Transmedia, learning and gender in the context of Italian *licei classici*

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Abstract

This paper analyses the digital profile of Italian Licei Classici students in terms of gender, focusing on the competences required by transmedia learning strategies. To this end, a quantitative methodology is applied to 400 adolescents, based on a questionnaire composed of indicators in the field of new media literacy. Italian adolescents show positive digital skills and attitudes towards transmedia, higher than the reference values for each indicator; moreover, in terms of gender, the traditional differences are generally neutralised (and even women show higher values than men). From the point of view of transmedia learning (adaptable, flexible and not technically demanding), the values in which women are better versed (information skills and transmedia navigation) mean that learning opportunities are more favourable to them. Therefore, the context of licei classici can not only host transmedia learning experiences, but there transmedia learning can also be a proposal against the traditional gender digital divide.

Keywords

transmedia; media education; gender divide; digital skills; transmedia learning.

Introduction

The first article of the Declaration of Human Rights affirms that all human beings are born free and equal in rights and dignity. However, the reality is far from such a declaration and is not so simple. Especially with regard to gender, numerous studies and reports show that there are striking differences in several directions. For example, the General Labour Organisation (2019) points out that women in the 21st century still face difficulties in accessing both the labour market and managerial positions. In addition, women are often disadvantaged in the labour market due to factors such as caring or having children.

In the labour market described above, and more specifically in STEM (Science, Technology, Engineering and Mathematics), women are also not equally represented, as it is a male-dominated market. In contrast, the male profile prioritises goals that are aligned with success (Sáinz et al. 2017). The low presence of women in the technological work context and in their respective university studies can be partly explained by social constructions (including educational ones) and ultimately directly affect the self-perception of women in STEM fields (Bian et al., 2017). Indeed, this can already be observed in secondary education, where students show differences in their attitudes towards the use of digital technologies: boys tend to view their technological skills more positively than girls. In contrast, young women at this age have a lower self-image of their technological skills (Colley and Comber, 2003). The PISA report shows that there is already a gender gap at the age of 15 in Europe in general and in Italy in particular (OECD, 2015). One of the main pillars for tackling these inequalities is

education, which must work to increase the number of women who have access to and take up training in science and technology (Antoninis, 2020), and which must also offer them the opportunity to develop along the paths they freely choose (and also the ones they are most comfortable with).

Moreover, the challenge of gender equality has become more evident than ever at a time when access to technology and the development of digital skills are essential to remain integrated and part of 21st century society (OECD, 2017). A society in which culture has become participatory (Jenkins, 2006) and is not only consumed but also produced collaboratively, breaking down the barriers between the formal and the informal (Buonauro and Domenici, 2020). Furthermore, all the information presented above, together with the situation arising from COVID-19, has highlighted the importance of the appropriate use of digital technologies (Pew Research Center, 2020). Consequently, in this digitised context of media convergence, transmedia learning can be beneficial to the extent that it blurs the boundary between the formal and the informal, to show that citizenship is exercised by participating, consuming and producing information both digitally and analogously (González-Martínez et al., 2018). In other words, transmedia learning can be defined as learning with socio-constructivist and connectivist roots that leads participants to the construction and consumption of a collective history (Dickinson-Delaporte et al., 2020; Fleming, 2013). It is precisely because of this flexible and dynamic component, linked to the digital but not particularly technical, that transmedia learning can be an opportunity from the point of view of universal learning design (Alba Pastor, 2016), and it can be an opportunity for students.

For this reason, this study aims to understand the profile and digital skills of Italian *licei classici* students in terms of gender, with a focus on the potential of transmedia.

Conceptual framework

Gendering digital technologies

As we have seen, when the issue of technology is approached from a gender perspective, there are usually two main axes that underpin the debate. On the one hand, there is the difference in digital competence (DC) itself, as various studies show that it is women who tend to have a lower level of development compared to men, at least from a self-perceived perspective (De Moya et al., 2011; Prendes et al., 2019).

On the other hand, there is a more structural and communal issue, which has to do with the fact that most men still dominate scientific and technical studies, especially in the STEM field (Stoet & Geary, 2018). Furthermore, this fact is directly transferred to the labour market, as most positions are filled by men, especially in positions of responsibility (International Labour Organization, 2019). Nevertheless, regardless of whether women do not choose to study in these fields or opt for these professional positions, as the European Schoolnet (2018) points out, the grades obtained in STEM subjects are often the same for students of both sexes. Thus, the evidence points to a digital divide in access, but not in performance.

In light of the above, it should be noted that in order to address and better understand these inequalities, it is essential to know the reasons why these differences occur. As pointed out by Wang and Degol (2017), some of the main ones are: (1) labour market and occupational interests; (2) the role of women in society; and (3) societal beliefs about each gender's digital skills. This last point has a direct impact on students'

self-perception of their own digital skills: as Bian et al. (2017) show, this perception starts to materialise around the age of 6, and it is usually boys who perceive themselves better than girls. Moreover, this digital gender gap is perpetuated and can be further reinforced later in secondary school. At this stage of education, this gender digital divide may imply a different choice when it comes to choosing between a more scientific-technological or a humanities or social sciences subject (Vázquez-Cano, 2017), or may result in different levels of self-perceived DC at the university level (Flores-Lueg & Roig-Vila, 2017).

In any case, and regardless of the reason, there is clearly a situation of inequality with strong implications that make women a more vulnerable group, not only in terms of their self-perceived skills and labour market insertion, but also in their personal, civic and academic dimensions. For example, if attention is focused on the use of digital technologies and social networks, it is usually young girls who are at greater risk of excessive use (Malo-Cerrato et al., 2018) and who find themselves in situations of cyberbullying with more harmful consequences (Donoso-Vázquez et al., 2017).

Furthermore, while it is clear that the underlying problem is not the skills available to women, it is important to intervene to ensure that they are not left out of the labour market. Given that the jobs on offer today increasingly require digital skills (European Commission, 2016). To this end, organisations such as the International Labour Organisation (2019) or the OECD (2017) indicate that it is essential to carry out reports and analyses, campaigns to promote equality, improvements in infrastructure to achieve equal participation of women in the labour and technological context, and facilitating access to training and resources from early childhood with gender equality.

In short, it is clear that there is a need to improve training in technological skills and to combat gender stereotypes (UNESCO, 2017). Nevertheless, it should be noted

that this type of debate is becoming partially obsolete, as gender identity expressions have become an issue that is increasingly on the agenda and is now open to more realities than binary gender (Quinan and Hunt, 2021).It remains to be seen how they will be reconciled and intersect with this general vision of gender and ICT.

However, in addition to structural issues, there is also a gender digital divide. Clark and Gorski (2002), in their classic text on the gender digital divide, argue that there are three major gaps: (1) gaps in support and encouragement to value (as one's own) and enter technologised domains; (2) gaps in how women and men use the Internet (and technologies) differently; and (3) gaps in access to digital content and culture that is not hostile to women.

In this sense, Gil-Juárez et al. (2012) say that the gender digital divide can be very heterogeneous: for some groups of women it is closing, while for others (e.g. female university students in scientific and technical fields) it has been neutralised. The gender digital divide is therefore not linear, and at the macro level it even seems to be non-existent (e.g. when analysing the gender digital divide in EU Member States, Elena-Bucea et al. (2020) conclude that there is no difference in access to public administration e-services or social networks). However, it is clear that the gender gap does not determine how we get to this point: perhaps women who are already in the STEM field have neutralised the difference in terms of digital skills and are as competent as their peers; but it is clear that there is a gap preventing women from accessing the STEM field on equal terms and that there is undoubtedly a bias (or prejudice) that the technical (including the digital) is unsuitable for them (Palomares-Ruiz et al, 2020), which ultimately prevents them from becoming digital references in their communities. Similarly, Sánchez-Prieto et al. (2020), in relation to the general digital literacy of pre-service teachers: On the one hand, it seems that gender is not as

productive a variable as might be expected (the digital skills of the sample are average and there are no significant gender differences in them), although there is no doubt that, as in all professional sectors, even in teaching, which is so feminised, there is a gender gap (in this respect, for example, Ruiz-Palmero and Sánchez-Rodríguez (2010) did not observe significant differences from a digital point of view between schools coordinated by men or women); but the coordinators are mostly men, which speaks to this fluid duality of the gender and ICT binomial).

Transmedia, digital competence and media education

Once the gender digital divide has been addressed, in order to analyse the possibilities for the latter to become a tool for transforming the former, we need to introduce other concepts that concern us: transmedia learning and media education.

