Analysis of Social Worker and Educator's Areas of Intervention Through Multimedia Concept Maps And Online Discussion Forums In Higher Education

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Abstract: This diachronic study describes an innovative university experience consisting of the development of multimedia concept maps (MCM) in relation to social educators and social workers main intervention areas and an active discussion in online forums about the results obtained. These MCMs were prepared by students who attended the Information Technologies and Communication course as part of the Degree in Social Education and dual Degree in Social Education and Work during the academic years 2010-13 at Pablo Olavide University (Seville-Spain). Following a methodological framework based on virtual, collaborative action-research, a qualitative analysis is implemented to analyze 213 MCMs created by students and their interventions in ad hoc online discussion forums with a twofold methodological approach: firstly a qualitative analysis of word frequencies in MCM through the use of Atlas-Ti software and secondly a forum discussion categorization through a reticular, category based social network analysis using UCINET and yED Graph Editor. Among the most relevant conclusions, we can highlight that a combination of MCMs and discussion forums are highly interactive and collaborative digital resources and are especially beneficial when applied to social studies. Students were able to identify and categorize key areas of social and educational intervention, including: seniors, children, teens and drug dependence, people with disabilities, adults, mental health, socio-community care, and immigrants.

Keywords: social educator, social worker, multimedia concept maps, forums, online discussion, Higher Education

1. Introduction

Access to quality education is a fundamental right which has to face a paradigmatic change at the beginning of the XXI century. Recent Information and Communication Technologies' (ICTs) development needs new updated methodological practices and content according to the new information society (UNESCO, 2013). Thus, these practices contextualized in Higher Education are really important because all professionals with a university degree, regardless of the subject area, will have to demonstrate adequate competencies to implement plans and strategies using ICT tools in the socio-technological environment in which we live (Vázquez-Cano, López-Meneses and Fernández Márquez 2013). In the European Higher Education Area a methodological and assessment change is mandatory in order to enhance overall students' training by developing their technological, intellectual and social skills (Aguaded, López-Meneses and Jaen 2013). In this sense, the design and implementation of multimedia digital objects as well as online discussion forums can and should play an important role in methodological innovation and meta-cognitive strategies and processes, especially when applied to the understanding and conceptualization of social studies. Besides, when the design and development of these multimedia concept maps (MCMs) is embedded in active online learning communities, the collaborative learning is enhanced (LaPointe and Reisetter 2008). Because assessment is the fundamental driver of student learning (Boud and Falchikov 2007), the design of online assessment activities that drive desired learning outcomes is essential.

2. Multimedia concept maps and online discussion forums to foster educational innovation

A concept map is a technique used to develop the ability of creative thinking and increase competition in order to construct knowledge in an organized and inclusive way (Muñoz, 2010). In this sense, Novak and Cañas (2008) show the three main elements of a conceptual map: concept, proposition and line linking. Concept is

Reference this paper as Vázquez-Cano E, López Meneses E, and Sarasola Sánchez-Serrano J L "Analysis of Social Worker and Educator's Areas of Intervention Through Multimedia Concept Maps And Online Discussion Forums In Higher Education" *The Electronic Journal of e-Learning Volume 13 Issue 5 2015*, (pp333-346) available online at www.ejel.org

defined as a perceived regularity in events or objects, or records of events or objects, designated by a label. The label for most concepts is a word, although sometimes we use symbols such as + or %, and sometimes more than one word is used. Propositions are statements about some object or event in the universe, either naturally occurring or constructed. Propositions contain two or more concepts that are connected using linking words or phrases to form a meaningful statement. Sometimes these are called semantic units, or units of meaning. Figure 1 shows an example of a concept map that describes the structure of concept maps and illustrates the characteristics above (Novak and Cañas 2008).

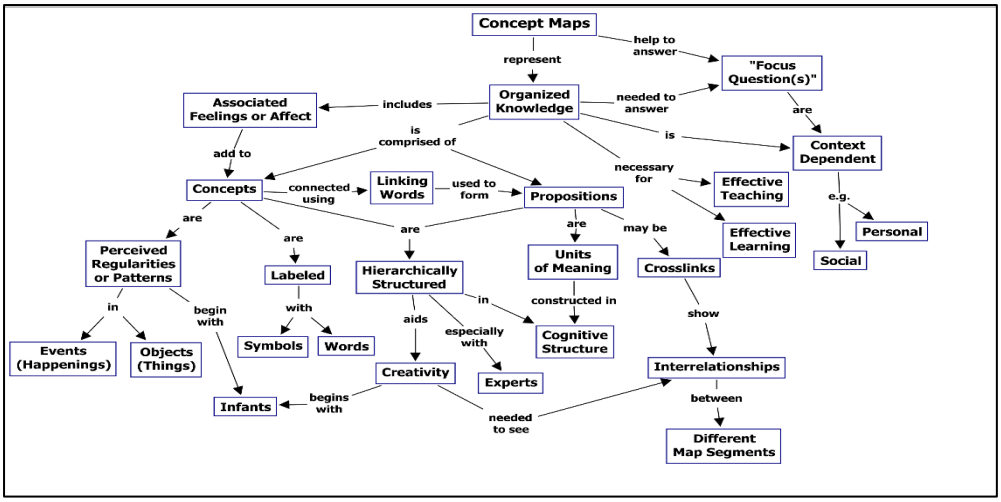

Figure 1: Conceptual map's structure (Novak y Cañas, 2008)

Source: http://cmap.ihmc.us/Publications/ResearchPapers/TheoryCmaps/Fig1CmapAboutCmaps-large.png

Regarding the educational field, besides enhancing student-centered pedagogy (Kinchin 2000), for Estrada and Febles (2000) concept maps are also useful at various stages of the learning process: in the planning phase, as a resource for organizing and viewing the work plan, showing the relations between contents, and schematically summarizing the program of a course. In the development phase, as a tool to help students to interpret the meaning of learning materials and in the assessment phase, as a resource for training and monitoring that makes it possible to view students' thinking, and if necessary, correct any errors concerning the main concepts.

