Chapter 10

HBBTV HISTORY AND ITS EDUCATIONAL POSSIBILITIES: TEACHING OPTIONS IN TIMES OF THE INTERNET

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ABSTRACT
Hybrid Broadcast and Broadband TV (HbbTV) is a new device that combines common visual and audio media consumption like we know it with the possibilities of the Internet. As a consequence, HbbTV facilitates not only new forms of consumption, but provides us with new possibilities in education. Schools and other educational institutions like universities have started to explore the advantages of this new technology with regards to its ability to create more horizontal, creativity fostering dynamics. Within this chapter we demonstrate how HbbTV, as a convergence tool (Jenkins, 2008) provides useful results for students and professors when installed in the seminar room. We will exemplify our discussions with results from our mixed method research. Final results point out that the HbbTV transforms educational space into a multimedia environment with completely new possibilities and challenges for students and teachers. On the basis of our analysis and possible results we will give some recommendations for using HbbTV and multimedia technologies in teaching and co-learning.

Keywords: HbbTV, education, television, internet, university, professor.

1. INTRODUCTION

The possibilities to access all kinds of contents via the Internet, to communicate and interact with people and to produce own contents, contributed to the on-holding consumers' demand for always new tools, programs and devices. One of those desires might have been the inspiration for the development of a tool/device that combines the audiovisual experiences of a TV set with the flexible forms of knowledge acquisition, consumption and social interaction that the Internet provides us with.

Videotext/teletext might be understood best as a first pioneering step towards such a device. However, latest since the Internet has provided us with never ending possibilities to act, consume, interact and get information on always better computers, the dream of a connected TV set has started.

Another important key element that helps us to understand the path towards HbbTV is the rise of Social Networking Sites (SNS). SNS allow users to create and provide contents, to consume them, and to communicate about and via these contents with others diachronically and simultaneously in real time. SNS have also allowed consumers to directly provide feedback to consumed products, and therefore to shape and form the production and consumption of media outputs in a much more direct and instant way.

Consequently it has been argued that SNS and other social media have contributed to a profound shift in the relationship between users and producers. They have contributed to the emergence of a new social phenomenon: the "prosumer" (Toffler, 1980), a fusion between the figure of the consumer and the figure of the producer. These transformations along SNS and Social media have given media production and consumption practices a completely new more democratic aspect. Connected TV sets such as HbbTV want to answer to these new needs and demands (Bajon, 2012) for various forms of self-representation via the Internet and especially Social Media (Thumim, 2012) in a much more instant way, and on a big screen. It is this democratizing aspect and the potentials of visual representation that are important parts of using HbbTV in the classroom.

Once established part of people's behavior with media, new devices were increasingly demanded that would allow combining consumption, production and socially interrelating with others. It is here where the explorations towards connected TV sets find their origin. In fact, connecting with others via Social Networks (SNS) is now an important part of people's behaviour when using HbbTV (Hybrid Broadcast and Broadband TV), a key element in their interactive and multimedia performance (Bachmann y Harlow, 2012) via a connected TV set.

One of the issues that had been widely discussed, with regard to the new technological developments that unite TV consumption and Internet use, concerned the terminal, or consumption form that will predominate at people's homes - the TV set or the computer. Whilst at first it seemed as if the TV set would slowly disappear from people's households, especially the speed of Internet connections and the quality of newest TV screens have allowed connected TV sets to celebrate a surprising return. Furthermore, with the appearance of other convergence technologies like smartphones and tablets the answer to the question which device might predominate in people's homes might become much more eclectic. What we know for the moment is that people prefer to a have and to use a variety of different technological tools to consume TV programs, to serve the Internet and to shift between different media channels (Jenkins, 2008).

The HbbTV (Hybrid Broadcast Broadband TV) is one of the latest steps towards TV-Internet convergence on a TV set (Fondevila-Gascón, 2012a). A declared goal of developing HbbTV sets (Marcos Álvarez, 2012) was taking a step further in direction to a connected and converged household within the Broadband Society (Fondevila-Gascón, 2012b). Another important aim of HbbTV developers was the development of a device that would allow a very quick and easy switching between provided and self-produced contents on a big screen, a must for the future of European society (Reding, 2008).