The concept of transmedia, as indicated by Scolari (2018), has a complex definition and is directly related to the skills (transliteracy) that subjects need to perform properly in this new cultural context. However, there is a consensus that the first definition was originally coined by Henry Jenkins in the 1990s, in the heat of the flowering of fan culture and media phenomena in which their consumers changed their role to also become participants (and producers) thanks to the use of technologies. This is the birth of the concepts of media convergence and participatory culture (Jenkins, 2006). Firstly, media convergence can be understood as the overlapping that occurs in digital media in a non-linear but sequential and non-sequential way. Secondly, participatory culture corresponds to that type of participation in society that involves a process of creation by individuals using their own tools. The merging of these two concepts has implied a reconceptualisation of the media consumer, who ceases to be passive and becomes a user who not only consumes, but also contributes, creates and

shares content. Moreover, over the years this definition has been adapted to the educational context and transmedia has become a didactic strategy (Dickinson-Delaporte et al., 2020).

On these two pillars, media convergence and participatory culture, the cultural framework of transmedia learning is anchored. It is important to take this information into account because only those who have transmedia literacy on elements such as collective intelligence, transmedia navigation or visualisation, among others, will be able to fully participate in the participatory culture referred to by Jenkins (González et al., 2018). Furthermore, from a pedagogical point of view, it builds on the socio-constructivist ideas of Vigotstky (Biggs, 1996) and the connectivist ideas of Siemens (Siemens, 2006). On the basis of all this, teaching-learning experiences (T-LE) can be based on the need for the learner to develop a story using the available resources that he/she likes most and to share it in a community context, which implies collaboration in order to build knowledge. This initial definition, combined with more contemporary nuances such as the possibility of integrating playful elements (Barreneche et al., 2018) and the ubiquity of current devices and omni-connectivity (mobile phones or tablets) (Romero-Rodríguez et al., 2021), makes transmedia an opportunity to build permeable learning beyond the educational centre (Amador, 2013). Finally, in addition to its novelty and potential attractiveness for younger students, it stands out for its flexibility and possibilities for personalisation (which means that each subject can decide which transmedia path to follow and which technological resources to use to do so).

But what do learners need to take part in such a transmedia teaching-learning process? To participate in such a process, in which content has to be navigated, consumed, contributed to, created and shared in both digital and analogue formats (Jenkins et al., 2009), we would say that it is essential to have digital literacy in a

general sense and what Jenkins calls new media literacy. This is because digital literacy is a set of knowledge, skills and attitudes that 21st century citizens need to develop in order to be part of society (Sánchez-Caballé et al., 2021). The requirements for a citizen to be considered digitally literate may vary, as there are numerous national and international frameworks that attempt to define the elements that make up digital literacy. For example, using the DigComp 2.1 framework as a reference, it can be considered when it provides skills related to: (1) information and data literacy, (2) communication, (3) content creation and development, (4) device security and safety, and (5) technical problem solving (Carretero et al., 2017).

At this point, it is worth considering the extent to which the gender digital divide takes the form of different digital skills. In this sense, for example, Cabezas et al. (2017), in their study with university students, say that men have higher levels of ICT knowledge and management, while women have better attitudes towards them. On the complexity of delving into the real nature of this digital gender gap, Vázquez-Cano et al. (2017) state that men always seem to rate themselves more positively than women in terms of their digital skills, although more in-depth studies (using techniques such as the Bayes factor) suggest that men and women are equally digitally competent. It is common for men to feel more able to use ICT (Flores-Lueg and Roig-Vila, 2017); and this is even more pronounced the more we focus on the purely technical dimensions of these skills (Aranda et al., 2019).

In relation to this non-linearity of digital skills in terms of gender (neither are the skills themselves a totem, nor do women form a uniform group in this respect), Grande-de-Prado et al. (2020) point out that women may outperform men in some dimensions, such as advanced use of word or image processing, respect for intellectual property, or familiarity with digital social environments. On the other hand, the digital gender gap

may take other non-competence forms, such as the dominance of androcentric communication patterns (Clark and Gorski, 2002).

At this point, it should be noted that while it is true that participation in transmedia ecologies requires digital literacy, participation in these ecologies also enhances the skills needed to navigate these discourses and follow the thread of the stories (Alper, 2013; González-Martínez et al., 2018; Kline, 2010). At this point, we could say that learning in this context requires some skills that are commonly referred to as new media literacies (NML). These NMLs were originally identified as eleven, but later another one was added to the list: play, performance, simulation, appropriation, multitasking, distributed cognition, collective intelligence, judgement, transmedia navigation, networking, negotiation (Jenkins et al., 2009) and visualisation (Reilly, 2013).

In short, transmedia learning is an option that, on the one hand, requires the availability of DCs and, on the other hand, allows for the further development of these digital skills. And, due to its flexibility and open approach, it can also be an open door to the personalisation of learning (along the lines of universal learning design (Alba Pastor, 2016). This is because, in a way, such practices allow for different modes of representation and, above all, action, in a collective way. Learning in this transmedial approach would require a certain level of DC and NML, especially those directly related to the key actions of these didactic proposals: collective intelligence ('the ability to pool knowledge and compare with others towards a common goal'), judgement ('the ability to assess the reliability and credibility of different sources of information'), transmedia navigation ('the ability to follow the flow of stories and information across different modalities'), multitasking ('the ability to scan one's environment and shift focus to salient details as needed') (Jenkins et al. , 2009, p. 4) and visualisation (Literat, 2014, p.

17), without denying the general importance of the other skills that also contribute to the desired goal.

Moreover, in the context of a gender digital divide, it may also be possible to take advantage of those points where women feel stronger digitally (Cabezas et al., 2017; Grande-de-Prado et al., 2020), in order to empower them and combat it.

In line with this idea, and linked to the gender discourse presented above, this study aims to understand the transmedia skills of Italian students of classical languages from a gender perspective and in terms of transmedia learning. All this in order to answer the following research questions:

- What is the profile of students at the Liceo Classico Italiano in relation to digital competence, transmedia literacy and attitudes towards ICT?
- What are the gender differences that can be established in this profile?
- Can transmedia learning be a way to reverse the gender digital divide?

Methodology

Participants and context

Starting from the population of Italian pupils attending the Italian Licei Classici, we worked with an accessible and random sample attending the G.M. Dettori and Siotto Pintor schools in Cagliari (Italy). One group from each grade (1st to 5th) was invited to participate in the research; the final sample was drawn from among them, who voluntarily answered the proposed questionnaire, administered in a single online format, at the request of the research team and with the consent of the management and teaching teams involved. The fieldwork took place between December 2020 and January 2021.

In the Italian context, the classical secondary school is part of the Italian national public education system, based on the transmission of educational values aimed at educating citizens on the basis of the classical humanist tradition, which is its strength. The cultural offer of the baccalaureate also aims to improve logical-mathematical and scientific skills, foreign language skills, art and laboratory methods. The liceo classico is a non-vocational course that prepares students for university. In the first two years, students study in depth: Italian, Latin and Greek grammar, foreign languages, geological history, mathematics, natural sciences and art history. In the third year, subjects such as philosophy, physics, classical and foreign literature are added. In the Italian education system, in addition to the liceo classico, established by the Legge Casati in 1859, there are other types of secondary school: Scientific, Humanistic, Artistic, Linguistic, Music and Dance.

In the end, 402 informants replied to the questionnaire, of which 400 useful answers were consolidated (n=400). In terms of gender, 78.1% were female, 20.5% male and 0.4% refused to be classified (Table 1). In recent years, there has been a clear predominance of females in the Licei classici, due to the fact that male students are more inclined towards technical-vocational studies, of which they are the majority. On this point, as far as the female vocation for the classical baccalaureate is concerned, 60.5% of the new students enrolled in 2019 are female, with peaks related to the specialisation Maieutic-Music, which reaches 90.6% and reaches 88.6% in the specialisation Human Sciences. On the other hand, there is a decline in the number of female students in technical and scientific disciplines: 70% of students are male. The data are provided by the Ministry of Universities and Research, updated in April 2019 (according to the official source: MIUR, Gestione Patrimonio Informativo e Statistica: https:// www.miur.gov.it/documents/20182/2155736).

In terms of age, the age groups below 18 years are logically predominant (less than 10% of the participants are above 26 years of age). 56.3% belonged to the Liceo C. Siotto Pintor and the rest, 43.7%, to the Liceo C. G. M. Dettori.

