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Transmedia Practices and Collaborative Strategies in Informal Learning of Adolescents

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Abstract: Transmedia literacy is the evolution from traditional media literacy to informal learning and participatory cultures. It analyzes the media literacy processes of young people through communities of practice in participatory contexts and through the use of digital discourses that enable the creation of transmedia universes. The present study is approached from a mixed research method, whose main objective is the analysis of adolescents' digital habits through several data-collecting tools: A survey, participative workshops, in-depth interviews, a media diary, and online observation. From that background information, the study subject has focused on Spain, and it is framed within the "Transliteracy: Transmedia skills and informal learning strategies" project, funded by Spain's ministry of Economy, Industry, and Competitivity. The studio is based on a sample of 237 adolescents, from 12 to 14 years old, all intensive users of digital technologies. Interesting results were obtained concerning different transmedia practices that are frequent in adolescents and the informal learning collaborative strategies they currently use. This research work concludes that the use of the Internet, although occasionally lacking adequate safety measures, increases self-sufficiency in adolescents' informal learning. They take control of their own learning, thus enhancing self-motivation and increasing the acquisition of transmedia competences.

Keywords: cooperative; collaborative learning; information literacy; informal learning; secondary education; teaching; learning strategies

1. Introduction

By using cutting-edge technologies in communication contexts, such as social media and mobile phone applications, we are favoring the development of a citizenship-centered, participatory culture (Jenkins et al. 2015; Pathak-Shelat and Bhatia 2018). Likewise, integrating technology into educational realities with a connectivist approach (Siemens 2004) allows us to test learning proposals, such as with videogames, augmented reality, gamification, or various digital narratives, which encourage creativity and pave excellent paths for students' empowerment. Participatory culture implies that relationships between adolescents take place far from the systematic spaces of formal education (Trilla 1986). Rather, they thrive on social media, blogs, chats, etc., where they both learn and socialize. This non-formal educative context allows for adolescents to develop strategies such as sharing, solving problems, carrying out tasks, collaboratively constructing knowledge, and boosting dynamic communication channels. Those dynamics shape transmedia literacy, as defined by Scolari (2018), which comprises skills, practices, priorities, sensibilities, learning strategies, and ways to share knowledge that are developed and applied in the context of the new participatory cultures. Such natural tendencies enable the creation of learning opportunities on social media, thus turning adolescents into interactive and more sociable subjects. The digital space connects us to a world that will never be totally explored, where our knowledge is enhanced, our preferences are altered, and our personal opinions

are shaped (Slater et al. 2017), towards the point of the encounter of citizens' cultural differences and political willingness to listen (Burgess and Green 2009). On this virtual network where prosumers (Toffler 2013) produce content (García-Galera and Valdivia 2014; Tur-Viñes et al. 2018), sometimes, rather than creating knowledge, corporations and lobbies fight to carve a niche on the Internet, thus displacing academic elements in favor of media, which have become social legitimators, distracting the audiences and creating entertaining speeches that invite one to surf the net easily, informally, and lightly (Lipovetsky 2016). Various research works found that a larger percentage of girls registered in three or more social media networks compared to boys (Malo-Cerrato et al. 2018). In this light, it was observed that girls search for more social links, while boys use their leisure time on multiplayer and role-playing games, as well as sexuality-related searches (Espinar and González 2009; Regnerus et al. 2016; Shen et al. 2016). Sarabia and Estévez (2016) state that, between 11 and 18 years of age, girls scored higher rates of internet addiction than boys, posting profiles and commenting. Other studies, however, obtained larger figures from males (Müller et al. 2016). In online social media contexts, support from fellow participants, either friends or relatives, is appreciated and becomes a motivation to keep oneself active online (Stroet et al. 2013; Tang et al. 2016).

In an innate manner, adolescents interact with emotion and fascination (Rowsell et al. 2016) through technology in their autonomously-organized groups, progressively more self-conscious of their abilities and the potential offered by emerging knowledge cultures. In the early youth, both as active or passive interacting subjects (Osuna-Acedo and Gil-Quintana 2017), in the relational factor enhanced by the Information, Communication, and Relation Technologies—ICRTs—(Marta-Lazo and Gabelas 2016), adolescents find their way through participatory culture (Gil-Quintana 2015), exercising collaborative skills of their own to create productions, express opinions, ideas, feelings, and convictions, take responsibilities, and make decisions in a transmedia scenario. This approach results in a type of narrative created by the youngest individuals, in which the story unfolds in multiple formats, some of them featuring consumers with an active role in the expansion process (Scolari 2013). This is a perspective on adolescents' informal learning strategies, related to the "10 T's taxonomy" (Osuna-Acedo et al. 2018a): Authentic tasks, transfer of learning towards professions, pedagogical transformation, IRCTs, transmediality, open temporality, collaborative teamwork, intercreative talent, transnationalism, and tolerance, as will be later discussed in this study.

