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Article

Meaningful Integration in Professional Communities: Examining User Behaviors in Catalyst

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Abstract

Online platforms have the potential to address the issue of world language teacher attrition by building professional learning communities. However, autonomous engagement is not guaranteed by the mere existence of said tools. In this article, we report findings from Catalyst user data analysis. Catalyst is an online professional development social portfolio that connects users to other professionals (in groups and as individuals). Specifically, we examine user behavior patterns in six areas—Group Membership, Goals, Evidence, Connections, Reflections, and Comments. Each feature was chosen because of its potential usefulness in facilitating meaningful and integrative participation in online professional platforms.

Results reveal three behavior profiles: 1-Testers, 2-Dabblers, and 3-Embracers. Each profile exhibits unique behaviors of engagement with the portfolio. Users who did not join any group were much more likely to show the lowest level of activity (i.e., Testers), while those who were part of a group and had more connections (i.e., Embracers) demonstrated the highest level of activity. These results support the theoretical foundation for sociocultural approaches to professional learning for teachers (e.g., Kabilan et al., 2011; Kabilan & Kahn, 2012; Kitade, 2014) and highlight the critical, and mutually reciprocal, relationship between social engagement and cognitive development.

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1. Introduction

Second language (L2) teacher education is in a current state of crisis. More than 40 states reported teacher shortages in world languages in 2017 (Cross, 2017). This number is expected to grow in light of the many changes to education due to COVID-19. The field faces an increase in demand for teachers as a function of high levels of teacher attrition and shifts in both student enrollment and teacher–pupil ratios (Sutcher et al., 2016). However, as this demand increases, enrollments in teacher preparation programs are dropping; data show a 35% decline between 2009 and 2014 (Sutcher et al., 2016; Swanson & Mason, 2018). This shortage in pre-service training is compounded by the reality that world language teachers often receive less (if any) professional development funding relative to their colleagues in other areas. Additionally, in small districts, the scarcity of human capital begets a reality of isolation for many world language professionals. This scarcity prevents the establishment of professional learning communities, communities that facilitate the critical functions of reflection, the application of theory to practice, and the exchange of ideas in a supportive environment (Arnold & Ducate, 2006).

While not a panacea, online platforms have the potential to address world language teacher shortages by building professional learning communities and connecting educators who might otherwise be isolated. These platforms have the capacity to quickly and efficiently vault the infrastructural barriers (e.g., time, distance, and funding) that prevent world language teachers from participatory professional learning in face-to-face contexts. Furthermore, participation in online, interactive learning has demonstrated both cognitive and social benefits for pre-service teachers (e.g., Arnold & Ducate, 2006; Arnold et al., 2009; Kitade, 2014). While there is still a gap in empirical evidence, it is likely that these benefits also hold true for in-service teachers. This study addresses this gap and explores the use of an online platform for in-service teachers.

However palpable the potential of professional cooperative learning, autonomous engagement in online communities is not guaranteed by the mere existence of tools that facilitate interpersonal connections. The purpose of this article is to examine user behavior patterns within Catalyst (https://catalyst.uoregon.edu), an online professional platform. Catalyst is a professional development social portfolio that connects practitioners as both individuals and

in groups in order to facilitate positive feedback loops and reflection. In this study, we examine user behavior patterns in six areas—Group Membership, Goals, Evidence, Connections, Reflections, and Comments—to illuminate the conditions in which user engagement seems to be the most robust and factors that could potentially inform the future development of, and participation in, online collaborative learning communities for world language educators.

2. Literature Review

2.1 Sociocultural Foundations

According to Vygotsky (1978), human learning, growth, and development are inherently social practices. Social interactions (e.g., dialog and imitation) facilitate the internalization of new knowledge and skills. This reality has been explored in a variety of contexts, including teacher training and reflection (e.g., Kabilan et al., 2011; Kabilan & Kahn, 2012; Kitade, 2014) and computer-supported collaborative learning (e.g., Arnold & Ducate, 2006; Arnold et al., 2009; Arnold et al., 2012). Of specific interest to the present discussion is Shabani's (2016) application of Vygotsky's theoretical framework to four central implications for enduring, meaningful professional development: (1) that practitioners participate in professional communities; (2) that adequate time is allotted for development to occur; (3) that external mediators (e.g., expert guidance and online platforms) provide follow-up and ongoing support; and (4) that the relationship between novice and experienced practitioners is mutually beneficial and collaborative. Inherent to these implications is active engagement in reflective practice and goal setting.

2.2 Reflective Practice and Goal Setting in Portfolios

Reflective practice is realized through the creation of goals. Ongoing engagement in this metacognitive strategy has been shown to facilitate rich and enduring development among language learners utilizing portfolios (e.g., Barrett, 2007; Cummins & Davesne, 2009; Novak et al., 1996). Of note, Moeller and colleagues' (2012) longitudinal study of students (n = 1,273) using LinguaFolio, a language-learning portfolio designed to promote self-regulated learning, demonstrated a statistically significant correlation between goal setting and standardized assessment ($p < .01$). Additionally, Ziegler and Moeller (2012) demonstrated that the mastery orientation of first-year Spanish and French students (n = 168) enrolled in classes with only limited LinguaFolio use decreased in comparison to their peers in courses adopting more meaningful integration with the same platform. In each case, ongoing goal setting and reflection were key to success.

