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Awareness and knowledge of cyberethics: A study of pre-service teachers in Malta, Norway, and Spain

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Abstract

This paper explores the awareness and knowledge of cyberethics held by pre-service teachers across three European countries. The study was conducted via an online survey and yielded 1,131 responses from pre-service teachers in Malta, Norway, and Spain. The facets of cyberethics included in this study focused on behaving responsibly online, safeguarding privacy, respecting copyright, seeking consent of friends before posting images or videos on social media platforms, and considering their professional identity as future teachers when posting online. The findings indicate that pre-service teachers reported relatively similar levels of competence in applying copyright and respecting privacy rules with pre-service teachers in Malta and Norway reporting higher degrees of knowledge and awareness than their counterparts in Spain. Malta had the most participants who reported that they always considered the potential impact that posting media online may have on their professional teaching career, followed by Norway. Spain had the largest number of pre-service teachers who stated that they rarely or never thought about this impact on their teaching career. This indicates a lack of awareness of behaving in an exemplary manner online in a more public and professional capacity. Our findings highlight the need for pre-service teachers' knowledge of cyberethics to be prioritised during Initial Teacher Education (ITE), especially at such a time when their professional identity is being shaped. A clear tension was noted between the perceived knowledge or competence and the declared practices of some pre-service teachers concerning the cyberethics items featured in the study. In light of our findings, we recommend that all ITE programmes include digital competence and cyberethics components in their curricula. This would enable pre-service teachers to develop an emerging professional and digital identity to face the challenges of becoming teachers in the 21st century.

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Introduction

The main purpose of this study is to explore the knowledge, awareness and understanding of cyberethics held by pre-service teachers and how this may contribute to their emerging professional identity. During Initial Teacher Education (ITE), pre-service teachers embark on a journey to become teachers and start developing an emerging teacher professional identity. Becoming a teacher in the 21st century poses challenges for pre-service teachers facing new kinds of responsibilities, competences, and roles. Pre-service teachers are expected to be increasingly digitally competent and able to use digital tools, resources, and virtual learning platforms in their teaching. Recognising the importance of digital competence in initial teacher education is pertinent for teachers' proficient and fluent use of digital technologies in their personal and professional lives. Furthermore, in teacher education, digital competence entails that educators are expected to be digitally competent to cater to their own professional needs and fulfil the pedagogical aspect of supporting their pupils in developing these digital skills (Lund & Eriksen, 2016; McGarr & McDonagh, 2021). However, pre-service teachers at the outset of their professional education do not necessarily make the connection between their online actions and their professional teacher or digital identities. Giæver et al. (2016) hold that the legal aspects of cyberethics, such as copyright and privacy, are less visible in classroom teaching due to the perceived complexity of these domains. Another issue to acknowledge is the potential incongruence between pre-service teachers' stated beliefs and their knowledge and practices (Anderson & Maninger, 2007). This interplay between what teachers say they do and what they actually do is not an uncommon finding (Deng et al., 2014) and is to be kept in mind when exploring pre-service teachers' stated knowledge and reported practices in personal and professional online presence and behaviour.

To explore pre-service teachers' awareness and stated or perceived knowledge about the issues highlighted above, this paper first presents a literature review focused on cyberethics and behaving responsibly online, and the professional and digital identities of pre-service teachers. This is followed by the study design, methods, results and discussion. Finally, the paper concludes by highlighting the main findings and proposing some recommendations.

Cyberethics: behaving responsibly online

Cyberethics encapsulates an element of being and acting on the internet or manoeuvering, participating, and behaving online in a legally and ethically manner. There are several terms that are either used synonymously or adjacently, such as computer ethics, information ethics, internet ethics (Capurro, 2007; Johnson et al., 2010) or e-safety (Šimandl & Vaníček, 2017) when dealing with the realm of moral issues related to computing and information technologies. Šimandl and Vaníček (2017) use the term e-safety and divide this into two areas: interpersonal e-safety which entails safeguarding oneself against risks such as cyberbullying and technical e-safety, which

