EDUCATIONAL WEB COMMUNITIES IN GREECE: A CRITICAL SURVEY AND MEASUREMENT OF SENSE OF COMMUNITY INDEX

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Abstract
Software used by online communities (virtual, web, Internet-mediated) share some functional and operational characteristics which distinguish them from other types of web applications and may vary from their basic attributes to specific tools, services, and various artifacts produced by the members of these web communities. Moreover, participation in online communities enhances the exchange of ideas and information, creation of peer relations, and development of collaborative networks, thus providing potentialities for informal learning and professional development for teachers and educators in a wider context. This work attempts to provide a functional specification of an educational web community and to substantiate the current status of educational web communities in Greece in terms of specific indicators such as the Sense of Community Index within the participants of these communities.

Introduction
According to Rheingold (1993), who first coined the term “virtual community,” evolution of Information and Communication Technology (ICT) and the formation of “cyberspace” comprise a significant baseline in human history. Human-computer interaction is now a bond connected with important human needs on several levels: personal (ideas, perceptions and personalities); social (social networking); organizational (e-business, e-learning); and political (e-democracy, e-citizenship, e-participation). The advent of more collaborative ICTs, such as Web 2.0 technologies, has created a new paradigm of media knowledge: classic one-way production of information is substituted on the Web by a dynamic process of information co-production, organization, discovery, and sharing (Kron & Sofos, 2007). With this new model, learning and teaching may emerge as a social activity based on collaborative creativity and Internet-mediated knowledge sharing.

Moreover, the 21st century teacher has to overcome new challenges and demands of the profession within a new educational context which is co-formatted by various social, political, economic and technological factors (Hargreaves, 2000; Whitehouse, McClosky, & Ketelhut, 2010). In this new context, online communities may serve as a means for professional inspiration and development, skills acquisition, and life-long learning for teachers and educators (Cornu, 2004; Lloyd & Duncan-Howell, 2010; Schlager, Fusco, & Schank, 2002; Whitehouse et al., 2010).
Based on these assertions, the first part of this work refers to the functional specification of an educational web community. The second part aims to gather information about educational websites in Greece and evaluate, through a critical review, their potential as web educational communities. Results show evidence of emergent web communities of various types, based on knowledge and practice sharing, mutual information and development of collaboration. The third part focuses on the measurement of specific indicators, such as the Sense of Community Index (SCI), within the participants of these communities.

**Terms and Definitions**

The term “community” traditionally refers to a group of people who live and act in the same geographical area sharing common aims and values and is determined by four distinctive characteristics: people, common ties, social interactions, time/space (Hillery, 1955; Poplin, 1979; Stuckey, 2007).

Rheingold (1993) first defines the term “virtual community” as “…social aggregations in the network, where people continue (despite various difficulties) to join public conversations, with an adequate level of humanity, thus forming a web of interpersonal relationships within the Cyberspace,” while Fernback and Thompson (1995) acknowledge the formation of electronic communities on the Internet but with the terms “electronic” and “community” being mutually distinctive and state that “… not all electronic aggregations are communities. Without the personal effort and commitment which characterizes the notion of community, chat rooms and online forums, are just communication means between people with common concerns” (p. 1). Preece (2000) considers the term “Internet community” as terminologically weak because any form of communication between two or more individuals on the Internet may be considered as a community formation; thus, she approaches Internet communities as groups of people “interacting in a virtual environment and having common goals, specific rules, and behavioral norms.”

Within the general context of learning, a “community of learning” is a community in which members are tied together by a common interest to inquire and learn together, share knowledge, and solve problems collaboratively by this process (Reinmann-Rothmeier, Mandl, & Prenzel, 2000) and a “group of people who share a common goal, work together, gain benefits from each other, respect different opinions, promote opportunities for active learning and develop a collaborative environment for empowerment of membership and new knowledge formation” (Kilpatrick, Barrett, & Jones, 2003).

Lipman (2003) refers to the “community of inquiry” as a social and educational environment which leads to the development of problem-solving skills between the members of the community and Hakkarainen, Palonen, Paavola, and Lehtinen (2004) refer to the “innovative knowledge community” whose major characteristic is the formation of new knowledge between the members of the community.
Within the general context of professional learning, Wenger, McDermott, and Snyder (2002) present “community of practice” (CoP) as groups of people who share a concern, a set of problems, or a passion about a topic and who deepen their knowledge and expertise in this area by interacting on an ongoing basis and Hildreth, Kimble, and Wright (2000) approach CoP as a group of professionals tied together in an informal manner via their engagement in a common class of problems and efforts to find solutions, thus comprising a potential inventory of shared knowledge and expertise.

