

PROMOTING DIGITAL COMPETENCE IN SPANISH SECONDARY SCHOOL: INDICATOR FOR ACADEMIC PERFORMANCE IMPROVEMENT

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ABSTRACT

Digital competency for academic performance lies at the heart in the modern curriculum and syllabus across the world. Several countries within the European Union (EU) and the United States of America (US) have adopted new learning systems which empower digital competence. Digital competency is a field which calls for teacher and student training for good results to be yielded. In view of the foregoing, the current study examines the digital competence and developments done by the Spanish Ministry of Education (SME) as well as the Organization for Economic Co-operation and Development (OECD) which offers the guidelines as well as the pillars which are required in setting up a digitalized competency for students' academic performance towards achieving a sustainable goal in the educational field. To this end, concept of digital literacy in education, TPACK model and strategies and position of OECD on digital competency in schools were examined. The impacts of digital life in schools and how it can improve students' academic performance were looked into. Based on the foregoing, the study concludes that a student that is acquitted with digital literate will be extremely functional, literate and numerate across the broad with lifelong skills and that there is need for stronger competence based learning and thematic approach pedagogy that will be geared towards students' competence improvement. The study recommends that school administrators and other stakeholders in education should create conducive environment where application of technology can be implemented to with a view to improve students' academic performance.

Keywords: Spanish Secondary School, Digital Competence, Academic Performance, School Administrators

INTRODUCTION

The world has become increasingly technological savvy and interestingly the students that come to the classrooms to be educated in most cases are digital natives eager to learn and absorb new information utilizing the devices they find “cool” and extraordinary. In an ideal learning environment, the 21st century classroom is a place that is energetic with much technological gadgets, internet, live social feed, and the allowance of students’ collaboration through student- centered learning opportunities (Crowley & Hever, 2015; Munte, 2017). Nowadays learners wish to be engaged, exposed, share their experiences and be provided with much opportunities of enhancement to increase their skills. The education industry has grown tremendously over the years and learning is now an opportunity that can be provided distantly, a student with the right attitude, discipline and tools can be living on one continent of the world while he or she is being educated on another continent in real time. Notwithstanding the myriads of growth, improved curricula and pedagogical practices. One thing that has remained steadfast is the fact that schools are preparing learners to become global citizens in order to be contributing citizens of any society (Williams, Kitamura & Keng, 2014).

Digital literacy or digital competency theme have been trending over the last twenty to thirty years as most of the society's activities are on the move of computerization and thus it is becoming an important point in the education debate in the 20th millennium. There are two main reasons behind the importance of digital competence in education. The reflection of the current topic is an element of presenting a greater understanding which is to improve students' academic performance. Over the last thirty years, activities pertaining to ICT done at school are still scarce due to the cultural and cognitive levels. Apparently, if one can be able to choose great activities which are cognitive wise and further be enhanced by technologies this result can be very critical (Passey 2006). Dealing with the subject of digital literacy in school is lifelong which means that reflecting on the personal and social structures can be a good way in the near future. In this context, the education research is bestowed with the responsibility of setting an outline of realistic projects as well as coherence in models to achieve schools’ set objectives and which can be realized within schools’ curricula. Third world countries along with private institutions can assess and adopt accordingly. The big question is how schools should be advised on assessment as well as the gradual development of competence, which tools to be used.

Studying the context of education in third world countries- mainly in the Caribbean region, it became increasingly evident that the education systems have much reformation to implement to further increase the students and teachers’ achievement. Additionally, it also drew on the disadvantages of our learners in these education systems and that they are somewhat these learners are short changed. How can such systems produce more holistically competent learners who are able to compete globally? Significantly, through the tenure of this research it was profound at the discovery of the practices of the European Union and the United States of America,

they have adopted several learning systems explicated throughout the paper which have empowered digital competences in their respective countries. This paper has focused on and further examined how secondary schools in Spain have combatted the requirements of their education policies to integrate technology into their teaching practices reaping successful results. These schools have demonstrated the robust need to move from the traditional based curricula in focusing on a competence-based curriculum that pave the way for their students to become global citizens ready for the world of work and beyond.