encompasses being able to set strong passwords to safeguard sensitive personal data from being published on social networks. These areas correspond with what Pusey and Sadera (2011) term as cybersafety (interpersonal) and cybersecurity (technical). In addition, they use the term cyberethics, thereby differentiating between security, safety, and ethics. They argue that these three domains overlap and that the ethics domains encompass moral choices individuals make on the internet, such as copyright, online etiquette, hacking, and online addiction. The overlapping and adjacent terms can give grounds to confusion. Tavani (2016) suggests that the term cyberethics is preferable as it 'refers to the study of the moral, legal, and social issues involving those technologies' (p. 3). Tavani's perspective highlights legal aspects such as privacy and copyright, as well as moral and social issues. To a certain extent, cyberethics is not 'new' ethics, but ethics applied to new situations with digital tools (Engen et al., 2018). As such, cyberethics can be seen to encompass moral and legal aspects such as privacy, copyright, online etiquette, and evaluating the credibility of digital information, issues that teachers will undoubtedly encounter in the classroom.

As an integral facet of a teacher's digital competence, cyberethics is also referred to in supra-national policies. The DigCompEdu framework, for example, includes cyberethics through the term 'responsible use'. The framework describes the ethical dimensions of educators' digital competence through professional pedagogic competences, for handling digital resources, as well as developing the learners' responsible use (Redecker, 2017). Marín et al. (2021) point out that there is currently a dearth of knowledge regarding pre-service teachers' perspectives on and familiarity with data privacy matters related to social media. Warnick et al. (2016) list four categories of cyberethics for teachers, one of which is 'illegal or reckless behaviour' (p. 773). This includes activities such as posting photos of oneself committing a contravention, not respecting copyrights, and sharing images or videos without the consent of involved third parties. McGarr and McDonagh (2021), for example, report that 48% of pre-service - teachers in their study shared images on social media without asking for consent. Gallego-Arrufat et al. (2019) report that 47% of Spanish and Portuguese pre-service teachers in their study reported risky practices such as sharing information and digital content inappropriately. Carpenter et al. (2019) argue that social media offers new possibilities for how teachers present themselves and these can be beneficial or problematic in terms of the development of teacher identity. Marín et al. (2021) underscore the importance of pre-service teachers' knowledge and skills concerning privacy in social media, especially as the latter will act as digital role models for their students. Behaving in an exemplary manner with regards to copyright is also a challenge, and Perrott (2011) recommends that it should be included in curricula after finding many teachers unaware of the laws on the use of copyrighted materials in the classroom and that several copyrighted materials do not fall under fair use. Gudmundsdottir et al. (2020) argue that ITE needs to prioritise the 'responsible use of ICT' (p. 10) by focusing on cyberethics. This need is further underscored by McGarr and McDonagh's (2021) findings, where pre-service teachers' understanding of key concepts associated with cyberethics showed limited knowledge, with 51% of the students answering incorrectly, for example, with regards to republishing content from Wikipedia. Similarly, Shin (2015) reports a lack of awareness

of copyright by pre-service teachers. Furthermore, Shin (2015) calls for teacher cyberethics training and for more research on how to address these topics at a level that students can relate to. This affirms the argument made by Gudmundsdottir et al. (2020) that competence in cyberethics should be seen as a key transversal skill for teachers.

Identity matters: personal, professional and digital

Pre-service teachers nowadays usually come from a generation where 21st-century technologies are part of their daily lives. They may own various digital devices and engage comfortably with technology daily. However, this does not mean that they know how to employ digital technology for pedagogical purposes (Kumar & Vigil, 2011) or even necessarily in legal and appropriate ways (Engen et al., 2014; Marín et al., 2021). Fox and Bird (2017) point out that with regards to social media, teachers struggle with whether, how, when, and with whom to interact, and whether the interaction is professional or personal (Fox & Bird, 2017). Once pre-service teachers embark on their journey to become teachers, they experience a transition from being a pupil to becoming a teacher. This entails the development of a professional identity that may be aligned with their personal identity or not. This means that students' online and social media actions prior to starting ITE may have consequences for their future professional identity as teachers. Digital identity can be understood as information published on the internet that makes up others' image of us, which includes personal data, images, news, comments, tastes, friends, and hobbies (INTECO, 2012). Teachers need to develop and administer their digital identity, which includes being conscious of their conduct in digital arenas (Kelentrić et al., 2017), both concerning the consequences this has on their professional identity and being able to guide the pupils in the development of their digital identities.