Although it would be logical to expect similar results related to portfolio use in pre- and in-service teacher training contexts, empirical evidence in these domains is not as robust in terms of sample size and duration of studies. Still, the positive potential of portfolios as professional learning tools is generally accepted and corroborated. For example, Oakley and co-workers' (2014) study of e-portfolios in a graduate teaching program (n = 23) revealed that 64% of pre-service teachers were able to achieve a medium level (out of low, medium, high) of reflection within the course of an academic year. Additionally, Pires Pereira's (2014) case study revealed that pre-service educators have the potential to view portfolios as "a learning text" (p. 533), a result echoed in multiple in-service teacher surveys (e.g., Attinello et al., 2006; Chakrakodi, 2010). Still, however positive the potential of portfolios, it should be noted that these positive perceptions were perhaps all but guaranteed given the prevalence of portfolio work in pre-service teacher training. As Pires Pereira (2014) writes, contemporary teacher education is, essentially, "learning how to become reflective and be able to build reflective practice" (p. 524).

Additionally, when evaluating portfolios for professional development, it is critical to consider the distinction between portfolios as an assessment tool and the processes of self-evaluation and reflection. Simply put, the potential of reflection to positively impact learning does not manifest simply because a space for reflection exists (see Etscheidt et al., 2012, for an overview of research indicating the importance of teaching reflective practices in pre-service teacher training). For example, the language of communication has been found to limit participants' ability to articulate complex reflections and commentary in pre- and in-service contexts (Bustamante & Moeller, 2013; Russell & Davidson Devall, 2016). Relatedly, studies warn that practitioners' awareness of the purpose of their portfolios and associated reflections is commonly lacking (e.g., Attinello et al., 2006; Oakley et al., 2014), and that portfolios are imperfect instruments for capturing all aspects of teaching (e.g., Attinello et al., 2006; St. Maurice & Shaw, 2004).

2.3 Goal Setting within a Community

However imperfect, the potential success of professional portfolios is closely tied to the establishment of a community of practice (CoP). CoPs are groups of people engaging in collaborative learning within a shared space and with a shared goal (Lave & Wenger, 1991; Wenger, 1998). Unfortunately, however, access to CoPs among world language teachers is varied, challenging, and, in some cases, non-existent, in part because the creation of physical spaces in which practitioners can meet and collaborate requires considerable time and financial resources. Kessler (2006) posits that a critical consequence of this scarcity of resources is that practitioners autonomously engage in self-teaching

through independently sourced materials. In a sense, this autonomy is positive; self-directed learning is desirable for professional growth, and practitioners' willingness to engage in self-teaching demonstrates an earnest desire to master their craft. However, a consequence of these isolated practices is that world language practitioners have few opportunities to collaborate in professional development settings. The substantive nature of this misalignment is heightened in the context of goal setting, which can take on new value when implemented within created communities. For example, goal setting in groups, provided that goals and tasks are shared, creates a sense of interdependence and rapport (Chao, 2006; Kern, 1995; Rovai, 2002; Senior, 2010), and provides an essential community to inquire about and celebrate progress (Gan et al., 2015; Robb, 2006). Additionally, Confessore and Park (2004) demonstrate that goal setting in communities has the potential to improve teachers' capacity for self-evaluation, although it should be highlighted that interpersonal interaction around achievement goals does not necessarily beget positive outcomes (see Poortvliet and Darnon, 2010, for a detailed discussion).

2.4 Engagement in Cooperative Learning in Online Communities

Online spaces, given their capacity to efficiently connect diverse, remote individuals, are one potential solution for the aforementioned deficit of professional development opportunities for world language teachers. Computer-mediated communication (CMC) supports debate, dialogue, and social interaction among geographically dispersed group members. This reality is particularly evident in early research regarding communication in synchronous computer-mediated communication (SCMC) contexts for students, but less so for teacher professional development. While the user group varies, it is expected that many of the same affordances, including an increased number of turns (e.g., Kern, 1995), independent communication with comparatively less need for facilitation (e.g., Chun, 1994), and an equalizing effect for all participants (e.g., Ortega, 1997) would hold true.

While there is great value alone in SCMC, asynchronous computer-mediated communication (ACMC) is particularly beneficial in communities such as those that exist within Catalyst – communities in which members are separated by geographic distance and differing time zones. ACMC has the potential to enable language teachers to engage socially and cognitively within a large community that shares their interests and preoccupations. This engagement manifests in teamwork focused on attending to the diverse issues that are most personally relevant to members (Arnold & Ducate, 2006; Arnold et al., 2009), and the implementation of ACMC creates room for downtime

in-between responses, meaning that participants have the potential to spend time processing, reflecting, and formulating responses that directly address the needs or ideas of the original poster or commenter (Pena-Shaff & Nicholls, 2004). Moreover, the explicit nature of the asynchronous environment, as seen in comments or on discussion boards, creates an environment in which all members can review all comments, in order to ultimately fuel self- and community-reflection (Macdonald, 2003). These group interactions are particularly relevant in the Catalyst tool and will be discussed in the explanation of the instrument in the subsequent section.

In summary, three key points are particularly relevant to the present investigation of user behavior in the Catalyst tool.