Our goal was to find out whether and how such new and advanced technologies might not only transform profoundly the relationship between consumers and producers but how it can change dynamics in the classroom or seminar room (Morais, Miranda, & Alves, 2014) and whether these changes were suitable for what we could call the education of the future. Short, we wanted to figure out whether HbbTV technology could transform the seminar room in a more open educational environment with more horizontal structures.

2. BACKGROUND

2.1. The Internet and television in the classroom

The rise of HbbTVs in households and the on-going demand for such devices tells us not only something about the future of the TV but something about the new demands of society. What we demand from a TV or a media device is more control about contents and a rather creative potential (Navarro, Villarreal y Martínez, 2010). We want to feel sovereign

and free, able to use our capacities and to relate via these self-expressions with others. In this sense the rise of HbbTV sets tells us something about a technological but also and more importantly about a political and social reality. We believe that if we look into that social reality that makes out of HbbTV such a crucial device of our times, we can explain whether and if yes why HbbTVs might be a good option for education in class and seminar rooms.

The first reason why HbbTVs are so popular is related with with our changed consumption behaviour, with when and what and how we want to consume. We want to explore contents along own lines, we want to follow personal interest and thoughts and we want to be able to comment and argue about what we consume. HbbTV gives us the freedom to do so. Along this line it is easy to picture the educational possibilities of an HbbTV device in the classroom. New educational tendencies towards applied learning, that is intuition and experience based, and flexibly adapts to questions and problems in class, rather than disciplinary and fix can make out of HbbTV a valuable tool in the class room.

Second, people expect more horizontality, more democracy and forms of knowledge acquisition that involve them as unique individuals and that comfort and stimulate their creativity. HbbTV directly feeds into such tendencies as it allow exploration, communication, interaction, creation and critical intervention along own terms. A transformation from a top down to a more horizontal form of "content distribution", towards democratization and towards a stronger involvement and stimulation of creative capacities can be also seen in the educational sector in which new forms of horizontal/democratic knowledge distribution win increasing popularity Wenger E. (2000, 2005). Not only the turn towards alternative education models in but also different citizen science projects in Urban and City Labs point into this direction. What is true for new institutions or older institution with new educational models is obviously also true for the more traditional institutions and educational settings. Schools, universities, short all those institutions that have traditionally taken over an important role in the education of the citizens of our world have started to rethink education and knowledge distribution, and have consequently started to implement horizontality fostering and creativity based educational techniques in the class and/or seminar room. Again working with HbbTV sets in the classroom might allow teachers to create and keep dynamics more horizontal.

Third, the quick development and rise of new Information and Communication Technologies (ICTs) in all kinds of life spheres and the growing importance we give to all kinds of abilities in order to use them have led to the general consent that we need to implement ICTs in education not just within IT classes but in all kinds of subjects. Education in digital technologies cannot begin when people need to use ICTs for work, education in ICTs can also not be limited to one or two topics. Digital literacy can only be achieved when ICT education is started within the youngest school classes, and when the use is explained by applying ICTs on different subject matters.

We believe that the combination of all three, a demand for a more "natural", non-disciplinary form of education, a demand for new forms of horizontal, creativity focussed and experience based education, and the demand for ICT skills in all kinds of jobs demand for creation of new structures and dynamics in the classroom and a more flexible approach to using digital multimedia tool. With our research we wanted to figure out whether and in how far HbbTV was able to contribute to the creation of such structures, to create a multimedia educational space in which new forms of action and interaction become possible that go beyond the simple use of ICTs in the classroom.

3. OBJECTIVES, DESIGN, METHODS, RESULTS

3.1. Objectives, design and methods

The central objective of our research was to find out whether and why HbbTV technology installed in a seminar/class room can (contribute to) create not only a multimedia-learning environment but also facilitate that teachers and students meet and engage differently, that they create and experiment with each other and that they overcome some of the basic problems of the traditional class/seminar room – false hierarchies between experts (teachers) and students that hinder a fluid knowledge exchange from both sides and missing engagement with the matter of a course from both teacher and student sides. In fact, with our research we wanted to figure out whether and how the HbbTV device would be able to transform the educational space into a multimedia space with completely new features and challenges.