Moreover, “knowledge community” is defined by Salis and Jones (2002) as “. . .a learning community which is formed around common goals and meaningful issues, pertains to common intentions on problem solving actions, comprises a repository of implicit knowledge which potentially can be transformed into an explicit one, produces new knowledge, and exploits the index of the emotional intelligence of community members” (p. 26).

Finally, under the context of general social formations, Wenger et al. (2002) refer to “task groups” where individuals collaborate on the basis of a certain project and “communities of interest” where individuals share common professional or personal interests. Also, there are references to more informal communities such as “communities of relations” based on emotional and social needs of their members, “trading communities” based on economical trades, and “virtual worlds communities” based on members’ entertainment needs.

Online communities of learning and practice cultivate formal, informal and non-formal types of education (Schwier, Morrison, & Ben, 2008). “Formal/informal” education refers to the existence of a specific and well-defined learning curriculum within an educational institution (K–12 school, college, university), or a third-party educational organization and “non-formal” education refers to activities that promote self-awareness, with no curriculum, no evaluation and where participation may be intentional or not.

Beyond these types of education which can be supported by online communities, evolution of Web 2.0 technologies promotes not only learning but collective creativity as well, because communities are realized in a “bottom-up” approach, enabling more effective knowledge sharing via peer relations among community members. In this context, personal and professional inspiration of teachers and educators may be supported at both theoretical and practical levels, encouraging them towards a more self-organized teacher professional development (TPD) (Darling-Hammond, 1994).

These definitions provide a basic framework for analysis of this study’s findings in the three basic dimensions of community, education and technological infrastructure which can be used to form a more general concept of an “Internet-mediated educational community” with the following distinctive characteristics and attributes (see Figure 1):

- people, common ties, interactions in time and space
- common interests and practices
- common learning and educational goals in formal or informal settings
• professional development
• knowledge management and sharing
• ICTs & Web 2.0 services

Figure 1: Internet-mediated educational communities

Research

Identity and limitations
The main purposes of this work were to:

• gather information about educational websites in the Greek domain (.gr),
• evaluate their potentialities as internet-mediated educational communities,
• survey the level and various aspects of teacher participation within these communities (Kostas, Bratsalis, & Sofos, 2011), and
• measure the indicator Sense of Community Index (SCI) between members of these communities.

This work was part of a research project for the Postgraduate Studies Program, Primary Education Department at the University of the Aegean and it took place during academic years 2009–2010.

Research was conducted in a specific time frame and cannot take into account the evolution and the dynamics of the Web over time.

This work presents results on critical survey and SCI indicator level.
Methodology

Work was based on a report published from the EU concerning the level of usage of Web 2.0 technologies in educational settings, describing best practices and initiatives from various European countries (Redecker, 2009).

More specifically, we examined the evaluation checklist of this report and adapted it on our own needs and research questions. This adapted checklist had three distinctive parts:

- general information such as page identity, demographic data,
- social tools, emphasizing user collaboration with Web 2.0 technologies, and
- artifacts, tangible or intangible, that mediate human activities. (Vygotsky, 1978)

Using this list, an extensive web search was conducted. The most important Greek search engines and thematic portals were examined in order to find educational web sites. After filtering the results with various criteria (e.g., the content’s update frequency, the validity and reliability of operator, commercial or not), a set of 37 web sites were chosen (see Appendix A for a list of the sites). The web sites were evaluated against the checklist and the results were processed.

Moreover, a questionnaire survey was conducted among members of the communities in order to gather data about demographics, teachers’ expectations, level and modes of participation and usage (presented in Kostas et al., 2011) and to generate responses from the Sense of Community Index 2. The questionnaire included 19 “closed” and 1 “open” question and the 24-item scale for the SCI-2. From the initial set of the 37 web sites, 24 were chosen to participate in the survey and 176 members of 19 web sites fully answered the questionnaire (Kostas et al., 2011).