1. Although world language practitioners demonstrate a willingness and desire to engage in professional development, they are often isolated and lack the necessary resources and infrastructure for critical professional collaboration and cooperative learning.
2. Professional communities have the potential to extend professional learning and foment growth.
3. Digitally mediated environments for communication demonstrate the potential benefits of connecting professionals who are separated geographically in meaningful, growth-oriented engagement.

3. Research Questions

To gain insight into the user behaviors that indicate sustained participation in online communities, we examined user count data in the Catalyst tool. In doing so, we attempted to answer the following questions.

1. What patterns of user behavior emerge in examining activity over time?
2. Does the type of group a user joined affect the pattern of use with the tool?
3. How do users differ in terms of the specific activities they carry out with the tool?

4. Method

4.1 Participants

Participants in this study included 346 world language educators (teachers, administrators, and teacher trainees) throughout the United States. It is

expected that most participants were either delivering or enrolled in professional development as part of STARTALK, a short-term summer program that is a component of the National Security Language Initiative; however, for reasons of anonymity, the exact percentage of participants from STARTALK is impossible to determine.

4.2 Instrument

Catalyst is an online social platform for professional development that is based on the Teacher Effectiveness for Language Learning (TELL) Framework (http://www.tellproject.org/framework). Users engage with the TELL Framework within Catalyst with the explicit purpose of promoting goal setting, self-evaluation, and reflection. These reflective practices are extended via the platform's capacity to connect users with one another as individuals as well as in groups. However, these connections are optional, and users are not required to cultivate professional communities to utilize any of the platform's features. Features within the Catalyst tool related to this study include setting goals, uploading evidence, connecting with other users, documenting reflections, and commenting on work (evidence uploaded by self, others, and personal reflections) stored within the platform.

Setting Goals

Within the Catalyst tool, users are able to set up to four concurrent goals by first selecting one of the TELL Framework's seven domains (Environment, Planning, Learning Experience, Performance & Feedback, Learning Tools, Collaboration, and Professionalism). Once the domain is selected, users then view the related criteria (main indicators) and the relevant sub-criteria (user goals) (see Figure 1). At that point, the user is prompted to articulate an optional plan for achieving the selected goal.

Uploading Evidence

The Catalyst tool allows users to upload evidence related to all goals within the TELL Framework, not just those that have been identified by users as personal goals. In order to upload, users select a goal and are prompted to self-evaluate using a holistic scale that includes the following levels (from least proficient to most proficient): "I do this rarely," "I do this sometimes," "I do this most of the time," and "I do this with confidence" (see Figure 2).

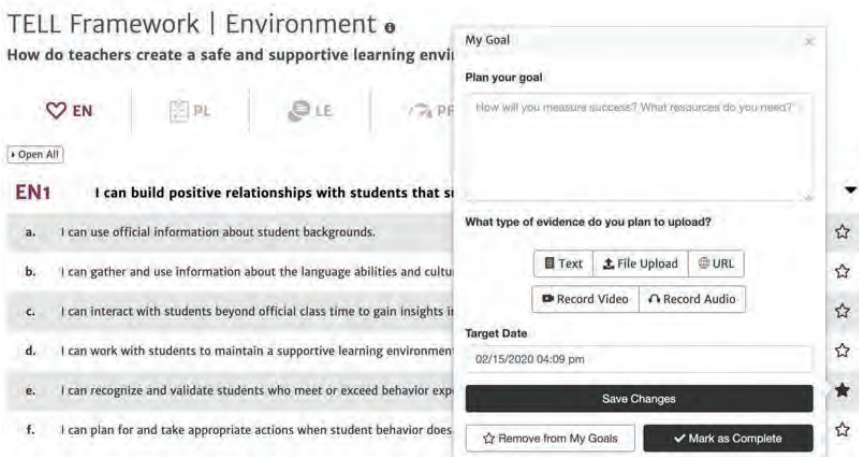

Figure 1. Setting goals in Catalyst.

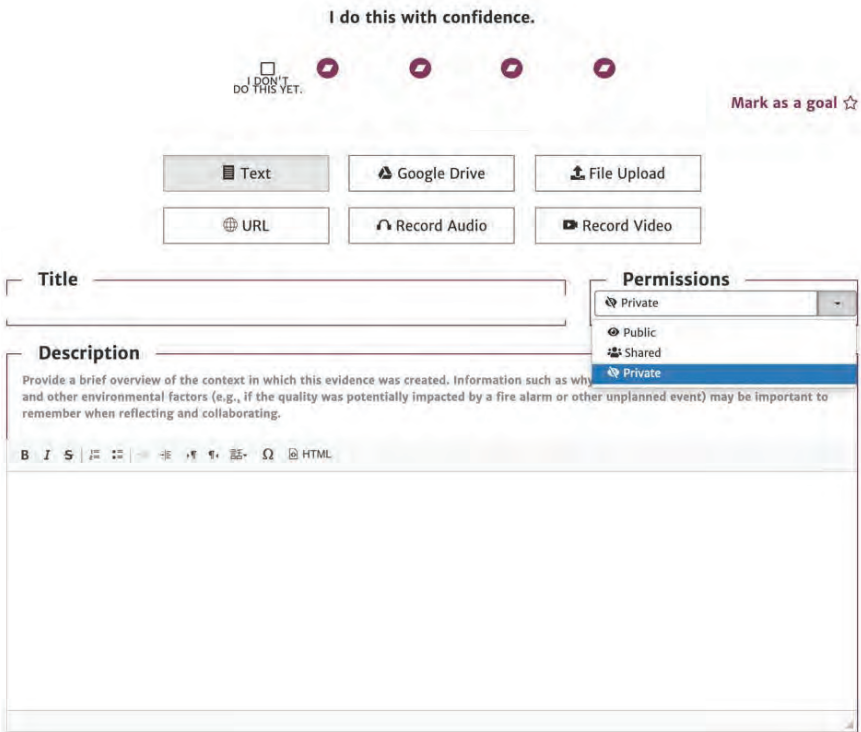

Figure 2. Evidence upload in Catalyst.

