

The integration of values, skills and competences in quality education through the subject “Computer Science”

Salvador Peiró, Gladys Merma, Diego Gavilán
University of Alicante
Alicante, Spain

salvador.peiro@ua.es, gladys.merma@ua.es, diego.gavilán@ua.es

Abstract

Students spend much of their time exposed to information and communication technology, which could positively or negatively affect the framework of their values. Given the importance of this fact, the research provides a critical examination of values, attitudes and skills that teachers believe should be integrated in Computer Science and Technology subjects. From the data provided by the participants, a classification of values is suggested. The sample consisted of 226 teachers who teach Computer Science and Technologies in 1st, 2nd and 3rd year of Secondary School (ESO). The findings of this empirical research show the relationships between the percentage of teachers who prefer the integration of certain values, attitudes and skills in teaching and the estimated mean assigned to these values. Furthermore, it was found that attitudes and individual capacities such as obedience, optimism and care for physical appearance, being careful and hardworking prevail, and that there is a limited presence and evaluation of social skills such as cooperation, teamwork, togetherness and solidarity. The results of this study could be used to design a more modern curriculum in line with reality, integrating values and technologies.

Keywords: moral values, attitude, ability, information and communication technology, computer science

1. INTRODUCTION

For many years now Information and Communication Technology (ICT) has been revolutionizing the world and is currently part of our daily lives. Education has not been immune to the impact of ICT; it has been introduced in the field of education and its impact on adolescents is high, due to the number of hours spent on computers and because it is one of their favourite activities, one which allows them to communicate via social networking, play games and watch videos online (Rideout, et al., 2010). Accordingly, its influence is greater than other traditional areas such as family and school, as has been demonstrated in various studies conducted in different countries like USA, Netherlands and Spain (Fernández, et al., 2013; Peiró & Merma, 2011; Subrahmanyam & Greenfield, 2008; Valkenburg et al., 2006).

ICTs benefit education in a number of ways, but their use also poses difficulties, not only those related to the availability of resources, for example, the lack of computers in classrooms and teacher training (Mooij & Smeets, 2001; OECD, 2001; Pelgrum, 2001), but also other issues related to values, attitudes and skills, which have not yet attracted the attention of the educational research community. In this line, some researchers such as Salomon, Perkins and Globerson (1991) suggest that computers supplant mental exercise and this is why students are losing a number of skills such as the ability to summarize, organize and synthesize (Rothenberg, 1997). They even consider that computers can change the way people think, their ability to process

information (Hokanson & Hooper, 2000), the ability to relate to others (Malo, 2006; Morahan-Martin & Schumacher, 2000) and can lead to a loss of control over adolescents (Kaltiala-Heino, et al., 2004; Eppright, et al., 1999). Therefore, it is crucial to investigate new ways of teaching and learning that are not only focused on cognitive development, but also on promoting the learning and development of personal and social skills such as thinking, cooperation, tolerance, harmony and optimism, among others. While the primary purpose of the use of ICT involves the intervention of scientific knowledge and its application in solving technological problems (Eisenberg et al., 2010), we still need to know if it is possible to use integrated values, skills and attitudes to guide the use of technologies based on more human and social criteria.

This study starts from the premise that ICT has a positive effect on the learning of values, attitudes and adolescent skills (Farrell, 2012, p. 154). The focus of this research is to look at ICT education by reflecting on ICT itself, a process that may help create environments of powerful and authentic learning, and so facilitate active learning, higher order thinking (Jonassen, 1999), cooperative learning and reflection on curricular contents (Susman, 1998). Based on these principles, the objectives of this research are: a critical review of the values, attitudes and skills that teachers believe should be integrated in the subjects of Computer Science and Technology in Spain, during the first, second and third years of Secondary Education; and develop a proposed classification of values from data provided by the research participants. The subjects of Computer Science and Technology form part of the curriculum of Secondary Education (Decree Law 112/2007, of 20 July approving the curriculum of Secondary Education was established in Valencia) and, according to curriculum objectives, should promote the acquisition of basic skills such as interaction with the physical environment through knowledge of the world of computing, autonomy and personal initiative by using active methodology, and also reflection on the social, civic and cultural framework.

2. THE FOCUS OF THE SKILLS, VALUES AND ATTITUDES IN THE TEACHING OF COMPUTER SCIENCE AND TECHNOLOGY

Values are dynamic and interrelated realities, and so customs, ways of behaving and expressing ourselves all vary, and are greatly influenced by culture and the particular historical moment (Grünberg, 2000). They are directed towards and become an integral part of individuals depending on what they have internalized during education, and are linked to feelings, attitudes and skills, which manifest themselves in behaviour (Kohlberg & Candee, 1984).

Sen (Drèze & Sen, 1995, p. 10) puts forward an interesting theory on the importance of capacity development in the human being, which has not yet been examined deeply in education. A Bangladeshi economist and philosopher, he explains the concept of capabilities and states that these relate to the freedom and choices people have to decide what kind of life they want to lead. This posture is important because it establishes a relationship between capacity, human well-being and satisfaction. The human being is "a concentration of freedom to accomplish something, and capabilities to function", the basic concepts of this approach being "functionality and capability" (Sen, 1995, p. 266). Functioning is an achievement, whereas capability is the power to achieve (Sen, 1990; Sen, 1987). In short, capabilities are what a person can do or be –attitude– making the most of their freedom.