Jenkins et al. (2015) stated that participatory culture is a reality with few barriers towards lifelong construction of knowledge and citizenship commitment, with a strong support for creation and exchange, as well as an informal type of affiliation, in which the most experienced ones share their knowledge with the beginners in an infinite, circular relationship. This concept includes all kinds of cultural productions and dissemination/exchange processes online. This participatory culture overshadows trade culture and is established on the intersection of three trends. The first one is the consumers' freedom to file, comment, appropriate, and reactivate contents. The second trend consists of letting oneself go by the "do it yourself" mantra, which has an impact on the way citizens use the new online media. Constantly and with some initial motivation, but without a final goal, they check, review, follow, or block, update, and set up new modifications in their digital identities. In the third place, large corporations promote the use of images, ideas, and stories reflected by the visual reality and demanded by the most active and intercreative audiences (Berners-Lee 1996). While citizens empower themselves and assume authority to participate in the collective intelligence (Lévy 2004), lobbies watch over that participation and protect their ideological and financial interests (Osuna-Acedo et al. 2018b), so that there is a double clash between horizontality and verticality on the one hand, and unidirectionality against bidirectionality on the other. As a result, some adolescents are not totally aware of the dangers involved in such participation, concerning safety, control, and even addictions, neuroticism, and emotional instability (Oztüz et al. 2015; Jeong et al. 2016; Peris et al. 2018; Laninga-Wijnen et al. 2019; Kligler-Vilenchik et al. 2018).

The Transmedia Literacy Project has engaged and continues to engage an interdisciplinary group of researchers of reference at an international level on media literacy, transmedia narrative, participatory

culture, pedagogy, and educational innovation. This study is part of a wider international research focused on the analysis of specific skills developed by adolescents in eight countries: Australia, Colombia, Finland, Italy, Portugal, Spain, United Kingdom, and Uruguay (H2020 Transmedia Literacy). From that background information, the study subject has focused on Spain, and it is framed within the "Transliteracy: Transmedia skills and informal learning strategies" project (Ref.: CSO2014-56250-R), funded by Spain's ministry of Economy, Industry, and Competitivity. The variables used in the mentioned Transliteracy project are also used in the present work. The design and development of this project are based on the current reality observed in a number of Spanish regions: Andalucía, Cataluña, Madrid, Valencia, and Galicia. The study's total sample comprises 237 adolescents, all of them regular users of digital technologies and the new media characteristic of this liquid society (Bauman 2016). Most adolescents consider themselves advanced users, have been familiar with digital technologies for several years, and perceive new media as part of their "natural environment" (Scolari 2018). The study's goal is to draw a map featuring the different transmedia practices and the practice-based, informal learning strategies currently used by adolescents, which are analyzed through a mixed methodology. The data collection tools chosen by the study's researchers are a survey, workshops, and interviews. The results are then interpreted using a systemic analysis of the adolescent reality.

2. Materials and Methods

2.1. The Study Area

This research's main goal is to study the habits, attitudes, and informal learning strategies related to adolescents' online transmedia skills in order to identify significant differences regarding their sex, as well as checking whether their actions are coherent with the collaborative learning and participatory culture. The findings pursued not only include the identification of what adolescents do while they are connected, but also intend to identify the online safety-related competences they are developing. These hypotheses or assumptions, listed below, explain the phenomenon to be studied and for the final results' structure:

Hypothesis 1 (H1). *There are significant differences in the way adolescents use the Internet depending on their sex.*

Hypothesis 2 (H2). *There are significant differences in the online security strategies followed by adolescents depending on their sex.*

Hypothesis 3 (H3). *Social relations and interactions carried out by adolescents online obey an informal learning system coherent with the collaborative learning and transmedia practices.*

2.2. Participants and Procedure

Quantitative and qualitative data were collected separately so that the study would be based on neopositivist and interpretative paradigms. We have opted for neopositivism because it is based in critical realism, according to which the social reality is "real" but only knowable in an imperfect, probabilistic way (Corbetta 2007). While positivism claimed that it is possible to get to know reality using objective methods, neopositivism admits that such absolute objectivity is virtually unreachable and, thus, obtained results will be only partially certain. Neopositivism's goal is the explanation of what is being observed and intends to generalize through laws that, differently from positivism, are revisable and permanently provisional. On the other hand, interpretivism presumes that there is no clear objectivity because the researcher is somehow related to the subject of research and, therefore, interpretative science is required to figure out the meaning of what is being observed. For interpretivism, the generalizations formulated are also, in fact, possibilities rather than certainties. Within the boundaries of interpretivism, a netnographic (meaning ethnography applied to

cyberspace) approach will be provided in order to research and understand the social reality unfolding among adolescents in virtual communities (Del Fresno García 2011; Washington Turpo Gebera 2008). The netnographic approach works as a method that problematizes the use of the Internet, which is interpreted and re-interpreted by the use adolescents make from it as a space for fluent, dynamic, and mobile interaction. In our case of study, netnographic analyses have centered on the identity, discourse, and meaning (Ivan 2019; Kozinets 2017) of adolescents' actions. Purposely, we have based this on the basis established by Meneses Cabrera and Cardona (2014), who proposed a study of specific media events in order to understand adolescents' online actions.

The research's design and development were implemented based on the current state of the matter in five Spanish regions (where education policies are developed and implemented autonomously): Andalucía, Cataluña, the Madrid region, the Valencia region, and Galicia. The research intended to compare, in Spain, the results of a previous research carried out in the European context (H2020 Transmedia Literacy; Pereira et al. 2018). The study's total sample comprised 237 adolescents, aged between 12 and 14 years, who were students in the first, second, and third years of Mandatory Secondary Education, according to the Spanish Education system. The students volunteered to respond to the survey's questions and participated in the media workshops, the media diaries, and individual interviews conducted on research purposes. Males comprised 46.8% of the sample and 53.2% of participants were female, which can be considered a balanced proportion in terms of sex.