Thus, research on the instructional effectiveness of concept maps' has already some history in the educational field (Horton et al. 1993). In this sense, different research studies show how concept maps can help to improve students' performance in various knowledge areas (Flateby 2010; Facione 2011), as well as to enhance critical thinking for problem solving, decision making and organization of thoughts (Karabacak 2012). In addition, concept maps reinforce the development of different cognitive operations such as perception, textual memory, reasoning and the ability to synthesize (Tzeng 2009) and demonstrate their effectiveness as tools to improve the assessment of their studies (Ruiz-Primo and Shavelson 1996; Keppensa and Hayb 2008, Cabero, López Meneses and Ballesteros 2009; Lucian, Schalk and Schruijer 2010).

Along with the design and implementation of MCMs, the use of an online discussion forum can encourage deeper analysis, critical thinking and reflection than a student is likely to achieve working alone or in a face to face situation with other students. Herron and Wright (2006) suggest that online discussions can be used to enable socially-mediated reflection. This interpersonal dialogue might be socially orientated or subject-matter orientated, or a mixture of both. (Gorsky and Caspi 2005). The social construction element emphasises the additional value to be gained through collaborative learning, and the programme team want to facilitate and encourage the opportunities for joint learning and construction of knowledge. Students benefit from participating in discussions initiated by other students, they can seek clarification from other students, and build a sense of a scholarly community (Brown 1997; Laurillard 2002). One of the main benefits of asynchronous online discussion for students is having more time to carefully consider their own and other

student's responses, and to be able to "rewind" a conversation, to pick out threads and make very direct links between different messages (Salmon 2002, 35). Studies have suggested that online community discussion has been well received by students and can result in discussions that are "engaging, vibrant and active" (Revill and Terrell 2005, 240). In particular asynchronous discussion forums are nowadays widely used in formal and informal educational contexts, applying principles of constructivism, emphasizing social interaction during learning activities (Gunawardena et al 1997; Corich et al 2004). These approaches can enhance students' critical thinking through problem solving and collaboration. It focuses more on the process of learning than just attaining information, involving discovering how to analyze, synthesize, judge and create-apply new knowledge to real-world situations (Walker, 2005). As pointed out by Dillenbourg (1999) it is necessary for the learner to externalize his/her thoughts and ideas in order to achieve proper reflection, thus promoting writing messages in discussion forums as an ideal reflective process. Literature points out that intensive discussion and social interaction may lead to multiple knowledge construction phases (Hewitt, 2003; Schellens and Valcke, 2005; Bratitsis and Dimitracopoulou, 2008).

The literature suggests three factors that should be considered in planning an online discussion, the organization of the forum, the motivation of students to participate and the ability of students to participate effectively. Vonderwell and Zachariah (2005) found that the structure of the discussion forum is essential for successful learning and assessment. Brooks and Jeong (2005) suggest that online discussions should be organized into discussion topics and that within each topic there should be pre-established threads within which arguments are clustered. It is suggested that pre-structuring threads in this way may be an effective method of facilitating in-depth critical discussion. Where discussions are not threaded, discussion may become repetitive, thereby discouraging student participation (Wu and Hiltz 2004). The third consideration in planning online discussions is the ability of students to actively participate in the discussion at the required level. Salmon (2002) argues that a scaffolding approach needs to be taken to the facilitation of online activities so that students move through five stages of learning. The five stages are: access and motivation, online socialization, information exchange, knowledge construction and development. The crucial role of online activities at this stage is to promote and enhance reflection and maximize the value of online learning for the students (Salmon 2002). Reflection can be encouraged by posing reflective questions for students to address (Hulkari and Mahlamaki-Kultanen 2007; López Meneses and Vázquez- Cano 2013). This is referred to by Salmon (2002, 31) as the "spark" for the online activities. The questions should, where possible, refer to the subject content such as readings relevant to the question posed.

These two digital methodological strategies —design and implementation of MCMs and online discussion forums— can contribute significantly to the development of generic and specific strategies in the European Higher Education Area such as: self-regulated learning, communicative, instrumental and interpersonal competencies. These benefits are in agreement with Jonathan Grudin and Steven Poltrock (2012) who suggest that employing collaborative work as a strategy in Higher Education contributes to the enhancement of learning, allowing the sharing of different opinions and points of view, increasing the value of one's own perspective and facilitating the exchange with course mates, since it activates and directs learning towards a successful approach to communicative situations among peers.