In line with this theoretical reflection, and in order to find possible relationships between values, skills and attitudes, the question of whether a value is needed to develop any ability or attitude arises. The answer is yes. An example related to the theme of this research is when a student is very skilful in surfing the Net and managing social networks. If he uses these skills to mock someone, spreading photos and videos that infringe on the personal integrity of a colleague (cyber bullying), it is not morally acceptable. The capability per se, as Sen (1995) argues, is not bad, because this student could use his skills in order to manage social media to collaborate, for example by creating a campaign against bullying, and to do this he could employ his abilities. Consequently, we can say that values are related to the exercise of skills and attitudes, and therefore it is important to address the issue of their better integration in school curriculums.

Gasper (2002) also refers to the "O-capabilities" (O for option and opportunity), noting the need to combine individual action and social action, which means what a person is capable of doing and what opportunities the social context will provide. Bonvin and Thelen (2003) also argue in favour of a relational perspective between opportunities and capabilities, and Nussbaum (2000) suggests merging external capabilities – the "O-capabilities" of Gasper and "S-capacities" of O'Neil (2000) in order to refer to capacities of reason. He advocates that education should help people have more freedom to live thoughtfully, and help students develop evaluative reasoning (Robeyns, 2005). These processes correspond to *being* and *doing*, a value that Nussbaum and Sen used to define individual capacities. As we have seen, human capabilities reflect the heterogeneous collection of desirable states of an individual, focussing on his effective opportunities to carry out the actions and activities he wants to do, and be who he wants to be (Robeyns, 2005). Analytically, the capability approach emphasizes the personal, social, economic, cultural and institutional factors that give people the opportunity to do and be what they value in life (Otto & Ziegler, 2006). Education could play a role in learning and spreading skills, attitudes and values in students (Peiró, 2000) so that they are able to create, independently, a new set of skills. This implies that values should not be an "added extra" in teaching, but on the contrary, they must be the very essence of quality education (Lovat, 2010; Clement, 2009).

From these arguments it follows that teachers have the opportunity to influence, at least to some extent, the development and use of technology, and matters directly related to it, such as IT, could be a good tool to promote values, creative skills and attitudes based on cooperation, diversity, negotiation and problem solving.

3. METHOD

The research is empirical, as it seeks to explore, describe, analyze and explain educational phenomena using evidence (Punch, 2013). The study is based on a survey given to a random sample graded according to educational level and province. The sample was taken from schools in the Alicante's province - Valencian Community (Spain) - and the educational stage of the sample is Secondary Education. Regarding the centre types, we have included public, subsidized and private schools. The criteria for selecting the sample was that the participants were teachers of the subject Computer Science and Technology.

The data was collected between September and December 2013 and transcribed and organized on the on-line platform of the research team of *Interdisciplinary research on values, violence and education*, at the University of Alicante (website <http://violence.dste.ua.es/>). Subsequently the analysis and interpretation of the data was carried out. Statistical analysis was done using the SPSS 11.9 program, in order to obtain the views of teachers and establish the relationships between values, attitudes and skills. Computer science teaching is the mean, mode and standard deviation.

3.1. Instrument

The survey was developed by the research group of the Faculty of Education at the University of Alicante and was part of a longer questionnaire which involves all the subjects taught in Secondary Education. The subject Computer Science and Technology was chosen for this research. We asked the teachers participating in the study about those values, skills and attitudes they believed should be included in the teaching of these subjects.

In the survey, there were 28 items related to different values, attitudes and skills, and also an open question, in which participants were asked to name one or more other values they considered should be included. The Likert scale was used for the evaluation of the items: *Always* required (5) should *almost always* be proposed/encouraged/promoted (4), should be proposed *sometimes* (3), should be proposed *rarely* (2) and should *never* be proposed (1).

3.2. Participants

The sample consisted of N = 226 teachers who teach the subjects of Computer Science and Technology in 1st, 2nd and 3rd years of Secondary School in public, private and subsidized schools in before mentioned Alicante's province. Their average age is 38.5 years (20-55 years) and their average professional experience of 16.2 years (1-40 years).

3.3. Procedure

First the values, attitudes and skills were identified and defined (Table 1), and then the questionnaire was validated with the participating experts. This team consisted of seven specialist teachers who are part of the research group of the Department of Theory and History of Education at the University of Alicante (Spain). The values, attitudes and skills were carefully selected with the concept of "totality" as a basic principal; i.e. considering the education of a complete person, with harmonious development of all their faculties and dimensions (Miczka, 2013). Furthermore, the values, abilities or attitudes were classified into two groups: individual, related to the uniqueness of the individual, focusing on the personal, and what makes us different from others, and the social dimension, which is linked to openness, interaction, and affects interpersonal and institutional relations.

