

## Soft Skills: a comparative analysis between online and classroom teaching

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**Abstract.** Currently the Spanish universities are making a great effort to effectively incorporate the development and assessment of generic skills in their training programs. Information and communications technologies (ICT) offer a wide range of possibilities but create uncertainty among teachers about the process and results. It is considered of interest to conduct a study to analyze the extent to which social skills like commitment, communication and teamwork are acquired by students and teachers. It seeks to ascertain the influence of the learning context, online or classroom training, in the development of these personal skills among the participants in the sample. For this study two universities have been chosen, Universidad a Distancia de Madrid (UDIMA) offering online training environment, and Universidad Politécnica de Madrid (UPM) with classroom training modality. A total of 257 individuals, 230 students and 27 teachers have answered the survey called Evalsoft. This instrument was designed in the project with the same name by a research team from Universidad Complutense of Madrid (UCM). Some interesting conclusions can be highlighted: it is in the online context where there are higher levels of commitment and teamwork than in the classroom modality; teachers have higher social skills than students and these improve with age. Sex and the training program appear to influence these social skills.

### Introduction

In the educational context of Bologna, skills training is a commitment to educational quality, a task entrusted to teachers, which currently is yet to materialize in many universities and degrees [1,2]. From a constructivist perspective, the skills are not an educational model themselves but an approach to education for life and professional performance quality [3,4]. A driver of change is presented with the integration of Information Technology and Communication (ICT), due to the breakdown of the space and time barriers and the providing of opportunities for information, communication and training. The growing demand for virtual higher education induces skeptical reactions related to its assessment; most people believe that On-Line training is not as good as the one offered on-campus [5]. On-Line learning, as per [1], is marked by two very different perspectives: individual and cooperative. According to [6], e-learning is defined as the "combination of an electronic element, typically a computer, and a learning technique" for the development of new knowledge or skills, individually or collaboratively.

For higher education institutions is crucial to assess the skills and guide the university graduates to the requirements for the jobs [7]. Through European project Reflex (2008), the graduates value the University against their competence education. Within interpersonal skills, teamwork, ethic

commitment and interactive capability are especially important [8,9]. However, there are critics against the excessive use of the ICT in the educational field, trend known as techpositivism [10,11,12]. The mentioned authors declare that the ICT integration has been limited to a digitalization of the materials; without being accompanied with the needed tools for an On-Line environment, such as interactivity, critical analysis merged with a deep thinking and practice experience. This review is shown in On-Line quality surveys. [11] Consider that the virtual format does not allow a complete combination of behaviour and environment, because of the nature of the competences itself. The On-Line context is limited by the “impossibility of a fluent talk and the lack of personal and direct contact with professors and classmates”, therefore, a blended learning is recommended; traditional education with On-Line support because, from their experience, the competences development in E-Learning environments is a very complex task.

Research studies on E-Learning show that the conventional organization methods used in traditional teams do not necessarily produce the same benefits in a virtual context [13,14,15,16]. On the other hand, lots of research works take their conclusions out of results obtained after the application of in situ educational strategies in On-Line contexts [17]. To [18], the integration of the ICT with a traditional methodology features learning results similar in terms of specific competences development, and better results related to motivation and problem solving within the traditional education. In this framework, some authors say that one of the conditions that makes “cooperative learning to result in better achievements, it is a face-to-face action” [19]. How the learning context influences in the acquisition and development of the following competences: teamwork, commitment and communication? Can these competences been learnt and completely developed in an E-Learning context? How do teachers and classmates evaluate these competences?

The investigation tries to know the assessments of the principal authors in the situation of a learning experience of interpersonal competences (teamwork, commitment and communication); doing the comparative analysis of it within a virtual context and a traditional one, making sure that the results will not be systematically generalized to all kind of contexts, knowing areas or any kind of student, but that they will be properly used to validate the work’s hypothesis; being the hypothesis to valuate if a greater use of the ICT will obtain a better grade of acquisition and development of the mentioned competences or not. According to [20], it can be affirmed that it is necessary to know and evaluate the effectiveness of the ICT, because its correct use is of vital importance for teachers and students [21]. The increment of the auto evaluation of competences in higher education centers can be justified from this perspective.