3. Description of the activities and cohort

This research project was developed in two phases. The first one was based on the development of MCMs in relation to social educators and social worker's main intervention areas. These MCMs were prepared by students who attended the Information Technologies and Communication course as part of the Degree in Social Education and dual Degree in Social Education and Work during the academic years 2010-13 at Pablo Olavide University (Seville-Spain). The innovative experience consisted of encouraging introspective reflection by the students through concept maps used to identify and discuss the main social worker and social educator's intervention areas with an interactive digital application called Mindomo (http://www.mindomo.com). This software enables social concept maps to be dynamically and easily designed. The university experiment was developed in groups (2-4 students) in class, working collaboratively from digital mobiles devices and personal computers to establish the main social worker and social educator's intervention areas. For each intervention area, it was also requested to incorporate an image and a video in order to represent its meaning and socio-educational relevance. Once each MCM was finished, students inserted it over their own personal subject-blog and it was also sent to the general subject-blog http://mapasconceptualesestudiantes.blogspot.com.es/ (Figure 2). Students wrote a brief commentary

(maximum 500 words) describing the main aspects of their MCM and included the following information: university degree, course, name and the link to their blogs. For fostering participation and collaborative work, it was possible to make comments about content and format in the MCM developed by each group of students in the online discussion forum.

Figure 2: Subject-blog. Source: http://mapasconceptualesestudiantes.blogspot.com.es/

In addition, to help students in the development of their own blogs, there were different electronic tutorials and word clouds to clarify concept map objectives and procedures developed by senior students from the previous academic years. Figure 3 is one example of these blogs made by students.

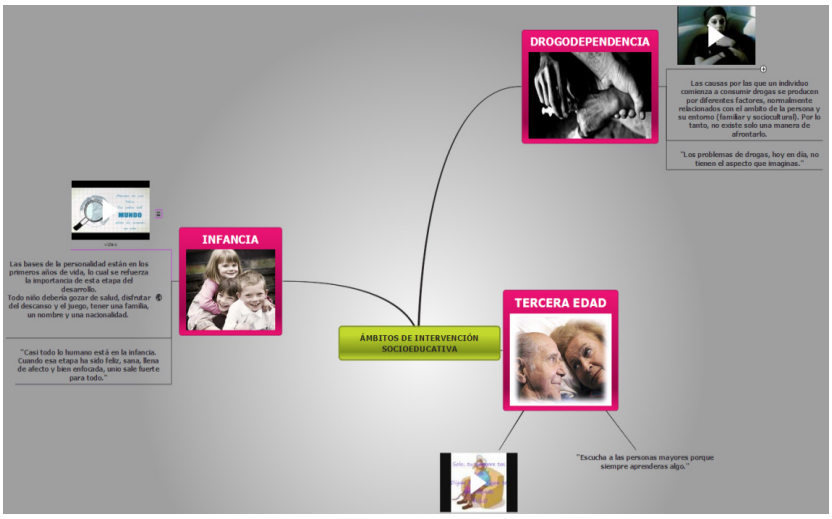

Figure3: Multimedia concept map implemented by a university student. 2012/13. Source: *http://www.mindomo.com/mindmap/02818007b81f440aba391cbe9c62fed3*

Once the MCMs were finished and shared in the subject-blog, the second phase was developed. Students were asked to reflect on the categories and content showed in their MCMs. This phase was all done using an online discussion forum for active discussion. For the implementation of this phase, we used the free software "phpBB" (https://www.phpbb.com/). phpBB offers a completely modularized user control panel to give students full control over their account on the board. The main topics put forward in the forum were: analysis of Social Educator and Social Worker's main areas of intervention. The forum was moderated by two professors and each student had to participate at least five times during the development of the subject. The topic proposed matched the two research dimensions stated in the first two objectives of the study.

The cohort that took part in this research project was comprised of students who attended the Information Technologies and Communication course as part of the Degree in Social Education and dual Degree in Social Education and Work during the academic years 2010-13 at Pablo Olavide University (Seville-Spain).

Table 1: Cohort

Variables	*Items*	*F*	*%*
Gender	Male	*93*	*47.44*
	Female	*103*	*52.55*
Age	22-25	*112*	*57.14*
	25-30	*45*	*22.95*
	30-35	*26*	*13.26*
	35-40	*10*	*5.10*
	+40	*3*	*1.53*

4. Objectives

The main objectives of the research can be formulated as follows:

- To analyze Social Educator and Social Worker's main areas of intervention according to students' perceptions in the Information Technology and Communication Technologies (ICT) course during the academic years 2010-13.
- To study the diachronic evolution of Social Educator and Social Worker's main areas of intervention during the academic years 2010-13.
- To assess the effectiveness of didactic approaches with the use of MCMs and online discussion forums in social studies.