Variable	Frequency	%
Gender		
Woman	300	75
Man	99	24.75
Non-binary	1	0.25
Course and age		
1st (14-15	118	29.5
2nd (15-16	61	15.25
3rd (16-17	92	23
4th (17-18	53	13.25
5th (18-19	76	19

Table 1. Sample and biodata (own elaboration).

Instruments

It was decided to start with several existing questionnaires, born in the heat of new media literacy and media education, to which we added an initial (non-psychometric) section on the availability and use of digital resources to better define the media profile. On the one hand, the New Media Scale (Literat, 2014), which addresses Jenkins et al.'s (2009) categories of collective intelligence, judgement, transmedia navigation and visualisation, was partially administered. Due to the time constraints on the informants' responses to the questionnaire, it was not considered appropriate to offer them the complete questionnaire with all the items of each of the 12 dimensions of the NML, so we focused on offering them those that, a priori, are considered to be more closely related to the skills required in didactic proposals for transmedia learning, as mentioned in the theoretical framework. In this first approach to the object of study, these four dimensions were considered as a first positive balance (time and effort of the participants on the one hand; possible knowledge generated on the other), as detailed in

Author (2022). On the other hand, the Media and Technology Usage and Attitude Scale by Rosen et al. (2013) was fully administered to determine attitudes towards technology (positive attitudes, negative attitudes, preference for multitasking, and ICT anxiety and dependence). In order to explore multitasking habits (a skill inherent to transmedia), we used the Multitasking during homework scale (Martín-Perpiñá et al., 2019). Due to its specific focus on multitasking in the educational context (during the development of learning activities), we considered it more appropriate to use this instrument rather than the Multitasking dimension of Literat (2014). Finally, in terms of digital literacy, we applied the Digital Literacy Scale (Rodríguez de Dios, 2018) on technological, personal safety, critical, device safety, information and communication skills; it is a scale specifically designed for adolescents.

All these instruments were translated into Italian by the main researcher, a native Italian speaker; in addition, a comprehension test was carried out with the target informants to confirm their validity. Finally, with informed consent, the questionnaire was administered in a virtual version in order to speed up not only the response, but also the emptying of the data and their storage on the servers of the University of Girona (Spain).

We used SPSS 17.0 to analyse the data. For significance tests, we used the Chi-square test for non-parametric data and the ANOVA test for parametric data; for the analysis of relationships, we chose Pearson's correlation coefficient. Confidence levels of 0.05 or 0.01 were used, as indicated.

After analysing the reliability coefficients, they are considered acceptable for the ranges commonly accepted in the field of education. They are detailed in Table 2.

Scale	Variable	Crombach Alpha
New Media Literacies	Collective intelligence	0.669

	Trial	0.693
	Transmedia navigation	0.691
	Visualisation	0.742
Attitudes	Positive attitudes	0.660
	Anxiety and dependence	0.756
	Negative attitudes	0.686
	Multitasking trend	0. 135*
Digital Literacy Scale	Digital literacy	0.735

Table 2. Reliability indices (*Item discarded for analysis due to low reliability) (own elaboration).

Results

In order to better structure the summary of the results, we will first analyse the general characteristics of the subjects in terms of availability of technological resources and use and consumption profiles; secondly, we will analyse the indicators obtained with the instruments described in the previous section.

Overview

In terms of availability of resources, 98% of the subjects have a mobile phone or tablet (with a clear predominance of IOS, 72.6%), and it is this mobile device that they prefer to connect from (60.5% use it to connect from home, 6.4% from school), as opposed to the computer, which is used by 21.8% from home, 3.2% from school. They go online a lot: 40.7% go online 3-5 h/day, 35.5% go online 6-8 h/day and 11.5% say they are always online. They usually have a profile on a social network (93.5% say so);

Instagram is predominant (91%); WhatsApp is the predominant messaging service (98.5%).

In terms of gender, it appears that women are less likely to go online than men (Figure 1), more likely to use the telephone from home (Figure 2) and more present on social networks (Figure 3): although fewer women report having a profile on social networks in percentage terms, they are more likely to use Instagram and significantly fewer say they do not use it regularly. In any case, all these differences are small and not statistically significant.

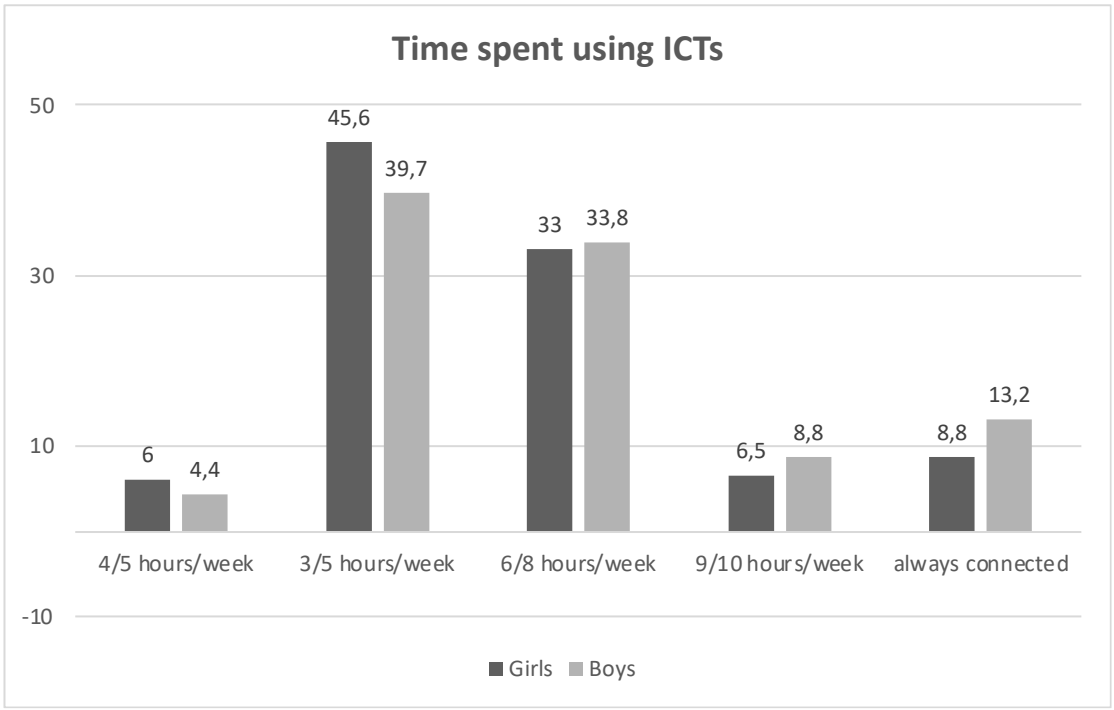

Figure 1. Time devoted to ICT (% of subjects in each group who use ICT in each time slot) (own elaboration).

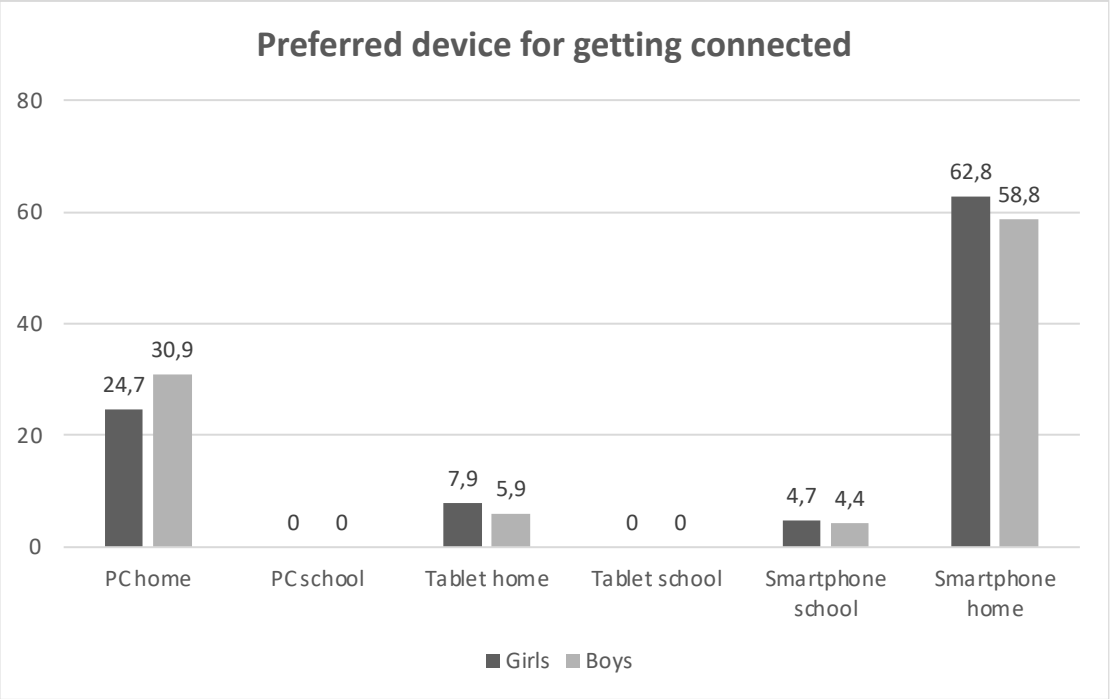

Figure 2. Device from which informants perceive they prefer to connect (in %) (own elaboration).