The validity of the self-evaluation, referring to the acquisition and development of competences, is demonstrated by [22]; for them, the error in the measurements of self-reports done to some students “did not severely limit its validity”. Conclusion reached by other authors like [2,7]; who maintain that a good method to obtain information of the competences level of the university graduates is its own auto-evaluation. Based on the self-evaluation, a tool named EvalSoft [23] is selected in order to make the research study with the objective of valuate the interpersonal competences of commitment, communication and teamwork.

## **Methodology**

The current study is part of the analytical-descriptive methods. The selection of this design has been motivated for the comparative objectives more than casuals [24]. This survey is classified among the transversal designs, because it contains information from a unique temporal milestone that in this case, refers to the closure of the academic year 2012-2013.

In addition, a questionnaire related to tools and techniques used in the development of competences and making different between the ones used in an On-Line context or in a traditional one. The frequency of the used of these tools and techniques is also measured by this questionnaire. Lastly, identity variables are put into the study; variables that are considered influential in the potential assessments of the participants. These variables collect the classification data: professors or

students or both categories, gender, age and permanence time in the virtual environment or in the traditional one.

### Instrument

The tool is used for the data collection which is made through the three questionnaires: 1) Commitment is evaluated using the Likert scale of four elements and with two dimensions: social/group compromise and ethic commitment. 2) Communication is composed by thirteen items evaluated using the Likert scale, with peer assessment. The structure is formed by four dimensions: “Expressive Skills”, “Interactive Component” (relation, motivation), “Flexibility” and “Metacognitive Part”. 3) Teamwork is composed as a “semantic differential” with ten levels. It is structured in six dimensions: “Participatory attendance to group meetings”, “Brainstorming”, “Contribution to cooperative group processes”, “Support and encouragement to group members” and “Consensus and acceptance of the rules for the operation of the team”.

Lastly, the identification data block, which includes the variables of age, gender and years of traditional/On-Line education, is presented. The display order seeks to improve the honesty in answering [25]. Therefore, the first block performs a self-assessment of the commitment competence as an introduction; the following questionnaire is the one of the communication, in which the participant values the group interaction of his colleagues and, finally, the self-evaluation related to teamwork. The identification data will be place at the end to encourage spontaneity of responses.

### Descriptive Analysis of the sample

The sample consists of 257 participants, of which 10,50% (27 participants) are teachers, 74,32% are students (191 participants) and 15,18% (39 participants) corresponds to students whose professional activity is teaching. Distribution of the participants according to the field of knowledge is shown in the following graphic:

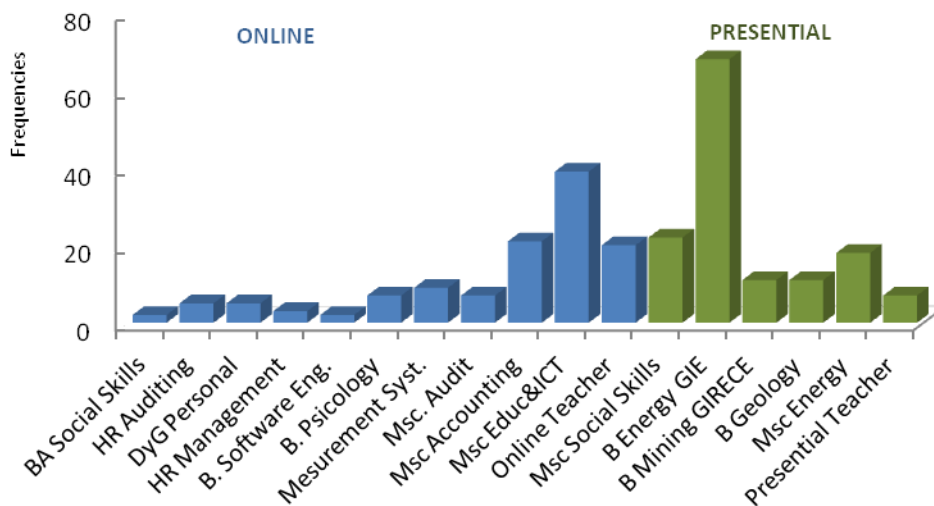


Figure 1. Histogram of knowledge areas.

The age average is 28,8 years with a mode of 19, which means that the most of the grade students are on first years (3rd and 4th terms, 2nd year of the degree). The age range is wide (min. 18 yrs – max. 59 yrs) because there are teachers that are students of master at the same time.