Connecting with Other Users

The Catalyst tool connects users as individuals and in groups. In order to connect as individuals, users select "Add members" from the "My community" section of their profile and are prompted to search for other individuals by name, language, goals, and (self-identified) strengths within the TELL Framework. Users may also search for public groups to join using the same search criteria as those that are utilized for adding community members (see Figures 3 and 4).

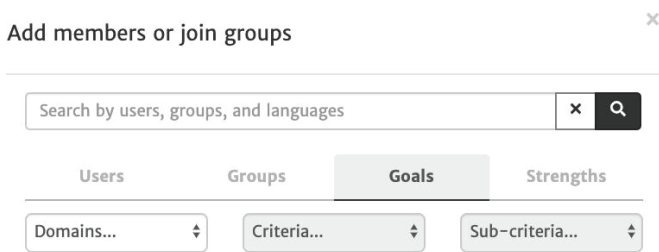

Figure 3. Modal for connecting with users and groups in Catalyst.

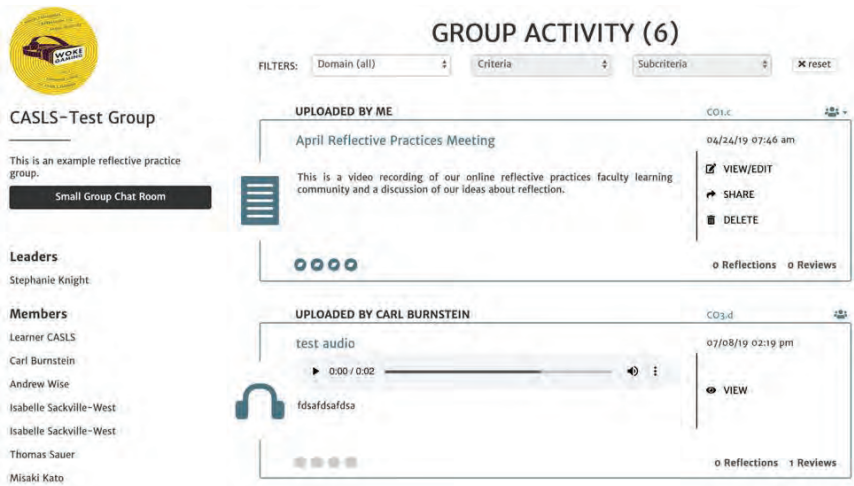

Figure 4. Group dashboard.

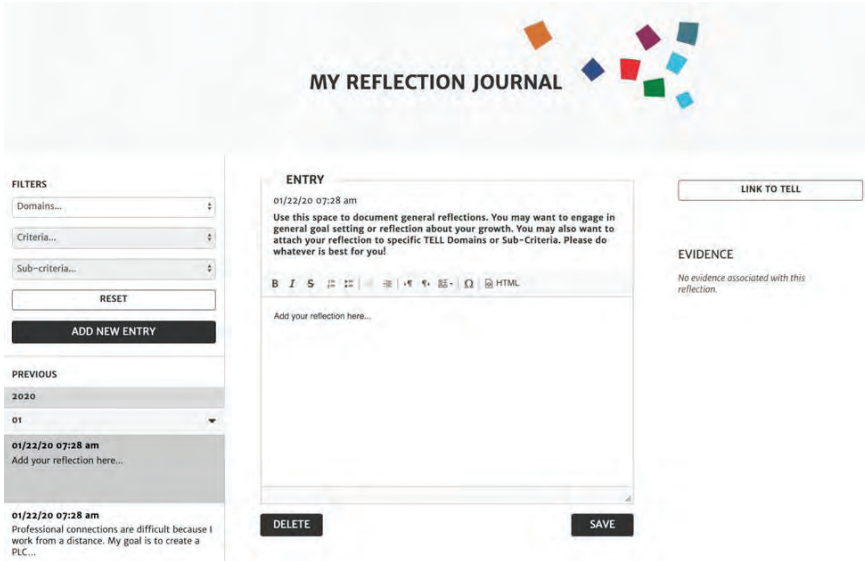

Figure 5. Reflection journal.

Documenting Reflection

In Catalyst, reflection is most typically documented in a journal that provides users with a space to document personal reflections related to their goals and strategies for teaching and professional development. Users choose whether to link these reflections to specific goals within the TELL Framework (see Figure 5).

The reflection journal is also populated by reflections that users document upon uploading evidence. Unlike other personal reflections documented by participants at the time of this study, these evidence-linked reflections (Figure 6) could be shared with groups or individuals, as determined by the sharing permissions associated with the evidence.

