Edtech remarks for a roadmap on future teaching: Internet governance and paths to innovative pedagogical practices for learning and teaching

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Abstract

Standards and practices in education and technology on the web are still themes not very often discussed among brazilian educators and it hinders even more their participation in crucial debates on internet governance. The area of education and technology shelters educators and policy makers, grouped in a number of associations but none has yet contributed with remarks for a roadmap on future teaching, concerned with the evolution of the internet governance ecosystem. The focus of this writing is to identify elements which indicate an innovative use of technologies in education integrated with the curriculum, based on the practices reported and points out ways in which educators can be involved in internet governance issues. The methodology of selection of data and analysis of results used a software of qualitative research named CHIC and analysis of content of documental data. The results of this research have brought the mapping of tendencies for innovative practices in education.

Document

1 Introduction

The education and technology area in Brazil consists of teachers, researchers, educational institutions administrators and policy makers concerned about the evolution of teaching and learning in the age of the internet. A number of institutions addresses this topic, directly or relating it to other issues or periodical events such as congresses or meetings. However, there isn't an unified voice of those professionals regarding the roadmap for further evolution of the internet governance ecosystem. Let alone the acknowledgment and assurance of the Internet Governance principles. The purpose of this content is to re-examine Brazilian publications about education and technology and indicate some paths for innovative teaching and learning. This research originated in Catholic University of São Paulo Post-Graduate Program in Education: Curriculum, in the context of thesis within the field of Web Curriculum, a new concept about teaching with the internet and a biannual seminar which has already gathered over 800 publications on the subject.

The execution of the Seminars Web Curriculum in Catholic University of São Paulo Brazil (PUC-SP) was accompanied by many discussions about pedagogical practices with technologies integrated with the curriculum. The educators which have accompanied the issues related to technology have recognized the need for more availability of information. Texts and interviews such as in podcasts (audio conversations) done for the Blog Web Curriculum, and the proceedings with the scientific articles which were presented in the events, help bring back some of this universe.

The methodology for selection of data and analysis of the results used interviews and analysis of the content going beyond documentary data (blog and articles associated with I and II Web Curriculum). It is possible to see also a panoramic view of the incorporation of technologies in the pedagogical practices, with a view which examines more the Web 2.0. In order to make it possible to draw this research trajectory, it was done a process of identification of documented practices in articles, analyzed in national databases which had records of other events about the theme of the technology use in education, what resulted in the development of a matrix of categories, which ended up serving as a support to identifying the use of technology in education, in a perspective of innovation in the curriculum, integrating Web 2.0, systemized scientifical knowledge and the

experiencies which students bring from their life and context.

As a result of previous interviews with specialists and readings of scientific literature (SAVIANI, 1992; FREIRE, 1996; LITWIN, 1997; ALMEIDA, 2000; PRADO, 2003; ALMEIDA, VALENTE, 2007; ALMEIDA, SILVA, 2011), this investigation came to some concepts of Innovative Trends, Innovation and Innovative Practices in Education. In order to perform the analysis and interpretation of the data, the option taken was to use the software CHIC (Cohesive Implied Hierarchical Classification) with the goal to build categories which could verify the existence of innovative practices in the proceedings of I and II Seminars Web Curriculum and also in the blog Web Curriculum.

2 The software CHIC – Cohesive implied hierarchical classification

The software CHIC – Cohesive Implied Hierarchical Classification was developed by Régis Grass, professor at the Polytechnical School at Nantes University and brought to Brazil by professor Saddo Almouloud, from the Departament of Mathematics of the Center of Mathematical, Physical and Technological Sciences at Catholic University of São Paulo. This software, according to Moraes and Valente (2008), extracts from a set of data, rules of association between variables, crossing subjects and variables to provide an index of quality of association and represents an structure of the variables obttained by means of these rules offering as a result a directory-strucure shaped in the for a tree of similarities, a tree of cohesiveness and a graphical representation of implications.

In order to execute the analysis and interpretation of the data for this work, the option to use the software CHIC had in mind the goal of building categories which could evidentiate the existence of innovative practices in the proceedings of the I and II Seminars Web Curriculum and also in the Blog Web Curriculum. It is important to remind that there is no software that can act as the solution to every need of the data analysis but CHIC presented itself as a reasonably viable choice.