Aiming to explain the adolescents' reality concerning their participation on social media, a mixed method was designed. The triangulation of qualitative and quantitative techniques provided a sound outcome, since it was confirmed that results obtained through different methods and research techniques converged (Callejo and Viedma 2010). As far as quantitative techniques are concerned, numeric values were assigned to each response in order to study all possible relations among variables. As for qualitative techniques, a systematic study was conducted on groups of adolescents in order to detect the social relations and interactions that occurred during their participation on social media, as well as to find out whether they obeyed an informal learning system.

This ethnographically focused study is based on the recognition of the actor's perspective and the researcher's capability to understand that actor's values, statements, and actions while immersed in the cultural world of the population sector—adolescents, in this case—which constitutes the subject of study. Especially inspiring for the research team was the notion of short-term ethnography, which involves the researchers' immersion in people's lives through a series of questions that will eventually reveal what the context of the subject of study is like. The principles of short-term ethnography are adjusted to the theorical, methodological, and empirical interests of the project, which intends to focus on what adolescents are doing on social media.

Field work was carried out between March and September in 2016. Two secondary schools per region were chosen, according to each area's education specificities. Selection criteria were based on types of funding (publicly or privately owned, state-subsidized centers) and location (province's capital or rural areas). Each partner in the research selected the two centers to be subject of study in their region, once those agreed to collaborate in the research. Then, the research process was explained to students and their families, making sure everyone involved (students, families, and schools) submitted their signed consent before data collection commenced, through surveys, workshops, individual interviews, and a media diary.

Firstly, 100 surveys were conducted; secondly, 78 workshops—focused on videogames and participatory culture—were held, and, finally, 22 media diaries and 40 individual interviews were conducted with several students who had excelled at the workshops. Surveys provided statistical data needed to map the sociological and demographic characteristics of the participant students, as well as information concerning use of media and creativity. The two participative workshops, each two hours long, were useful to analyze, in an immersive way, the adolescents' transmedia practices and their media consumption, as well as to explore aspects such as content production, exchanges, competence acquisition, and informal/collaborative learning strategies. Three researchers

took part in the workshops, assuming tasks such as workshop coordination, support, and video and photo recording. The in-depth interviews and the twenty-two media diaries revealed a detailed understanding of those transmedia practices popular among the most active participants, with a special emphasis on the creative skills and informal learning strategies they followed to acquire the mentioned competences. An interactive conversation was arranged to take place in front of an electronic device's screen, so that researchers were present at the adolescents' practices: To determine how they create and share content, how they play videogames, how they learn about a game, when and who taught them or helped them to solve problems, and how they shared and collaborated among peers. The media diary consisted of a self-administered protocol whose goal was to explore participants' media routines over one week: Management of the time devoted to social media, activities developed, and differences between weekdays and weekends. Finally, the adolescents' favorite websites, celebrities' profiles, and online communities were observed (netnography) (Germain et al. 2017) in order to obtain first-hand information about the social media sites that adolescents referred to during the interviews and workshops and wrote about in their media diaries.

Data collection was carried out during extra-curricular hours in each participating center, and was supervised by purposely trained research assistants. Students were informed about the study's goal and related ethical questions, including the voluntary participation, privacy, and data confidentiality. In every participating center, only those students willing to participate and whose families agreed to the teenagers' participation finally took part in the study.

2.3. Measures and Data Analysis

Taking both the neopositivist and netnographic research paradigms as a base, quantitative data were obtained from the adolescents' answers concerning their uses, habits, and attitudes towards the Internet. In this sense, it must be taken into account that most teenagers make no difference between internet sites and social media, and that they interact mainly on the latter. The survey permitted a classification of responses and the association of certain variables in order to subsequently study the correlations between variables through SPSS (Statistical Package for the Social Sciences) software. According to Corbetta (2007), the surveys had predefined response options, which could be then transformed into quantitative responses. From those responses, the previously formulated exploratory hypotheses were either confirmed or discarded, which led to proposals of theories of a provisional nature to tentatively explain the obtained results. Concerning the surveys, we ensured that the researchers' presence would not affect the students' responses, which permitted a standardization of the responses provided by the sample (Corbetta 2007). The survey comprised 71 questions based on Likert's technical criteria with dichotomic and polytonic answers, thus providing the subject with a clear statement (Murillo Torrecilla 2006). The survey was properly validated by experts in quantitative analysis techniques at Spain's National University of Distant Education (UNED). All were pertinent questions (covering the research's hypotheses and goals), as well as adequate (concerning language) and clear (concerning editing). The survey helped us focus individually and properly on each answer in order to find the adolescents' opinions, expectations, and criteria concerning the study's research questions.

As for the data collection, it was carried out through 99 interviews (18 in Andalucía, 22 in Catalonia, 20 in the Valencia region, 19 in the Madrid region, and 20 in Galicia), 20 workshops (10 twenty-session workshops about participatory culture and 10 further twenty-session workshops about videogames). Once all pieces of content from the workshops, media diaries, and interviews were collected, they were categorized using Nvivo software in order to analyze their meanings and conceptual networks. Workshops, media diaries, and interviews are techniques in which the researcher obtains the subjects' personal perceptions concerning the situation being analyzed (García Pérez 2014).