Commenting on Work Uploaded by Other Users

The Catalyst tool includes several comment sections, and users may leave comments (after posting a peer review) on the evidence uploaded and shared with them (see Figure 7), and they may also respond to any comments that others have provided.

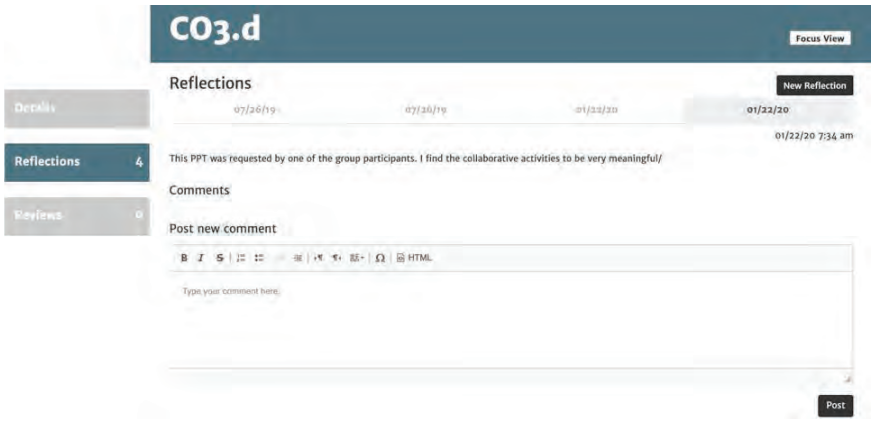

Figure 6. Evidence with reflection.

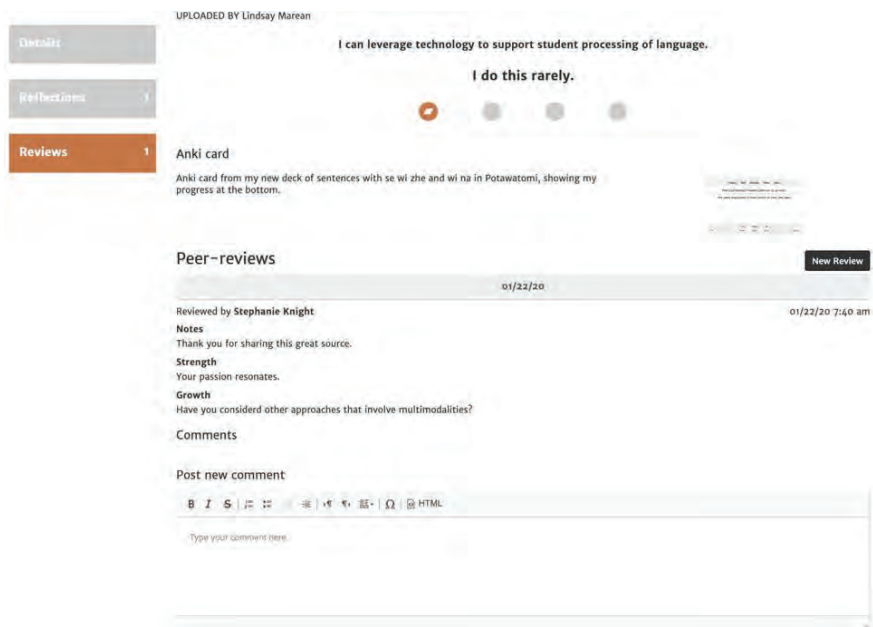

Figure 7. Commenting.

4.3 Data Collection Procedure

During the spring STARTALK Conference, program directors and instructors in attendance were introduced to the Catalyst tool and invited to sign up. Demonstrations were provided, and technical staff assisted in the sign-up process at the conference and upon request during the summer. All teacher training programs were invited to use the tool, but none were required to do so. Notably with regards to the Catalyst tool, however, each STARTALK teacher training program required the articulation of specific TELL criteria and sub-criteria as training outcomes.

4.4 Data Analysis Procedure

After completion of the summer programs, a data set was compiled from the site's database by user. Data were used with permission, and participants were identified only by a random code number. Data for the study were limited to users who signed up between May 3 and July 27, 2019, in order to limit the data (as much as was possible) to those involved in summer programs. For these users, activities conducted between May 3 and October 22, 2019, were included in the study. This date range permits the opportunity to examine usage of the Catalyst tool for a time following the summer program period.

User behavior was then compiled and analyzed across six features, each selected for its role in establishing interaction with the platform and among the users themselves: types of group membership, number of goals set, number of evidence samples uploaded, number of connections made, number of reflections, and number of comments. Similar patterns were compiled to establish user types (research question 1), and then patterns for each user group were compared (research questions 2 and 3).

5. Results

Research question 1: What patterns of user behavior emerge in examining activity over time?

As previous literature indicates (e.g., Ziegler & Moeller, 2012), reflective tools are useful if they are used in a regular and sustained manner. *Regular* indicates that a tool is used at repeated intervals that are not too widely spaced; *sustained* indicates that the use occurs over a significant length of time. For this study, these factors are interpreted in the context of a six-month period. For our purposes, regular use is defined as accessing the tool at intervals of less than nine days over the six-month period. Sustained use is defined as regular use that continues for at least 12 days.