With the goal to obtain results coherent with the field studied, an option was made to divide the research in four phases: the first occurred between May and September of 2008, moment in which there was the planning and execution of the I Seminar Web Curriculum. The second phase started in July 2008 finishing at May 2010. The strategy used in this phase was the analysis of content which ended up being need for a deeper comprehension of the observations in the blog Web Curriculum. The third phase started in July 2010 and ended right after the II Seminar Web Curriculum, initiating then the fourth and last phase, when was done a content analysis of the blog soon after the execution of the second seminar, once that the blog Web Curriculum remained active.

Given the trajectory presented, the study of what was to be analyzed in this work was limited to four objects which are: the proceedings of the two versions of the seminars Web Curriculum and the two periods of posts on the blog after the I Web Curriculum and after the II Web Curriculum. The data obtained in the preliminary phase served as a theoretical support for the concepts of innovation, innovative practices etc.

The procedure of analysis with CHIC has developed through some main processes. The first was the mapping of the items to be analyzed in the specific case of this research, a spreadsheet was used to register all the texts with their keywords to be analyzed (articles from both seminars) and presented by their authors (such keywords referred to web 2.0 tools, softwares, applications and also concepts).

After this initial mapping in a spreadsheet, the archive in comma separated values was transported into the CHIC program and then there was the generation of trees of similarities, which show the convergences and divergences between the texts and the practices analyzed. To every greater group of branches in the tree of similiarities the name class was given and the smaller groups represented in the tree-shaped graphic, the name subclass was given.

The analysis of classes in the similarities tree generated by CHIC resulted in the indication of convergence between practices of integration of technologies in the curriculum, all within the scope of the concept Web Curriculum. The analysis evidentiates, also, the trends for innovative practices which could be found in all the material presented in the seminars Web Curriculum and also in the event blog.

The categories are of great value in the data analysis, once that, the information basis used is well varied, which makes it harder and maybe even near impossible to obtain results. It is important to remember also that the categories are objective and are related with each other. According to Prado (2003), the category summarizes a whole of ideas expressed in the texts analyzed and which where identified from the interpretative analysis of the records.

3 Procedures of analysis with CHIC

To perform the data analysis, at first there was the attribution of codes to all the elements of content identified as significative given the theoretical basis and goals of the current research. To every element of content an identification code was attributed and the list of elements formed the first column of the spreadsheet which generated the tree of similarities at CHIC.

The procedure was done in the same manner with the oral presentations, posters and case studies located in the proceedings of the I and II Seminars Web Curriculum. The article which were presented as oral presentation were given a code with the preffix “comum” (as inspired by the word communication) and to those that were presented as poster was given a code with the preffix “poster”. The final of the code was a simple numbering pattern inherited from the article analyzed, therefore the name of an article was replaced, for example, by “comum_011” in the spreadsheet for analysis. The heading of the spreadsheet which generated the tree of similarities of CHIC was filled with the keywords found in the content.

The spreadsheet was then built and divided in sections, including the content of the proceedings of 2008, according to the timeline of events presented.

<See attached picture 1-chic-analysis-procedure>

The keywords were chosen based on the use of web tools in the classroom, since the investigation of practices guided the discussion of the concepts which generated the trends for an innovative education. There was the execution of a process of finding synonims to avoid repetition of keywords. Terms such as "videoconferencia" and "flashmeeting", being the last the name of type of videoconferencing tool, were grouped in only one column named videoconference (abbreviation videoconf.) in such a way that there was a reduction of keywords and enable visibility of the similarities between determinate practices.

A process of filtering the keywords was also performed to remove words which weren't directly connected to practices of the use of the web in education.

The next step was executing the time division with the goal to try to create a timeline aiming to identify the practices of the use of the web in education through time, considering the two periods of the seminar.

The tree of similarities produced by CHIC is the result of convergences and divergences of the words encoded initially for the construction of the spreadsheet, complemented by the software through means of data processing and accompanying the execution of the analysis which were made by the researchers.