Sense of Community Index Indicator

McMillan and Chavis (1986) defined “sense of community” as “a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together.” They proposed sense of community as a 4-dimensional construct:

- integration and fulfillment of member’s needs;
- membership: boundaries, emotional safety, sense of belonging, personal investment and a common system of symbols;
- influence: member to group, group to member, member to member; and
- shared emotional connection: shared history and participation within the community.

Based on this construct, they developed a 12-item scale as a quantitative measure of sense of community, called the Sense of Community Index (SCI). Several studies have demonstrated that the SCI has been a strong predictor of participation with good validity. Despite the overall reliability adequacy, the 4 sub-scales had inconsistent
reliability. For this reason, the research team redesigned the scale into a 24-item scale (SCI-2) (Chavis, Lee, & Acosta, 2008).

**Results**

A first finding from the general information checklist results was that 28 (75.7%) of the web sites had an individual (or a group of individuals) as operator, while only 9 (34.3%) had an operator from the public sector (school, university, ministry of education, etc.). Also, another interesting finding was the age of the web sites, i.e. how long the web sites had been “alive” (Table 1).

<table>
<thead>
<tr>
<th>Years “alive”</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1</td>
<td>9</td>
<td>24.33</td>
</tr>
<tr>
<td>From 1 to 5</td>
<td>11</td>
<td>29.73</td>
</tr>
<tr>
<td>More than 5</td>
<td>13</td>
<td>35.13</td>
</tr>
<tr>
<td>No data</td>
<td>4</td>
<td>10.81</td>
</tr>
<tr>
<td>Total</td>
<td>37</td>
<td>100.00</td>
</tr>
</tbody>
</table>

According to the technological infrastructure, 33 (89.1%) of the web sites were developed using an Open Source Content Management System (CMS), while only 4 (10.1%) of the web sites were created using static HTML technology. Moreover, as Figure 2 shows, the majority of the web sites refer to K–12 education.

**Figure 2: Educational sectors of web sites**

As a next step, we searched for evidence about the formation of communities within the examined web sites. Preliminary results showed that 23 (62.16%) of the web sites (see Appendix A, links marked with “*”) could be characterized under the general concept of “Internet-mediated Educational Communities.”
Moreover, evidence of four basic types of communities was found (Table 2), while 25 (67.56%) of the web sites support learning/training and co-operation activities and 23(62.16%) of the web sites support professional development activities, in general.

<table>
<thead>
<tr>
<th>Type</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community of Practice</td>
<td>4</td>
<td>17.39</td>
</tr>
<tr>
<td>Community of Interest</td>
<td>12</td>
<td>52.17</td>
</tr>
<tr>
<td>Community of Learning</td>
<td>6</td>
<td>26.10</td>
</tr>
<tr>
<td>Task Group</td>
<td>1</td>
<td>4.34</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>23</td>
<td>100.00</td>
</tr>
</tbody>
</table>

According to the usage of interaction and collaboration tools within the members of the web sites (Figure 3), analysis found usage of traditional electronic communication tools such as forums in 22 (59.46%) web sites, while 28 (75.68%) of the web sites provide profiling services for the users, which is a basic characteristic of web communities. Moreover, 24 (64.86%) of the web sites offer learning material sharing among the users, thus stating the increasing need for educational resources on the web for teachers and educators.

Finally, according to the type of the artifacts produced by the users of the web sites, research showed a variety of actions and activities (Figure 4), with the most important being exchange of ideas and discussions (62.16%) and file sharing (54.05%).
In this work, we present results from the SCI-2 scale (Chavis et al., 2008), which, unlike the earlier version, was able to cover all the attributes of a sense of community described in the original theory. A Likert-like scale (4 items: not at all = 0, somewhat = 1, mostly = 2, completely = 3) was developed instead of the True-False. The scale was tested and the analysis of the SCI-2 showed that it is a very reliable measure (coefficient alpha = .94). Beyond the basic 24 questions, there was an initial question: “How important is it to you to feel a sense of community with other community members?” which is a validating question aiding in the interpretation of results that many studies have found is correlated with the total sense of community (Figure 5).