### Main results and discussion

The average of the items of each questionnaire is made in order to obtain a unique value which represents the evaluation of each competence of study. Comparison values IndAi (commitment)

according to learning methodology (On-Line = OnL, Presential = Pres). It observes that in On-Line environment there are higher levels of commitment and teamwork than in the classroom modality. The descriptive analysis provides the summary of value shown in table 1.

Table 1. Descriptive summary of the competence: Commitment according to educational modality.

Type	# surveys	Media	Median	Std. Deviation	Coef. Variation	Std. Asimetr y	Std. Kurtosis
OnL	100	3,73	3,83	0,37	9,93%	-12,81	34,28
Pres	130	3,46	3,50	0,43	12,34%	-3,87	3,12

Both data groups have the standardized coefficients of asymmetry and Kurtosis beyond the normal range. Figure 2 shows the asymmetry to the right of both data groups.

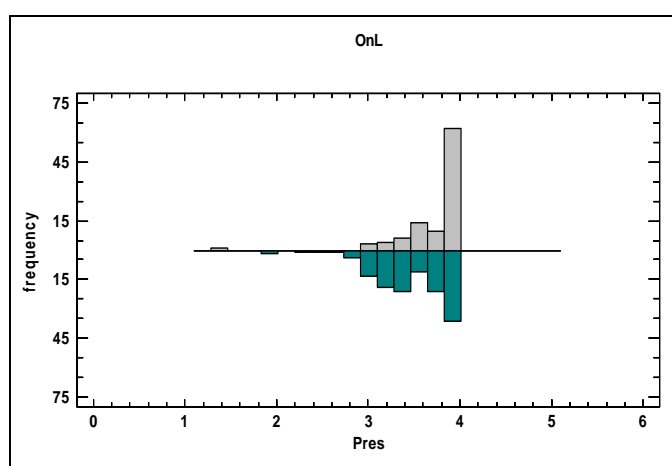


Figure 2. Histogram of the competence commitment in both online and presential contexts.

The graphic highlights the maximum values for the assessment “totally agree” that correspond to the value 4 of the horizontal axis. The columns group the obtained data (competence: Commitment) and allow us to appreciate a greater distribution of values (from 4 to 1) in classroom context, green bars, against On-Line environment, grey bars, in which it can be clearly seen, the concentration in the maximum value (4).

Both Mann-Whitney (Wilcoxon) median equality test and the distribution comparison one of Kolmogorov-Smirnov, shows a signification  $p-v < 0,01$ , therefore, the significant differences between both groups, in this dimension, must be admitted; being the higher the commitment of the On-Line group.

Dispersions do not show any differences in the graphic. In this event, it is inadequate to do the F test of equality of variances because of the lack of normality.

Due to its interest, results obtained through the self-evaluation of the competence of Commitment are compared to results from the competence of Teamwork (IndCi), according to educational methodology (On-Line = OnL, Presential = Pres) (Table 2):

Table 2. Summary of statistics of IndCi (Teamwork) according to educational methodology.

Type	Number	Media	Std. Deviation	Coef. Variation
OnL	100	2,6116	0,863122	33,05%
Pres	130	2,27385	0,82039	36,08%

At the graphic of boxes, it can be seen a higher assessment of this competence by the On-Line participants rather than the one given by the participants of the classroom method (Figure 3).

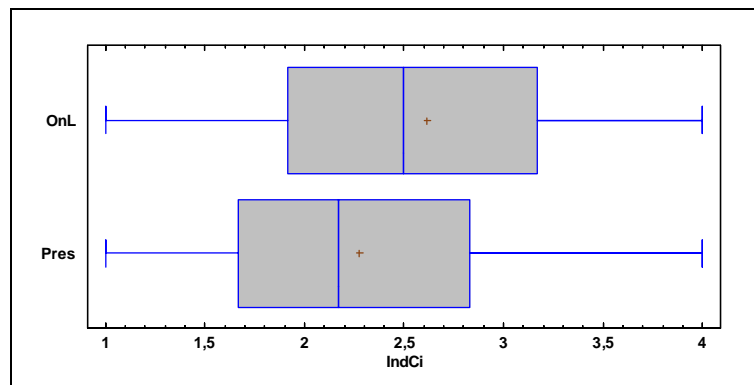


Figure 3. Boxes IndCi (Teamwork) according to educational Methodology.