The similarity coefficient can be obtained through a specific screen of the software CHIC and it is the numerical representation of the relationship attributed between two or more variables, which in this case are the keywords. The stronger relationships can be visualized in the graphical form of the tree of similarities also through a red emphasis in the line of the graph. The general view of those analysis indicates the panorama of the practices of integrating technologies into the curriculum and the innovative trends found.

4 Analysis of the proceedings of the I Seminar Web Curriculum – CHIC

In the creation by CHIC of the tree of similarities of the 2008 proceedings of the I Seminar Web Curriculum, one could notice several knots and forkings. The closest a knot was to another, it resulted in closeness of a set of terms, indicating greater similarity. However, one could consider in the analysis also knots without the red line for emphasys of relevance, considering the meaning of the relationship for the context at hand, in accordance with the interpretation of the researchers.

<See picture 2-web-curriculum-2008-event-publications-page>

One of the strongest relationships in the tree of similarities was between the articles identified with the keywords “audio-podcast” and “concept-mapping”.

Another important relationship which appears in the tree of similarities in the proceedings of 2008 is the one which relates virtual learning environments such as Moodle with web ICT tools such as videoconference. This class was named as “new characteristics of virtual learning environments”. The keywords “vc-fm” and “moodle” relate each other with “chat” and “forum” showing practices in learning environments.

It is interesting to notice that the coexistence of tools as virtual learning environment (VLE) such as Moodle and other more technically complex such as the videoconference shows an important path of enhancing the possibilities of a VLE.

The third relationship very strong in the tree of similarities has brought other four technologies which were indicated in the works of the I Seminar Web Curriculum, “blog”, “wiki”, “video” and “photos”. This class can be named as “multimedia publishing online”.

The relationship is notably strong between the doubles of elements or subclasses “blog”, “wiki”, “video” and “photos”, indicating that the multimedia content (video and photos) is inserted in determinate moments of online publishing (blog and wiki), in the pedagogical practices with technology.

Another important relationship is evidently meaningful for the investigation in focus. The class relates “research” and “internet” with greater similarity, with the red line for emphasys, and relates the pair with “laptops”. The name of this class was “research with educational laptops”.

The class “research with educational laptops” brings together articles from researchers which have brought experiences of the use of the web in the classroom with educational laptops. The pedagogical work with portable computers was done with the use of strategies such as internet research and the creation of blogs aiming the production of knowledge and collaboration.

The general analysis of the works of the I Seminar Web Curriculum shows some interesting characteristics in regards to the researchers' practice for the integration of technologies in the curriculum in the year of 2008 such as: documentation of practices in audio; new characteristics of virtual learning environments; multimedia online publishing and research with educational laptops.

These characteristics of the use of technologies in education have been brought from the

works of 2008 and are the beginning of a full picture about the trends in innovation in integrating technologies in the curriculum. We will see, on the forthcoming analysis, the next parts of this picture which will complete the panorama of trends in innovation.

5 Analysis of the proceedings of the II Seminar Web Curriculum – CHIC

<See picture 3-web-curriculum-2010-biannual-event-page>

The tree of similarities of the proceedings of the II Seminar Web Curriculum brings some of the themes similar to those of the I Seminar Web Curriculum. There can also be perceived selected themes in terms of similarity such as in “youtube” and “social-media”.

The proximity between “youtube” and “social-media” brings an aspect very meaningful when analyzing the use of social media in education. The pedagogical practices with social media have intensified and the teachers researchers have related it to the publication of online content, in this case, video.

The class “interconnection between social media and online content” brings the relationship established in articles between the use of social media and the publication of multimedia content, specially video in Youtube. The investigation of social media is based on content produced and selected by students and teachers, as online videos, and the pedagogical work is built starting with this content.

Another class which also is evident in the analysis by CHIC in the proceedings of the II Seminar is the one that relates “GoogleDrive” and “moodle”. The class indicated was named “Virtual learning environment and Web 2.0 tools”. Moodle, a virtual learning environment which is one of the most used, is even more complemented by external tools characteristic of the Web 2.0, such as GoogleDrive.

Virtual learning environments are being considered with new possibilities by the researchers in reference to the association of Web 2.0 interfaces and the articles which contain these keywords confirm the concreteness of a trend which begun to happen in the I Seminar and in the II Seminar already indicate the occurrence of these changes. The type of learning virtual environment more present in the articles in the platform Moodle.