On the other hand, society is faced with socio-cultural activities which impact cognitive structures involved in the purchase and processing of information and knowledge which call for redefining literacies. In line with Walter Ong, changes applying to language have broad repercussions on the level of cognitive processes as well as the organization of knowledge (Passey, 2006). Today it is hard to foresee which new cognitive practices are emerging that pertain to the changes in the technology the world is offering. In this case, changes pertaining to simple forms of literacy have a close relationship with knowledge models as well as forms.

In view of the foregoing, the focus of the current study was is to examine digital competence for student's academic performance with the application of a case study and analyze how the practice relating to digital competence is related to the objectives set towards reaching sustainable goals in digital competence for students' performance in future.

Concept of Digital Literacy in Education

The word digital literacy was used by Glister (1997) which had an emphasis on the capability of critical thinking other than the application of information technology skills. In less than fifteen years the definitions have multiplied. Some authors define digital literacy as the results of the complex integration of competencies, knowledge, and skills. In line with Tornero (2004), digital competency is an integration of abilities which call for technical, intellectual and all competencies related to citizenship. In agreement with Martin (2005), digital literacy is the awareness, ability, and attitude of people towards use of digital tools appropriately and facilities to identify, manage, access, evaluate, integrate and synthesize of resources digitally. Consequently, Gapski puts digital competence as two main domain strands of normative media education and instrumental technological which corresponds to pedagogical aims and usage respectively (Gapski 2007). Additionally, literacy is not a unitary approach but it incorporates students in making sense of the world. Further we could examine the importance of multi-modal literacy and its significant in students having the ability to communicate diversely. Therefore, a student who has literacy competence and is a digital native will have the skills to function as a global citizen and will therefore excel in his or her academics.

Consequently, new technology is constantly in use in the education sector and thus when students are competent enough, they can perform well in academics.

In addition, many developed nations are using digital modes in schools, and therefore it acts as a benefit to the learners. Predominantly, the issue of digital competence for students' performance is multidimensional since the world has been integrated into a village. A sedentary lifestyle has also prompted the occurrence of digital capability since many people can learn from their homes. This review concentrates on promoting digital competence for students' academic performance which is very vital in the educational journey of every student, as most countries are on the move of integrating digital life in the form of Information and Communication Technology hubs as well as in industrialization. By examining the digital competence plans brought by SME and international organizations, this paper supports digital competence in the education sector and gives an outstanding summary of the hierarchy of digital expertise.

Technology Integration Model and Strategies

Living in a digital world means that education and way of life must respond to the changing world. Digital technology integration and digital competence is paramount in managing the education system. Though there may be constraints and limitation, compensations must be implemented to adequately meet the needs of our learners. Early studies such as Attewell and Battle (1999) assessed the impact of home computers and school performance via the plication of National Longitudinal study. Their findings were vivid on that school performance among a selected number of student's grades had a positive correlation with performance. In line with Fairlie (2012), the use of computer and internet can supplement the current curriculum and hence enrolling students who have home computers can be of great help as they have high IQ compared to those who are not exposed to computers in their daily lives. Consequently, students who failed to join high school can be enrolled in the search with a computer. With this view, several family characteristics, there is a high likelihood of school enrolment among students who have exposure to home computers.

According to Schmitt and Wadsworth (2006), a strong positive correlation between school performance and home computers via the use of the British Household Panel Survey was established between the years 1991-2001. In addition, Fuchs and Woessmann (2004) had a negative review on the impact of home computers to performance in that student who own home computers have a bad performance in both math and test scores. The application of ICT in learning processes can lead to the acquisition of better digital skills which are more useful when applied more frequently.

Jackson et al. (2011) used longitudinal data for the youths with low income and continuous and automatic recording with the use of internet over a period. He found a unique relationship between academic performance and the use of the internet. According to him, the youths who used the internet more frequently got higher scores as compared to the ones that had less access to the internet. He, therefore, concluded that the children who used the internet more had better reading skills and thereby resulting in better academic performance. In both university undergraduates and foreign undergraduates, Usman et al. (2014) found in his study that there is not much and

significant difference in academic scores in relation with the use of the internet. Kischer and Karpinski (2010) studied the mutual relationship existing between the use of Facebook and academic performance. The study related the academic performance to Grade point average, and they showed that the Facebook users registered lower Grade Point Average than those that did not use Facebook. According to Amiri (2009), his study on the effects of the availability of computers and digital availability on academic performance in youth indicated some positive effects regarding digital literacy and academic performance and participation in class learning processes.