Table 1. Definition of the values, skills and attitudes

Value, ability, attitude	Definition
p1. Comply with rules (Obedience)	You accept and enforce fair rules.
p2. Carefulness	You treat things carefully.
p3. Generosity	You give all you can, help others.
p4. Truth	You say what you believe is true, look for the truth and tell the truth.
p5. Respect	You respect others, respect their opinions, ways of thinking and proposals.
p6. Order	When looking for an object amongst your personal things, you know where to find it. You do what you have to do at all times, giving priority to the most important.
p7. Joy	You are of a happy disposition. You react positively in any situation, encourage others.
p8. Care for your physical appearance	You like to look presentable, feel good about yourself and others.
p9. Socialization	You like to be with others, do not think badly of others. You accept others as they are, meet them

	socially, and work as a team.
p10. Sincerity	You say what you think at all times. Usually you are usually yourself and do not fake anything. Your actions reflect your way of thinking.
p11. Punctuality	You are punctual, arriving at school on time, give in homework and assignments when required.
p12. Perseverance	You never give up, even though it means investing a lot of effort and hard work. When you start an activity, you always finish.
p13. Strength	You keep going at difficult times. You are strong and do not weaken or become frightened. You face up to challenges bravely.
p14. Optimism	You see the bright side of things.
p15. Industriousness	You try to do things as best you can and work hard to fulfil your goals
p16. Understanding	You try to understand the opinions of others even though you do not share them.
p17. Audacity	You feel able to solve any problem, not just those related to school subjects. You are not afraid to perform complex tasks.
p18. Charity	You offer things without expecting a reward.
p19. Religiosity	In your relationships, if you want to express religious beliefs, you do not fear what others might say or think.
p20. Sports	You believe that sport is good for your health, are interested in watching and doing sport.
p21. Effectiveness	You think that technology can help you carry out tasks.
p22. Tolerance	You are indifferent about whether one of your group is from another race. You socialize with those who are different (race, sex, colour, language...). You defend human rights.
p23. Prudence	You analyze and reflect on what others tell you, ideas, thoughts, etc. Before you accept something as true, you reflect on it. You think before taking action.
p24. Discretion	You are discrete about your home, your family,

	your private life.
p25. Reflection	You know how to be alone and think critically before taking action; you evaluate the situation prior to acting.
p26. Sobriety	You know how to dominate your whims, value things fairly, put reasonable limits on your actions.
p27. Forgive	You show willingness to forgive certain actions.
p28. Cooperation	You encourage cooperation, dialogue, and reconciliation.

Surveys were handed out to participants in two ways: by email and in person. Each teacher received a survey. Once the completed questionnaires had been collected, we proceeded to their respective encoding and the responses were transcribed on the website of <http://violencia.dste.ua.es/> project, corresponding to Questionnaires, Performance-Teaching section. Maintaining the information in an electronic format allowed for efficient data processing. Subsequently, the data was given a first analysis and the results were the mean of each value, attitude and ability. SPSS.19 statistical software was used to analyze the data further by applying the required statistical tests: reliability test "t" Student test and analysis of variance and mode.

4. RESULTS

The "t" Student distribution to measure the reliability of the items is 0.872, a value that is highly reliable. Meanwhile, the total average of the collected data, based on the Likert scale is 4.2. It can also be seen that no significant differences are detected between the different items. Some relevant results are: the teachers consider that tolerance (4.62), punctuality (4.60), respect (4.58), being careful (4.55) and compliance with rules (4.53) are values that should "almost always" be promoted in teaching the subjects of Computer Science and Technology, and also consider effectiveness (3.53), the practice of one's religious beliefs (3.67), reflection (3.77), sobriety (3.87), discretion (3.88), taking care of physical appearance (3.96) and charity (3.98) are the values that should "rarely" be taught in the subject in question (Figure 1).

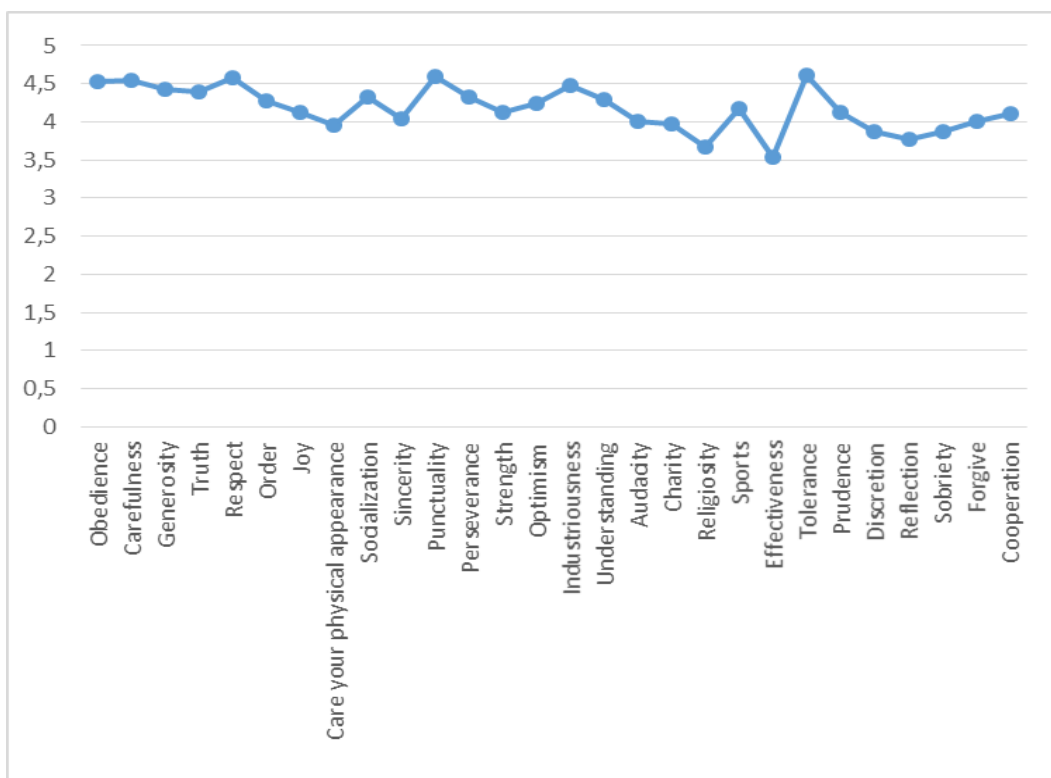


Figure 1. Overall average values, attitudes and skills in the subject of Computer Science