In order to determine the statistical reliability of the collected data from our study through their internal consistency, Cronbach's Alpha was applied using SPSS software. The results obtained were

0.862, above the acceptable threshold of 0.7, which shows a high degree of reliability (Cronbach and Shavelson 2004). This high level confirms the internal consistency of the data.

3. Results

For the analysis of hypotheses H1 and H2, the answers to certain items in the survey were analyzed in order to determine if there are significant differences in the adolescents' behaviors regarding their gender. In Table 1, the p-values of chi-square tests are presented in order to find the degree of independence between gender (X6) and the 24 variables listed on the table and introduced as items in the survey.

Table 1. P-values of chi-square tests for the independence of nominal variables considered in the study.

Variables	*P*-Values
X6: Gender (n = 237)	
X30: Whenever possible, I search for my favorite series online (n = 237)	0.000 *
X31: I like watching YouTube channels (n = 237)	0.909
X32: I like making online music lists (n = 237)	0.014 *
X33: I search for the music/films I like online and I download them (n = 237)	0.246
X34: I like playing online games with friends (n = 237)	0.000 *
X36: When I visit friends at their homes, we usually play videogames (n = 237)	0.001 *
X38: When I visit friends at their homes, we usually film a video (n = 237)	0.000 *
X39: If I like a film, I usually search for the story's book, videogame, soundtrack (n = 237)	0.306
X40: I search online for the best playthroughs of my favorite videogames (n = 237)	0.000 *
X41: I like recording and uploading videos (n = 237)	0.257
X42: If I like something, I immediately post comments on social media (n = 237)	0.324
X43: If I like something, I immediately share it with friends (n = 237)	0.138
X44: I like taking and sharing pictures (n = 237)	0.000 *
X45: I like having many followers on social media (Instagram, Facebook, etc.) (n = 237)	0.259
X46: I like doing fan-fictions based on my favorite series, films, and comics (n = 237)	0.101
X47: I like cosplay (n = 237)	0.333
X50: I like creating stories, games, tutorials (n = 237)	0.471
X52: When I need to know how to do anything, I search online (tutorials) (n = 237)	0.023
X59: It annoys me when friends upload pictures of me without asking me first (n = 237)	0.194
X60: I consider the consequences of uploading my videos online (n = 237)	0.158
X63: I accept all friend requests on social media (n = 237)	0.012
X65: There are online sites where I participate without saying who I am (nickname) (n = 237)	0.001 *
X68: I am concerned about others' opinions about me on social media (n = 237)	0.206
X69: I like always being connected (n = 237)	0.395

* The relationship is significant at 0.01.

As shown in Table 1, a clear dependence of adolescents' gender (X6) can be observed in eight variables: X30 (Internet searching), X32 (Online music lists), X34 (Online videogames), X36 (Gaming), X38 (Video recording), X40 (Favorite videogames), X44 (Pictures), and X65 (Social media participation), which allows us to estimate their Kendall and Spearman correlation coefficients (CC) with respect to the X6 variable, as shown in Table 2.

The interpretation of Table 2 confirms a significant negative correlation between variable X6 and variables X34, X36, X40, and X65, which means that male teenagers stand out over female teenagers for four habits: Online gaming with friends, playing videogames when together at friends' homes, accepting all friend requests on social media, and, finally, participating in certain Internet sites with their identities concealed under a nickname.

Table 2. Kendall and Spearman's correlation coefficients (CC) between X6 (gender) and variables X30, X32, X34, X36, X38, X40, X44, and X65.

			X6	X30	X32	X34	X36	X38	X40	X44	X65
Kendall's Tau_b	**X6**	CC	1.00	0.277 **	0.139 *	−0.538 **	−0.560 **	0.228 **	−0.441 **	0.306 **	−0.240 **
		S. (bil.)	0.000	0.000	0.019	0.000	0.000	0.000	0.000	0.000	0.000
		N	237	237	237	237	237	237	237	237	237
	X30	CC	0.277 **	1000	0.201 **	−0.042	−0.117 *	0.076	−0.043	0.165 **	−0.080
		S. (bil.)	0.000	0.000	0.000	0.439	0.026	0.154	0.429	0.002	0.132
		N	237	237	237	237	237	237	237	237	237
	X32	CC	0.139 *	0.201 **	1000	−0.002	−0.058	0.066	0.031	0.172 **	0.087
		S.(bil.)	0.019	0.000	0.000	0.976	0.275	0.219	0.573	0.001	0.107
		N	237	237	237	237	237	237	237	237	237
	X34	CC	−0.538 **	−0.042	−0.002	1000	0.601 **	−0.015	0.534**	−0.143 **	0.276 **
		S. (bil.)	0.000	0.439	0.976	0.000	0.000	0.776	0.000	0.008	0.000
		N	237	237	237	237	237	237	237	237	237
	X36	CC	−0.560 **	−0.117 *	−0.058	0.601 **	1000	−0.064	0.466 **	−0.173 **	0.297 **
		S. (bil.)	0.000	0.026	0.275	0.000	0.000	0.229	0.000	0.001	0.000
		N	237	237	237	237	237	237	237	237	237
	X38	CC	0.228 **	0.076	0.066	−0.015	−0.064	1000	−0.020	0.216 **	0.019
		S. (bil.)	0.000	0.154	0.219	0.776	0.229	0.000	0.711	0.000	0.726
		N	237	237	237	237	237	237	237	237	237
	X40	CC	−0.441 **	−0.043	0.031	0.534 **	0.466 **	−0.020	1000	−0.194 **	0.288 **
		S. (bil.)	0.000	0.429	0.573	0.000	0.000	0.711	0.000	0.000	0.000
		N	237	237	237	237	237	237	237	237	237
	X44	CC	0.306 **	0.165 **	0.172 **	−0.143 **	−0.173 **	0.216 **	−0.194 **	1000	−0.120 *
		S. (bil.)	0.000	0.002	0.001	0.008	0.001	0.000	0.000	0.000	0.025
		N	237	237	237	237	237	237	237	237	237
	X65	CC	−0.240 **	−0.080	0.087	0.276 **	0.297 **	0.019	0.288 **	−0.120 *	1000
		S. (bil.)	0.000	0.132	0.107	0.000	0.000	0.726	0.000	0.025	0.000
		N	237	237	237	237	237	237	237	237	237