The tree of similarities resulting from the analysis of the scientifical production of the proceedings of the II Seminar Web Curriculum indicated a class which related concepts that point out to one of the contemporary concerns of the researchers. The terms “mobile-devices” and “hypermedia-hypertext” have brought articles which show the possibilities for education of mobile computational devices such as educational laptops and tablets, having in mind the use of the web through links or hypermedia.

The traditional analysis of more than one broad class converges with the findings described before. The additional class includes the subclasses “youtube” and “social-media” complemented in the tree of similarities by “twitter”, “blog” and “fotos”.

The class brings back interesting aspects of the analysis such as “interconnection between social media and online content” and “virtual learning environments and Web 2.0 tools”. These aspects are presented in the studies which show the need of the expanded classroom,the one in which learning happens beyond the physical space, and even so, of the learning environment designated by the institution, integrating the social media and other tools of the web.

The publications of the proceedings of the II Seminar Web Curriculum have shown even more paths for the integration of technology in the curriculum which complement those

shown in the edition of the seminar of two years before. The classes found in the analysis reflect some of the categories of the use of the web in education such as: interconnection between social media and online content; virtual learning environments and Web 2.0 tools; Mobile devices and the use of the web and the use of the web for media production.

6 Analysis of the blog Web Curriculum with the use of CHIC

<See PDF 4-blog-webcurriculum>

The first time period of the blog covers the text published since its origin in May 2008, passing through the time of the first seminar in June 2008, until before the second seminar, in June 2010.

The tree of similarities of the blog until the period before the II Seminar Web Curriculum showed most of the terms which also could be seen in the tree which brings the analysis of the proceedings of the I Seminar Web Curriculum. However, in this tree of similarities there is an order of alignments different than the connections between the branches and we have also pointed out some of these classes which bring terms with a greater relationship.

The terms in the tree of similarities of the blog differentiate by referring texts which also bring themes of the events online or lectures organized by the research group which happened in between both seminars. In the first class analyzed there are already terms related to these online events such as “site-portal”, “chat” and “twitter”. This class was

named “online publication in twitter and sites”.

The relationship “online publication in twitter and sites” brings similarities between terms which indicate a progressive change in the online publication of discussions about the integration of technologies in the curriculum, having as scenario the events online themselves involving the research group responsible for Web Curriculum.

The class “online publication in sites and twitter” shows, therefore, that the meetings between researchers can be complemented and made more dynamic with the materials and online comment exchange in spaces such as educational sites with links in the blog Web Currículo and in the Twitter which accompanies it. This type of publication intensified from 2008 to 2010 to the point of meaning a whole new group of headlining program which happened in the online events.

Another class which also related online events which investigated themes of the Seminars Web Curriculum, such as “social-media” and “augmented-reality”. This class was named “investigation of themes such as social media and augmented reality”. The class unites the terms "augmented-reality" and "social-media", since these were part of the online events with researchers which participated in the Seminar Web Curriculum.

Another class evidentiated in the tree of similarities which analyzed the posts of the first period of the blog Web Curriculum pointed out onlline events. The class which related the terms “second-life” and “streaming” was named “live participation on distance learning online events about education and technology”.

This class originated from the similarity of texts of the blog Web Curriculum which bring back debates occurred online with the participation of internet users from several parts of Brazil and of the world. Watching and participating in the video debates or in virtual worlds aren't activities restricted to the online events with researchers, but also they have been found in the everyday of teachers' practices which also do research. This can be inferred from the next class which is evident in the tree of similarities of CHIC, which relates the terms “media” and “laptops”. This class was named “activities with media in educational laptops”.

The relationship between "media" and "laptops" brings texts about the events of the Seminar Web Curriculum and also about productions of researchers of the group at PUC-SP. The studies of researchers are documented in the blog Web Curriculum, for the identification of new themes of investigation and research trends.

The analysis of the first period of texts in the blog Web Curriculum shows a face of the investigation about the integration of technology in the curriculum which still is only at the beginning in the scientific writings by the researchers, one which unites the experimentation and the scientifical observation. The everyday practices, in scientific events and in the classroom, have privileged the experimentation and enlarged the frontiers in the current use of technologies. The classes analyzed have shown aspects such as: online publication in sites and twitter, investigação of themes such as social media and augmented reality, participation in live distance learning events on online debates about education and technology, activities with the integration of media in educational laptops.