User login data were used to determine the pattern of days the tool was accessed. The patterns of regular/non-regular and sustained/non-sustained

Table 1
Definitions of User Activity Patterns

Profile name	Activity pattern	Count	Percentage of users
1-Tester	User set up an account and interacted with the tool during a single day.	135	39.02%
2-Dabbler	User set up an account and returned to it once, either as a single visit or as a single burst* of activity of less than 12 days, such as during a class.	109	31.5%
3-Embracer	After setting up account, user returned multiple times, and/or had multiple bursts* of activity, or sustained activity over a period of 12 days or more.	102	29.48%

*A burst of activity is a period during which users were active in their account regularly for a period of time and the time between each login was less than nine days.

use were used to develop user activity profiles. Three patterns of activity were identified in the data set. These activity profiles distinguished between those who minimally engaged with the tool (1-Testers), those who used it during a specific restricted period of time (2-Dabblers), and those who engaged with it repeatedly during the study period (3-Embracers). Table 1 shows the three patterns of activity, the definition of each pattern, and the number of users in the database who displayed each pattern.

Research question 2: Does the type of group a user joined affect the pattern of use with the tool?
A feature of the Catalyst tool allows users to join a public group if they choose. During the study period, two types of groups were available. There were 19 groups set up at the request of STARTALK, one for each summer program (Admin Created). An additional 40 groups were optionally created during the summer by fellow users (User Created). A user might choose to join any of these 59 groups or may not choose to join any group at all (Not Joined).

In order to determine if an association exists between the type of group a user joined and the subsequent activity pattern, a chi-square test of independence was performed. The relationship between these variables was significant (χ^2 (4, n = 346) = 101.00, $p < .0001$). Specifically, users who did not join any group were much more likely to show the lowest level of activity (i.e., 1-Tester). Table 2 shows the frequency and percentages of each combination of group type and pattern of activity. Results are shown as a bar chart in Figure 8.

Table 2
Association of Type of Group Joined by Pattern of Activity (n = 346)

	Pattern of activity			
Group	**1-Tester**	**2-Dabbler**	**3-Embracer**	**Total**
Not Joined (n)	105	30	19	154
percentage	30.35	8.67	5.49	44.51
row %	68.18	19.48	12.34	
column %	77.78	27.52	18.63	
Admin Created (n)	6	17	19	42
percentage	1.73	4.91	5.49	12.14
row %	14.29	40.48	45.24	
column %	4.44	15.60	18.63	
User Created (n)	24	62	64	150
percentage	6.94	17.92	18.50	43.35
row %	16.00	41.33	42.67	
column %	17.78	56.88	62.75	
Total (n)	135	109	102	346
percentage	39.02	31.50	29.48	100

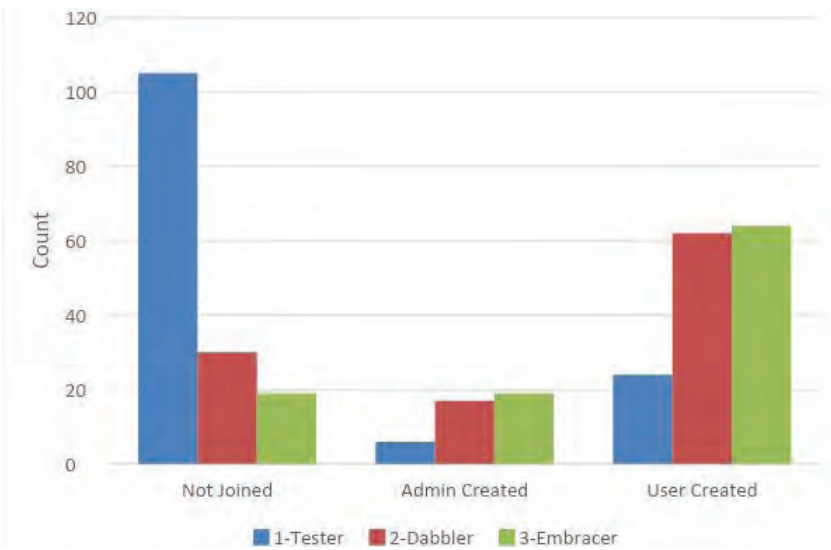

Figure 8. Type of group joined by pattern of activity (n = 346).

Research question 3: How do users differ in terms of the specific activities they carry out with the tool?
It is expected that the more times users log into their accounts, the more they will engage in platform activities. However, it is not necessarily the case that users with different activity profiles will engage in various activities proportionally across each activity type.

Relevant behavior patterns were examined by comparing the number of times users with each activity profile utilized each feature of the Catalyst tool. The data were submitted to ANOVA analyses with post hoc contrasts between the patterns of activity. Table 3 shows the results for each feature, while Figure 9 provides the results as a bar chart. As can be seen, 1-Testers did little more than interact with the goal setting feature. The 2-Dabblers showed comparatively high average counts for goal setting and uploading of evidence. While 3-Embracers also showed comparatively high average counts for goal setting and evidence uploads, they were particularly notable in that their average number of connections was over six times greater than that of 2-Dabblers. Additionally, they utilized the reflection feature approximately 2.5 times more than 2-Dabblers.