For both values groups, normality and variance can be equally considered (test F,  $p-v > 0, 1$ ); therefore, the medias' difference of t test would be chosen in this case. Its  $p-v = 0, 00276458$  rejects the medias equity by 99%.

There are significant differences in the assessment of this competence with a higher punctuation by the On-Line students.

When comparing the groups of teachers and students, who also work in the educational field, to the rest of students, the results are higher in the first group than in the second; which means that there is a stronger compromise among professors than students. According to [14], the commitment to the group and to the task is essential; it is closely related to the achievement of the objectives and the satisfaction of the group members [26,27].

If we observe the behaviour of the age variable in the results, it can be stated that, according to [28], it influences in the self-perception of the compromise with the colleagues and with the task, reporting higher values as higher is the age and the other way around. Regarding the gender, women assess their competence Commitment with higher values than men, which is consistent with the collected investigations in the meta-analysis of [14]; these investigations state that there is a greater cohesion and engagement of themselves.

Secondly, the results obtained from the competence Social Skills are analyzed by grouping all items Bi in a way that an analysis of the global marks, referring to the three groups of participants, can be made in an IndBi average.

A comparison among the following groups of participants takes place: students, student-teacher and teachers; On-Line methodology versus traditional education and taking into account the relation with the age and the gender too.

The Lèvene test, to compare variances, allows not to reject the equality ( $p-v=0,662685$ ), to accept the normality (because of the standardized values for asymmetry and kurtosis) therefore, in this case, a test ANOVA with  $p-v < 0, 01$  has been done; this test shows the most significant differences among groups. The comparison of variances of values of age's groups (Ind\_Edad) does not indicate any significant difference at 95% according to Lèvene test ( $p-v = 0, 09$ ), but by pairs, F test (Fisher) identifies differences between the 22-years-old group versus the 55-years-old one; and this last one against the 33-years-old one, taking  $p-values < 0, 01$  (Table 3).

Table 3. Comparison of Variances according Ind\_Edad.

	Test	P-Value
Lèvene	2,15245	0,0941492

Comparison	Sigma1	Sigma2	F-Ratio	P-Value
22 / 33	0,400405	0,393453	1,03565	0,8844
22 / 44	0,400405	0,496148	0,651294	0,0763
22 / 55	0,400405	0,685708	0,340973	0,0066
33 / 44	0,393453	0,496148	0,628875	0,0911
33 / 55	0,393453	0,685708	0,329236	0,0080
44 / 55	0,496148	0,685708	0,523532	0,1584

The comparison of the age groups at this table proves the null hypothesis, which says that, the standard deviations within each of the groups (22, 33, 44, 55) of the four columns, show identical results. Especially interesting is the p-value because it is greater or equal to 0,05; there is no a statistically significant difference among the standard deviations for a trusty level of 95%.

The table, also, shows a comparison of the standard deviations for each pair of samples.

There are two values of p below 0,05, which means there is a statistically significant difference between the two sigmas for a trusty level of 5%.

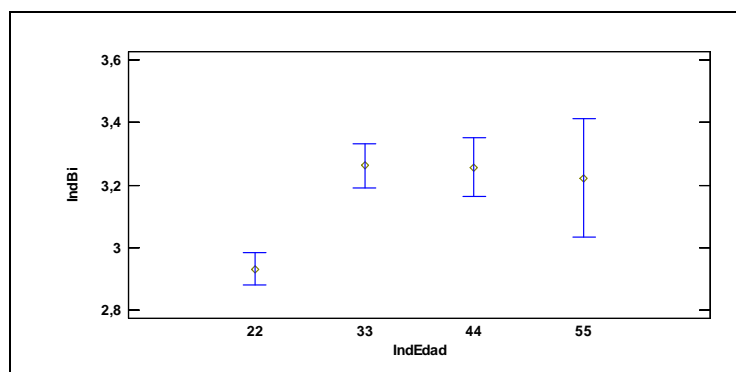


Figure 4. Ranges by method LSD at 95% for averages of IndBi groups according to their age.

The range multiple test detects significant differences between the pairs (Figure 4). There are differences in terms of the assessment of the competence Communication; the colleagues clearly manifest according to the generation they belong to: younger participants evaluate as worst this competence while older ones, do not. In most of the occasions, in the virtual context, the communication is written; hence it has to be reviewed and rethought in order to be clear, precise and specific. There is the possibility that variables as age and context, influence in the obtained result.