In general, the analysis of the first periodo of the blog Web Curriculum has brought aspects important in the integration of technology in the curriculum, since it has shown the collaboration that the web can bring into the debate. Being it through the video broadcast, social media or publication in blogs, the web may add and enhance the discussions of researchers and promote the construction of knowledge.

In the second period of the analysis of the blog Web Curriculum, begins with the II Seminar, one can notice even more the varied quantity of terms which bring pedagogical practices with the use of technologies, including characteristics of the Web 2.0.

The first class analyzed relates the terms “blog” with the double “video” and “mobile-devices” and also the term “twitter”. In this class can be found the relationship between several texts of the blog which bring the event videos. It is interesting to notice that the site that hosts and produces the videos acquires a new context when related to the practices such as mobile computation and the use of social media such as twitter. Therefore, we have called this class “mobile devices and multimedia production”.

The relationship between multimedia productions and the blog goes beyond merely hosting the content. When inviting to see the video through social media, it is implied the invite to follow or receive more news about the blog Web Curriculum through email, having access to more productions of the online profile of Web Curriculum.

A class which relates the terms “podcast” and “social-media” to the term “distance-learning” is evident in the blog analysis. It is about the texts which mention audio productions in the area of education and technology which are constant in the virtual learning environments of distance learning and are also disseminated through social media.

The texts related in this analysis bring podcast, proposal of learning through virtual environments and articles of researchers in reviews about the theme distance learning and teachers' professional training. Therefore, the online audio production is linked to practices of teaching and learning and contextualized in the investigation of the technologies integrated with the curriculum.

The analysis of an additional class helps to map and review the categories found. The class which unites “site”, “GoogleDrive” and “laptops” brings the extra pontuaction about the texts of the second period of analysis of the blog.

The classes indicated in this analysis brings elements related to online publication, the authorship of multimedia content and the practice of online education. They are: multimedia production and mobile devices and podcasts and learning.

The analysis of the second period of the blog Web Curriculum has brought important indications about the integration of technologies in the curriculum with the use of the web. The multimedia records and the learning environments have been some of the focuses of the actions of teachers researchers connected to the theme of investigation. As a trend for the education and technology, these actions of the use of the web must be intensified and collaborate for learning in several different spaces.

7 Final remarks

The analysis of the works and the online texts which accompany the I and II Seminar Web Curriculum PUC-SP, in the years of 2008 and 2011, had as a goal to identify characteristics of innovative practices in what refers to the integration of technologies in the curriculum. In the process of analysis of the publications of the Seminars Web Curriculum there was the construction of categories to help in the identification of trends for innovative practices. The study of the blog Web Curriculum has brought publications related to the themes referred between the works of the integrants of the research group in technologies in education, enabling to identify elements of the innovative use of technologies in education.

The qualitative methodology of data selection and analysis of the results done with the software CHIC was complemented by the analysis of content to the data, leading to examine several evidences, beyond the paths found in the categories indicated. The results of this investigation were the identification of characteristics of innovative practices in what is referred the integration of the technologies into the curriculum, a panorama of the publications of the I and II Seminars Web Curriculum and the indication of categories to help on the mapping of trends for innovative practices.

This is one of many experiences to integrate technologies in the curriculum and be conscious about internet governance principle in the space of schools and other educational institutions. Currently, Web Curriculum continues to produce biannual events, such as the 2012 and the 2014 (in preparation) and is the focus of publications by the researcher editor of the blog Renata Aquino Ribeiro, who participated on the Internet Forum of Brazil in Belém and events in CGI Brazil. The effort now is to continue the research in the area and the participation of the research group.

<See picture 5-web-curriculum-2012-event-page>

One of the future steps that this research has inspired, is the idea that the unfinished is also a part of the search for the best practice. There is never an end to the search to do more, want more in the everyday of the educator who seeks to integrate technologies in the curriculum. It is the movement of searching, unrestful and unsettling, which makes the analysis of the strategies for the use of education to perfect itself always.

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