Studies have indicated that there is more potential endogeneity in computer ownership and the impact in that children and parents who are more concerned with academic performance will purchase computers as compared to those whose parents are not concerned with their school well-being. Fairlie et al. (2010) in their study which exploited the US panel data sets such as the 2000-3 CPS computer and the use of the internet was in line with the monthly files as well as the National Longitudinal Survey of youth back in 1997. According to Fairlie et al. (2010), home computers greatly brought an outstanding effect that is positively strong on high school graduation alongside other academic outcomes.

On the contrary, it has long been recognized that there is a great prominence of incorporating technology into the curricula. Customarily, technology training for teachers has been fixated on assisting teachers' phobia to use and infuse technology in their instruction. Research in line with Koehler and Mishra (2009), posits that teaching should be reviewed greater than a teachers' knowledge. It further supports that the content, technology and pedagogy (TPACK) are extremely important to consider when instructing students. TPACK further sensitizes teachers to be aware and assertive in every single component of instruction and the teaching environment. It calls for greater planning and supports, that a lack of each of its element will create obstacles in the teaching and learning process. It is evident that the successes of the countries that have bought into integrating technology in schools have found innovative ways to educate train and improve their teachers' abilities to instruct students using one such as TPACK. Visualizing a classroom that has the adequate resources and a teacher that teaches from a constructivist approach but has the support and skills to infuse TPACK in most of her lessons will undoubtedly produce holistic digital learners.

There is an uncountable number of technology integration models nowadays that provide educators and the education system with the appropriate tools that enables students to apply ICT skills to their everyday lives. An education system that supports the curricula utilising technology will increase productivity in a school, while educators have the ability to even cater to the many learning styles and modalities such as the uses of multimedia and multimodal approaches. Technology must be used to support and scaffold the learning environment. For technology to be meaningful in our education systems, these systems must be dynamic and diverse in creating curricula that is designed to give the affordances of technology that is visible, applicable and demonstrated with the critical elements of the taxonomy. Students not only need to learn and be empowered through these skills and knowledge but be able to function and

demonstrate them through both lower and higher order thinking skills (Koehler & Mishra, 2009).

The Spanish Ministry of Education and the OECD on Digital Competency in Schools

In 1997, the OECD (Organization for Economic Co-operation and Development) made the DeSeCo project which had the objective of giving the conceptual threshold to identify primary competencies which individuals needed to have in preparation of life's challenges. The challenges comprised of students demands in employability, good performance in school and other challenges which were with the aim of balancing social equity and sustainable development in the academic sector via digital competence (OECD, 2005). In this view, the competencies that students needed to meet academic performance have become more challenging which required more than just mastering class skills. After a while, the European Commission gave a thought on the importance of the education sector as a lifetime event which is a global event as a way to shift the knowledge-based economies while already in 2005, the member states were urged to adapt education system which provided students with key digital competencies required to have academic performance in lifelong learning.

Even though competencies may exceed by far, digital competence means being able to meet all challenging demands by mobilizing and drawing on all knowledge attitudes and skills in a particular context (OECD, 2005) competencies can still be taught for academic purposes. The competencies recommended by the European Parliament and the council as of 18 December 2006 were on the key competencies in lifelong academics (European Council, 2006) which was intended to give a common reference across all education policymakers, policies affecting the youth and training the providers. In line with the Eurydice report (2012) all EU states have been configured to the national strategy in pursuit of Digital Competence. Digital competence has been taught as a cross-curricular approach across all the EU states at Primary level and secondary schools' level-1. Other countries have integrated ICT in some of the subjects or teaching them as a separate unit. Consequently, all teachers should be familiar with digital competence which is a primary goal as per the new OECD. Latest reports from the OECD's TALIS study show that less than 20% of all teachers feel the need for more training on ICT skills while only 15% agreed to the use of new technology at their workplace. One of the updated teacher networks in Europe, "eTwinning" gives an ample environment for all Europe teachers to partner with peers and learn good ways of harnessing ICT for teaching. A study carried out by Twinning in (2015) posited that many teachers feel that e Twinning is moderate in teachers. ETwinners compiled a report which proved that there is a great increase in digital teaching as well as learning practices which include participation in online courses, collaborative creation of materials with other students and use of other networks.