Table 2. *Cont.*

			X6	X30	X32	X34	X36	X38	X40	X44	X65
Spearman's Rho	**X6**	CC	1000	0.308 **	0.152 *	−0.587 **	−0.622 **	0.252 **	−0.481 **	0.339 **	−0.264 **
		S.(bil.)	0.000	0.000	0.019	0.000	0.000	0.000	0.000	0.000	0.000
		N	237	237	237	237	237	237	237	237	237
	X30	CC	0.308 **	1000	0.235 **	−0.052	−0.143 *	0.090	−0.052	0.200 **	−0.098
		S. (bil.)	0.000	0.000	0.000	0.427	0.027	0.165	0.430	0.002	0.134
		N	237	237	237	237	237	237	237	237	237
	X32	CC	0.152 *	0.235 **	1000	−0.001	−0.072	0.078	0.036	0.208 **	0.105
		S. (bil.)	0.019	0.000	0.000	0.986	0.271	0.231	0.585	0.001	0.106
		N	237	237	237	237	237	237	237	237	237
	X34	CC	−0.587 **	−0.052	−0.001	1000	0.682 **	−0.017	0.615 **	−0.170 **	0.326 **
		S. (bil.)	0.000	0.427	0.986	0.000	0.000	0.797	0.000	0.009	0.000
		N	237	237	237	237	237	237	237	237	237
	X36	CC	−0.622 **	−0.143 *	−0.072	0.682 **	1.000	−0.076	0.545 **	−0.207 **	0.355 **
		S. (bil.)	0.000	0.027	0.271	0.000	0.000	0.244	0.000	0.001	0.000
		N	237	237	237	237	237	237	237	237	237
	X38	CC	0.252 **	0.090	0.078	−0.017	−0.076	1.000	−0.026	0.261 **	0.020
		S. (bil.)	0.000	0.165	0.231	0.797	0.244	0.000	0.691	0.000	0.754
		N	237	237	237	237	237	237	237	237	237
	X40	CC	−0.481 **	−0.052	0.036	0.615 **	0.545 **	−0.026	1.000	−0.225 **	0.342 **
		S. (bil.)	0.000	0.430	0.585	0.000	0.000	0.691	0.000	0.000	0.000
		N	237	237	237	237	237	237	237	237	237
	X44	CC	0.339 **	0.200 **	0.208 **	−0.170 **	−0.207**	0.261 **	−0.225 **	1.000	−0.143 *
		S. (bil.)	0.000	0.002	0.001	0.009	0.001	0.000	0.000	0.000	0.028
		N	237	237	237	237	237	237	237	237	237
	X65	CC	−0.264 **	−0.098	0.105	0.326 **	0.355 **	0.020	0.342 **	−0.143 *	1.000
		S. (bil.)	0.000	0.134	0.106	0.000	0.000	0.754	0.000	0.028	0.000
			237	237	237	237	237	237	237	237	237

* The correlation is significant at the 0.05 level (bilateral). ** The correlation is significant at the 0.01 level (bilateral).

Additionally, Table 2 has revealed a significant positive correlation between variable X6 and variables X30, X32, X38, and X44, meaning that female adolescents stand out above male adolescents for four habits: Searching for their favorite series online whenever possible, making music lists to listen online, film videos when they gather at friends' homes, and taking and sharing pictures.

The gender perspective is a central issue in the present research work; therefore, major significance is granted to the gender-based comparative analysis about the habits and behaviors teenagers showed when interacting on social media and the different patterns observed concerning how boys and girls searched on the web, participated, the languages they used, and formats they preferred—audio (music), visual (photos), or audiovisual (videos and online games).

There is a positive correlation, not gender-dependent, between participation on social media and the use of videogames and self-recorded videos. As a matter of fact, both activities, videogames and videos, have become actual hallmarks for today's teenagers.

As for H2, the variables showing some interdependence with gender issues are X43 (I share everything I like), X59 (they get annoyed if someone upload pictures of them without permission), X60 (consequences of uploading their videos), X62 (concerns about having their profiles broken into), X63 (they accept all friendship requests), and X65 (entering social media with a hidden profile). However, only X59, X60, X62, and X66 are coherent about following online security.

Subsequently, the combined tools of Kendal and Spearman and Cronbach's Alpha coefficient validate the research results, as well as their methodologic choices. The correlations carried out in the quantitative analysis of the collected data validate the differences found among adolescents concerning competences, preferences, and various active practices while using the Internet in general and social media in particular.