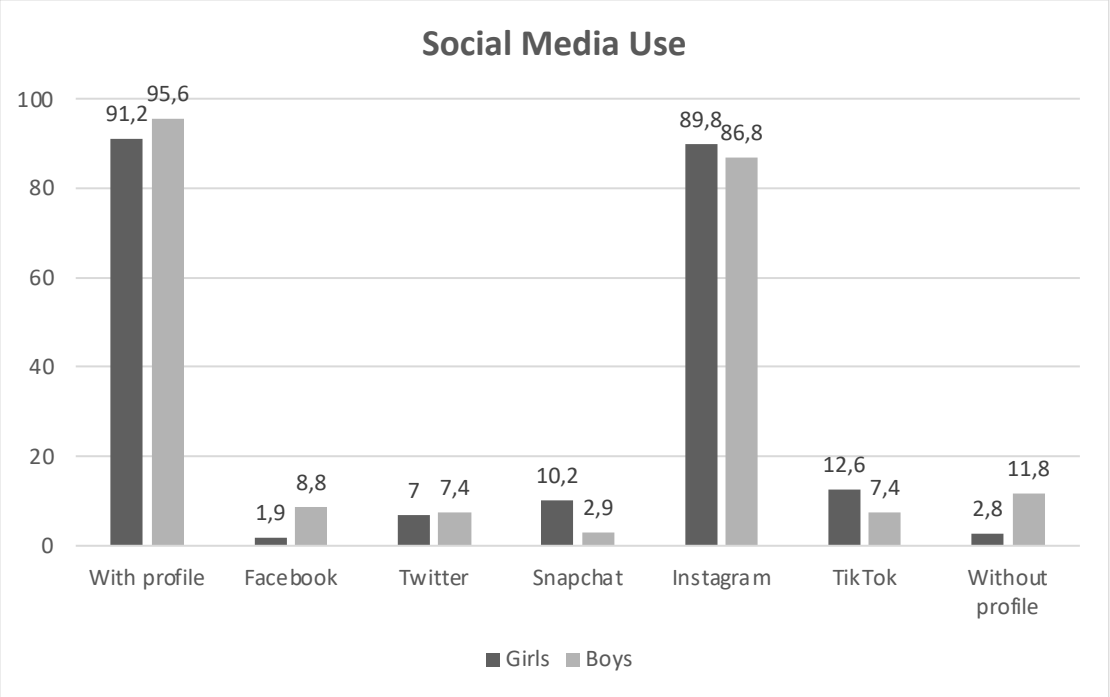

Figure 3. Presence in social networks (% of subjects from each group present in each category) (own elaboration).

In terms of the purposes of this technological use, they use ICT for academic activities (85.1%), listening to music (88.3%), reading novels or newspapers (23.4%), watching films or series online (64.2%), checking emails (65.2%), taking photographs (71.6%), shopping (52%) or interacting on social networks (82.1%). Again, gender differences are not significant, nor do they reveal any clear pattern (Figure 4).

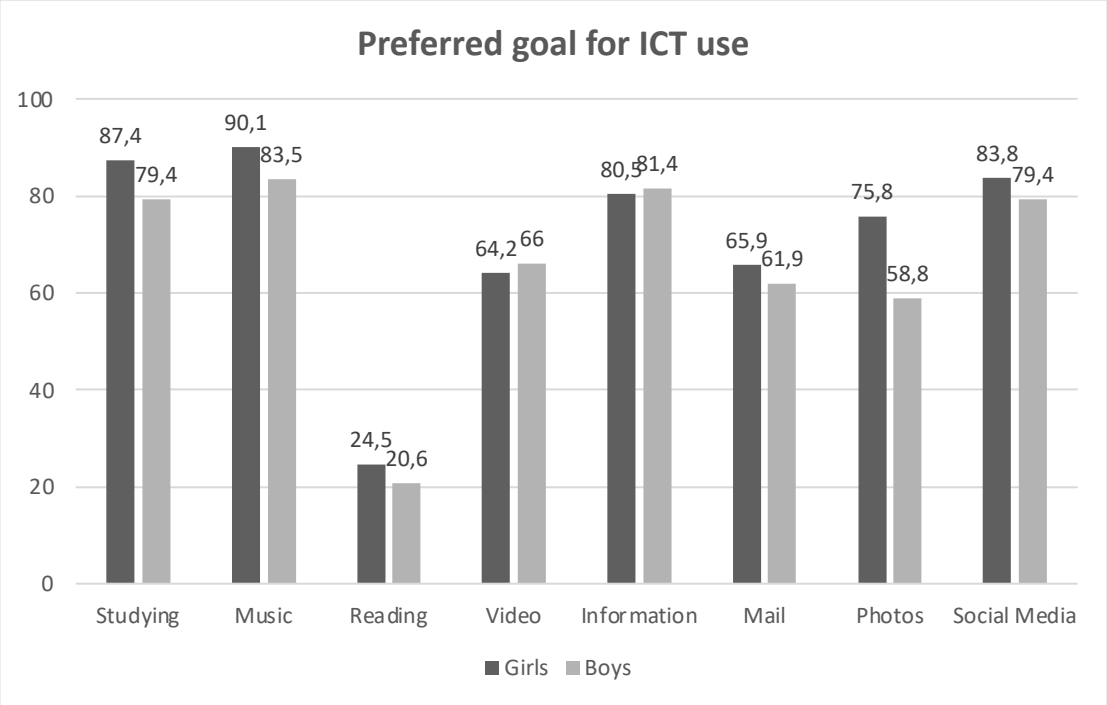

Figure 4. Preferred uses of ICT (% of subjects in each group who use ICT for each purpose) (own elaboration).

In this social sphere, 56.5% say they only include people they know; 53.5% say they check the identity of their contacts on the Internet. With these contacts, they discuss academic matters (53.5%), sport (32.6%), music (65.2%) or leisure in the broadest sense (television, series, books; 61.3%); as curious residual subjects, we find politics (1%), the environment (0.5%) or current affairs (0.2%).

Finally, with regard to the purpose of academic ICT use, they say that they use the net during academic activities in general (97.7%), to complete classroom activities (61.4%), to complete learning activities entirely online (73.6%), to collaborate synchronously with their peers at home (66.7%) or at school (17.4%), or to communicate with their teachers outside school (35.8%). Although girls seem to be more interactive outside school and boys more so at school (Figure 5), the difference is not significant and the pattern of ICT use is generally the same.