Impacts of Digital Life in Schools

The impacts of digital life have been felt in every aspect of life such as in the commerce world, social activities and an academic journey. In this case, the fact remains that everyone has to be conversant with digital life in whichever field they are working from (Ferrari, Punie & Redecker 2012). Following the recommendations of international organizations, many educational systems have integrated a competency-based in digital to do away with the traditional subject-based curriculum to enhance students' performance both in class in the outside world. The world is taking a step into a digitalized system where all activities taking place are in a digital order. However, the move does not seem that easy in any schools' practice. In many developing countries it is not that easy as they do not have the required infrastructure to harness digital education.

In reference to the notions of information and ICT for digital competence as laid by the Catalan ministry of education, international organizations and the Spanish Ministry of Education regarding the notion of teaching. From professional experiences teaching in Jamaica and Turks and Caicos Islands these countries also sign on to international policies that are not readily practical for the learners and teachers due to lack of resources. Nonetheless, promoting digital competence for students in the pursuit of academic performance has been encouraged (Ferrari, Punie & Redecker, 2012). Digital competence is termed as one of the eight great pillars for life-long learning developed by the European Commission and is a necessary event in the fulfillment of a student's dream in the classroom setting. Digital competence is in a bid to bringing into essence a performance in school while aiming for job competence in the market. Young learners have to be accompanied in the development of competence while guaranteeing optimal development in the information sector as well as ICT. The call for digital competence also emphasizes all teachers to be digitally literate. Many teachers have enrolled in the digital training phase one program which had the aim of assessing their level of competence in the project dubbed DIGCOMP project.

The training used rubrics provided by the Common Digital Competence Framework for Teachers by the Spanish Ministry of Education (SME). However, the conceptions on their level of digital competence were very low in the initial stages of the training. Students in the same training showed a high competence as they scored highest in information and this indicated that they performed many operations in the ICT field while being students (Ferrari, Punie & Redecker, 2012). Safety and communication, without including digital data protection as well as the preservation of data with digital identity were analyzed. OECD and the European Commission introduced the digital competence curriculum back in 1997 (Krumsvik, 2011). The European Union defined the eight pillars of competencies which are the integration of knowledge, skills, and attitudes. However, the way the modules were developed could not find a way into everyday school practice to bear instant results. In line with the OECD's DeCeSo project (2002), it is evident that digital competence among the students' academic performance requires several dimensions in the perspective of using sophisticated tools; interacting with other students in mixed groups: bearing responsibility for one's life and acting separately. A research done by international

organizations is one of its kind. The last years have seen the concept of competence in digital education take a route towards reflexive pace other than technical approach on ICT following an ICT panel proposed in 2002 by the Educational Testing Service (ETS). In the panel, the concept pursued in ICT literacy shows the capability in the use of communication technologies and tools to access, integrate, manage and to create more info to be able to apply it from day to day life. The U.S. International Society for Technology in Education (ISTE) came up with the National Education Technology Standards (NETS-S) and performance indicators for students (International Society for Technology Standards Education 2007). In line with the NETS-S, when a student is digitally competent, they exhibit critical and creativity in the ability to use digital media in working collaboratively to evaluate information.