The Total Sense of Community Index is defined as the sum of the four sub-scales (Table 3), which also proved to be reliable with coefficient alpha scores of .79 to .86.
• Total SCI = Q1 + … + Q24
  - Sub-scale 1 [Reinforcement of Needs] = Q1 + … + Q6
  - Sub-scale 2 [Membership] = Q7 + … + Q12
  - Sub-scale 3 [Influence] = Q13 + … + Q18
  - Sub-scale 4 [Shared Emotional Connection] = Q19 + … + Q24

Table 3: SCI: Sub-scales (SC*) and Total*

<table>
<thead>
<tr>
<th>Sites</th>
<th>SC1 Max=18</th>
<th>SC2 Max=18</th>
<th>SC3 Max=18</th>
<th>SC4 Max=18</th>
<th>Responses</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="http://www.e-paideia.net">www.e-paideia.net</a></td>
<td>9.59</td>
<td>5.27</td>
<td>7.41</td>
<td>7.95</td>
<td>22</td>
<td>30.23</td>
</tr>
<tr>
<td><a href="http://www.e-enosh.gr">www.e-enosh.gr</a></td>
<td>9.33</td>
<td>5.13</td>
<td>6.73</td>
<td>8.20</td>
<td>15</td>
<td>29.40</td>
</tr>
<tr>
<td><a href="http://www.eduportal.gr">www.eduportal.gr</a></td>
<td>8.36</td>
<td>5.36</td>
<td>7.00</td>
<td>7.55</td>
<td>11</td>
<td>28.27</td>
</tr>
<tr>
<td><a href="http://logogreekworld.ning.com">http://logogreekworld.ning.com</a></td>
<td>8.86</td>
<td>3.71</td>
<td>6.71</td>
<td>8.57</td>
<td>7</td>
<td>27.86</td>
</tr>
<tr>
<td><a href="http://science">http://science</a> teachersnet.ning.com</td>
<td>9.71</td>
<td>7.23</td>
<td>8.74</td>
<td>10.29</td>
<td>31</td>
<td>35.97</td>
</tr>
<tr>
<td><a href="http://physics8th.ning.com">http://physics8th.ning.com</a></td>
<td>8.00</td>
<td>5.33</td>
<td>6.83</td>
<td>7.33</td>
<td>6</td>
<td>27.50</td>
</tr>
<tr>
<td><a href="http://www.e-selides.gr">www.e-selides.gr</a></td>
<td>8.88</td>
<td>6.00</td>
<td>7.00</td>
<td>11.13</td>
<td>8</td>
<td>33.00</td>
</tr>
<tr>
<td><a href="http://www.pekp.gr">www.pekp.gr</a></td>
<td>8.78</td>
<td>5.67</td>
<td>8.22</td>
<td>10.44</td>
<td>9</td>
<td>33.11</td>
</tr>
<tr>
<td><a href="http://www.e-yliko.gr">www.e-yliko.gr</a></td>
<td>8.73</td>
<td>5.77</td>
<td>8.45</td>
<td>9.00</td>
<td>22</td>
<td>31.95</td>
</tr>
<tr>
<td><a href="http://ylikonet.ning.com">http://ylikonet.ning.com</a></td>
<td>9.08</td>
<td>5.77</td>
<td>8.15</td>
<td>9.46</td>
<td>13</td>
<td>32.46</td>
</tr>
<tr>
<td><a href="http://greeklamscommunity.ning.com">http://greeklamscommunity.ning.com</a></td>
<td>8.38</td>
<td>6.50</td>
<td>8.00</td>
<td>7.88</td>
<td>8</td>
<td>30.75</td>
</tr>
<tr>
<td>Other (fewer than 6 responses per site)</td>
<td>8.86</td>
<td>6.67</td>
<td>8.06</td>
<td>8.53</td>
<td>9</td>
<td>32.11</td>
</tr>
<tr>
<td>Total</td>
<td>9.15</td>
<td>5.79</td>
<td>7.81</td>
<td>8.86</td>
<td>176</td>
<td>31.61</td>
</tr>
</tbody>
</table>

* Values are expressed in mean values

Analyzing the results of the initial validating question (Figure 5) and the mean values of total and sub-scales SCI (Table 4), we observe non-conformity between them. Even if users state a relative high importance for them to feel a sense of community with other members, the Total SCI is beyond the base value (total value = 72, base value = 36). This means that even if on a personal level users feel that participation within web communities is important, this does not correspond to higher levels of participation, services usage, and collaboration between them. This is clearly stated by the answers of the users in questions concerning their expectations from the web communities, tools usage level and modes of participation, where analysis of the results (Kostas et al., 2011) revealed that participation level was low in terms of bi-directional communication in the following instances:
• **User to user**: users were mainly asking for help (pedagogical and didactical issues and less technical) instant of collaborating in order to exchange ideas and good practices.