5. Method

The method was qualitative and descriptive for the analysis of MCMs and was based on social network analysis (SNA) for the analysis of participation in online discussion forums. For the analysis of first phase, 213 contributions in form of MCMs created by students were processed, analyzing words or clusters of meanings as registration units. Subsequently, the conceptual frame was transcribed and categorized taking as reference the guidelines established by different authors (Miles and Huberman 1994). This descriptive and qualitative part of the study was organized in two stages. Stage one was developed according to "data reduction" principles. It consisted of developing rational procedures as categorization and coding data, identifying and differentiating units of meaning. The procedures were: "data categorization" which involves simplifying and selecting information to make it more manageable. A process that involves "unit separation" to report segments following spatial, temporal, thematic and grammatical criteria. "Unit identification and classifying" was established to classify conceptually the units covered by a single topic with meaning. This procedure can be inductive while examining the data, or deductive, having previously established the categorization system, after reviewing literature on the specific field of study. Subsequently, we developed "synthesis and grouping processes". These processes complemented the last ones and enable the most representative categories to be re-categorized into meta-categories. To finish this first phase, the coding process was performed. It is a manipulative operation where each category is assigned to each textual unit. In this sense, each selected unit has been coded for frequency count through the computer-assisted qualitative data analysis software Atlas-Ti 7. From the start, there was clear criteria for distinguishing registration units, since most of the students chose three core concepts in each category. The second stage consisted in making the "Interpretation and inferences". The Atlas-Ti software facilitates the creation of data files to organize structured databases that can be analyzed using various qualitative techniques, such as clustering and categorization. For the development of this first phase, two coders were instructed to independently unitize the text messages.

Furthermore, the messages in online discussion forums were analyzed from the perspective of social network analysis (SNA); this methodology provides a relational approach following the reticular morphology of social connections. It enables an understanding of the form and structure of the relationships established as a whole, something which is essential in order to reach an understanding of the underlying mechanisms in the students' statements in educational forums, facilitating hidden interaction patterns (Barabási 2002; Knoke and Yang 2008). SNA is based on the premise that the structures formed by the relationships among different elements provide a more thorough explanation of the whole, the social environment and also each of the elements than when their different traits are taken unitarily (Castells and Monge 2011; Caverlee, Liu and Webb 2010). Therefore, the procedure of using Atlas-Ti and a reticular SNA generates more complete results in order to understand relationships and opinions in virtual learning environments. With that aim this SNA methodology has been applied to identify text units that may justify the reasons declared by students when reflecting on main intervention areas. To this end the software UCINET 6 and the viewer yED Graph Editor 3.11.1 were used, with the aim of editing the graph and making it easier to understand. The matrix scheme used to generate the graph has been the following:

$$\Pr(\mathbf{Y} = \mathbf{y}) = \left(\frac{1}{\kappa}\right) \exp\left\{\sum_{A} \eta_A g_A(\mathbf{y})\right\}$$

Where ηA is the corresponding configuration A parameter (whose outcome cannot be zero if all pairs of variables in A are assumed to be "conditionally dependent"). Also, gA(y) = yijIIAyij is the statistical network configuration corresponding to A; gA (y) = 1 if it coincides with the observation "and" on the network, and if the network does not appear in the result is 0. κ is an amount that ensures standardization (1) is a proper probability distribution. All models of exponential random graphs take the form Eq. (1) which implies a general probability distribution of graphics in "n" nodes considering that there are different assumptions dependence with the consequence of choosing different types of configurations as relevant to the model. Considering this equation, the only configurations that are relevant for the model are those in which all possible links are mutually configuration contingent with each other.

6. Results

The first qualitative phase was analyzed with the participation of two coders who were instructed to independently unitize the MCMs' text messages. After a first round of unitizing, inter-coder reliability-measures were calculated. We calculated Guetzkow's U, which measures the reliability of the number of units identified by two independent coders, as follows (Holsti 1969):

$$U = (O1 - O2) / (O1 + O2).$$

O1 represents the number of units identified by coder 1, and O2 the number of units identified by coder 2. After the first unitizing run, Guetzkow's U equaled .0077, showing almost 100% conformance in the number of units identified by the coders. To check textual consistency of the identified units (Weingart et al. 1990), inter-coder unitizing reliability was additionally calculated (compared electronically units of coder 1 and coder 2 using the Excel-program). In our case, textual consistency was as high as 85.31% in the first round, which is considered an excellent result (Simons 1993). Using these main categories and the respective subcategories (total: 17 categories), the two coders independently assigned a single code to each unit. After this first main coding round, we calculated Cohen's kappa to check inter-coder reliability. The basic version of Cohen's kappa suggested by Brennan and Prediger (1981) that we used is calculated as follows:

$$\kappa = (\Sigma P_{ii} - \Sigma P_i \times P_i) / (1 - \Sigma P_i \times P_i).$$

ΣP_{ii} is the observed proportion of agreement, and $\Sigma P_i \times P_i$ reflects the chance proportion of agreement (Holsti 1969). To determine the conceptual incisiveness of the categories and to identify potential issues for improvement in the coding scheme, we had to systematically compare the preliminary coding results of the two coders. For this purpose, we developed the inter-coder consistency matrix and applied it to both the main category and subcategory level. For demonstrative purposes, Table 2 displays study results for the main categories.