Table 3
ANOVA of User Activity on Goals, Evidence, Connections, Reflections, and Comments for Three Classes of Engagement (1-Tester, 2-Dabbler, and 3-Embracer)

Feature	Engagement	Mean	*SD*	*F*	*p*-value	Significant contrasts
Goals	1-Tester	1.41	5.57	19.73	< .0001*	1-Tester vs 2-Dabbler
	2-Dabbler	14.15	21.82			1-Tester vs 3-Embracer
	3-Embracer	9.50	18.08			2-Dabbler vs 3-Embracer
Evidence	1-Tester	0.30	0.86	9.49	< .0001*	1-Tester vs 2-Dabbler
	2-Dabbler	2.78	7.52			1-Tester vs 3-Embracer
	3-Embracer	2.13	3.36			
Connections	1-Tester	0.16	0.63	57.05	< .0001*	1-Tester vs 3-Embracer
	2-Dabbler	1.03	2.11			2-Dabbler vs 3-Embracer
	3-Embracer	6.52	8.51			
Reflections	1-Tester	0.09	0.33	26.62	< .0001*	1-Tester vs 2-Dabbler
	2-Dabbler	1.82	5.96			1-Tester vs 3-Embracer
	3-Embracer	4.44	5.68			2-Dabbler vs 3-Embracer
Comments	1-Tester	0.02	0.19	1.83	n.s.	
	2-Dabbler	0.08	0.36			
	3-Embracer	0.39	2.80			

* Significant at $p < .0001$

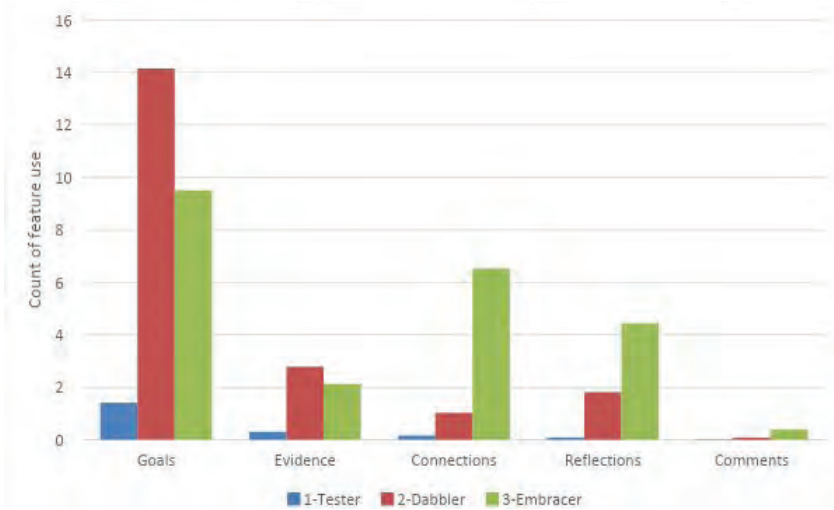

Figure 9. Mean user activity for each feature by pattern of activity.

6. Discussion

The data discussed here reveal critical insights related to the establishment of effective professional development communities for world language teachers. The behavior patterns associated with each user type illuminate ways in which successful communities may emerge and coalesce. Unsurprisingly, group engagement emerges as the most critical factor in determining user engagement. These insights are discussed in the subsequent subsections.

Research question 1: What patterns of user behavior emerge in examining activity over time?

As has been discussed throughout the dataset, 2-Dabblers and 3-Embracers used the various features within the Catalyst tool much more than 1-Testers. The 1-Testers typically only interacted with the goal setting feature, perhaps a function of the reality that STARTALK summer programs were required to articulate TELL sub-criteria as their learning outcomes. As such, these goals were probably both familiar and accessible to many users of the Catalyst tool.

Particularly given the non-compulsory nature of Catalyst use within STARTALK programs, 1-Testers' inaction within the platform provides additional support for the critical nature of meaningful integration of tools within professional learning opportunities. Ben-Bassat Levy and Ben-Ari (2007) and Ziegler and Moeller (2012) point to a positive relationship between task value

and the regular, sustained use and integration of learning tools. It is likely that the Catalyst tool was not meaningfully integrated into 1-Testers' larger programs, especially because these users did not typically join even admin-created groups. Given this likelihood, it is also unsurprising that 1-Testers did not make individual connections on the platform.

Importantly, this lack of meaningful tool integration in a community may yield nefarious consequences. As is specifically highlighted in Ben-Bassat Levy and Ben Ari (2007), user perception of tools is likely to be negative (in lieu of positive or neutral) when users only interact with them superficially, regardless of their potential positive affordances. The potential disruption caused by these negative perceptions can impede uptake of the tool in the immediate future and serve as a hurdle complicating the uptake of future iterations of the tool. In this sense, the critical role that professional development community leaders play in stimulating ongoing connections via modeling and community participation with tools like Catalyst (Germain-Rutherford, 2015) is heightened.

Research question 2: Does the type of group a user joined affect the pattern of use with the tool?

Count data provided a means to differentiate users based on their behaviors. The most notable distinguishing behavior among user groups was whether they had joined a group on the platform (see Table 2). These results align with previous work on interplay of learning and social activity in professional development (e.g., Kitade, 2014), as well as the literature related to establishment of professional communities in online spaces (see Schlager and Fusco, 2003, for a detailed discussion).

Notably, user-created groups within the platform were relatively more popular than admin-created groups. Roughly 12% of users (n = 42) within the Catalyst tool joined groups created by administrators, and 43.3% of users (n = 150) joined user-created groups. These results provide some evidence of the critical nature of practitioner autonomy in professional endeavors discussed by such researchers as Hyslop-Margison and Sears (2010). Additionally, user-created groups may indicate a shift of users toward increased self-directed learning, echoing a similar development to that discussed in Robb (2006) and McCarthy (2011).