In 2000, the Association of College and Research Libraries (ACRL) came up with new standards concerning information literacy where the capacity to determine the nature as well as the extent, ability to evaluate information critically and credibility of the information were the essential components of the information literacy (ACRL, 2000). Emphasis on socio-ethical aspects has been the focus with the introduction of a web-based 2.0 (Jenkins et al., 2006). Questions have been stratified on the ethical consideration basing on the web. The main questions are whether the web can develop ethical minds (Anàlisi 2008; Antonio Calvani, Antonio, Finiy, Maria & Ranieri 2007; Gardner, 2010) and the aspect has been under a study by the New Media Literacy Team situated at the MacArthur Foundation. In pursuit of the research, factors such as authority, credibility, participation, and ownership were to be the primary goals of the research James et al., 2009). In addition, the European Commission (EC) pointed several initiatives which were to be elevated in the development of the digital literacy within the Member states (EU). Following the developments, a group of experts was made to determine how the curriculum was to be developed to be functional in the academic performance of students. Following the December of 2006, the European Parliament (EP) in line with the council made two recommendations which were impartial to be considered.

The recommendations were on key competencies on the lifelong learning (2006/962/EC) which was a new framework outlined for the digital competence in lifelong learning. Digital competence in this platform was defined as the critical use and confidence in the use of Information Society Technology (IST) in work, communication, and leisure. It shall be noted that the combination of leisure, work, and communication have a direct relationship with academic performance. Digital competency is a basic skill in ICT where it is applied in retrieving, accessing, storing, presenting, producing and exchanging of useful information as well as communication and participating in collaborative networks through the use of the internet. Coherently, the European Parliament made other recommendations concerning minor and Human dignity protection (2006/952/EC) which emphasized on teacher training on the aspect of media literacy and the incorporation of media literacy in the education sector as a way of expanding the student's capacity and responding to positive attitudes as per all user. A study conducted by the EC concerning media and digital literacy assessment has been

initiated (Celot & Tornero, 2009). Media literacy is defined on the competency of individual and environmental factors.

How Digital Competence Can Improve Students' Academic Performance

The concept which has to take the route on digital competence has shifted from technical meaning to a more complex concept to gain a pedagogical meaning. The concept developed was said to be made up in a more critical dimension. Following the European Recommendation, the concept developed pursues core competencies in the education sector. However, it is important to preserve the concepts behind digital competence from all forms of reductionism. The concept of digital competence aimed at academic performance follows integration of abilities and cognitive skills, social in nature and relational which can make it a nonlinear one in achieving complex deals. Digital competence in this concept has been put as the capability of exploring new technological situations in a way which is more flexible to analyse, select and critically employ any data and information, exploit all potentials pertaining to technology to present and solve problems in a more collaborative manner (Calvani, Fini & Ranieri, 2009). In line with this new definition, there are three basic dimensions which are emphasized: the technological dimension, the ability to explore as well as facing problems and application of new technological faces more flexibly: the ability to read, cognitive dimension, selection, interpreting and analysing data to process information. Patience and reliability are skills which all the students need to consider. Consequently, the ability of interaction with other individuals can be a useful measure towards oneself as they can exchange ideas. Digital competence is believed that it should start at an early age while some decide on the time spent on them as well as types of technologies that should be highly considered. For instance, some principles such as coding are to be learned via the use of paper cups or even blocks.

In Romania, Malamud and Pop Eleches (2011) assessed the impact of home computers on adolescents and child outcomes by the use of a typical regression discontinuity design. This was achieved through the exploitation of voucher programmes in the Romania state. The outcome indicates that these home computers have complicated effects and impacts on human capital development. The results also show that these children that purchased computers had improved computer skills but had registered lower grades in academics alongside increased cognitive skills. According to Fairlie et al. (2012), in his field experiment found that the provision of computers to college students led to the achievement of improved educational outcomes contrary to the control group which was less than non-experimental estimates. Another relationship studied by Leung et al. (2012) comparing internet literacy and academic performance showed positive academic performance. The study showed that people who have high digital literacy had better performance in their overall grades and survived well in academic competence. In online learning, digital literacy has a positive impact on academic performance in that it led to the improved application of learning platform software and the advancements of both academic and digital skills which in turn brought about positive effects on academic performance amongst students.

Digital competence is of great importance in the field of labor market outcomes because they provide an important labor input. They contribute to the acquiring of vast

knowledge and skills in terms of academics, which has greatly transformed how people learn. It has also improved the understanding of technical skills and how the technology can be integrated to pass information and execute tasks more effectively. This digital competence is beneficial in completing school assignments by the application of the computer software and computer programmes, for example, the typical spreadsheets and word processors. It also reduces the chances and risks of using unreliable sources to extract information and thereby reducing cases of plagiarism. Digital competence describes technology-related skills such as information technology and literacy skills. Additionally, in academic performance, it also involves the critical use of information technology to execute work, during leisure and also inefficient conveyance of credible information.