Table 2: Results for Inter-coder Consistency-Matrix

Cod.1/	CT	SN	AL	DH	DD	MH	CS	SA	SE	FL	DV	HL	MN	PR	PT	SW	IM
CT	**328**	34	22	23	18	8	9	10	23	21	12	10	7	4	16	18	21
SN	23	**349**	21	12	13	14	10	5	7	8	9	10	11	12	11	10	9
AL	17	21	**198**	10	11	10	12	10	10	9	8	7	6	5	3	4	2
DH	15	18	10	**260**	9	8	7	9	10	11	12	10	8	9	11	12	13
DD	8	17	11	6	**328**	8	10	11	12	13	6	7	8	9	5	11	12
MH	4	15	12	5	12	**162**	9	10	10	12	8	9	6	7	8	9	10
CS	12	10	10	10	13	4	**57**	8	8	9	3	4	5	6	7	12	16
SA	15	5	9	11	10	7	9	**125**	10	8	23	4	3	10	11	12	13
SE	5	12	8	7	9	8	7	2	**42**	10	11	6	7	10	9	10	12
FL	19	12	11	8	8	9	8	12	2	**10**	10	11	12	11	8	11	12
DV	21	11	12	9	7	10	9	13	3	9	**78**	6	10	12	4	5	9
HL	3	16	12	10	8	12	10	5	10	5	23	**21**	3	13	3	12	13
MN	7	3	10	11	12	34	11	7	5	7	23	9	**16**	6	2	14	12
PR	9	5	9	12	11	12	12	8	7	8	12	5	3	**42**	2	15	10
PT	11	6	8	10	21	12	15	15	8	10	3	6	6	12	**16**	16	9
SW	10	7	7	9	23	6	16	14	3	11	5	12	8	10	3	**26**	8
IM	8	8	6	8	1	8	9	12	2	12	6	12	9	9	5	9	**109**
Total	515	549	376	421	514	332	220	276	172	174	252	150	130	187	124	198	290
Ag.	**81%**	**86%**	**85%**	**87%**	**88%**	**89%**	**87%**	**86%**	**85%**	**81%**	**83%**	**87%**	**88%**	**81%**	**89%**	**83%**	**89%**

Childhood-teens at risk (CT), Seniors (SN), Adults-long life learning (AL), Disability/handicap (DH), Drug dependence (DD), Mental health (MH), Community care-social services (CS), Socio-cultural animation (SA), Special education (SE), Family (FL), Domestic violence (DV), Homeless (HL), Minorities (MN), Prison (PR), Prostitution (PT), Social welfare (SW), Immigrants (IM). Ag. Agreement.

We found a relatively middle-high coding correspondence of κ = .85.58 Kappa values above .80 are generally considered a very good result (Brett et al. 1998). This value is relatively high compared to results reported in other studies and can be considered as highly satisfactory (Lombard, Snyder-Duch and Bracken 2002). The results obtained after data encoding and information interpretation show that university students have established an average of 4.16 concepts associated with the main areas of social educator and worker's interventions areas. According to students' conceptions, we found a terminological combination, in which some population sectors obtain beneficial actions associated with the social educators and workers interventions, such as children, youth, elderly, homeless, immigrants, with the main intervention areas (socio-cultural, drug addiction, domestic violence, prostitution, prison, social-community attention, etc.). Leaving aside this conceptual fusion, percentages are shown in Table 3.

Table 3: Main intervention areas in social educator and social worker jobs

Areas of intervention	***% Cases***	***Nb Words***
Childhood - teens at risk	**63%**	328
Seniors	**67%**	349
Adults - long life learning	**38%**	198
Disability/handicap	**50%**	260
Drug dependence	**63%**	328
Mental health	**31%**	162
Community care / social services	**11%**	57
Socio-cultural animation	**24%**	125
Special education	**8%**	42
Family	**2%**	10
Domestic violence	**15%**	78

Homeless	**4%**	21
Minorities	**3%**	16
Prison	**8%**	42
Prostitution	**3%**	16
Social welfare	**5%**	26
Immigrants	**21%**	109
Total	***100%***	***2167***

By analyzing the percentages, we can highlight the following areas: Seniors (67%), childhood-adolescence along with drug dependence (63%), disability (50%), adults (38%), mental health (31%), socio-community attention (24%) and immigrants (21%). Other areas that students have identified as the highest priority for intervention in Social Education and Social Work are: domestic violence (15%), socio-community care (11%), special education and prison (8%), social welfare (5%), homeless people (4%), prostitution and other minorities in general (3%) and family (2%).

One interesting result is to compare diachronically the students' perceptions about main intervention areas along the three academic years. This evolution gives us useful information about how students perceive the intervention areas along their university studies and the influence of the development of the different university subjects. These diachronic results can be observed in Figure 4.

During 2010/11, attention to the children and adolescents at risk was the most relevant period considered by students (81%). During the academic year 2011/12 it did not have much importance (44%), in the year 2012/13 this was recorded again as more important (63%).

- The same graph in V shows the areas of elderly care (73% in 2010/11, 54% in 2011/12 and 83% in 2012 /13) , adults (46 % in 2010/11 , 23% in 2011/12 and 52% in 2012 /13), mental health (35% in 2010/11, 22% in 2011/12 and 41% in 2012 /13).

- However, in the areas of disability (46 % in 2010/11, 43% in 2011/12 and 72% in 2012/13) and drug dependence (61% in 2010/11, 61% in 2011/12 and 72 % in 2012/13), we found that these areas remain stable during the first years and increase during the last years.

On the other hand, we highlight the references to areas that increase along the academic years, such as community care and social services (18% in 2010/11, 22% in 2011/12 and 43% in 2012/13), gender violence that happens to be marked by 9% of students in 2010/11 to 21% and 17% in subsequent courses. As with the issue of immigration, increasing from 9% to 35% and 20%, homeless (0% in 2010/11, 3% in 2011/12 and 13% in 2012/13). On the opposite side, specialized education decreases on students' consideration throughout the academic years, from 10% in 2010/11, 7% in 2011/12 and 4% in 2012/13.