In order to come forward with some valuable empirical data we decided to carry out a case study (Yin 2014, Bassey 1999) within the Abat Oliba CEU University, in Barcelona (Spain). The case study as methodology allows the researcher to carry out explorative research with a small sample. The basic idea is that rather than doing an extensive research on many research objects, the researcher focuses on one research object that is studied intensively and exhaustively. Although using a small sample size results are transferable on other settings and research objects. Therefore, the case study approach is valuable for research projects in which the researcher has very limited access to empirical material, either because the researched phenomenon is relatively new or difficultly to access. This is also true for the field of educational research (Bassey 1999). In our case it was especially the novelty of the technology that made it difficult to work with a big sample size. Furthermore, we wanted to explore intensively the effects and use value of HbbTV in the classroom, which might have been impossible with a bigger sample size.

In fact, at least in Spain, Abat Oliba CEU University has been one of the first universities that experimented with HbbTV technology in its classrooms. Therefore, this university provides some unique insights into educational possibilities related with HbbTV technology in class/seminar rooms. Doubtlessly we are aware of the risks of such a small sample. E.g. our data might be partly biased by social class. Abat Oliba CEU University is a rather small private university that attracts a quite specific student profile.

In order to gather useful data we worked with three different methods. We carried out qualitative interviews with all second year students in 2013 and with five of their professors. We sent out an open evaluation questionnaire to all students of the university by the end of the two different semesters of the year 2013 in which we asked students to evaluate the use of technologies in the classroom and which allowed them to comment on problems, challenges and opportunities of these HbbTV uses in the class. Additionally, we did 10 seminar room observations in the seminars of professors using HbbTVs in their class. These field observations provided us with additional data about those things that did not enter into the qualitative interviews and the questionnaires but that helped us to understand contradictive answers, unclarities, and some of the emotional reactions that participants showed when being interviewed but that were not explained or verbally explicitized.

After having collected all the different data we brought them together and codified them. Rather than working with the questionnaires as quantitative data sets we translated them into meaningful information that explained/contrasted interviews and field observations. By interpreting data collected with three methods, and by relating them synergistically with each other we were able to gain some interesting results and to extract

some of the consequences that HbbTV has when installed in an educational space (Fondevila-Gascón, Sierra-Sánchez & Del Olmo-Arriaga, 2011).

3.2. Results

In order to present a structured analysis of the gathered results we will order the uses that teachers and students make of HbbTV into the three fields in which supposedly changes in education occur: a more experimental, creativity fostering, real world problem oriented approach, more democratic horizontal structures in the class room, and the need to be literate with ICTs in order to cope with new demands from the labor market (and society). On the basis of the comparison and of results from our field observation, interviews and questionnaires we will look whether and in how far HbbTV technology can contribute to the transformation of the seminar room into a space with new characteristics and potentials.

3.2.1. Experimentation/Applied Learning/Creativity. Teachers emphasized that HbbTV devices in class allowed them to approach problems differently and to discuss them in a more transversal way. The possibility to follow different thought streams, and to spontaneously explore a topic a little further than planned, gave their teaching and the interaction with the class a stronger liveliness and allowed them to stay close to emerging questions and to the specific demands and needs of students. This was also one of those things that students valued most positively. Students underlined in their interviews that teachers had started to engage stronger with them and that some teachers had adapted much stronger to questions or topics that were raised in the course.

Teachers insisted also that the possibility to play games within the class and to show and interact with students on a big screen was a very positive feature of HbbTV in class. The possibility to use and play (educative) games in class allowed students' to use their creativity. This creative engagement fostered a better and stronger interest of students for the course contents and related students with each other. Furthermore, playing games allowed teachers to include students with different profiles, to respect their different interests and to build on their strengths and weaknesses. Students also expressed that games had become a very positive part of their seminars. In fact, some interviewed students emphasized that they felt now much more addressed and included since online games were being played. Reportedly, contents seemed more attractive to them as it 'invited them to actively do something' (student, Journalism, 23 years). In this sense we can say that introducing interactive gaming education (introduction of gaming exercises, assignments, answers with options) was a big success.