Digital technologies have led to great improvements in the production processes since the production processes since the production systems are not manual anymore. A digitally competent individual has a lot of skills, knowledge, and attitude for collaboration, the creation of content and knowledge and more know-how in technical operations. This helps one in evaluating and identifying technologies that are essential to execute tasks via digital tools. The digital competence is one of the many competencies for learning whose aim is personal development and fulfillment, social inclusion and the acquisition of worth employment in a learned society. It has been found that digital tools are key tools in academics which extensively affect the quality of education. This is seen clearly in the close and easy collaboration and interaction of learners and teachers, with easy access to information and literature and the use of various learning materials. Governments have defined digital competence as a cross-curricular set of skills attitudes and knowledge which are set in enabling confident creative as well as the critical use of technological systems. However, digital competence is not to be confused with Information and Communication Technologies (ICT) as it is categorized as a skill which enables an individual to be confident. Wales launched its Digital Competence Framework (DCF) in September 2016.

Digital competence is to be started at an early age, but researchers have suggested that the types of technologies, as well as the amount of time spent on digital technologies, should be monitored by teachers, parents or guardians. Principles such as coding, need parental guidance as one can get low motivation from some failed attempts. Talking pictures have been found to be very educative in the project of e Twinning as it engaged students from lower primary to use them in communication as well interpreted tales which they were told in a classroom setting. Basically, the main point was that children could comprehend to the fact that photos cannot just be used as pictures but can depict different points of view.

CONCLUSION AND RECOMMENDATIONS

In promoting digital competence for students' academic performance, the stage must be set for a constructivist approach that promotes several components. When reviewing Garrison's community of inquiry, the variances of social, cognitive, educational and teaching presences are dissected with much emphasis on collaborative

learning. Creating diversified conducive learning environs that enables the learners to create knowledge, invent, explore and innovate their own notions. Surely, if students are facilitated using the above approaches, they will surely succeed. It is important to meet the needs of the learners we are receiving and most come to the classroom has digital natives ready to strengthen those skills. A student that is digital literate will be extremely functional, literate and numerate across the board with lifelong skills that he or she must hone for the working world.

Once the structure is implemented, administrators can assess and evaluate developments such as the reaction, behavior, learning and product in their programmes. The Kirkpatrick model of evaluation explicitly informs educators of the importance of evaluation. Such practices lend itself to tweaking and improving, resulting in greater successes from those teaching and learning. ICT skills can greater be taught and enforced at the student teacher level, therefore equipping those who matriculate with the skills, attitudes and knowledge to sharpen their learners' digital skills. There is a stronger need for competence based learning and thematic approach pedagogy tailoring, this will further improve the students' digital competences. Collaboration between home and school is critical in attaining high student performance in digital competence. Therefore, home and school must work cohesively in providing the necessary tools and resources for students to be able to innovate and create. Administrators, teachers and para professionals must remove the learning barriers and be open to exploring and utilizing current practices.

Additionally, be willing to learn and improve their digital competence and footprints. Education systems must identify strengths and weaknesses, vital strategic enablers and how these will further facilitate a strong, creative and dynamic environment. Turning a school culture where students and staff are empowered to make the most effective use of technology to support their learning and teaching, maintaining high achievement and performance rates.

REFERENCES

- Amiri, S. (2009) The effects of information and communication technology on at-risk children of low economic status: Make It-Take It After-School Case Study, *International Journal of Education and Development using Information and Communication Technology*, 5(3), 141-147.
- Attewell, P., Battle, J. (1999). Home computers and school performance. *The Information Society*, 15, 1–10.
- Calvani A., Fini A. & Ranieri M. (2009). Assessing digital competence in Secondary Education – Issues, Models, Instruments. In M. Leaning (ed), *Issues in Information and Media literacy. Education, Practice and Pedagogy*, Santa Monica (CA), USA: ISI.
- Calvani A., Fini A. & Ranieri M. (2010). La competenza digitale nella scuola. Modelli e strumenti per valutarla e svilupparla. *Trento*: Erickson.