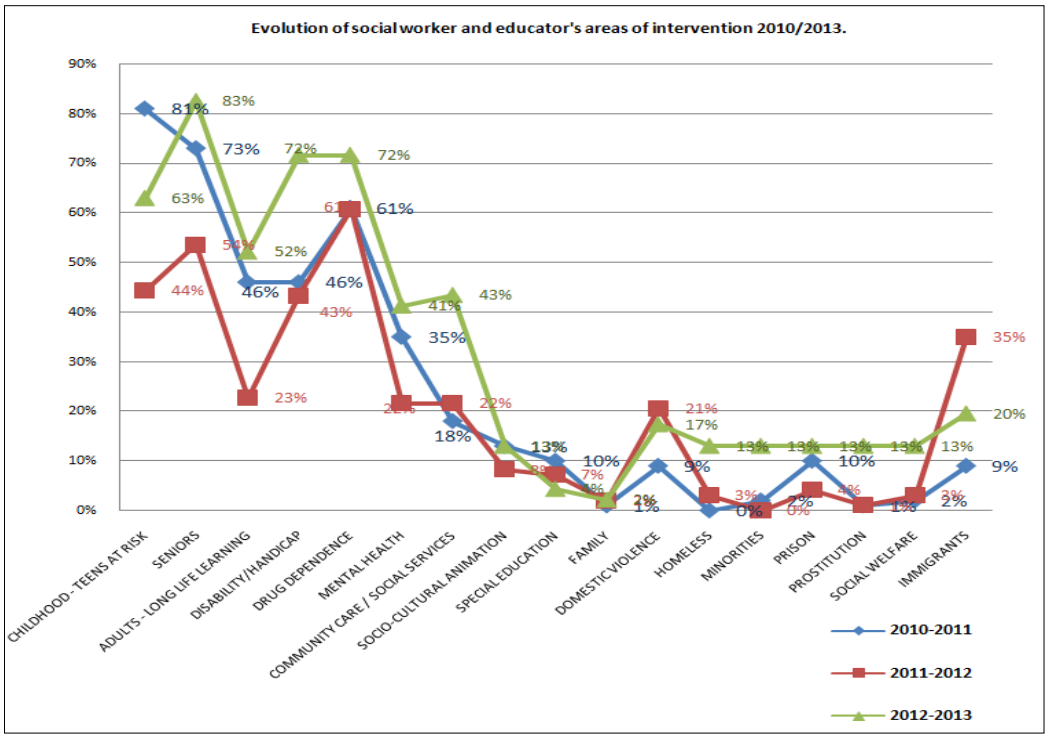

Figure 4: Intervention areas evolution along three academic years

This qualitative and descriptive study was complemented with the analysis of the perceptions, commentaries and opinions of the students in the two topics of the forums. Some of these areas have been delimited by students in online discussion forums, as follows:

Children, adolescents: *Childhood's educational intervention has, as a main objective, to support young people with family, educational and emotional basic needs through a social action with the child and his/her family to prevent non-adaptive behaviors. In the area of childhood, adolescence and youth we can highlight youth hostels, youth houses, educational farms, playgrounds, play centers, youth information points, environmental education centers, open centers, shelters for children and teenagers, and adoption services, among others* [P56-123].

Seniors: *The intervention with the elderly is important to design interventions adapted to the different needs of this population and consider the contexts and environmental factors that make people age. Thus, it is necessary to recognize other factors besides health as determinants of aging. In this area, we can name: day centers, residential centers, sheltered accommodation, home help services and leisure areas* [P25-23].

Adults: *Social educator has to be involved in the normalization of everyday life* [P91-87].

Disability: *Social educator proceeds to develop intervention programs to avoid their marginalization in the society in which they live* [P67-12].

Drug dependence: *Drug addiction is related with three main social educator's intervention areas: primary prevention to avoid consumption, secondary prevention when the subject has already had contact with drug and tertiary prevention (Harm Reduction) for dependency cases. In this last scenario the agent would try to prevent the situation from worsening and seek to reduce the risks associated with consumption (spread of infectious diseases such as HIV or hepatitis, overdose risk, etc.)* [P89-101].

Mental health: *In the current psychiatric care, the involvement of interdisciplinary teams composed of different professionals is a priority. Psychologists, social workers, and more recently, the incorporation of social workers to these teams* [P159-45].

Gender violence: *The social educator shall make them see that they should not be afraid or ashamed to express how they feel and say what they are going through* [P123-78].

Immigration: *Thousands of people are risking their lives or become indebted to mafias to find a better place in which to live and work to raise their families, many of them are rejected or excluded by the society of the country they migrated to. In this area many other problems come into play, sometimes closely related to prostitution or human trafficking* [P89-45].

Homelessness: *Different situations like evictions, illness, loneliness, etc. force many people to live on the streets. Society rejects and ignores these people, sometimes thinking they chose that situation or have deserved for several reasons. As more and more people are in this situation, educators and social workers have to help them to get out of that difficult situation in which they are* [P12-47].

In order to develop a more systematic approximation to students' participation we analyzed from the perspective of social networking analysis (SNA), the network of interactions obtained in the topics of the online discussion forum with the most significant connections. Therefore, we edited the final UCINET and Netdraw network using the yED Graph Editor 3.11.1 (Figure 5) in order to make it more visual and comprehensible.