From our field observations we can confirm that these uses of technologies in class really made a difference. In fact, especially whilst using games and thereby experimenting with contents students did not only seem better engaged and more motivated in class, they were also pulled stronger together. As one student told us: "Sometimes after class, we just stayed and continued talking… In fact, the communication about these games has become a part of our daily talk. I mean we hang out and talk about music and stuff… and sometimes about the games we play in our seminar." (Student, 3rd year, Communication Department). Getting the contents of class in everyday life conversation is an important advancement in direction of a more integrated and deeper knowledge and a step towards the establishing of a knowledge and discussion culture. As one of our professor confirms: "They are much stronger in discussing and debating concepts in class. They know more and they know how to talk about what they know." (Teacher, Communication).

3.2.2. Democratization/Horizontalization. A second important field of transformation in media consumption as much as in education that we mentioned, concerned the tendencies towards a more horizontal structuring, and at least an intended democratization of content consumption, content creation and of discussion culture.

Starting to analyse our interviews with professors and students and looking at the open answers in the questionnaires, we quickly acknowledged that both sides agreed that the use of HbbTV in the seminar room had paved a new way in order to engage and to interact with each other and to relate with contents. An important part of this new form of interaction was based on the use of Social Media. Teachers reportedly used social networking tools (Facebook, Twitter, LinkedIn or YouTube in the class) not only as object of teaching but also as an additional content provider, as a possibility to engage with teachers in class and after class and as an in- and after class debating tool.

In our field observation in various seminars we were able to observe how teachers, followed newest topics with students and were therefore able to discuss contents directly, and to discuss different consequences of online communication whilst observing predicted and discussed possible outcomes. Furthermore, in some classes Twitter was used to communicate with students and teachers in class. This had the advantage that whilst talking students were able to discuss some of their questions on screen whilst the professor was talking and shyer students felt readier to ask questions, e.g. via Twitter that could then be addressed by the teacher.

A further positive democratizing consequence of Facebook and Twitter in class had to do with the transference of a part of the discussion to moments after class. Student continued commenting on Facebook group topics. In this off-class environment the traditional hierarchy between teacher and student disappears. As one of our teachers mentioned: "In our Facebook group I am not the teacher I am just another voice. Sure you never lose who you are for others but I feel like this and I guess my students do also do."

Another useful and democratizing part of the HbbTV came from making use of polls in class. On the one hand side, this allowed teachers "to understand what students wanted, and what they thought and understood." On the other hand it allowed students to share their perceptions and to feel encouraged to participate stronger in class.

3.2.3. ICT skills. As we explained, ICT skills are fundamental not just for specific computer-related jobs but for all kinds of activities and professions in the Network society (Castells, 1999). A central discovery of our research was that students not only discovered the possibilities to use the web and web tools but that teachers learned also from students. In fact, some students were able to show teachers some of the latest Internet related developments, such as different forms to use Google Docx. In many cases ICT skills were developed by bringing together abilities of teachers and students. Such a collaborative context allowed creating a crowd-science context within the seminar room. Another great advantage with HbbTV was that teachers and students were able to observe problems and possible mistakes when using the Internet ad hoc. Furthermore, students understood much better that ICTs and ICT skills could be an improvement for all kinds of tasks. Last but not least the use of tools in class that were applicable outside of class allowed students and teachers to work on their ICT skills when returning to their homes.

3.2.4. General Assumptions. Based on our analysis, we can affirm that HbbTV technology really allowed the creation of new educational practices within the seminars on three levels: a better and more integrative experimentation/creation/consumption, a more horizontal classroom structure, and a better form to develop and use ICT skills. HbbTV

technology stimulated teachers to experiment with new methods to educate, such as various techniques of interactive discussing, collaborative experimenting and gaming. HbbTV technology allows students and professors to consume together and interact with each other not just through common forms of interaction but also via the Internet on various levels and via various channels and helps to overcome some negative group dynamics. In this sense HbbTV technology as an open and horizontal technological system facilitates a much more flexible and student oriented, more social and more democratic learning and teaching behavior, that invites students to participate, and to continue thinking and using concepts after class.

