

Bullying in Virtual Learning Communities

Stefanos Nikiforos, Spyros Tzanavaris, and Katia Lida Kermanidis

Abstract Bullying through the internet has been investigated and analyzed mainly in the field of social media. In this paper, it is attempted to analyze bullying in the Virtual Learning Communities using Natural Language Processing (NLP) techniques, mainly in the context of sociocultural learning theories. Therefore four case studies took place. We aim to apply NLP techniques to speech analysis on communication data of online communities. Emphasis is given on qualitative data, taking into account the subjectivity of the collaborative activity. Finally, this is the first time such type of analysis is attempted on Greek data.

Keywords Bullying • Virtual Learning Communities • Natural Language Processing • Sociocultural Learning Theories

1 Introduction

Bullying has become a major problem in recent days concerning different groups of people: educators, parents, government, scientists. The digital form of bullying, cyber bullying, has been widely expanded mainly through the internet. Despite the research results so far, there are a lot of questions to be answered [1, 2]. In this work it is attempted to use NLP techniques for speech analysis within Virtual Learning Communities (VLCs) in order to investigate new aspects of the problem [3–5], mainly in the context of sociocultural learning theories [6–8].

2 Related Work

Research in the field of NLP related to cyber bullying has given results so far in locating bullying [9, 10], or harassment episodes [11], or identifying roles of the participants in them [12, 13]. There are also works aiming at the distinction between

S. Nikiforos (✉) • S. Tzanavaris • K.L. Kermanidis
Department of Informatics, Ionian University, Corfu, Greece
e-mail: c13niki@ionio.gr

bullying and teasing [13], others attempting to locate language standards or analyze emotions of the participants [14], while others propose live control systems on social networks using virtual agents regulations combined with user evaluation and behavior modification [15].

The major drawback of the existing works is the behavioral treatment type of the issue. This method is surface and gives provisional results, without creating learning (internal process and permanent behavior modification). Moreover, they mainly use quantitative data, disregarding the subjectivity and the need of adaptation of analytical models by language/country [2, 16].

In that context sociocultural learning theories can be a promising framework, since they are taking into account such social aspects [6, 17, 18]. In the hereby study it is attempted a setup of four case studies, where basic principles of sociocultural theories are examined at the level of VLC: teacher's role to behavior modification, **learning at** collective level, problem solving activity motivates struggle and, inner speech inside virtual community.

From a psychological point of view, the study of the aspects above consist a critical point to behavior (bullying) motivation [19, 20]. Recognition of motives is a secondary phenomenon arising only at the level of members' personality and continuously being produced during the course of its development. It is possible to explain this underlying motive only objectively, from 'outside'. To recognize the real motives of its activity, the VLC must also proceed along an 'opposite go back way' speech analysis, with the difference, however, that along this way he will be oriented by signals-experiences, emotional 'marks' of living in it [19]. Setting or re-setting ideal motives in a virtual community via inner speech using authentic activities worth a lot for a teacher, since he can helps this way community and its every member.

A lot of methods have being proposed for a collaborative activity into a physical learning community in order to get transformed and existing as a virtual one. Problem-based learning, project based learning, learning by design are some of them. In the present study is used 'Problem Project Based Learning with Formative Interventions in Authentic Activities' model for implement collaborative solving activity in a VLC, where Problem Projects are not restrict designed rather formative intervened [21]. During the collaborative activity, the VLC removes to a new balance point every time a formative intervention happens. This way, the results of the educational research are of more value since they are outcomes under real circumstances—an associated 'creative chaos' [22]—rather than pre-structured and strictly controlled instructional processes.

The above approach can be considered as blended one which combines self-paced learning, synchronous or asynchronous web collaborative learning, and face-to-face classroom learning, enhancing at the same time inner speech development inside VLC.

In the present research is suggested that the socio-cultural framework of the VLCs should be taken into account for analysis of speech and emotions. We propose

speech and artifacts analysis on VLCs aiming to answer the following research questions: *Does cyber bullying exist on VLCs? What is the development of cyber bullying during the transformation process of a community? Which are the motives of the participants in bullying episodes? How can we tackle the problem targeting to the transformation of the motives and the permanent behavior modification?*

In the following section are described the case studies contributed to these questions.