Statistical analysis based on the 28 items –values, attitudes and skills– also show the following results. 45.3% of participating teachers believe that they should always promote the values, attitudes and skills outlined above in the teaching of Computer Science and Technology, 34.2% that they should almost always be promoted, 13.1% only sometimes promoted, 4.7% said rarely and 1.6% that these values should never be promoted in the above subjects.

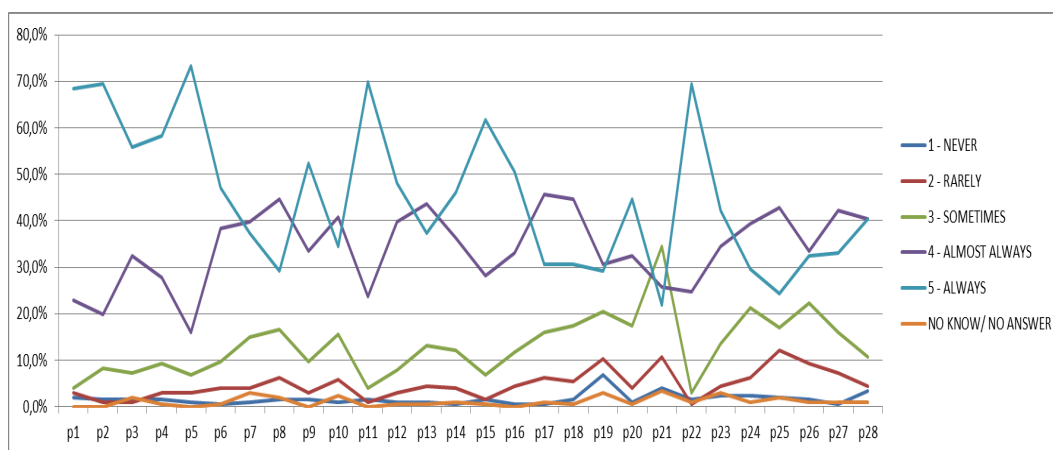


Figure 2. Average global percentage of values, attitudes and skills in the subjects of Computer Science and Technology

Furthermore, the percentage analysis shows that 73.3% of the teachers interviewed said that respect (p5) is the value that should be encouraged in classes of Computer Science and Technology, followed by punctuality (p11) (69.9%), carefulness (p2) (69, 4%) and tolerance (p22) (69.4%), while 6.8% of teachers believe religion and cooperation (p28) should never be promoted (p19) (3.4%). Similarly, the percentage results for effectiveness are surprising (p21), as 3.9% of participants believe that they should never encourage the teaching of this competence, 10.7% think only sometimes, 34.5% rarely, 25.7% almost always, and only 21.8% that it should always be encouraged.

In order to determine the validity of the indicators, the following analysis was carried out: average, variance, standard deviation and mode (Table 2) in order to facilitate the systematic elucidation of indicators and lead to a proper interpretation by determining as accurately as possible the characteristics and meanings represented by each of the 28 items.

Table 2. Results of descriptive statistics: variance, standard deviation and mode

	MEAN	VARIANCE	STANDARD DEVIATION	MIN	MAX	MODE
p1	4,53	0,73	0,86	1	5	5
p2	4,55	0,65	0,80	1	5	5
p3	4,43	0,63	0,79	1	5	5
p4	4,39	0,77	0,88	1	5	5
p5	4,58	0,67	0,82	1	5	5
p6	4,28	0,69	0,83	1	5	5
p7	4,12	0,78	0,88	1	5	4
p8	3,96	0,85	0,92	1	5	4
p9	4,33	0,76	0,87	1	5	5
p10	4,04	0,85	0,92	1	5	4
p11	4,60	0,55	0,74	1	5	4
p12	4,32	0,67	0,82	1	5	5
p13	4,13	0,75	0,87	1	5	4
p14	4,25	0,73	0,85	1	5	5
p15	4,48	0,65	0,81	1	5	5
p16	4,29	0,76	0,87	1	5	5
p17	4,00	0,77	0,88	1	5	4
p18	3,98	0,83	0,91	1	5	4
p19	3,67	1,45	1,20	1	5	4
p20	4,17	0,84	0,92	1	5	5
p21	3,53	1,16	1,08	1	5	3
p22	4,62	0,50	0,71	1	5	5
p23	4,13	0,96	0,98	1	5	5
p24	3,88	0,98	0,99	1	5	4
p25	3,77	1,04	1,02	1	5	4
p26	3,87	1,04	1,02	1	5	4
p27	4,01	0,83	0,91	1	5	4
p28	4,11	0,99	0,99	1	5	4

The standard deviation shows that religiosity (p19), efficacy (p21), reflection (p25) and sobriety (p26) are the attitudes that are furthest away from the mean, which is consistent with the variance values, where p19 = 1.45, p21 = 1.08, p 25 = p26 = 1.04 and 1.04. Meanwhile, mode shows that the most frequent and repeated value in the participating teachers responses is 5

(always) in the case of 14 values and attitudes, followed by the value of 4 (almost always) for 13 attitudes and 3 (sometimes), in the case of one competence (efficacy).