These innovative developments with and along HbbTV were strongly reflected in our interviews and questionnaires. Students and teachers confirmed a stronger engagement in class and a better and more critical use of contents and course materials. Numerically expressed the perceived quality of the courses from students' side rose from 2,9 to 4,1 on a Likert-Scale (1 worst to 5 best). The general satisfaction with teaching increased in those classes in which HbbTV technology was used (from 3,9 to 4,2). In the open questions and interviews, students expressed that they saw in used technologies "helpful", "engaging", and "interest generating" tools that made classes more modern and less dry. Teachers using HbbTV in class reported about an increase of participation in classroom activities that had not only to do with direct interaction with and via HbbTV but the long term effects of HbbTV on ICT uses at home.

However, from the interviews tand from our field observations we know that there are new challenges and problems related with the introduction of HbbTV technology in the seminar rooms, such as sometimes lax attitude of students in class, missing concentration and student's focus on social media themselves rather than their educative potentials. Here teachers or professors are demanded to put up boundaries and to use these new multimedia tools in an applied, however clearly focused way so that students cannot and will not get lost in the sheer endless possibilities to use the web.

4. FUTURE RESEARCH DIRECTIONS

Probably it will take a while until HbbTV devices will become part of every seminar room. However, based on our research we can say that younger students, growing up in multimedia environments, demand increasingly multimedia uses in the classroom. It is with secondary school students that future research has to be carried out. We consider that with regards to the advantages and challenges of HbbTV implementation in universities long term and comparative studies might also be necessary. We can study empirically the use of multimedia in educative HbbTV, applying an accepted scientific methodology (Fondevila-Gascón, 2012c, Fondevila-Gascón, 2014). Furthermore, we can follow the relationship of HbbTV with instant messaging (Fondevila-Gascón, Carreras-Alcalde, Mir-Bernal, Del Olmo-Arriaga & Pesqueira-Zamora, 2014), the election of University (Fondevila-Gascón, Del Olmo-Arriaga & Carreras-Alcalde, 2012), with digital production models (Fondevila-Gascón & López García-Navas, 2015) and with social networks (Fondevila-Gascón & Perelló-Sobrepere, 2014). Class, gender and place might have a crucial impact of uses possibilities and challenges with HbbTV in the class/seminar room (Volman, van Eck, Heemskerk, & Kuiper, 2005). Following this logic we also suggest comparative studies between different regions and/or countries.

5. CONCLUSION/DISCUSSION

HbbTV technology is not only a new form to combine Internet and TV consumption. It provides the teacher and the student with completely new possibilities when introduced into the classroom. We were able to find a variety of different uses of these technologies e.g.: the work with social networking applications (use of social networks in the class and after class), the possibility to gather online information, to motivate students and to create positive class dynamics through virtual gaming education, to increase interactivity between teachers and students but also in peer-to peer relationships and in order to facilitate a more actively student driven learning environment. In this sense, HbbTV contributes positively to the creation of a creativity and constructive criticism fostering, horizontal, more democratic, real life demands focused learning environment that reflects general transformations and demands from our society. It is by transforming the seminar room into a place where everyone can act and interact, where different student types and profiles can act and interact according to their demands and needs, where contents can be explored and consumed according to concrete emerging needs and where skills can be learned that serve socialization and professionalization outside of the aula that HbbTV significantly turns the seminar room into something completely different. A question that we definitely have to ask ourselves is, whether this gained horizontality, creativity and the focus on the now rather than the contents to be learned does not create completely new challenges and difficulties, such as a lower student attention in class, a missing ability to do profound readings of the literature and missing ability of students to accept that the content of a class is determined by the relevancy of topics and contents not only by students' desires. Another not yet discussed problem is to expect too much from the technology itself. As literature shows educational differences condition the abilities of students to use and to make use of these technologies (Heemskerk, I., Brink, A., Volman, M., & Ten Dam, G., 2005). These inequalities might be unsolvable by introducing a technology, be it HbbTV or any other ICT.

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