Beijaard et al. (2004) argue that teacher professional identity is the perception that teachers hold of themselves at a present time. Teacher identity is not a static construct to be taken as a fixed formed identity but is considered dynamic and constantly in a state of flux (Engeness, 2021; Olsen, 2016). Sachs (2005, p. 15) view of identity points to multiple dimensions in the inclusion of how to be, how to act and how to understand as elements for attention; it encompasses both the personal and professional aspects of identity. We argue that this holds true for the development of a teacher's digital identity that is conducive to the responsible and competent use of digital technologies in both their personal and professional lives. Being in a position to ably and proficiently develop and shape their professional identity entails adopting and cultivating behaviours perceived as representing an image of teacher (Beijaard et al., 2004). Pre-service teachers need to be supported to be more aware of their professional digital teacher identity and how this may be nurtured and developed. Helleve et al. (2020) point out that in the transition from being a student to becoming a teacher, pre-service teachers should be aware of and take responsibility for how they want to present themselves as teachers on social media.

The above literature points towards the need for further understanding and knowledge pertaining to pre-service teachers' perspectives on cyberethics issues, and for a deeper understanding of how social media practices may impact their personal and professional identities.

The Study

As teacher educators, we are interested in the perceptions pre-service teachers have of their own awareness, knowledge and practices in relation to responsible behaviour online. Additionally, any potential incongruences or tensions may highlight areas for potential growth in their professional development as pre-service teachers during their ITE. The overarching focus of this study is to explore pre-service teachers' knowledge and awareness of cyberethics as featured at the beginning of their ITE journey. In this study of pre-service teachers from Malta, Norway, and Spain, we raise the following research questions:

RQ1: To what extent do pre-service teachers consider the impact on their professional identity when posting on social media?
RQ2: How do pre-service teachers perceive their competence in copyright and privacy issues online?
RQ3: How knowledgeable are pre-service teachers in relation to copyright?

The research questions were posed to guide the focus of this quantitative study. Thus, the questions were defined gradually and were drafted and revised to enable a flexible approach to accommodate the research findings and the three factors that emerged from the exploratory factor analysis. We first describe the background to the survey and offer a brief contextual backdrop to cyberethics provisions in the curricula for school and ITE. Then we describe the participants, questionnaire items and data analysis.

Background to the Survey

This paper draws on a larger study that took place through a collaborative networking process through an ERASMUS+ funded project. The study aimed at comparing pre-service teachers' development of digital competence across the participating countries through a survey (DiCTE, 2019). The design of the survey was built around the PEAT model, which covers pedagogical (P), ethical (E), attitudinal (A), and technical (T) dimensions of digital competence. The survey included 53 items covering these aspects, both open-ended (2) and Likert-type questions (51), with self-reported competence rating and knowledge items. The survey was designed, piloted and redesigned in three iterations (in 2017, 2018 and 2019). Subsequently, the survey was developed and validated as a data collection tool. The survey items were translated into the official languages of the respective countries and administered to pre-service teachers during their first weeks of ITE. For the purposes of this paper, we focus on the ethical dimension through the selected survey items that are described in a subsequent section about Questionnaire Items and in Table 1.