Based on the research results, the values in Computer Science teaching, according to participant teachers, have been categorized. The 28 items (values, attitudes and capabilities) have been ranked according to the average of each, that is according to the importance given to each value by those participating in the research. The average, ranked from highest to lowest, ranges between 4.69 maximum and 3.52 minimum. As a result of this procedure, the following table showing the hierarchy of values, attitudes and skills was obtained:

Table 3. Values, attitudes and skills averages

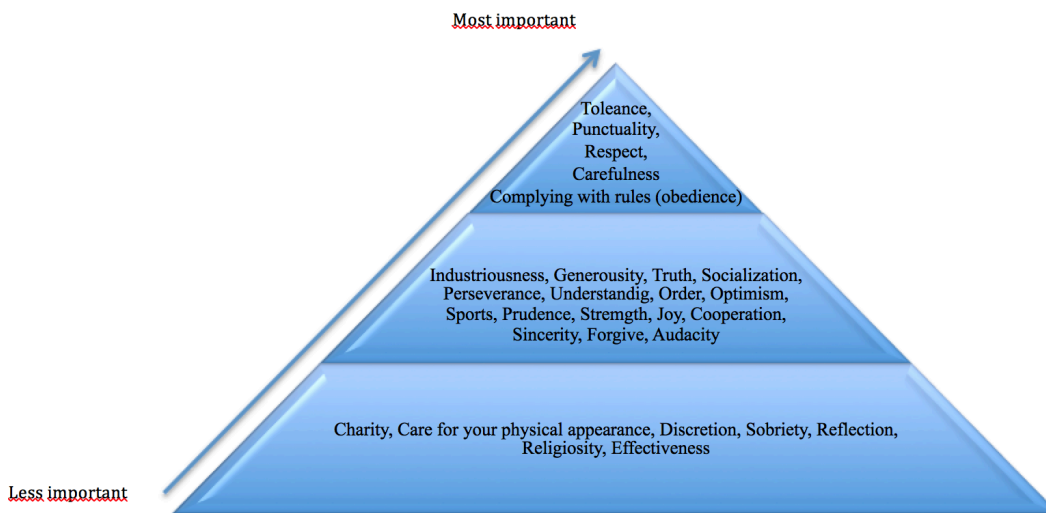
First group	Mean
Tolerance	4,62
Punctuality	4,60
Respect	4,58
Carefulness	4,55
Complying with rules (Obedience)	4,53
Second group	
Industriousness	4,48
Generosity	4,43
Truth	4,39
Socialization	4,33
Perseverance	4,32
Understanding	4,29
Order	4,28
Optimism	4,25
Sports	4,17
Prudence	4,13
Strength	4,13
Joy	4,12
Cooperation	4,11
Sincerity	4,04
Forgiveness	4,01
Audacity	4,00
Third group	
Charity	3,98
Care of physical appearance	3,96
Discretion	3,88
Sobriety	3,87
Reflection	3,77
Religiosity	3,67
Effectiveness	3,53

The first block, the average of which is between 4.62 and 4.53, contains the values, attitudes and skills with greater presence and which are valued more highly. Four personal values that correspond to the individual dimension are shown: punctuality, complying with rules and regulations, being careful and industriousness, and two social values, tolerance and respect for others.

In the second section there are thirteen individual values: generosity, truth, perseverance, optimism, order, strength, sincerity, joy, care of physical appearance, wisdom, beauty, courage, forgiveness, and three social values: socialization, understanding and cooperation. The mean ranges from 4.48 to 4.00.

In the third block there are six personal values: charity, sobriety, discretion, reflection, religion and effectiveness. The mean ranges from 3.98 to 3.53.

Consequently, clusters of values, attitudes and skills which could be integrated in the subject of Computer Science, Secondary Education, according to the participating teachers, could be represented in the following pyramid of values:



5. DISCUSSION AND CONCLUSIONS

Teacher belief systems are represented as a complex network of attitudes and values (Ertmer & Ottenbreit-Leftwich, 2010), which influence their practice (Richardson, 1996). Several researchers have argued this hypothesis; and Schofield (1995) suggests that a change in the teacher's role, in his philosophy and thought, could have an influence on the real integration of computers in the classroom. VanNatta & Fordham (2004) argue that teaching philosophy is a possible indicator of how the computer is used and Ertmer, et al. (2012) argues that the teaching of Information Technology in schools is in line with the beliefs of teachers. If the beliefs and values of teachers can be inferred from what they say, think and do (Rimm-Kaufman, Sawyer, 2004; Calderhead, 1996), knowing the opinions of the teachers of Computer Science and Technology on the values that should be integrated into the aforementioned subjects in Secondary Education would be a good way to know how, when and to what extent they are actually incorporated into their teaching. Consequently, a strategy for promoting the integration of values in the teaching of Computer Science could be the changing of teachers' beliefs on what kind of values, attitudes and skills should be promoted in the teaching of subjects related to technology.