The analysis of these aspects confirms horizontal and participative dynamics based on collaborative learning and participatory culture (Jenkins et al. 2015), as will be observed in the following epigraph. Those dynamics have a significant impact on the adolescents' empowerment along their own informal learning process, reinforcing their epistemic maturity, as well as contributing to the formation of social and collaborative learning groups.

About H3, the adolescents' speeches transcribed from the individual interviews, the media diaries, and the workshops they took part in were analyzed and classified. The informal learning system that adolescents use when interacting in cyberspace was shown through the qualitative analysis of the content provided. The categories used in the present work were obtained from a thorough analysis of the students' statements and the coincidences found when comparing sentences used in the samples. Nvivo software was used to classify the adolescents' speeches into categories and, most of all, to create conceptual networks between categories according to the meaning of those speeches. This way, the specific strategies used by the students while engaged in informal learning were clearly shown. Table 3 presents those categories associated with informal learning strategies, concerning searching for information, trial and error strategies, and information management. They were all elicited from the interviews, media diaries, and workshops conducted.

It is clearly shown that informal learning practices are based in collaborative strategies and transmedia practices, with a particular relevance of the following categories: Learning through practice, either individually (checking tutorials, following experts, etc.) or as part of a team (asking peers for help, jointly creating content, etc.); learning by problem-solving, usually on forum boards and through collaboration; learning by playing games, usually group-playing; learning by imitation and through elicitation, particularly from and with experts; learning through the assessment of others, who are considered role models; learning by teaching others, either peers or adults; and guided learning, mainly by being motivated by teachers to share content.

Table 3. Categories of informal learning strategies developed.

Categories	Specific Strategies	Excerpts from the Adolescents' Speeches
Learning through practice	Search for information	• They search on Google, YouTube, video tutorials, Youtubers/gameplays, Instagram, fan pages, forum boards, Wikipedia, WhatsApp, blogs, Edmodo. • Follow experts to find their own interests. • Search for tutorials. • Check content in English or in foreign languages with subtitles.
	Trial and error strategy	• They learn with media by trying options until they achieve their objectives. • They learn through trial and error how to play videogames and use apps they are interested in. • They are interested in creating visual and audiovisual content, as well as artistic content, and use trial and error to achieve their goals.
	Organization of information	• They organize the information they consider useful in private folders.
Learning through problem-solving	Ask for help	Ask peers for help Ask adults they know (mainly teachers and family) for help
	Ask for other users' opinions	Search on Google for other users' opinions about the same question
	Hacking	Search on internet forums about the hack they need.
	Use of tricks/cheating/ignoring rules	Ignore rules or cheat at playing in order to progress in the game. They often think that cheating in a game is a waste of money
Learning by playing games	While playing videogames, look for details and failures (beta-testing), and learn issues—related to the game or not—in the process	Learn foreign languages, mainly English, improve social and personal competences, and acquire school-subject content They laugh at the failures they find in videogames
Learning by imitation and simulation	Imitation in place	Learn by directly observing other players' skills as they play or watching YouTube videos
	Imitating influencers and posts on social media	They imitate experts, such as Instagrammers
Learning by assessing	Assessment of content produced by themselves or others	They assess others' success and learn from it They record their performance to assess themselves and keep learning and improving
Learning by teaching	Teach adults	They attend to others' learning needs by posting on social media
	Teach peers (collaborative learning)	Self-recording on video to share their skills though mobile phones or social media
	Teach younger people	They teach younger people to play videogames at a basic level They teach younger people to search the web for information
Learning by others' elicitation/Guided learning	Teachers' elicitation	They are motivated to upload information to shared folders on the Cloud or virtual classrooms
	Learn by following seniors' suggestions and instructions	They often open their first email account at some senior's suggestion

4. Discussion

In many of the aspects studied in the research, adolescents show no significant gender-based differences. In this sense, we can conclude that, overall, they share concerns and interests about the following aspects: They like having large numbers of followers online, they care about what is being said about themselves online, and both, but particularly girls, constantly check for new notifications. These adolescents of the digital era state in their answers that they like being "always connected" (Arab and Díaz 2015). Living in the participatory culture involves being constantly connected and able to interact with others, regardless of time and space (Jenkins et al. 2015). In informal education contexts, such connectivity and collaborative learning (Carbonell Sebarroja 2017) are coherent with the need shared by all adolescents to comment on everything they like online, right in the moment in which those things happen (Masanet et al. 2019). Participatory culture implies that adolescents assume that learning spaces reach far beyond the classroom: To their daily lives, their families, and social media (Osuna-Acedo et al. 2020).

In the study, H1 is confirmed by finding that adolescents present significant differentiating characteristics according to gender. Male adolescents prefer to devote their time to online gaming with friends, especially when they gather in some of their homes, thus favoring socialization among players. Female adolescents, on the contrary, prefer to gather at friends' homes to make videos. Individually, females like making their own online music lists as well as shooting and sharing pictures. Moreover, while boys look for playthroughs of their favorite games, girls search for their favorite series online. Such results have been observed in previous research works as well (Tur-Viñes et al. 2018).

As for searches and downloads carried out by adolescents, distinctive traits are also found concerning gender. They all devote their spare time to searching and downloading films and music, making and uploading videos, and commenting and sharing on social media, particularly among friends. Two features seemingly raised equal interest among male and female students: Making fan fictions of series, films, and comics, and participating in cosplay (costume playing) related to their favorite games. As for differences, boys are more prone to searching on YouTube channels than girls, while the latter prefer to download the books, soundtracks, etc. of their favorite films.