Research question 3: How do users differ in terms of the specific activities they carry out with the tool?

While examining the behaviors of users who did not embrace the Catalyst tool is illuminating, perhaps the most intriguing behavioral discrepancy among user profiles is that 2-Dabblers used goals and evidence more than 3-Embracers, but 3-Embracers showed higher levels of making connections with other

individuals (by a factor of six) and reflecting. Given that the transformative potential and importance of evidence-informed decision-making in professional learning communities is well documented (e.g., Hargreaves, 2003), one might logically expect 3-Dabblers to have relatively higher evidence counts. However, Stickler and Hampel's (2015) adapted pyramid model of skills for negotiating an online teaching space provides some insight as to what may be happening at both a tool-specific and social level to explain the data at hand. At the most foundational level (level 0) of the model, teachers must have basic competence in information and communication technologies (ICT). As was discussed previously, it is likely that the 1-Testers were not provided with this requisite training, given that they did not typically join groups, including admin-created groups. In ascending order, the other levels of the pyramid are: (1) specific technical competence for dealing with technological constraints and possibilities; (2) facilitating communicative competence and online socialization; and (3) creativity, choice, and own style (p. 65). An evaluation of the present data indicates that 2-Dabblers were likely operating at the second level, and are building their competence and familiarity of the tool within their established groups. However, the more entrenched (but more autonomous) 3-Embracers demonstrated evidence of having moved into the third level of the pyramid by engaging in more personally directed activities, such as seeking out individual connections and documenting reflections within the platform. The influence of social interaction on individuals thus manifests as both a solution for isolation and an impetus for intentional, autonomous work.

7. Conclusion

7.1 Limitations

When interpreting these results, it is critical to note that the use of count data is limited in complexity; many behaviors that could contribute to 3-Embracers' uptake of Catalyst are simply unobservable. For example, it is possible that within participant groups, 3-Embracers had a clearer understanding of the purpose of the portfolio than 2-Dabblers or 1-Testers, an understanding described by Attinello and colleagues (2006) and Oakley and co-workers (2014) as foundational to portfolio success. Also, specific group leaders may have invested more time than others in the teaching and exploration of the technological infrastructure at play, likely yielding a higher relative preponderance of 3-Embracers in their groups. Additionally, we are unable to discern if participation correlated with specific demographic factors, and we did not evaluate the quality of participants' reflections and asynchronous interactions. In particular, given that reflective skills develop over time, a longitudinal analysis

would have provided more insight as to the relationship between professional growth and online social portfolio use.

Nevertheless, our examination of user behaviors within the Catalyst tool supports the sociocultural theoretical foundations of learning. Not only were users more likely to engage in a sustained manner in the platform if they joined groups, but 3-Embracers demonstrated behaviors that are indicative of self-directed learning within the platform. Indeed, examining the count data of different user profiles illuminates the behaviors that are indicative of meaningful participation in a professional online community. Such insight is especially important in contemporary teaching contexts, as the present infrastructure for professional development for world language educators is relatively weak when compared with other disciplines.

7.2 Implications for Future Research and Practice

In this study, we used count data to examine user behaviors on Catalyst, an online social portfolio designed to connect educators and to engage them in professional reflection and growth. Specifically, we wanted to find out what types of behavior patterns were most typical on the platform, whether group participation had any impact on behavior patterns, and what differentiated users who only interacted with the platform superficially (1-Testers) from users who accessed it with some consistency (2-Dabblers) and users who accessed it in a regular and sustained manner (3-Embracers). In alignment with sociocultural theories of learning, we discovered that group participation was a great indicator of whether users would use the platform consistently, and we discovered that those who used it the most consistently displayed a tendency toward self-directed endeavors (e.g., connecting with individuals and writing reflective journals).

Future research in this area would expand the analysis from count data to include other critical components of an online social portfolio. This research might include, for example, interviews and surveys to analyze user perception data as well as perceived value of group interactions. Furthermore, research examining the dynamics of specific groups (e.g., how they are created, how they are managed, and external social variables) would also add insight into their effectiveness in creating the connections described here, as well as the multitude of factors that could contribute to overall success. Additionally, a qualitative analysis of participant artifacts and associated reflections, as well as the technological infrastructure and training that the participants access, would provide clarity surrounding user behaviors that are unobservable. This research would provide additional insight into the critical ingredients for success in online social professional development portfolios.

In terms of practice, an obvious interpretation of our results would yield a structure for professional online social portfolios in which group participation is compulsory and specific behaviors (e.g. uploading evidence) are prescribed by group leaders. We advocate that such an interpretation is limited, and perhaps even detrimental, due to its potential to strip teachers of their autonomy and sense of mastery. We suggest that teacher leaders wishing to provoke meaningful development and change among community participants should instead focus on developing their foundational competencies (e.g. technical know-how and reflective skills), and ensure sustained integration of the pedagogical tool(s) at hand through the creation of opportunities to participate in self-directed experiences and the facilitation of peer-to-peer connection. In doing so, they will likely create the opportunity for additional connection, a clear indicator of meaningful interaction in the online platform examined here.

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