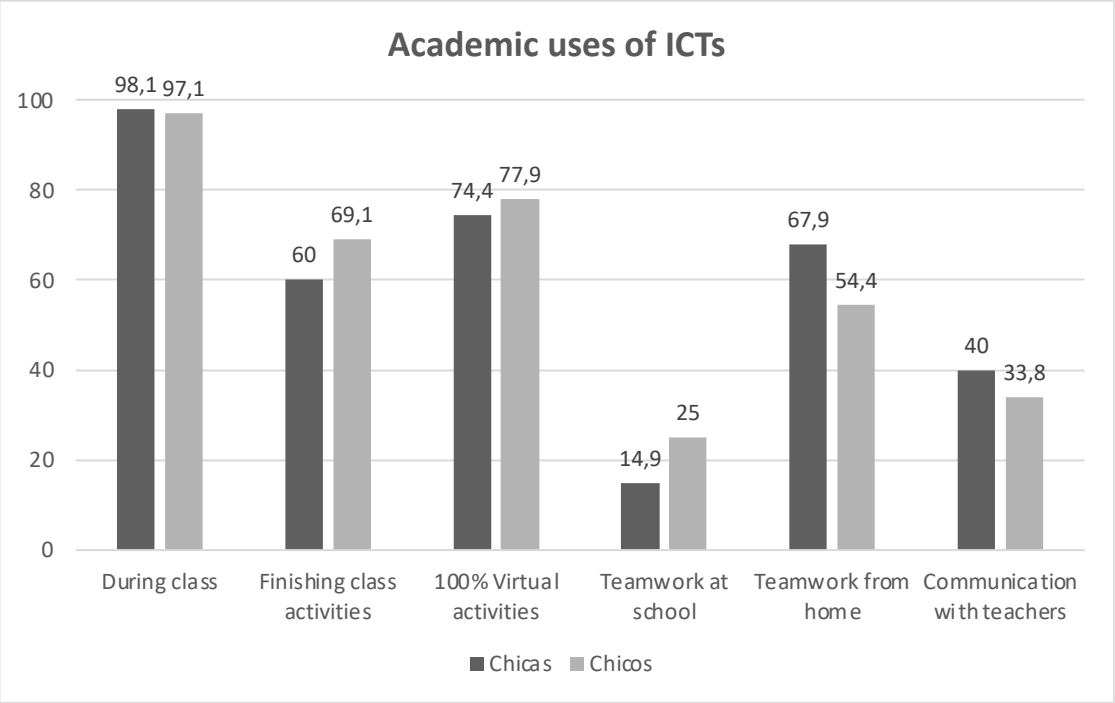

Figure 5. Purpose of academic use of ICT (% of subjects in each group who use ICT for each purpose) (own elaboration).

Students' digital profiles

If we first analyse the overall digital literacy scores, taking as a reference the Digital Literacy Scale by Rodríguez de Dios (2018) (Table 3), we can see that the scores of some dimensions are slightly higher than the reference (personal safety or critical skills); on the other hand, others are lower (mainly technological or information skills).

Moreover, the standard deviations are also lower (sometimes significantly so), which tells us about a more homogeneous sample.

			Rodríguez de Dios (2018)	
	Media	**SD**	**Media**	**SD**
Technological skills	3.36	.44	3.80	.73
Personal security skills	4.12	.63	4.09	.83
Critical skills	3.73	.63	3.43	.74
Device security skills	3.20	.87	3.25	.93
Information skills	2.62	.67	3.37	.70
Communication skills	3.52	.61	3.69	.58

Table 3. Digital Literacy Scale (own elaboration).

There are also gender differences (Figure 6): on the one hand, female informants are less confident in device use (3.1 girls, 3.5 boys; 3.25 was the reference value), but more confident in information management (2.65 girls, 2.47 boys). Differences in critical, information and device security skills are statistically significant (< 0.05).

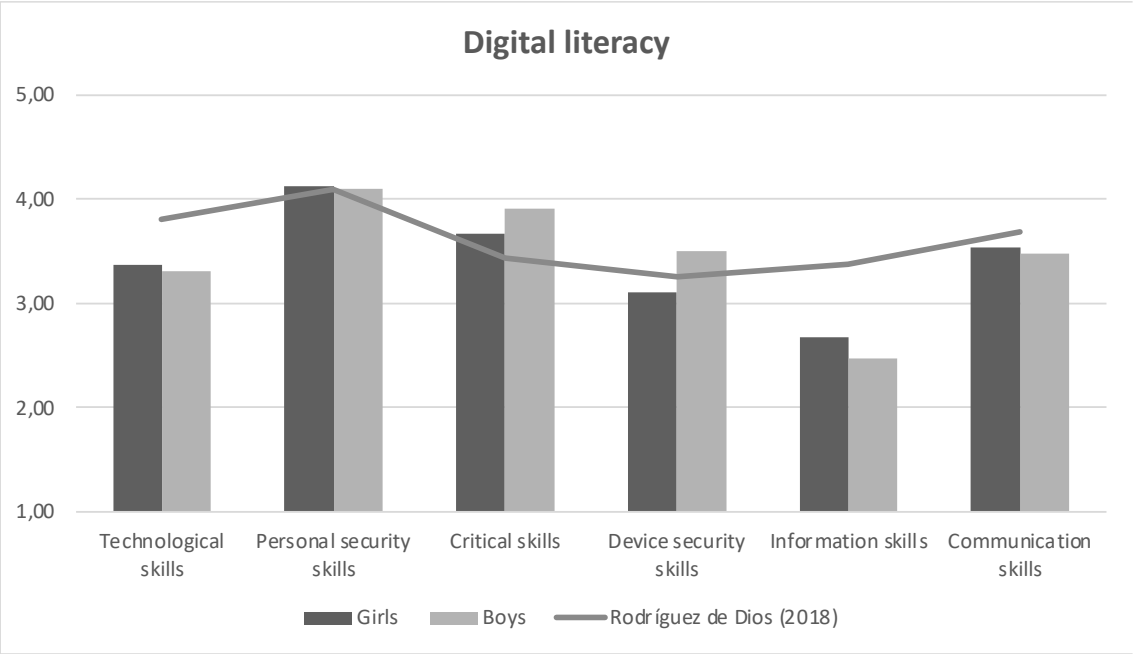

Figure 6. Digital Literacy Scale according to gender (own elaboration).

In terms of new media literacies (Table 4), the sample shows particularly high scores in transmedia navigation and in evaluating digital information, but lower scores in the community sphere (collective intelligence) or in assuming other identities on the net (visualisation):

			Estebanell et al. (2021)	
	Media	**SD**	**Media**	**SD**
Collective intelligence	3.89	.61	4.12	.56
Judgement	3.91	.55	3.88	.59
Transmedia Navigation	4.00	.59	3.75	.70
Visualisation	3.67	.52	3.82	.56

Table 4. Transmedia profile (own elaboration).

There are now also significant differences in terms of gender (with scores generally higher for girls) (Figure 7). In the specific case of transmedia navigation,

these differences are statistically significant (< 0.05): 4.05 for girls, 3.83 for boys; 4.00 was the reference value.

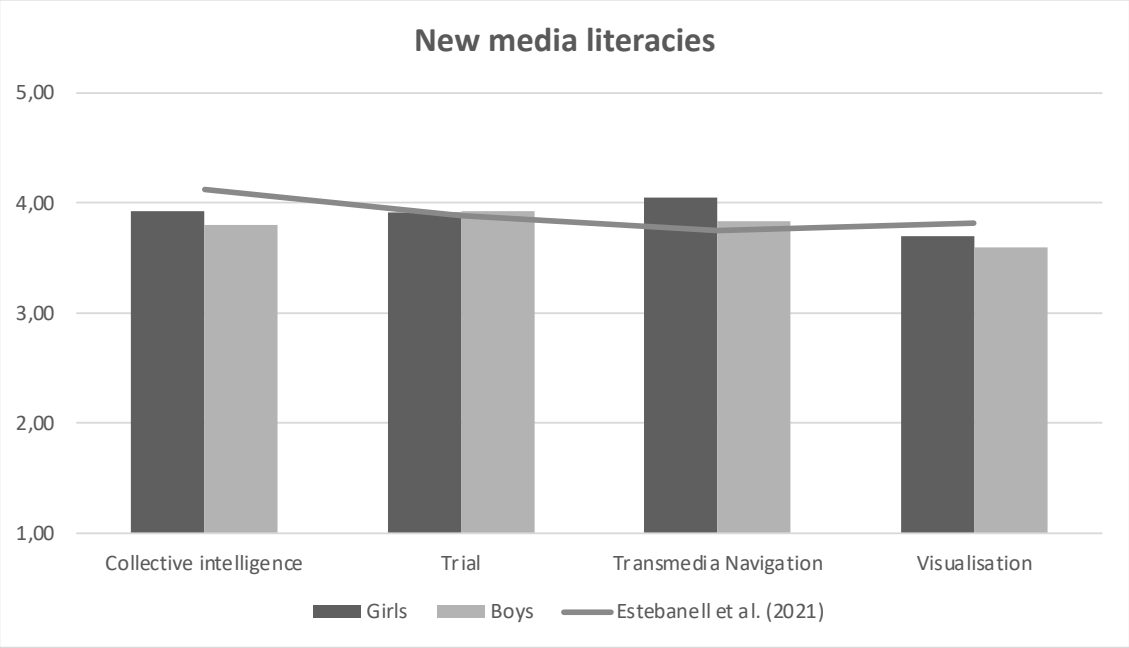

Figure 7. New Media Literacies according to gender (own elaboration).