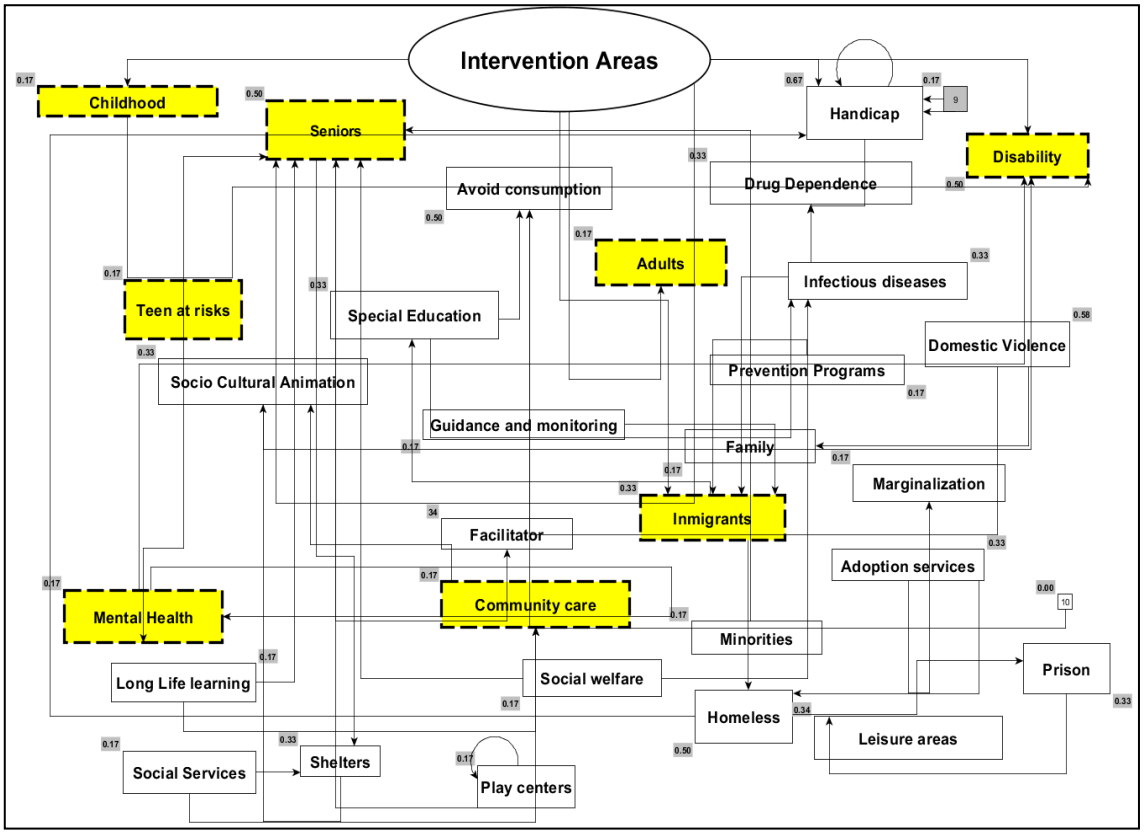

Figure 5: Intervention areas network

We can observe in yellow color the central threads of the forums. The average density of the two threads of the forum with the dichotomized matrix was .55 with .24 of standard deviation; which represents a high value for a sample of 196 students and an average rang of the network of 3.521; which indicates that the key word is interrelated with the average of about 3. This a high value for a total of 28 nodes. According to Figure 5, among the active participants who scored above average (Ave = 3.52) in the number of posts they contributed, all contributed a variety of entries that served different functions in the discussion thread. At the same time, these active participants also received diverse types of feedback from other members within the community. Almost everyone in the discussion acknowledged, directly replied to and commonly interpreted other members' posts in writing. Additionally, the majority of participants received acknowledgement, replies and interpretations of their posts from other members. There was also a good balance among types of participation each member engaged with and the types of feedback each member received.

Moreover, this result shows that more than two thirds of the possible connections were present and that a high level of participation was obtained. We have analyzed the centrality of the network to identify the most prominent aspects. To this end, we have referred to the analysis of the nodal value of intermediation and proximity (Table 4).

Table 4: Nodal value of intermediation and proximity in the online discussion forums

Intervention areas	Nodal Grade		Betweenness Grade		Closeness Grade	
	Degr.	Nrm Degr.	Betw.	nBetw.	Far.	Clos.
Childhood - teens at risk	20.0	54.550	64.5	33.0	76.0	40.10
Seniors	21.0	56.275	66.0	30.5	77.2	42.90
Adults - long life learning	15.0	46.250	57.5	23.5	54.0	32.50
Disability/handicap	18.0	49.750	61.0	25.3	59.5	39.50
Drug dependence	20.0	53.225	63.0	32.0	75.0	41.00
Mental health	14.0	43.750	52.0	27.5	52.0	31.00
Community care / social services	11.5	35.750	32.5	19.0	51.0	29.81
Socio-cultural animation	9.0	27.750	39.5	21.2	41.0	24.43
Special education	7.0	25.500	35.0	19.4	34.0	18.45
Family	1.0	2.500	10.0	8.3	14.0	29.61
Domestic violence	13.0	38.500	52.0	28.0	55.0	31.37
Homeless	2.0	3.500	11.0	9.2	22.0	26.12
Minorities	2.5	4.500	11.5	12.0	26.0	27.10
Prison	7.0	25.500	39.0	20.2	32.0	19.13
Prostitution	3.0	4.500	12.0	12.0	25.0	25.31
Social welfare	2.5	4.500	11.5	8.0	21.0	24.33
Immigrants	10.5	28.500	38.0	20.5	35.5	23.33