## Conclusions

It can be evidenced and concluded that ICT are suitable tools for the acquisition and development of the competences. Commitment is higher among teachers than students; this value is in direct relation to the age and, even, to the gender. Older people have more commitment and responsibility. Results show greater engagement to the task and colleagues from women. Communication presents the higher values among teachers, which is consistent to the fact that it is an essential part of the professional profile of the teacher. Comparing the educational contexts, On-Line participants are more compromised with the use and communication in the virtual class than the participants of presential classroom method. Following the same line, age directly influences into the expressive capacity, which allows us to state that the virtual educational methodology has the characteristic of decrease the visual and non-verbal signs, and it requires a high grade of reflexion. Teamwork is characterized by the interaction and knowledge transmission in order to create a collaborative setting that, in the actual study, reaches higher values in On-Line educational methodology and lower in classroom method.

Bologna Agreements' integration means a long term transformation. On-Line education has a grade of flexibility which converts it in the suitable tool to improve in competences; and at the same

time, it is through this context that the student realizes, with more intensity, the need of take charge of his apprenticeship. The On-Line educational context, while in use of the ICT, is positively related to the acquisition and development of the interpersonal skills. There is the need to deeply study the instructional designs in order to obtain the best results in terms of competences. The gender differences in the competences: Commitment and Teamwork, with higher values among feminine sex, advise to continue with this investigation line.

## References

- [1] J. Cabero et al. Aportaciones al e-learning desde un estudio de buenas prácticas en las universidades andaluzas. *Revista de Universidad y Sociedad del Conocimiento (RUSC)*, Barcelona 2013, Vol. 10 (1) pp. 45-60.
- [2] X.M. Triado, P. Aparicio-Chueca, A. Elasmiri-Ejjaberi. La evaluación de competencias en la Educación Superior: el caso de un máster universitario. *REIRE, Revista d'Innovació i Recerca en Educació*, Barcelona 2013, Vol. 6 (1), pp. 34-52.
- [3] C. Coll. Las competencias en la educación escolar: algo más que una moda y mucho menos que un remedio. *Aula de innovación educativa*, Madrid 2007, Vol. 161, pp. 34-39.
- [4] A. Tiana. Análisis de las competencias básicas como núcleo curricular en la educación obligatoria española. *Bordón. Revista de pedagogía*, Madrid 2011, Vol. 63(1), pp. 63-75.
- [5] P. Taylor et al. *The Digital Revolution and Higher Education: College Presidents, Public Differences on Value of Online Learning*. Social, P., & Trends, D., Washington D.C., 2011, pp. 11-20.
- [6] G.Z. Liu, G.J. Hwang. A key step to understanding paradigm shifts in e-learning: towards context-aware ubiquitous learning. *British Journal of Educational Technology*, London 2010, Vol. 41(2), pp.1-9.
- [7] J.M. Carot, A.C. Peiro, J.G. Ruiz, L. Lladosa. La opinión de los graduados europeos sobre la universidad cinco años después de haber finalizado sus estudios. *Revista de Sociología*, Madrid 2011, Vol.96, pp. 1269-1285.
- [8] J. González, R. Wagenaar. *Tuning Educational Structures in Europe. Final Report. Phase One*. Universidad Deusto, Bilbao 2003, retrieved 15-04-2013 <http://www.relint.deusto.es/TUNINGProject>
- [9] M. Montero. El proceso de Bolonia y las nuevas competencias. *Tejuelo: Didáctica de la Lengua y la Literatura. Educación*, Badajoz 2010, Vol. 9, pp. 19-37.
- [10] J. Njenga, L. Fourie. The myths about e - learning in higher education. *British Journal of Educational Technology*, London 2010, Vol. 41 (2), pp. 199-212.
- [11] V. Arranz, D. Aguado. Blended Learning for competency development: A descriptive analysis. *Pixel-Bit: Revista de medios y educación*, España 2005, Vol. 24, pp. 79-88.
- [12] J. Nicholson, D. Nicholson, J. Valacich. Examining the effects of technology attributes on learning: a contingency perspective. *Journal of Information Technology Education: Research*, California 2008, Vol.7 (1), pp. 184-204.
- [13] O.B. Ayoko, A.M. Konrad, M.V. Boyle. Online work: Managing conflict and emotions for performance in virtual teams. *European Management Journal*, Australia 2012, Vol. 30(2), pp. 156-174.
- [14] L.L. Martins, L.L. Gilson, M.T. Maynard. Virtual teams: What do we know and where do we go from here? *Journal of management*, Texas 2004, Vol. 30 (6), pp. 805-835.