- European Council (2006). Recommendation of the European Parliament and the Council of 18 December 2006 on Key Competencies for Lifelong Learning. (2006). *Bruss. Off. J. Eur. Un.*
- European Parliament (2006a). The recommendation the European Parliament and the Council of 18 December 2006 on Key Competences for Lifelong Learning. *Official Journal of the European Union* (2006/962/EC), L394/10- 18. Retrieved October 3, 2010, from <http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:394:0010:0018:en:P>
- European Parliament (2006b). Recommendation 2006/952/EC of the European Parliament and of the Council of 20 December 2006 on the protection of minors and human dignity and the right of reply in relation to the competitiveness of the European audiovisual and on-line information services industry. *Official Journal of the European Union* (2006/952/EC), L 378 of 27.12.2006. Retrieved October 3, 2010, from http://europa.eu/legislation_summaries/audiovisual_and_media/l24030a_en.htm.
- Fairlie, R. W., London, R. A. (2012). The Effects of Home Computers on Educational Outcomes: Evidence from a Field Experiment with Community College Students, *The Economic Journal*, 122, 727-753.
- Ferrari, A., Punie, Y., & Redecker, C. (2012). Understanding digital competence in the 21st century: an analysis of current frameworks. In A. Ravenscroft, S. Lindstaedt, C. Delgado, & D. Hernández-Leo (Eds.), *EC-TEL'12 Proceedings of the 7th European Conference on Technology Enhanced Learning* (pp. 79- 92). Berlin: Heidelberg: Springer-Verlag. doi:10.1007/978-3-642-33263-0_7.
- Gapski H. (2008). Alcune riflessioni sulla Digital Literacy. *TD- Tecnologie didattiche*, 43, 1, 23-25.
- Gilster P. (1997). *Digital Literacy*. New York: John Wiley.
- Jackson L. A., Eye A. V., Witt E. A., Zhao Y., Fitzgerald H. E. (2011). A longitudinal study of the effects of Internet use and video game playing on academic performance and the roles of gender, race, and income in these relationships. *Computers in Human Behavior*, 27, 228–239.
- Koehler, M. J., & Mishra, P. (2009). What is technological pedagogical content knowledge? *Contemporary Issues in Technology and Teacher Education*, 9(1). Retrieved from <http://www.citejournal.org/vol9/iss1/general/article1.cfm>

- Kirschner, P., Karpinski, A (2010). Facebook and academic performance. *Computers in Human Behavior* 26, 1237–1245.
- Leung L., Lee, P. (2012). Impact of Internet Literacy, Internet Addiction Symptoms, and Internet Activities on Academic Performance. *Social Science Computer Review* 2012 30: 403.
- Martin A. (2005), *DigEuLit – a European Framework for Digital Literacy: a Progress Report*, Journal of eLiteracy, 2, 130-136
- Organization for Economic Cooperation and Development. (2005). *The Definition and Selection of Key Competencies: Executive Summary*; Organization for Economic Cooperation and Development: Paris, France.
- Passey, D. (2006). Technology enhancing learning. Analysing uses information and communication technologies by primary and secondary school pupils with learning frameworks. *Curric.* 139–166.
- Schmitt, J. and Wadsworth, J. (2006). _Is there an impact of household computer ownership on children’s educational attainment in Britain? _ *Economics of Education Review*, vol. 25, pp. 659–73.
- Spanish Government. (2015). Orden ECD/65/2015, de 21 de Enero, *Por la Que se Describen las Relaciones entre las Competencias, los Contenidos y los Criterios de Evaluación de la Educación Primaria, la Educación Secundaria Obligatoria y el Bachillerato.* 6986–7003.
- Tornero J. M. P., Paredes O., Simelio N. (2010). Media Literacy in Europe. *From Promoting Digital Literacy to the Audiovisual Media.* Form @re, n. 70/September. Retrieved October 3, 2010, from <http://formare.erickson.it/wordpress/>