in a specific community and how they should be personalized to increase interest and participation [6]. The focus of this research is on the analysis of the motivations of teachers to participate in a collaborative platform for exploring, sharing, comment and co-create learning designs. This research therefore tries to stablish a relation between the participants' motivations and how they are fostered and enhanced through the features implemented in the OC's supporting platform. This leads to our research questions: Firstly, what are the teachers' motivations to participate in a collaborative platform to explore, share and comment open learning resources? Secondly, is there any relationship between the self-reported motivations and their perceptions of the features?

II. METHODOLOGY

To explore our research questions, we conducted a survey in the context of the project called 'Makers in the classroom' (Makers a les aules, original name in Catalan), which aims to train primary school teachers and students in the different phases of a 'Maker' educational activity. A minimum viable product (MVP) based on the Integrated Learing Design Environment (ILDE), called ILDE+, was designed specifically for this context to provide a collaborative platform for exploring, sharing, comment and co-create learning designs: it implements a *template* **(TEM)** to help with the creation of new 'Maker' resources and designs and provides basic metadata to *filter LDs* **(FIB)** when exploring the community resources. It also allows users to *comment on LDs* **(CMT)**, as well as to duplicate a LD to further modify it, always keeping the authorship of the original design. Users can also *co-design resources* **(COD)** by sharing the authorship of a design. Besides, ILDE+ implements *community features* **(COF)** such as a like button, and design counters of views and comments. ILDE+ gathers all the characteristics needed to support an OC of teachers [7].

Data was collected in two different scenarios: an open online course called "Introduction to Makers methodologies", and in a face-to-face training setting for a group of teachers at public schools in Barcelona (Catalonia, Spain). In both scenarios, the methodology to collect data was the following: first, participants filled a pre-questionnaire to gather sociodemographic information as well as information regarding their motivations to participate in a collaborative environment to explore, share and comment learning designs. Then, participants received the training regarding 'Maker' methodology and were introduced to the ILDE+ platform as a tool for sharing and exploring 'Maker' resources and designs, as well as for connecting with other

teachers. Participants were not previously familiar with the ILDE+ platform. Then, participants filled a post-questionnaire regarding their perception about the functionalities implemented in the ILDE+ instantiation and open-ended questions regarding the positive aspects and aspects to improve within the platform.

A quantitative analysis was conducted with the collected data using the R Studio software[1]. Qualitative analysis was conducted using the open coding method and the tool Voyant[2] for the analysis of the open-ended responses of the questionnaires to identify the main topics of teachers' responses. Information about participants' self-reported motivations was collected using an adaptation of the motivational model used by Nov et al. [8], the Self-determination theory [9] and the to the Technology Acceptance Model [10]. Six classes of users' motivations to actively participate in a collaborative platform of learning activities were defined (5-point level of importance): **collective motives (COM)** (the importance attributed to the objectives of the community); reward motives (divided in **reputation (REP)** benefits and **social interaction (SOI)** benefits); intrinsic motivation (divided in **enjoyment (FUN)** and the interest of **acquiring knowledge (KNO)** through collaboration); and make use of technology to facilitate learning activities, namely sharing, exploring and commenting learning experiences within the community **(SIM)**. Additional to participants' motivations, one question is focused on the perception of the users regarding the functionalities implemented in the ILDE+ platform (5-point level of usefulness). Besides, open-ended questions regarding the positive aspects and the limitations of the ILDE+ platform were incorporated into the questionnaires to collect qualitative data about functionalities that are not contemplated in the MVP version.

III. RESULTS

A total of 204 participants (42 males, 158 females, 4 prefer not to say/no answer) responded to the pre-questionnaire and 84 (15 males, 57 females, 12 prefer not to say/no answer) to the post-questionnaire. The average age of participants is 40 years old, with a standard deviation of 10. The post-questionnaire was distributed after the completion of the training session which resulted in a lower response rate. Regarding respondents' profile, 170 are in-service teachers (70 responded to the post-questionnaire), while 8 reported to be pre-service teachers and the other 26 have diverse profiles different than teachers. Despite that only SIM and TEM variables had significant differences (p-value <0.05) between the three profiles, we decided to only analyze in-service teachers' data.

The analysis of the motivations (170 valid answers) to participate in a collaborative platform for sharing and exploring their 'Maker' educational activities designs (Fig. 1) showed that participants main motivation is to gain knowledge ($M_{KNO} = 3$, $Mo_{KNO} = 4$), followed by enjoyment ($M_{FUN} = 3, Mo_{FUN} = 3$) and using technology for facilitate collaboration ($M_{SIM} = 3$, $Mo_{SIM} = 3$). In contrast, respondents have indicated that reputation ($M_{REP} = 2$, $Mo_{REP} = 2$) is the least important motivation to participate in such platform. Even when around

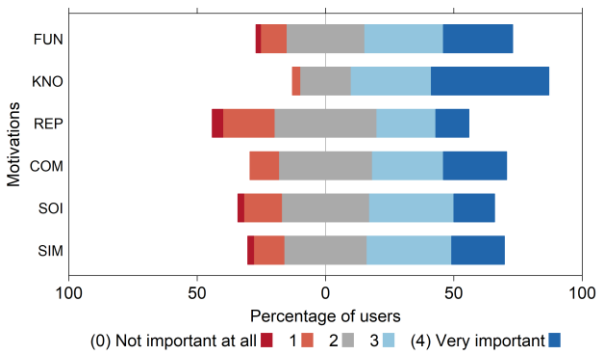

Fig. 1. Motivations to participate in a collaborative platform for 'Maker' activities design.