- [15] K.K. Merriman, S.M. Schmidt, D. Dunlap-Hinkler. Profiling Virtual Employees The Impact of Managing Virtually. *Journal of Leadership & Organizational Studies*, Texas 2007, Vol. 14(1), pp. 6-15.
- [16] R.K. Purvanova, J.E. Bono. Transformational leadership in context: Face-to-face and virtual teams. *The Leadership Quarterly*, Texas 2009, Vol. 20(3), pp. 343-357.
- [17] C. Cogliser et al. Not all group Exchange structures are created equal; effects of forms and levels of Exchange on work outcomes in virtual teams. *Journal of Leadership & Organizational Studies*, Texas 2013, Vol. 20, pp. 242.
- [18] H. Alvarez. Análisis comparativo del desarrollo de competencias conceptuales, procedimentales y actitudinales en la modalidad presencial y virtual del curso de fundamentación de la formación profesional integral. Universidad Sena Colombia, Bogotá 2013.
- [19] D.W. Johnson, R.T. Johnson, E.J. Holubec. El aprendizaje cooperativo en el aula. Paidós, Buenos Aires 1999, pp. 55-165.
- [20] E. Viles, M. Zarraga-Rodríguez, C. Jaca. Herramienta para evaluar el funcionamiento de los equipos de trabajo en entornos docentes. *Intangible Capital*, Barcelona 2013, Vol. 9(1), pp. 281-304 – Publicación online ISSN: 1697-9818 – Print ISSN: 2014-3214 <http://dx.doi.org/10.3926/ic.399>
- [21] A. Landeta. Nuevas tendencias de e-Learning y Actividades Didácticas innovadoras. Cuadernos de la Universidad Nacional Autónoma, México 2010, disponible el 24-05-2013 en <http://repositorial.cuaed.unam.mx:8080/jspui/bitstream>
- [22] R. Lucas, B. Baird. Global self assessment, *Handbook of psychological measurement: A multimethod perspective*, M. Eid & E. Diener, Washington D.C. 2006, pp. 29–42.
- [23] P. Sancho Thomas, M. García García, CH. Biencinto López, E. Carpintero Molina, C. Núñez Del Rio, E. Expósito Casas, Y.A. Ruiz Morales. Enhancing Moodle to Evaluate Softskills in Problem Based Learning Approaches. *Experiencias innovadoras en la era digital*. Bubok Publishing S.L, Cádiz 2001, pp. 120-131.
- [24] R. Bisquerra et al. *Metodología de la Investigación Educativa*. La Muralla, Madrid 2012, pp. 235-245.
- [25] J. Casas, J.R. Repullo, J. Donado. La encuesta como técnica de investigación. *Elaboración de cuestionarios y tratamiento estadístico de los datos*. Atención primaria, Madrid 2003, Vol. 31 (8), pp. 527-538.
- [26] M.G. González, M.J. Burke, A.M. Santuzzi, J.C. Bradley. The impact of group process variables on the effectiveness of distance collaboration groups. *Computers in Human Behavior*, Eagan 2003, Vol. 19 (5), pp. 629-648.
- [27] P. Aceituno Aceituno, La evaluación de competencias en el trabajo en grupo de aulas universitarias on-line: un estudio aplicado a la asignatura de organización de empresas. Proyecto ADA-Madrid: *Experiencias en Evaluación e-learning*. Madrid 2010. Retrieved 07-07-2013 en [http://moodle.upm.es/adamadrid/file.php/1/web\\_VII\\_jornadas\\_ADA/ponencias\\_virt.html](http://moodle.upm.es/adamadrid/file.php/1/web_VII_jornadas_ADA/ponencias_virt.html)
- [28] G.E. Kennedy, T.S. Judd, A. Churchwarg, K. Gray, K. Drause. First year students' experiences with technology: Are they really digital natives. *Australasian Journal of Educational Technology*, Australia 2008, Vol. 24(1), pp. 108-122.