Regarding the attitudinal component (Table 5), we also see some interesting findings (especially when comparing our data with the benchmark data): the positive attitude dimension is at a similar level as in Rosen et al. (2013); however, the dimensions of fear and dependence or negative attitudes appear to be significantly lower. Thus, there is an overall positive attitude component towards ICT.

			Rosen et al. (2013)	
	Media	**SD**	**Media**	**SD**
Positive attitudes	3.64	.51	3.66	.84
Anxiety and dependence	2.89	.95	3.15	1.09
Negative attitudes	2.89	.81	3.35	.92

Table 5. Attitudinal profile towards ICT (own elaboration).

Next we look at the gender differences (Figure 8). Girls show significantly higher scores than boys for fear and dependence (2.96 for girls, 2.66 for boys) and for negative attitudes (2.97 for girls, 2.64 for boys) (< 0.05). So, on the one hand, it seems that the whole sample has positive attitudes towards ICT, as we said, better than the baseline, but this is particularly strong in the case of boys.

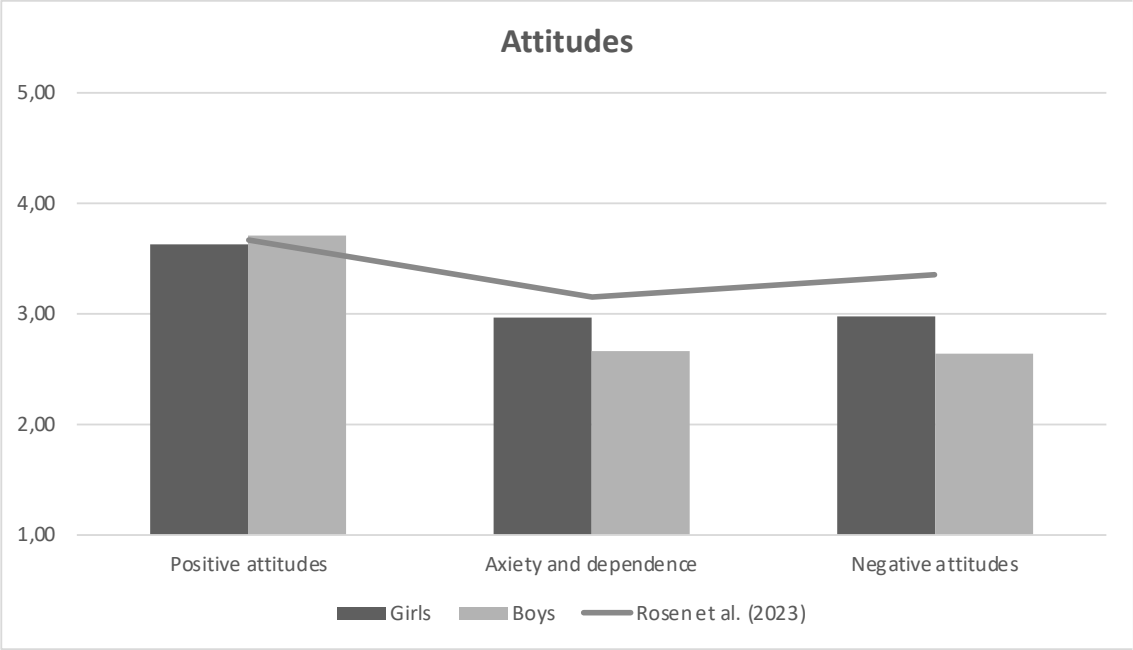

Figure 8. Attitudes towards ICT according to gender (own elaboration).

Finally, we focus on the multitasking profile, a skill that is closely related to transmedia and transmedia browsing in particular (Table 6). Our scores are significantly lower than those of the benchmark (Martín-Perpiñá et al., 2019): students in these two schools focus more on homework, without distractions, than Spanish students. In general, if we exclude the more social part (messaging and social networks), partly related to the school activity itself (contact with peers), the values are always lower (and not a little). In any case, as in the model study, the standard deviations are high, indicating considerable diversity in the sample in this respect.

			Martín-Perpiñá et al. (2019)	
	Media	**SD**	**Media**	**SD**
Watching television	1.34	.73	2.20	1.16
Listening to music	2.53	1.22	3.11	1.10
Read	1.43	.91	2.11	1.13

Talking on the phone	1.96	.97	2.15	1.14
Messaging	2.81	1.05	3.08	1.08
Social media	2.52	1.05	2.53	1.24
Watch films	1.48	.85	2.07	1.23
Using the computer	2.23	1.03	2.61	1.16
Video games	1.15	.51	1.79	1.14

Table 6. Rates of multitasking during homework (own elaboration).

Here, there are few significant differences according to gender (Figure 9): women (2.88) send more messages than men (2.60; the reference value was 3.08) (< 0.05); but, in any case, in the rest of the situations we cannot establish a constant gender pattern.

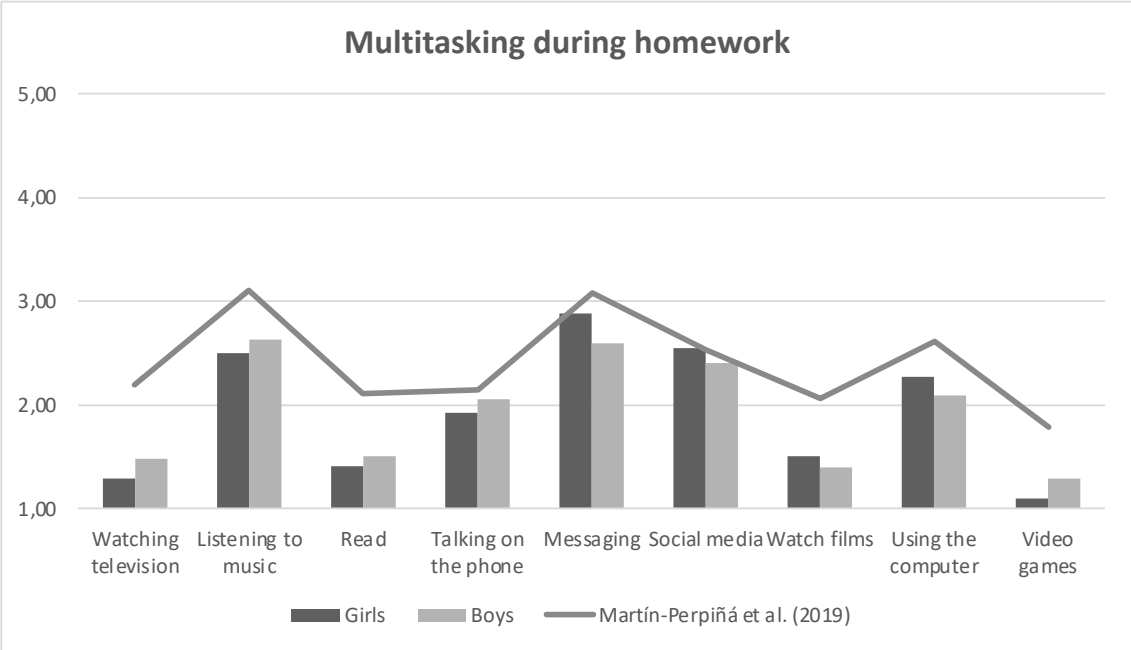

Figure 9. Multitasking during homework according to gender (own elaboration).

Discussion

On the basis of the results we have just presented, it seems that our informants have a digital profile that is suitable for transmedia learning experiences, both in terms of their general skills and in terms of their attitudes and specific skills related to transmedia: from the point of view of digital use, they are great consumers and very social online; their digital competence is important in all areas and they feel comfortable with it; and although they are not particularly multitasking, they can react fluently in situations where it is necessary, in the service of transmedia browsing. Beyond this general profile, we would even say that it is a favourable profile, as the sample generally stands out in some of the elements that the literature considers important, such as informational and critical skills or the social and collaborative dimension (Dickinson-Delaporte et al., 2020; González-Martínez et al., 2018; Jenkins et al., 2009). In this sense, we should take up what seem to be the main characteristics of transmedia learning experiences and ask ourselves what we find in the profile of these students that is in harmony with them. In this regard, Sánchez-Caballé & González-Martínez (2022) point out that transmedia learning requires collaboration, an important digital element, consumption of cultural products and remixes based on them, changing channels and languages (transmediation in the strict sense); and this is what we seem to find among our Italian high school students, boys and girls.