• **User to content**: users were downloading content (*content consumers*) rather than uploading (*content producers*) and the level of content creation was even lower.

From the stated expectations and the low participation level it is clear that a member (a teacher or educator of the Greek educational sector) of an Internet-mediated educational community mainly seeks to enhance teaching material with educational resources from the web and possibly find some answers to various professional issues. This finding can justify the values of SC1: Reinforcement of Needs and SC2: Shared Emotional Connection which seems to be the dominant sub-scale of the SCI indicator. Reasons for this may be insufficient ICT skills (especially in higher ages), lack of motivation and support by the state, and the well-known problem of the teacher’s “class isolation” (Beijaard, Korthagen, & Verloop, 2007; Hargreaves, 2000), where a teacher seeks professional help outside the school community.

**Discussion**

Because the formation and sustainability of traditional face-to-face communities could not be facilitated by the organizational and functional structure of the Greek educational system, web communities provided more favorable conditions for their application in educational settings as they eliminate time and spatial limitations. Our research showed that in the formation of web communities the most dominant characteristics were having knowledge and practice sharing, information exchange and co-operation, which promote learning and self-development at personal and professional levels.

Moreover, a large amount of tacit knowledge exists in every school or educational unit, and circulates among the closed group of the inter-school community: information is exchanged, discussed and reviewed, enhanced with new facts and ideas in an informal context; knowledge is circulated; and new knowledge is produced by the application of new didactic practices and methods. The results of this informal procedure are mainly available only to the co-operating teachers and even if those teachers innovate in their professional field and create new frameworks of creative and productive learning, they experience most often a kind of professional isolation (Coutts, Drinkwater, & Simpson, 2001).

A solution to this problem can be the formation of sustainable Internet-mediated educational communities, and especially Communities of Practice, as a means to exploit the practical and every-day professional knowledge of teachers and educators, in order to promote their professional development through informal forms and continuous learning and training.
Via their membership in communities, teachers and educators potentially may:

- easily discover already existing knowledge and practices,
- enhance their didactic practices more than their isolated colleagues (Becker & Riel, 2000),
- integrate innovative methods in student’s activities in a more productive manner,
- accept the right stimulus from the community so that their didactic practice can evolve naturally via collaboration activities within the community,
- transform an educational experience into a qualified application by describing the authentic content of this experience to the members of the community,
- develop apprenticeship relations between newcomers and experienced teachers and educators, and
- create a shared repository of collective knowledge and experience, which can be used as a means for life-long learning and training on existing and tested teaching innovations in real school settings.

Despite the obvious advantages and benefits of web communities, their holistic and successful acceptance faces many difficulties from theoretical aspects to practical design issues, facilitation schemes, members’ communication models, personal motivators, and legal and ethical issues (Kostas & Sofos, 2010). This is clearly illustrated from the low level of the Sense of Community Index as it was measured within members of 13 Internet-mediated educational communities in Greece.

Finally, this work may serve as a stimulus for further research on Internet-mediated educational communities in order to investigate their potential integration within an educational system.

References


Appendix A

1. www.e-paideia.net*
2. www.scool.gr
3. www.epyna.gr*
4. www.netschoolbook.gr
5. www.diktoyo.kedke.gr*
6. www.e-enosh.gr*
7. www.eduportal.gr*
8. www.etwinning.net/el*
10. www.e-diktyo.eu*
11. www.sch.gr*
14. www.mathima.gr
15. www.ratemyteachers.gr
16. www.sxolio.eu
17. www.alfavita.gr
18. www.edra.gr*
19. www.pedia.gr
20. www.thranio.gr
22. http://physics8th.ning.com*
23. www.e-sehides.gr*
24. www.el-sxolio.gr
25. www.e-daskalos.gr
26. www.pekp.gr*
27. www.edugate.gr
28. www.daskalos.edu.gr
29. www.creteportal.sch.gr
30. http://eclass.sch.gr*
31. www.tetradio.gr*
32. www.e-yliko.gr*
33. http://schoolnet.proto vouila.gr*
34. www.kpe.gr*
35. http://wikignosi.proto vouila.org*
36. http://www.youschoo l.gr/*
37. http://schoolbits.blogspot.com/*
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