36% of respondents consider reputation important, it is worth to notice that only 21 (12.4%) rated reputation higher than at least one of the other motivations. Additionally, a Wilcoxon rank sum test was run to compare the responses between online and face-to-face training participants and revealed that online participants ranked COM (p-value=0.022), SOI (p-value=0.007) and SIM (p-value=0.013) significantly higher than the face-to-face participants.

Participants were also asked about the usefulness perceived of the ILDE+ implemented functionalities (70 valid answers). Around 13% (9) of respondents indicated that they did not use nor recognize any of the functionalities. In summary, all functionalities were considered useful (Fig. 2), especially the different options for exploring designs and users (FIB1) and the co-design option (COD), while the design comments option (CMT) and the template for creating designs (TEM) were rated slightly lower than the rest of functionalities. A content analysis for the open-ended questions revealed that the most positive aspects of the platform according to participants is the sharing feature (sharing designs, experiences, ideas, and knowledge within a community of teachers). It also revealed that the main limitations reported by the participants were the limited available resources within the platform, the limited time for collaborating and the lack of training. Participants also mentioned the need of community filters to explore designs based on likes, views, or comments received.

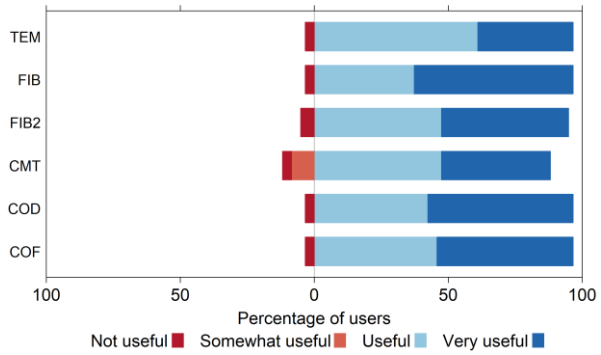

Fig. 2. Perception about the collaborative platform functionalities.

[1] https://www.rstudio.com/
[2] https://voyant-tools.org/

IV. DISCUSSION

This study explored two broad research questions about the motivations to participate in collaborative platforms for exploring, sharing, and discussing learning designs in a community of teachers. Regarding our first research question, participants identified different motivations to participate and contribute to such platforms. Even when most of the respondents indicated that knowledge gaining is their main motivator, they also acknowledged altruism and enjoyment as important motivators. Likewise, they are motivated to use the platform to facilitate collaborative activities. As for the reputation as a motivator, several studies provided evidence of the importance of reputation systems in OCs [11], [12], as reputation is highly associated with leadership and trust among community members. In our study, despite reputation was rated generally as the least important motivator, 21 participants rated reputation higher than other motivations, which suggests an indirect measurement of leadership among the study participants.

Regarding our second research question, results show that motivations provide a useful source for defining requirements when designing such collaborative platforms. For instance, in the study conducted, participants seek a technological tool to facilitate the process of exploring, creating, and sharing new content (SIM), since they reported to have limited time and resources to dedicate to extra tasks outside their every-day professional activities. Likewise, the importance given to the community goals (COM) suggests that participants need community indicators to evidence the progress and outcomes of the collaborative work. Furthermore, features such as rankings and reputation metrics are needed to foster trust, social interaction, and to provide a collaborative feedback of the available resources within the platform.

Regarding the limitations of this study, the surveys were not mandatory, and fewer participants completed the second survey. Therefore, our results are based on a descriptive analysis of the collected data rather than inferential statistics. Furthermore, the selected motivations' framework encompasses high level categories, and a detailed exploration of motivations is needed. Likewise, the usefulness of the different features was self-reported by the participants.

Future work should include the gathering of user behavior metrics from the platform to have a more objective measurement of the usefulness of each feature. Additionally, future studies should include pre-service teachers' motivational analysis and perceptions since they may have different needs as in-service teachers. Besides, it is necessary to perform a detailed analysis of the relationship between each of the motivational categories defined in this study and the different features of a collaborative platform.

V. CONCLUSION

The survey study conducted with teachers in a training course in the different phases of a 'Maker' educational activity provided results about the motivations to participate in a collaborative platform to create and share learning designs and resources. Results evidence that participants have other motivations beyond knowledge learning, such as the willing to help the teachers' community or to find technological tools to facilitate knowledge exchange and collaboration. Our results provide evidence of the importance of the analysis of participants motivations to foster trust, self-efficacy and to determine users' needs and requirements for the design of a platform to enhance collaboration within a community of teachers.

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