The study shows that there are relationships between the percentage of teachers who prefer the integration of certain values, attitudes and skills in the teaching of the subject and the mean estimate assigned to these values. For example, 69.9% assigned to "punctuality", 4.60 points on average, 69.4% give an average value of 4.53 to complying with rules (Obedience). These results agree with the findings of Thornberg's research (2008) in the sense that teachers seem to give a great deal of importance to rules and regulations, given that they reduce education values to the teaching of these, and they seem to understand, implicitly, that the instilling of values consists in teaching objective truths that invite people to live obediently under the authority of others (Carr, 1993) and blindly obeying rules and regulations.

It also stands out that the values and skills which are least valued are "discretion" (3.8 on average) and "reflection" (3.7 on average), highlighted only by a small percentage of teachers (29.6% and 24.3%, respectively), and also that the least valued competence is "effectiveness" (21.8% and 3.5% on average). It is crucial to emphasize the development of the ability to "be discrete," especially as exposing the personal lives of children and adolescents through ICT seriously puts their personal safety in danger. We also agree with Barak (2006, p. 123) in that reflection and collaboration play a central role in learning technology and computing, allowing learners to learn from experience and construct their own knowledge (Jonassen, et al., 2000). Meanwhile, the reduced evaluation and presence of efficacy by teachers of Computer Science contradicts what experts say, those who assert that efficacy is technical capacity directly related to ICT, the primary use of which is to give quick and simple solutions to a problem or situation (Barak, 2005).

To sum up, only 45.3% of teachers participating in the study think that values should "always" be taught in Computer Science courses in Secondary Education and 54.7% of teachers think that the integration of values into their teaching is unimportant. This result is disturbing as the absence or incorrect choice of these could be the main cause of conflict and crises (Peiró, 2009, p. 100). When teaching, values are always a part of education, but the important thing is to select the most important values. Consequently, the question arises: What are the values, attitudes and skills that should be integrated in teaching Computer Science? According to our study, and to the detriment of the social aspect, individual attitudes and skills prevail as the highest averages mostly correspond to values such as punctuality, obedience, being careful, industriousness, generosity, veracity, perseverance, understanding, optimism, order, strength, sincerity, joy, care of your physical appearance, prudence, aesthetics and daring. While social skills such as cooperation, teamwork, togetherness and solidarity have a limited presence, which makes us feel that Computer Science teaching is based on encouraging individual values and capacities. These results are consistent with studies by Nakamura (2013) and Hofstede & Hofstede (2005) who conclude that individualism prevails in today's society and that young people who are highly exposed to ICTs risk becoming isolated and unable to act with solidarity since they focus only on themselves (Engelberg & Sjoberg, 2004; Kraut et al., 1998). Should there be a danger that information and communication technology might promote conflicting values (Mansell, 2010), it is crucial that schools, especially now that the family unit is weaker (Myer, et al., 2013), should be a true socializing agent, promoting both individual and social values that will serve as a guide to pupils. We therefore believe that Computer Science and Technology teaching could be more beneficial to the integral education of students, if we promote teaching and learning values that develop both dimensions of the learner personality, educating people to be autonomous and open to dialogue, as well as encouraging social participation based on critical reasoning, being open and respectful towards others. To achieve these objectives we would need to cultivate a range of skills in students such as autonomy, self-control, the ability to discuss, critical understanding, empathy and social skills, based on permanent reflective practice (Barak, 2006; Jonassen et al., 2000). Abilities and attitudes are criteria that can be selected and thus are related to the exercise of freedom (Sen, 1995). For this reason, each individual constructs their own value system and that system guides their behaviour.

In addition, we agree with Guthrie et al. (2004) and Hannafin and Foshay (2008). For them, new technologies must not only be used as a tool to increase academic performance, but also to help students develop attitudes and skills for learning about life (Bereiter & Scardamalia, 2006), for resolving conflicts and improving relationships. If they are not used for this, they may become an instrument of ideological manipulation (Nivala, 2009) or a simple tool to seek irrelevant information (De Pablos, 2007). In short, the incorporation of ITC in the teaching of Computing and Technology subjects involves opportunities and challenges related to the way it is currently used in today's society and its potential uses. This involves, in particular, the integration of values and skills in the everyday development of the contents of these subjects; i.e. in the curriculum and in the teaching of values as a conscious activity and as a daily reflective teaching practice.

If professional development programs not only incorporate the use of technology but also strategies focused on the development of values and attitudes, the teaching of Computer Science would be more holistic. It is therefore important to organise training activities for teachers to

strengthen the integration of values in ICT. The results obtained in this study allow us to suggest the urgent need to review the underlying assumptions of what is meant by a real integration of values in the teaching of Computer Science and Technology. Modules in which skills associated with ICTs are developed from a more human and social perspective, should be included in the continuous teacher training programmes for computer science teachers.