3 Case Studies

In order to analyze bullying in the Virtual Learning Communities using Natural Language Processing (NLP) techniques, mainly in the context of sociocultural learning theories, the following setup of four case studies took place.

3.1 Case Study 1: Community and Individuals: The Influence of the Community to Behavior Modification

In this case study (CS) a Virtual Learning Community was created in order to implement an educational cultural project. Participants were mixed: an already existing physical learning community of 21 persons (being partners for over 6 years) and another team of 9 persons that had shown aggressive behavior in the past.

Implementation of the project took place in four main stages: During the first stage, participants communicated in a free style manner chat through wikispaces¹ platform. Second stage started after the formulation of the problem-based project. Participants discussed about the project and made their suggestions. In the third stage, participants began to act for the ‘solution’ of the problem-based project [23, 24]. In the final stage, participants uploaded and notified the final deliverables/artifacts.

The main target of the discussion and artifact analysis in this VC is to imprint the community incorporation progress.

The dataset of this CS consists of 655 words of chat between the participants.

The main research questions are: *Is the process of joining the community reflected to the speech of the participants? Is the speech of the individual participants influenced by the (inner) speech of the community? Is there any shift in the speech per stage?*

¹www.wikispaces.com.

3.2 Case Study 2: Combining Two Communities: The (Active) Role of the Instructor to Behavior Modification

In CS2 a VC was created in order to implement an educational cultural project. Participants in this VC were mixed: an already existing physical learning community of 21 persons and another existing physical learning community of 22 persons. In both communities participants were partners for over 5 years. The project took place in the same stages as in the above mentioned CS1. Instructors of each community had different roles: one had an active instructive role and the other had no participation in the virtual environment (he only participated in the physical class). The main target of the discussion and artifact analysis in this VC is to imprint the transformation of the two already existing communities into a new one.

The dataset of this CS consists of 5.913 words of chat between the participants.

The main research question is: *Does the active role of the instructor affect the behavior of the participants?*

3.3 Case Study 3: Non Collaborative Activities: Collaborative Problem Solving Activity Motivates Struggle

In CS3, a physical learning community - participants were partners for over 6 years—was transformed into a VLC through the wikispaces platform. Twenty persons participated, without having any problem-based activity. The online environment was used in a free style manner (mainly as a chat forum). Instructors had neither active, nor instructive role.

The dataset of this CS consists of 325 words of chat between the participants.

Comparing CS3 with CS4 where collaborative problem solving activity was on, research questions of interest are: *Does the non collaborative problem solving activity affect (i) the speech and (ii) behavior of the participants?*

3.4 Case Study 4: Problem-Based Activities

In CS4, 21 participants in a physical learning community (the same as in CS1 and CS3) were transformed into a VLC via wikispaces platform, implementing an educational cultural project. Projects were either assigned by the instructor or selected by the participants according to their interests.

This CS was implemented in two consecutive teaching periods.

The main target of the discussion and the artifact analysis in this CS is to identify possible differences in the speech and behavior of the participants among the teaching periods.

The dataset of this CS consists of 7.106 words of chat between the participants in the first teaching period and of 3.973 words in the second one.

The main research questions are: *Are there any differences in the speech of the participants between the two consecutive teaching periods? Is aggressive behavior (bullying) observed in the same level in the second teaching period compared to the first one?*

Next step for the hereby research will be data analysis, attempting to answer the questions above. Nevertheless posing such questions could be of general interest, e.g. for teachers and school researchers as bullying arises to schoolish reality.

4 Conclusion

The main contribution of the present research is the study of bullying in VLCs (Virtual Learning Communities) using NLP techniques, mainly in the context of sociocultural learning theories. We aim to apply NLP techniques to speech analysis on communication data of online communities. Despite the fact that the present research is at the preprocessing data stage, this is probably the first time such analysis is attempted in VLCs, and so over on Greek data, since similar researches could not be located. Identifying motives of the participants during a bullying episode in the base of inner speech is also innovative. Emphasis during analysis is given on qualitative data, taking into account the subjectivity of the project framework.

Recognition of motives using Natural Language Processing consist a critical point to behavior (bullying) treatment. Setting or re-setting ideal motives in a VLC via inner speech using authentic activities worth a lot for a teacher, since he can helps this way community and its every member.

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