This is particularly interesting when we analyse it in terms of gender, for two reasons. On the one hand, because in our study gender differences seem to be generally blurred. We have seen that, on the one hand, the literature always assumes that men are perceived as superior in terms of their digital skills (Bian et al., 2017; De Moya et al., 2011; Vázquez-Cano et al., 2017, among others). However, in most cases, these differences are not real, but rather beliefs that all subjects have regarding the gender-

ICT binomial, which always disadvantages women (Palomares-Ruiz et al., 2020; Wang and Degol, 2017). It is therefore particularly positive to document that, on the one hand, in the general sense (use and consumption, attitudes and skills), gender differences in relation to ICTs are neutralised (which implies an improvement in the perception of the relationship between ICTs and women); and, on the other hand, in the specific case of transmedia, it is not only a difference that is neutralised, but one that favours women in some important respects, since it is they who have advantages in terms of information management or transmedia navigation. It is true that prejudices remain (in that they are stronger in the more technical aspects, such as the security of devices) and have less negative attitudes (in line with Aranda et al., 2019, for example); but opportunities are opening up. And we should think about these opportunities precisely because of some of the elements we have highlighted in our findings: although girls are generally less connected than boys, they use devices that allow for more agile and natural transmedia prosumption, and have a greater presence on social networks than boys (which enhances the collaborative and social element of transmedia learning). In addition, they are more focused on digital use linked to academic and cultural activities (direct study or reading, interaction, music consumption), which is more in line with the transmedia learning approach. Finally, in the strict sense of the skills most closely linked to TL, we find that girls stand out in transmedia browsing and in the multitasking most closely linked to this browsing for learning (messaging, presence on social networks and use of the PC). This is a very positive fact in terms of the gender gap.

These opportunities can, to a certain extent, take the form of transmedia learning, which, due to its flexibility and low technological requirements, can make it possible, in the school context, to open up a path that allows all students (but especially female students) to find their own ways of expression and representation in the key of

universal design (Pastor, 2016), in such a way that the potential of what students are strongest in is harnessed to empower them as creators of content at the service of their own learning (Antoninis, 2020). Therefore, to some extent, the data we have collected confirms that students in licei classici can face the challenge of transmedia learning with optimism, and perhaps even see it as a gendered opportunity, particularly in terms of the digital humanities.

Conclusions

What have we learned from this research, despite the limitations of its context? First, we have confirmed, even among the youngest, that the digital gender gap is complex and not only related to the different availability or use of technological resources, but perhaps also to what women expect to be able to do with them (the socially expected meanings and uses) (Bian et al., 2017; UNICEF, 2020). The differences between young people in terms of skills related to the transmedia field are not pronounced, nor are they only positive for men. Rather, girls have more positive perceptions of digital skills linked to social and information skills than boys. This allows us to go beyond the traditional technical vision of educational resources and opens up a new concrete path towards overcoming the digital gender divide. What is this path? The literature suggests that one way to overcome the digital gender divide could be to offer girls the opportunity to use digital resources in a meaningful way (that makes sense to them) (Mariscal et al., 2019); and this is what we seem to find in transmedia learning, because of its intrinsic characteristics (in fact, related to universal design for learning). On the one hand, a didactic proposal (to be explored and studied through practice) that makes special use of the skills in which girls are stronger; and on the other hand, from there, a learning experience in which they can feel more

comfortable and also empowered as technology users, precisely because their use of ICT is meaningful to them (Acilar and Sæbø 2021). Therefore, transmedia learning can be a didactic experience that can fight against this gender divide, especially in a context such as the Italian liceo classico, where the gender digital divide is more than evident.

References

Acilar, A., & Sæbø, Ø. (2021). Towards understanding the gender digital divide: a systematic literature review. *Global Knowledge, Memory and Communication*, *ahead-of-p*(ahead-of-print), 1–17. https://doi.org/10.1108/GKMC-09-2021-0147

Alba Pastor, C. A. (2016). *Diseño universal para el aprendizaje: educación para todos y prácticas de enseñanza inclusivas*. Morata.

Alper, M. (2013). Transmedia Play: Literacy Across Media. *Journal of Media Literacy Education*, *52*(2), 366–369. www.jmle.org

Amador, J. (2013). Aprendizaje transmedia en la era de la convergencia cultural interactiva. *Educación y Ciudad*, *25*, 11–24.

Antoninis, M. (2020). *A new generation: 25 years of efforts for gender equality in education*. UNESCO.

Aranda, L., Rubio, L., Di Giusto, C., and Dumitrache, C. (2019). Evaluación del uso de las TIC en estudiantes de la Universidad de Málaga: diferencias de género. *Innoeduca. International Journal of Technology and Educational Innovation*, *5*(1), 63. https://doi.org/10.24310/innoeduca.2019.v5i1.5175

Author (2022).

Barreneche, C., Polo Rojas, N. D., & Menéndez-Echavarría, A. L. (2018). Alfabetismos Transmedia en Colombia: estrategias de aprendizaje informal en jóvenes gamers

en contextos de precariedad. *Chasqui. Revista Latinoamericana de Comunicación*, *0*(137), 171–189. https://doi.org/10.16921/chasqui.v0i137.3510

Bian, L., Leslie, S.-J., & Cimpian, A. (2017). *Gender stereotypes about intellectual ability emerge early and influence children's interests. Science, 355(6323), 389–391.* doi:10.1126/science.aah6524

Biggs, J. (1996). Constructive alignment in university teaching. HERDSA. Review of Higher Education, 1, 5.

Buonauro, A., & Domenici, V. (2020). Scuola, alfabetizzazione digitale e cittadinanza attiva. Verso un'educazione alla democrazia e all'incontro con l'altro. *Sapere Pedagogico e Pratiche Educative*, *5*, 55–66. https://doi.org/10.1285/i26108968n5p55

Cabezas González, M., Casillas-Martín, S., Sanches-Ferreira, M., and Teixeira-Diogo, F. L. (2017). ¿Condicionan el género y la edad el nivel de competencia digital? Un estudio con estudiantes universitarios. *Fonseca, Journal of Communication*, *15*(15), 109. https://doi.org/10.14201/fjc201715109125

Carretero, S., Vuorikari, R. and Punie, Y (2017). *DigComp 2.1: The Digital Competence Framework for Citizens*. Publications Office of the European Union.

Cimpian, J. R., Kim, T. H., & McDermott, Z. T. (2020). Understanding persistent gender gaps in STEM. Science, 368(6497), 1317-1319.

Clark, C., and Gorski, P. (2002). Multicultural Education and the Digital Divide: Focus on Disability. *Multicultural Perspectives*, *4*(1), 28–36. https://doi.org/10.1207/s15327892mcp0404_6

Colley, A., & Comber, C. (2003). Age and gender differences in computer use and attitudes among secondary school students: what has changed?. Educational Research, 45(2), 155-165.

De Moya, M.V., Hernández, J.R., Hernández, J.A. & Cózar, R. (2011). Análisis de los estilos de aprendizaje y las TIC en la formación personal del alumnado universitario a través del cuestionario REATIC. Revista de Investigación Educativa, 29(1), 137-156.

Dickinson-Delaporte, S., Gunness, A., & McNair, H. (2020). Engaging Higher Education Learners With Transmedia Play. *Journal of Marketing Education*, *42*(2), 123–133. https://doi.org/10.1177/0273475318775138

Donoso-Vázquez, T., Hurtado, M. J. R., & Baños, R. V. (2017). Las ciberagresiones en función del género. *Revista de Investigación Educativa*, *35*(1), 197-214.

Elena-Bucea, A., Cruz-Jesus, F., Oliveira, T., and Coelho, P. S. (2020). Assessing the Role of Age, Education, Gender and Income on the Digital Divide: Evidence for the European Union. *Information Systems Frontiers, online pre.* https://doi.org/10.1007/s10796-020-10012-9

European Commission (2016). Digital Europe and the EC´s Skills Strategy. Publications Office of the European Union.

European Schoolnet (2018). Science, Technology, Engineering and Mathematics Education Policies in Europe. Scientix Observatory Report.

