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Patterns of Builders participation: a study with psychology's undergraduates

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Introduction

In the last decade, a large number of studies have emerged to facilitate internalization and building opportunities mediated by virtual learning environments. Within this framework, two interrelated lines of empirical studies have analyzed the dynamics generated in this environment. A first group of studies, called discussion and analysis of contributions, was directed toward examining dialogic and cognitive processes involved in internalization and knowledge building (e.g. Chuy, Zhang, Resendes, Scardamalia, & Bereiter, 2011). A second group of studies using structural analysis have examined participation and interaction during asynchronous activity building (e.g. Philip, 2010).
These studies show that the virtual learning environment does not always produce symmetrical benefits for the members of the community, sometimes generating compact communities and sometimes fragile ones. In a compact community there are shared knowledge-building objectives, with relatively symmetrical degrees of participation and building efforts. In fragile communities, a large number of members are more dedicated to individual than to shared objectives, or many of these participants lack motivation for community knowledge building, showing high levels of asymmetry. In this sense, it is logical to consider that a thorough analysis of profiles of participation and building processes, as well as the building impact on the community, could indicate what type of community was generated by participants (compact or fragile).
Thus, the aim of the present poster was to identify the presence of these types of communities, analyzing profiles of students in the virtual community, namely, the Knowledge Forum.

Methodology

Participants

The participants were 73 pedagogy undergraduates (71.2 % females, 28.8% males) from the Universidad de Granada (University of Granada, SPAIN). They were enrolled in an educational research course as part of a five-year degree program in pedagogy. The pedagogical model for this subject mainly involved working on three cyclical foci of activity (individual, cooperative, and community) to resolve authentic problems.

Instruments & analytic procedure

The tool, called Contribution and embedded in the Knowledge Forum, was used to gather data on students' participation in the community to solve authentic problems in the knowledge forum environment. Moreover, Impacting "Builders" was a measure that asked every member of the community the following questions: What were the most important contributions to your learning process? What were the most original contributions of the virtual community? Based on these data, a structural analysis was performed to calculate the relative indices of the reading, the build-ons, the total building time, the mean building time, and the impact of these constructions on the community. Finally, a cluster analysis was applied using K-means to find out what types of profiles were generated in the community, and which members made up these clusters.

Results

Descriptive analysis shows us a positive, asymmetric distribution in most of the variables, except reading participation. These results indicate that a high percentage of students have done the minimum build-on required for the subject. Likewise, we can interpret that another significant percentage of students participated regularly in the platform, but their contributions were not as relevant for the community. Finally, a small percentage of students participated regularly in the platform, and their contributions had an impact on the community.