H2, however, cannot be confirmed because no significant differences have been found between boys' and girls' attitudes towards their competences concerning online safety. In fact, scarce strategies are found focused on online safety. The only difference is a higher percentage of male adolescents stating that they use a nickname different from the one they use on their profiles on certain Internet sites, perhaps as a consequence of their participation in games, but, still, they allegedly accept all friendship requests on social media. Both boys and girls claim that they consider the possible consequences of uploading their own videos on social media, and both are annoyed when someone uploads pictures of them without prior permission (Durán and Martínez-Pecino 2015; Vázquez et al. 2018). Online safety measures adopted by teenagers seem clearly insufficient and, in fact, they admit that they accept all friend requests they receive on social media without filtering, especially boys, who like having as many followers as possible.

There is one more trait differentiating the current adolescents from those of previous historic periods: They like creating stories, games, and tutorials using ICRTs. This is linked to the Participatory Age's concepts of intercreativity, co-creation, and co-authorship (Guerrero-Pico et al. 2018). It is also coherent with the adolescents' attitude towards the premise: "No one knows everything, everyone knows something, all knowledge resides in humanity" (Lévy 2004), which is very similar to the quote by the remarkable pedagogue Paulo Freire: "No one knows everything, and no one ignores everything" (Freire 1999). Furthermore, according to the definition by Cobo Romaní and Moravec (2011), which is itself based in the official definitions recognized by the European Union, all of this informal learning reality is understood as the non-intentional learning that occurs naturally, spontaneously, and holistically, independently from formal education, in any quotidian context (Hod and Sagy 2019). It originates when adolescents interact with other people through dialog and practice, through exploration and experiences, nearly always in collaborative environments (Chatzí and Molina

2015; Gil-Quintana 2015; Laninga-Wijnen et al. 2019) and without involvement of a teaching team. Subsequently, it is understood that it will happen throughout life, unpredictably (Pereira et al. 2018).

In addition to all previous considerations, learning in the age of Participatory Culture (Jenkins et al. 2015) is utterly different from traditional learning. While the latter is ruled by a hierarchical communicative approach, the current times demand lifelong collaborative learning. Hierarchy becomes horizontality, so that learning is not only understood in terms of official education (Gil-Quintana 2016). Informal learning is winning the battle on social media. Through his connectivist learning theory, Siemens (2004) encourages a decentralized form of learning that empowers individuals as responsible for their own learning in both analog and digital spaces. "We all learn with everyone" is the motto followed on cyberspace and the one adopted by adolescents as their identity hallmark (Yang et al. 2018).

Basing on the previously mentioned remark, H3 can be confirmed as well. Moreover, it can be observed that the conclusions of the results' analysis are similar to those of the "10 T's taxonomy" (Osuna-Acedo et al. 2018a), which refers to adolescents' informal learning strategies. A direct correspondence can be appreciated between nine out of the ten principles stated in the 10 T's taxonomy and the present research's results:

- Authentic tasks, or application to real-life situations. Adolescents tend to the applicability of what they learn to real-life situations, which is, after all, the purpose spurring them into action.
- Learning transfer towards professions, which means to learn by aiming at corporate work in the professional world. It is worth mentioning, however, that potential applications to a professional context are not among adolescents' concerns. Such denial of their professional future might be caused by their perception of the working contexts as a distant scenario—they are still engaged in compulsory education—or because they are not motivated by professional difficulties ahead, so somberly pictured by media. This reveals itself as a new research line that should be explored, bearing in mind the present study's results.
- Pedagogical transformation, with an increasing importance of common interest groups and e-participation. Adolescents identify on social media what they must learn to look for in order to find joint participation with experts, collaborative learning groups, etc. They openly admit that they follow experts to find what their own interests may be.
- ICRTs. The research has clearly shown that the relational factor is essential to adolescents. They openly claim that they interact and collaborate on Google, YouTube, video tutorials, Youtubers/gameplays, Instagram, fan pages, assistance forum boards, Wikipedia, WhatsApp, blogs, and Edmodo, all of which are virtual spaces that allow participation.
- Transmediality, with multiformat resources from various sources. When speaking about preferences of use in digital technologies, adolescents do not understand content production without those multiformat resources, which are, in turn, the main reason for why they search on the sites mentioned in the previous taxonomic principle.
- Open temporality, closely related to lifelong learning. Perception of time for adolescents obeys the standards set by the digital technologies they live with at every moment. The fact that they search for tutorials as an informal learning strategy demonstrates their capacity to adjust to the relativity of time on the Internet, and, as a matter of fact, while searching for tutorials, adolescents look not only for the actual version they need, but also for further information contained in previous tutorials.
- Collaborative teamwork. The results of this research work clearly show that adolescents understand perfectly well the advantages of collaborative work; they use it with their peers and with external subjects, which may be older or younger than them. Remarkably, they organize the obtained information in a collaborative way during their information searching by criteria practices, in perfectly arranged folders of their own, which gives an idea of the potentiality and systematicity in those informal learning strategies carried out by adolescents.