Our discussion thread topology illustrated three types of dynamics, the short thread pattern that consists of one post and one reply only; the extended thread pattern that consists of several consecutive posts corresponding with the previous post and the branched thread pattern where multiple replies were made to a single post. This last pattern has the highest nodal degree (Table 4). The centrality shows the position of the concepts featured in the network and reveals a rather high result of 63% with a total number of 25 nodes. The maximum value (maximum number of connections of a node in the network) is 12 (Childhood) forming nodes 18 to 20 (disability/handicap, drug dependence and seniors), the nucleus of the graph, according to the concept of "k-cores". The results show that the aspects with the highest normalized degree (Nrmdegree: percentage of connections that have a node above the total of the network). The results of the intermediation 51,202 provides us relevant information regarding the frequency with which a node appears in the shortest circuit (or geodesic) which connects to the other two, in other words, showing when a topic can be an intermediary amongst others. We have reported in the facilitator group those nodes which have a higher degree of intermediation (≥20) and that reoccur in the three analyzed dimensions. The results of the degree of

proximity indicate that these bigger nodes are concentrated in those aspects which serve to interrelate the main intervention areas marked in yellow color (Table 4).

7. Discussion

Combining the suggested qualitative procedure of content analysis with the subsequent categorization of network of interactions in online discussion forums through social networking analysis (SNA), we were able to shed light on the various types of main intervention areas derived from a diachronic perspective during three academic years.

Among the main results drawn upon the diachronic study of academic courses emphasize, in the first instance, that the development of concept maps media developed by the student have been used to meet the first two objectives of our study, the diachronic evolution of the areas of intervention of the social educator and social worker, showing that there is an increase over academic years, such as community care and social services (18% in 2010/11, students 22% in 2011/12 and 43% in 2012/13), gender-based violence that happens to be marked by 9% of students in 2010/11 to 21% and 17% in subsequent courses. As with the issue of immigration, increasing from 9% to 35% and 20%, homeless (0% in 2010/11, 3% in 2011/12 and 13% in 2012/13). These results are in line with results in other studies (Kearney, et al. 2000; British Association of Social Workers 2002; Cunningham 2004). Thus, social workers and educators are not the only professionals likely to be working with individuals and families in different circumstances. Indeed, in the nature of the complexities, interactions and risks involved, many people will also be dealing with other professional groups from the health, education, housing, employment and justice services. The research suggest students' perceptions and priorities when developing these protection procedures from main intervention areas. These students' priorities reflect, in part, the eight Millennium Development Goals (European Parliament Council Commission 2006) based on the eradication of extreme poverty and hunger; achieve universal primary education; promote gender equality and empower women; reduce the mortality rate of children; improve maternal health; combat HIV/AIDS, malaria and other diseases; ensure environmental sustainability and develop a global partnership for development.

According to objective three, the work and study through MCMs and online discussion forum can significantly facilitate the tasks of a teacher, as we can see in other studies (Bratitsis and Dimitracopoulou 2008). Students' participation in online forum can support critical thinking through interactions, taking place within asynchronous discussions, in order to achieve high quality learning outcomes. With this activity, students have developed inner understanding of social educators and social workers' areas of intervention from an holistic point of view and a self-regulation approach.This approach has revealed the importance of intense interaction among discussions' participants, as a prerequisite for the development of *critical thinking* and *knowledge construction*, also reported in other studies (Bratitsis & Dimitracopoulou 2008).

It was discovered that the students' familiarity and interest in the topic affected the dynamics of participation (Gao, Zhang & Franklin, 2013). The majority of the discussion was composed of acknowledgement, interpretation, and reply. Results in online forums showed that the main topics developed with highest Nodal Degree were: Seniors (21), Childhood - teens at risk (20), Drug dependence (20), Disability/handicap (18), Adults - long life learning (15), Mental health (14), Domestic violence (13) and Community care / social services (11,5).

The results also showed that students usually question when they are posting disagreements towards their peers, and usually reiterate the other person's opinion before acknowledging each other. The results suggest that both active and passive participation have merits in terms of learning. Active participation allows participants to practice and showcase their critical thinking skills, while passive participation allows member to gain more insights from the entries contributed by the other members. According to Figure 5, most members of this discussion community completed information exchange at least once, but the entire class failed to form one complete strongly connected component. There were 5 individuals who were left as independent components, while the rest of the class formed a complete strongly connected component.

Furthermore, evidence of improvement in the students' behavior during dialogic activities has also been reported as we can see in SNA results. Students were tighter connected with their partners in the online discussions and the participation pattern of most of the experimental groups' students was much more widely spread within the discussion threads. Then, the teacher would have the opportunity to select the indicators

more suitable to the designed activity, further decreasing his/her work load, by transferring a portion of the regulative tasks to the users (Bratitsis and Dimitracopoulou 2008).

Acknowledgements

This research is part of a big research called: "Didactic training in Cloud Computing: Digital skills, teaching strategies and e-activities with Web 2.0 technology in the EHEA", under Action 2 of Innovation Projects and Faculty Development funded by the Department for Teaching and European Convergence of Pablo de Olavide University (Seville-Spain).

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