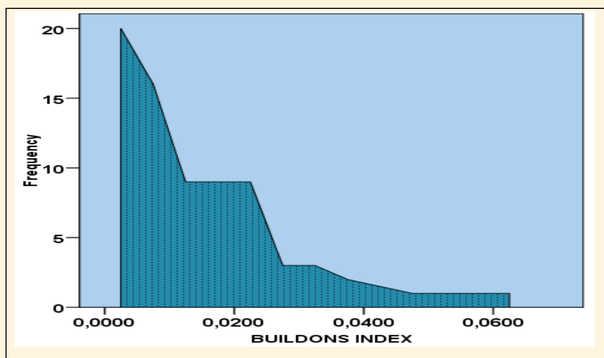

Figura 1. Descriptive analysis: Buildons Index

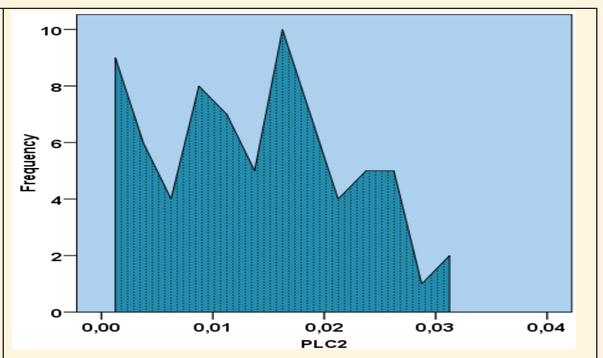

Figura 2. Descriptive analysis: Reading Index

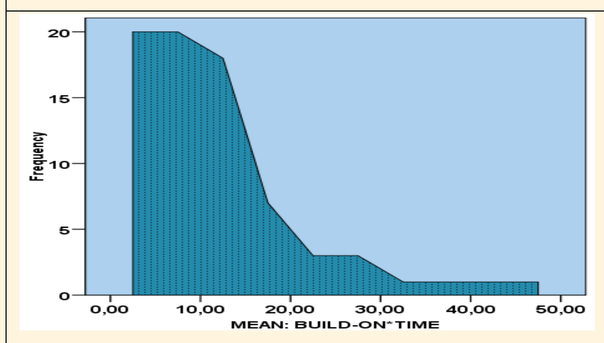

Figura 3. Descriptive analysis: average build-on time for each construct

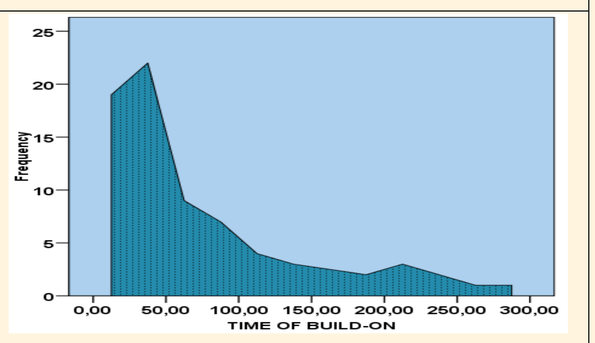

Figura 4. Descriptive analysis: Total Build-on Time

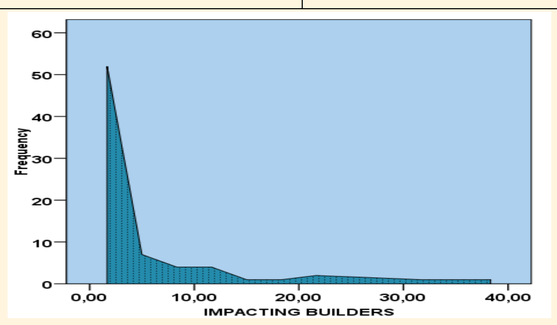

Figura 5. Descriptive analysis: Impacting Builders

The descriptive results above lead us to apply a Cluster analysis in order to examine potential student profiles. The applied Cluster analysis revealed four specific learning patterns (Table 1, Figure 6).

Table 1. Cluster Analisis: K-mean

Variables*	Cluster 1 (n= 41)		Cluster 2 (n= 7)		Cluster 3 (n= 4)		Cluster 4 (n= 21)		Associated Statistical Values	
	Mean	DS	Mean	DS	Mean	DS	Mean	DS	*f*	*p*
Reading Index	.011	.008	.02	.008	.02	.004	.01	.006	26.678	.000
Build-on Index	.008	.007	.022	.007	.04	.018	.016	.009	20.729	.000
Build-on Time	19.34	19.34	185	28.80	251.5	22.86	83.04	21.08	312.259	.000
Average build-on time	5.06	4.29	20.76	7.66	16.96	6.40	15.35	9.52	19.786	.000
Impacting Builders	.96	2.06	17.51	14.53	13.18	3.88	3.06	3.52	5.650	.002