- Intercreative talent. What defines adolescents is the joint creation of knowledge as a form of collective intelligence. Adolescents openly declare their interest in creating visual, audiovisual, and artistic content using trial and error as a strategy of action.
- Transnationalism, because they allow geographical gaps to be overcome. Adolescents conceive cyberspace as the global village, as outlined by McLuhan (1962). Adolescents consult content with no discrimination by nationality, and, to do that, they use English as the communication language in cyberspace, as well as subtitles in their first language.
- Tolerance concerning ambiguity and error when not all pursued goals are achieved and in the coexistence of cultures, ideas, interests, etc. Adolescents use trial and error and imitation strategies, looking for specific sites that could provide them with clues about solutions to their problems and needs.

Somehow, the 10 T's Taxonomy, when applied to transmedia practices and collaborative strategies typical of informal learning in adolescents, shows a significant progress compared to traditional learning methods. In the end, when learning informally, teenagers do not follow the methodological strategies they use in the classroom, but choose very different ones instead. They prefer opt for genuine tasks or real-life situations, aiming to transfer their learning to the real challenges they encounter in their daily lives. Likewise, they are eager to learn whatever experts may teach them, and consider the latter as intermediate leaders who catalyze and facilitate their informal learning processes. They do not need anyone guiding their learning all the time; instead, they consciously use the wide range of action provided by transmediality, where their demand for informal learning is not limited by time or space. Finally, they are open to co-authoring and joint creation of collaborative work with like-minded groups, therefore practicing and reinforcing values such as tolerance, peaceful coexistence, respect, etc.

Using the adolescents' own speeches, their informal learning strategies in and outside of the official education institutions have been categorized in the study's qualitative part. While reporting for UNESCO, Delors et al. (1997) warned about the need to develop the eight basic competences and to let learning continue along life in an increasingly aged population and with ever higher rates of academic failure. It was hardly surprising that, as the author pointed out, adults detached themselves from the academic world (formal learning) and, moreover, from any other type of learning (informal, non-formal learning), unless they perceived a clear benefit in it. In the end, adolescents in the sample stated that they learn through:

- Ludic processes, in a research–action way.
- Imitation and/or simulation, particularly following the leading roles of influencers.

Bauman (2016) also refers to lifelong learning and states that, in the liquid world we all live in, so changeable and oversaturated, it is essential to search for what is useful at each moment, forget about the obsolete, and never stop looking for new useful information. Adolescents have unquestioningly followed informal learning guidelines because, as read in their own statements registered in this research work, there, they find all of the benefits that they sought. Somehow, they have unconsciously assumed the model by Delors et al. (1997) about the eight basic competences focused on "learning by doing" throughout life, so that they often search for and arrange information by using trial and error strategies. This search for information becomes an enigma to be solved in the same way all problems are solved. Thus, they ask questions and seek help from experts in the field in order to achieve their learning goals.

5. Conclusions

Adolescence is a period of surprising growth and brain restructuring, which provides humans with abilities for abstract thinking, for expressing themselves in original ways, and for moving graciously. In addition, adolescents possess a great discernment in discovering abilities and skills so that they can leave the solid criteria established, and instead drift away down the liquid channels of the current society, fascinated at what is new and exciting, being protagonists of their own adventures of interaction,

participation, and construction of knowledge. Adolescents learn through games and the creation of transmedia narratives, by simulation and imitation of their influencers, the appreciation or rejection of either own or others' productions, from a peer-to-peer learning approach, and by collaboratively teaching others, younger or older. Ultimately, it is a network of self-taught experience that fits squarely within the "10 T's taxonomy": Authentic tasks, learning transfer towards professions, pedagogical transformation, ICRTs, transmediality, open temporality, collaborative teamwork, intercreative talent, transnationalism, and tolerance.

This research work concludes that the use of social media, despite the often-insufficient safety measures taken, increases adolescents' self-sufficiency towards informal learning because they take over the reins of their own training, thus enhancing their motivation and fostering their transmedia skills. Adolescents learn to search for and select relevant information, to assess sources, looking for alternatives when necessary, and to organize information, in addition to enhancing a correct use of language. They are reinforcing their creativity and imagination for lifelong learning, encouraging reflection and wisdom by learning how to learn. From the education systems in every country comprising our global village, we shall seize such academic opportunities that awaken the cognitive and emotional constitution of adolescent thought, engaging girls and boys in collaborative learning experiences spinning around transmedia literacy, as the essential approach deeply rooted in the basis of education and communication.

The data shown in the present study are limited, firstly, by the boundaries inherent to formal and informal contexts, and secondly, by the transmedia competences that the adolescents acquire. From that perspective, transmedia literacy should be taken into consideration as education practice, since it could provide future opportunities to recover the knowledge previously developed in informal contexts and bring it back to the classroom. In addition, a systematic study process is highly recommended, with a larger number of participants engaged and stronger commitment by education authorities, whose members should also play a main role in supporting the development of competences suitable to be obtained through transmedia practices. It is essential to invest in more research in the field of the collaborative culture of teenagers and the practices they carry out in production, exchange, and transmedia consumption. Likewise, further research is needed regarding the analysis, development, and implementation of the 10 T's taxonomy in formal education. In our constantly changing society, the collaborative strategies and transmedia practices presented in this study need to be constantly updated; therefore, further research will be needed to keep track of how teenagers change their informal learning strategies over time. To this, we can add the obtaining of answers to other questions about the actions of teenagers in media and social networks. In addition to these questions, it is essential to bet on research that recognizes the importance of the union between collaborative strategies and transmedia practices in formal and informal educational environments. The results of this research can serve as a guideline for defining and designing proposals in the context of (trans)media literacy programs in training spaces.

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