REFERENCES

- Barak, M. (2005). From order to disorder: the role of computer-based electronics projects on fostering of higher-order cognitive skills. *Computers & Education*, 45(2), 231–243.
- Barak, M. (2006). Instructional principles for fostering learning with ICT: teachers' perspectives as learners and instructors. *Education and Information Technologies*, 11(2), 121–135.
- Bereiter, C., & Scardamalia, M. (2006). Education for the knowledge age: design-centered models of teaching and instruction. In P. A. Alexander, & P. H. Winne (Eds.), *Handbook of Educational Psychology* (2nd ed). (pp. 695–713). Mahwah, NJ: Erlbaum.
- Bonvin, J. M., & Thelen, L. (2003). *Deliberative democracy and capabilities. The impact and significance of capability for voice*. Paper presented at the 3rd Conference on the Capability Approach, 7–9 November, Pavia.
- Calderhead, J. (1996). Teachers, beliefs, and knowledge. In D. C. Berliner, & R. C. Calfee (Eds.), *Handbook of Educational Psychology* (pp. 709–725). New York: Simon & Schuster.
- Clement, N. (2009). Perspectives from research and practice in values education. In T. Lovat, & R. Toomey, *Values Education and Quality Teaching* (pp. 13–25). Springer Netherlands.
- Carr, D. (1993). Moral values and the teacher: Beyond the paternal and the permissive. *Journal of Philosophy of Education*, 27, 193–207.
- Decreto 112/2007, de 20 de julio, del Consell, por el que se establece el currículo de la Educación Secundaria Obligatoria en la Comunitat Valenciana.
- De Pablos, J. (2007). Algunas reflexiones sobre las tecnologías digitales y su impacto a diferentes niveles sociales y educativos. En L. Aires, J. Azebedo, I. Gaspar, A. Teixeira, *Comunidades Virtuais de Aprendizagem e Identidades no Ensino Superior* (pp. 31–38). Lisboa: Universidade Aberta.
- Drèze, J., & Sen, A. (1995). *India: Economic Development and Social Opportunity*. Oxford: Oxford University Press.
- Eisenberg, M., Johnson, D., & Berkowitz, B. (2010). Information, communications, and technology (ICT) skills curriculum based on the Big6 skills approach to information problem-solving. *Library Media Connection*, 28(6), 24–27.
- Engelberg, E., & Sjoberg, L. (2004). Internet use, social skills, and adjustment. *CyberPsychology & Behavior*, 7, 41–47.
- Eppright, T., Allwood, M., Stern, B., & Theiss, T. (1999). Internet addiction: A new type of addiction? *Missouri Medicine*, 96(4), 133–136.
- Ertmer, P. A., & Ottenbreit-Leftwich, A. T. (2010). Teacher technology change: how knowledge, beliefs, and culture intersect. *Journal of Research on Technology in Education*, 42(3), 255–284.
- Ertmer, P. A., Ottenbreit-Leftwich, A. T., Sadik, O., Sendurur, E., & Sendurur, P. (2012). Teacher beliefs and technology integration practices: A critical relationship. *Computers & Education*, 59(2), 423–435.
- Farell, G. E. (2012). Formación de valores mediante las tecnologías de la información y las comunicaciones. *Revista Cubana de Informática Médica*, 4(2), 154–160.
- Fernández, I. M. S., Calatayud, V. G., Vicent, P. L. (2013). Adolescentes y comunicación: las TIC como recurso para la interacción social en educación secundaria. *Pixel-Bit: Revista de Medios y Educación*, 42, 23–35.
- Gaspar, D. (2002). Is Sen's capability approach an adequate basis for considering human development? *Review of Political Economy*, 14(4), 435–461.
- Grünberg, L. (2000). *The Mystery of Values: Studies in Axiology* (Vol. 95). Rodopi.