Fleming, L. (2013). Expanding Learning Opportunities with Transmedia Practices: Inanimate Alice as an Exemplar. *Journal of Media Literacy Education*, *52*(2), 370–377. https://digitalcommons.uri.edu/cgi/viewcontent.cgi?article=1124&context=jmle

Flores-Lueg, C., & Roig-Vila, R. (2017). El género y su incidencia en el nivel de competencia digital autopercibido por estudiantes de Pedagogía. *International Journal of Educational Research and Innovation (IJERI)*, 79 -96

Gil-Juárez, A., Feliu, J., and Vitores, A. (2012). Gender and ICT: Around the gender digital divide | Género y TIC: En torno a la brecha digital de género. *Athenea Digital*, *12*(3), 3–9. http://www.scopus.com/inward/record.url?eid=2-s2.0-84877697452&partnerID=MN8TOARS

González-Martínez, J., Elisabet, S.-S., Estebanell-Minguell, M., Rostan-Sánchez, C., and Esteban-Guitart, M. (2018). Sobre el concepto de alfabetización transmedia en el ámbito educativo. Una revisión de la literatura. *Comunicación y Sociedad*, *33*(septiembre-diciembre), 15–40.

González-Martínez, J., Serrat-Sellabona, E., Estebanell-Minguell, M., Rostan-Sánchez, C., & Esteban-Guitart, M. (2018). Sobre el concepto de alfabetización transmedia en el ámbito educativo. Una revisión de la literatura. Comunicación y sociedad, (33), 15-40.

Grande-de-Prado, M., Cañón, R., García-Martín, S., and Cantón, I. (2020). Digital competence and gender: Teachers in training. a case study. *Future Internet*, *12*(11), 1–15. https://doi.org/10.3390/fi12110204

Jenkins, H. (2006). *Convergence Culture. Where Old and New Media Collide*. Nwe York University Press.

Jenkins, H., Clinton, K., Purushotma, R., Robison, A. J., and Weigel, M. (2009). Confronting the Challenges of Participatory Culture: Media Education for the 21st Century. In *Building the Field of Digital Media and Learning* (Vol. 21, Issue 1). https://doi.org/10.1108/eb046280

Kline, D. T. (2010). Metamedievalism, Videogaming, and Teaching Medieval Literature in the Digital Age. In T. Kayalis and A. Natsina (Eds.), *Teaching Literature at a Distance. Open, Online and Blended Learning* (pp. 148–162). Continuum.

Literat, I. (2014). Measuring new media literacies: Towards the development of a comprehensive assessment tool. Journal of Media Literacy Education, 6(1), 15–27. Retrieved from http://digitalcommons.uri.edu/cgi/viewcontent.cgi?article=1141&context=jmle

Malo-Cerrato, S., Martín-Perpiñá, M. & Viñas-Poch, F. (2018). Excessive use of social networks: psychosocial profile of Spanish adolescents. *Comunicar, 56,* 101-110.

Mariscal, J., Mayne, G., Aneja, U., & Sorgner, A. (2019). Bridging the gender digital gap. *Economics*, *13*, 1–12. https://doi.org/10.5018/economics-ejournal.ja.2019-9

OECD (2015). *PISA report 2015.* OECD. https://www.oecd.org/pisa/pisa-2015-results-in-focus.pdf

OECD (2017). The Pursuit of Gender Equality.*An Uphill Battle.* OECD Publishing.

Organización Internacional del Trabajo (2019). *Un paso decisivo hacia la igualdad de género. En pos de un mejor futuro del trabajo para todos.* Departamento de Condiciones de Trabajo e Igualdad.

Palomares-Ruiz, A., Cebrián, A., López-Parra, E., and García-Toledano, E. (2020). ICT integration into science education and its relationship to the digital gender gap. *Sustainability*, *12*(13). https://doi.org/10.3390/su12135286

Pew Research Center (2020). *53% of Americans Say the Internet Has Been Essential During the COVID-19 Outbreak.* Pew Research Center.

Prendes-Espinosa, M. P., García-Tudela, P. A., & Solano-Fernández, I. M. (2020). Gender equality and ICT in the context of formal education: A systematic review. *Comunicar*, *28*(63), 9–19. https://doi.org/10.3916/C63-2020-01

Quinan, C. L., & Hunt, M. (2021). Non-binary gender markers: Mobility, migration, and media reception in Europe and beyond. European Journal of Women's Studies, 00(0), 1.11.

Reilly, E. (2013). Visualization as a New Media Literacy in B.S De Abreu & P. Mihailidis (Ed.) *Media Literacy Education in Action. Theoretical and Pedagogical Perspectives* (p. 45-51). Routledge. https://doi.org/10.4324/9780203076125

Rodríguez de Dios, I. (2018). *Risks on Interactive Communication in Adolescents. Digital Literacy Diagnosis and Intervention* [Universidad de Salamanca]. https://knowledgesociety.usal.es/sites/default/files/tesis/Rodríguez-de-Dios%2C I. Risks of Interactive Communication in Adolescents. Digital Literacy Diagnosis and Intervention.pdf

Romero-Rodríguez, J. M., Aznar-Díaz, I., Hinojo-Lucena, F. J., & Gómez-García, G. (2021). Uso de los dispositivos móviles en educación superior: relación con el rendimiento académico y la autorregulación del aprendizaje. *Revista Complutense de Educación*, *32*(3), 327-335.

Rosen, L. ., Whaling, K., Carrier, L. M., Cheever, N. A., & Rokkum, J. (2013). Media and Tech Usage and Attitude Scale: An Empirical Investigation. *Computers in Human Behavior*, *29*(6), 2501–2511.

Ruiz Palmero, J., and Sánchez Rodríguez, J. (2010). El género como factor influyente en la estrategia para integrar las tic en la práctica docente. *Píxel-Bit. Revista de Medios y Educación*, *37*(julio-diciembre), 67–76.

Sáinz, M., Castaño Collado, C., Meneses, J., Fàbregues, S., Müller, J., Rodó, M., Martínez, J. L.; Romano, M. J., Arroyo, L., & Garrido, N. (2017). *¿Por qué no hay más mujeres STEM? Se buscan ingenieras, físicas y tecnólogas.* Fundación Telefónica.

Sánchez Prieto, J., Trujillo Torres, J. M., Gómez García, M., and Gómez García, G. (2020). Gender and digital teaching competence in dual vocational education and training. *Education Sciences*, *10*(83), 1–12. https://doi.org/10.3390/educsci10030084

Sánchez-Caballé, A. & González-Martínez, J. (2022). Transmedia learning: fact or fiction? A systematic review (Aprendizaje transmedia: ¿realidad o ficción? Una revisión sistemática), *Culture and Education*, https://doi.org/10.1080/11356405.2022.2121131

Sánchez-Caballé, A., Gisbert-Cervera, M., & Esteve-Món, F. (2021). Integrating Digital Competence in Higher Education Curricula: An Institutional Analysis. *Educar*, *57*(1).

Scolari, C. (2018). *Teens, media and collaborative cultures. Exploiting teens' transmedia skills in the classroom*. TRANSLITERACY - 645238 H2020 Research and Innovation Actions.

Siemens, G. (2006). Connectivism: Learning and knowledge today. Global Summit 2006: Technology Connected Features, Sydney, Australia.

Stoet, G., & Geary, D. C. (2018). The Gender-Equality Paradox in Science, Technology, Engineering, and Mathematics Education. *Psychological Science*, *29*(4), 581-593.

UNESCO (2017). *Cracking the code: Girls' and women's education in science, technology, engineering and mathematics (STEM).* United Nations Educational, Scientific and Cultural Organization.

UNICEF (2020). *Gender equality and COVID-19*. https://data.unicef.org/topic/gender/covid-19

Vázquez-Cano, E., Marín Diaz, V. M., Maldonado Berea, G. A., and García-Garzón, E. (2017). The digital competence of social sciences college students from a gender perspective. *Revista Prisma Social*, *19*, 347–367.

Vázquez, I. M. & Blanco-Blanco, A. (2019). Factores sociocognitivos asociados a la elección de estudios científico-matemáticos. Un análisis diferencial por sexo y curso en la Educación Secundaria. *Revista de Investigación Educativa, 37*(1), 269-286.

Wang, M.T., & Degol, J. L. (2016). Gender Gap in Science, Technology, Engineering, and Mathematics (STEM): Current Knowledge, Implications for Practice, Policy, and Future Directions. *Educational Psychology Review, 29*(1), 119-140. doi:10.1007/s10648-015-9355-x