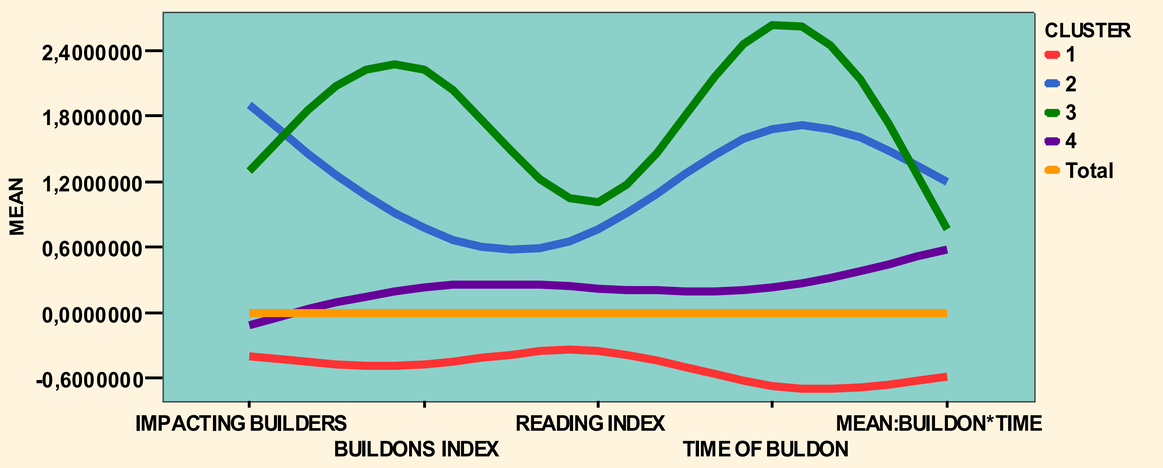

Figura 6. Cluster & Variables

The first pattern was made up of students who presented the lowest scores for all variables. This pattern, consisting of 41 students, shows that these students presented a low level of reading/build-on frequency and time of building. Likewise, these students were not relevant enough for the community. This pattern was identified as consonant and negative because the participation was sporadic and irrelevant. The students belonging to this pattern did not gain benefits from their participation in the community and they did not generate significant contributions for the community.
The second pattern, made up of 21 students, showed medium-high scores regarding reading, build-on, total time of build-on and mean time for each build-on, but only 3.6% of the community considered their build-on relevant. This pattern has been identified as dissonant and positive because their build-on was not considered relevant, but they showed an adequate level of participation in the community. Therefore, these students gained benefits from participation in the community.
The third and fourth pattern showed high scores in all variables. However, the students belonging to the third pattern showed the highest scores with regarding to building time, reading and building frequency.
In addition, discriminant analysis was applied in order to measure the degree of success of the classification realized by cluster analysis. The results revealed that 100% of original cases were correctly classified (see, Table 2).

Table 2. Validation of Cluster Analysis: Probabilities of Group membership

		Cluster 1	Cluster 2	Cluster 3	Cluster 4	Total
Count	Cluster 1	41	0	0	0	41
	Cluster 2	0	7	0	0	7
	Cluster 3	0	0	4	0	4
	Cluster 4	0	0	0	21	21
Porcentage	Cluster 1	100	-	-	-	100
	Cluster 2	-	100	-	-	100
	Cluster 3	-	-	100	-	100
	Cluster 4	-	-		100	100

*100% of original grouped cases correctly classified.

Discussion and conclusions

In general, our results indicated four student profiles. Two profiles showed an adequate participation, and they were relevant knowledge builders for their community peers. However, the size of these profiles is a worrisome aspect, because the sum of the members in both profiles was only 15% of the total number of community members. A second type is composed of students participating in the community whose contributions are not very relevant to their community peers. This profile made up 27% of the total community. But the problem in this community was that the participation and relevance of the build-ons from a high percentage of students was insufficient for generating a compact community.
We hypothesize that these results can be explained primarily from three interrelational aspects:
(1) Students were not familiar with the learning platform: Knowledge Forum. In this sense, we consider that prior training could be interesting in order to controlling the effect of "lack of familiarity".
(2) The Knowledge Forum platform was used exclusively during four month. Therefore we think that the time of application of the platform was short. In this sense, we believe that the individual differences (previous experience and motivation by new technologies, motivation for working in community, other academic responsibilities ...) influence these results.
(3) Another important reason would be that there are differences among students regarding their patterns of co-building of knowledge. Thus, some students have a tendency to elaborate contributions from other previous contributions by copying or reproducing them, while other students strive to transform knowledge. This hypothesis would explain the impact the builders had.
In sum, these results are logical for the reasons provided. Therefore, we consider it important for future studies to address these weaknesses.

References

Chuy, M., Zhang, J., Resendes, M., Scardamalia, M., & Bereiter, C. (2011). Does Contributing to a Knowledge Building Dialogue lead to Individual Advancement of Knowledge? In H. Spada, G. Stahl, N. Miyake, & N. Law (Eds.), *Connecting Computer-Supported Collaborative Learning to Policy and Practice:*
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Philip, D.N. (2010). Social Network Analysis to examine interactions patterns in Knowledge Building Communities. *Canadian Journal of Learning and Technology, 36*, 1-20.

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