- Guthrie, J. T., Wigfield, A., Barbosa, P., Perencevich, K. C., Taboada, A., Davis, M. H., Safiddi, N. T., & Tonks, S. (2004). Increasing reading comprehension and engagement through concept-oriented reading instruction. *Journal of Educational Psychology, 96*, 403–423.
- Hannafin, R. D., & Foshay, W. R. (2008). Computer-based instruction's (CBI) rediscovered role in K-12: An evaluation case study of one high school's use of CBI to improve pass rates on high-stakes tests. *Educational Technology Research and Development, 56* (2), 147–160.
- Hofstede, G., & Hofstede, G. J. (2005). *Cultures and Organizations: Software of the Mind*, 2nd ed. NY: McGraw-Hill.
- Hokanson, B., & Hooper, S. (2000). Computers as cognitive media: examining the potential of computers in education. *Computers in Human Behavior, 16*(5), 537–552.
- Jonassen, D. (1999). Designing constructivist learning environments. In C. Reigeluth (Ed.), *Instructional Design Theories & Models. Vol. 2: A new paradigm of instructional theory* (pp. 215–236). Nueva Jersey: Lawrence Erlbaum Associates.
- Jonassen, D., Peck, K., & Wilson, B. (2000). *Learning with Technology: A Constructivist Approach*. Prentice Hall: Upper Saddle River, NJ.
- Kaltiala-Heino, R., Lintonen, T., & Rimpelä, A. (2004). Internet addiction? Potentially problematic use of the Internet in a population of 12-18 year-old adolescents. *Addiction Research & Theory, 12*(1), 89–96.
- Kohlberg, L., & Candee, D. (1984). The relationship of moral judgment to moral action. In L. Kohlberg (Ed.), *Essays on Moral Development: The Philosophy of Moral Development Vol. 2* (pp. 498–581). San Francisco, CA: Harper and Row.
- Kraut, R., Patterson, M., Lundmark, V., Kiesler, S., Mukopadhyay, T., & Scherlis, W. (1998). Internet paradox: A social technology that reduces social involvement and psychological well-being? *American Psychologist, 53*, 1017–1031.
- Lovat, T. J. (2010). Synergies and balance between values education and quality teaching. *Educational Philosophy and Theory, 42*(4), 489–500.
- Malo, S. (2006). Impacto del teléfono móvil en la vida de los adolescentes entre 12 y 16 años. *Comunicar, 27*, 31.
- Mansell, R. (2010). The information society and ICT policy: a critique of the mainstream vision and an alternative research framework. *Journal of Information, Communication and Ethics in Society, 8*(1), 22–41.
- Miczka, T. (2013). Conception of Integral Person as Basis of Education in the 21st Century. *Journal of Educational and Social Research, 3*(7), 334.
- Mooij, T., & Smeets, E. (2001). Modelling and supporting ICT implementation in secondary schools. *Computers & Education, 36*(3), 265–281.
- Morahan-Martin, J., & Schumacher, P. (2000). Incidence and correlates of pathological Internet use among college students. *Computers in Human Behavior, 16*, 13–29.
- Myer, R. A., Williams, R. C., Haley, M., Brownfield, J. N., McNicols, K. B., & Pribozie, N. (2013). Crisis Intervention With Families: Assessing Changes in Family Characteristics. *The Family Journal, 1066480713513551*, 1–8.
- Nakamura, Y. (2013). Consideration on American individualism II: Individualism transformed and its subsequent impasse. *Bulletin of Keiwa College, 22*, 31–41.
- Nivala, M. (2009). Simple answers for complex problems: education and ICT in Finnish information society strategies. *Media, Culture & Society, 31*(3), 433–448.
- Nussbaum, M. C. (2000). *Women and Human Development: The Capabilities Approach*. Cambridge: Cambridge University Press.
- OECD (2001). *Learning to Change: ICT in Schools*. Paris.
- O'Neil, O. (2000). *Bounds of Justice*. Cambridge: Cambridge University Press.
- Otto, H. U., & Ziegler, H. (2006). Capabilities and education. *Social Work & Society, 4*(2), 269–287.
- Peiró, S. (2000). *Educación en Función de los Valores: Fundamentos, Teorías, Estrategias y Planteamiento para Efectuar Investigación en la Acción*. España: Universidad de Alicante.
- Peiró, S. (2009). *Valores Educativos y Convivencia*. España: ECU.

- Peiró, S., & Merma, G. (2011). Una mirada crítica a las repercusiones de la televisión en la educación. *Polis*, 10(29), 413–432.
- Pelgrum, W. J. (2001). Obstacles to the integration of ICT in education: results from a worldwide educational assessment. *Computers & Education*, 37, 163–178.
- Punch K. F. (2013). *Introduction to Social Research: Quantitative and Qualitative Approaches*. Sage.
- Richardson, V. (1996). The role of attitudes and beliefs in learning to teach. In J. Sikula (Ed.), *Handbook of Research on Teacher Education* (pp. 102–119). New York: Simon Schuster/Macmillan.
- Rideout V. J., Foehr, U. G., & Roberts, D. F. (2010). *Generation M2. Media in the Lives of 8- to 18-Year Olds*. A Kaiser Family Foundation Study.
- Rimm-Kaufman, S. E., & Sawyer, B. E. (2004). Primary-grade teachers' self-efficacy beliefs, attitudes toward teaching, and discipline and teaching practice priorities in relation to the "responsive classroom" approach. *The Elementary School Journal*, 321–341.
- Robeyns, I. (2005). *The capability approach and welfare policies*. Paper presented at the conference on gender auditing and gender budgeting Bologna, January 2005.
- Rothenberg, D. (1997). How the web destroys the quality of student's research papers. *The Chronicle of Higher Education*, 43(49), A44.
- Salomon, G., Perkins, D. N., & Globerson, T. (1991). Partners in cognition: Extending human intelligence with intelligent technologies. *Educational Researcher*, 20(3), 2–9.
- Schofield, J. (1995). *Computers and Classroom Culture*. Cambridge: Cambridge University Press.
- Sen, A. K. (1987). The Standard of Living. Cambridge: Cambridge University Press.
- Sen, A. K. (1990). Gender and cooperative conflict. In I. Tinker (Ed.), *Persistent Inequalities* (pp. 123–149). New York: Oxford University Press.
- Sen, A. K. (1995). Gender, inequality and theories of justice. In M. Nussbaum and J. Glover (Eds.), *Women, Culture and Development: A Study of Human Capabilities* (pp. 259–273). Oxford: Clarendon Press.
- Subrahmanyam, K., & Greenfield, P. (2008). Online communication and adolescent relationships. *The Future of Children*, 18(1), 119–146.
- Susman, E. B. (1998). Cooperative learning: A review of factors that increase the effectiveness of cooperative computer-based instruction. *Journal of Educational Computing Research*, 18(4), 303–322.
- Thornberg, R. (2008). The lack of professional knowledge in values education. *Teaching and Teacher Education*, 24(7), 1791–1798.
- Valkenburg, P. M., Peter, J., & Schouten, A. P. (2006). Friend networking sites and their relationship to adolescents' well-being and social self-esteem. *CyberPsychology & Behavior*, 9(5), 584–590.
- Vannatta, R. A., & Fordham, N. (2004). Teacher dispositions as predictors of classroom technology use. *Journal of Research on Technology in Education*, 36, 253–271.