Study Context: Cyberethics in Curricula in Malta, Norway, and Spain

The Maltese curriculum for schools specifically mentions the responsible use of the internet, as well as 'making informed choices over privacy, taking responsibility for their actions, respecting

intellectual property, abiding by the terms and conditions of systems they use and respecting the rights and feelings of others' (Directorate for Quality and Standards in Education [DQSE], 2015, p. 46). Similarly, the Norwegian curriculum defines cyberethics as being able to follow the rules for protecting privacy and using media in a responsible manner, including strategies for avoiding unwanted incidents online, reflecting ethically, and assessing their own role on the internet and in society. In Spanish, the expression 'Buenas Prácticas TIC' (*Good Practices in ICT*) is used, which refers to generic concepts such as the prevention of cyberbullying, the early detection of harassment on the internet and issues related to privacy and security online (DECRETO, 2014). In Spain, these guidelines are generally issued on a regional basis. The Maltese (DQSE, 2015) and Norwegian (Norwegian Directorate for Education and Training [NDET], 2017) contexts are somewhat similar with nationwide curricula. This means that as former primary and secondary school students, the Maltese and Norwegian pre-service teachers participating in this study would have had some formal curricular provision related to cyberethics dimensions referred to in this paper. At the tertiary education level, the Maltese and Norwegian universities have policies to address cyberethics (University of Malta, 2018; Universities Norway [UHR], 2016). In relation to the participating Spanish university, there is a general policy published on the university website, but it has not yet been widely disseminated to staff or students.

Participants

The participants were drawn from the 2019 cohorts of students starting ITE programmes at universities in Malta, Norway and Spain. To reduce any confusion, each country mentioned in the study (Malta, Norway, Spain) stands for the participating institution and not all the ITE institutions in each respective country. A non-random sampling method was adopted and the student teachers were invited to participate in completing an online survey. At the Spanish university, the survey was conducted over a 3-week period at the beginning of the semester. At the Norwegian and Maltese universities, student teachers were provided with the link to the survey. All participants were briefed about the study and encouraged to participate but were told that participation was voluntary and that they could withdraw at any time. The Norwegian students had just commenced a 5-year program leading to a Masters in Teacher Education, the Maltese students a 2-year graduate programme leading to a Masters in Teaching and Learning and the Spanish students a 4-year undergraduate program leading to a degree in Teacher Education.

The total number of participants who completed the survey was 1,131. These were distributed across the countries as follows: 55% from Spain (n=622, response rate 86%), 31.9% from Norway (n=361, response rate 96%) and 13.1% from Malta (n=148, response rate 85%). Female students accounted for 78% of the participants. This gender distribution reflects a high number of female ITE candidates; however, that is commonly observed in Malta, Norway and Spain. Overall, 50 % of the participants were between 18 and 20 years old. Maltese students were older than their Spanish and Norwegian counterparts, with 89% of Maltese students ranging from 21 to 30 years old, whilst 82% of the Spanish and 41% of Norwegian students were under 20 years old. Further details about the participants' age and gender by country/institution are in Appendix A.

Questionnaire items

For this paper, to investigate pre-service teachers' awareness of cyberethics as part of their emerging professional digital identity, nine questionnaire items focusing on copyright and privacy were selected from the 2019 survey as listed in Table 1 below. Items 1, 2, 6, 7, 8 and 9 were answered by Likert type scales ranging from 1 to 5 (depending on the statements, these ranged from 'always' through to 'sometimes', or 'strongly agree' to 'strongly disagree'), whilst items 3, 4 and 5 were multiple-choice questions.

Table 1: Survey items related to cyberethics

Selected Questionnaire Items
1. Before I post images on social media, I consider whether it might have an impact on my teaching career
2. Before I post videos on social media, I consider whether it might have an impact on my teaching career
3. A pupil has created a text with images copied from Wikipedia. Can the pupil publish the text with the images on the internet (e.g., on Facebook or blog)
4. Who owns the copyright on an assignment produced by a pupil at school?
5. Can you republish an image downloaded from an image-sharing service on the internet (such as Instagram, Pinterest)?
6. Rate your competence: applying copyright rules online
7. Rate your competence: applying privacy rules online
8. When I share images of friends on social media, I ask for consent
9. When I share videos of friends on social media, I ask for consent

These survey questions in Table 1 above focus specifically on the pre-service teachers' perceived knowledge and awareness of cyberethics. These items feature respecting privacy rights and seeking consent from third parties when posting images or videos of them on social media platforms (3 items), in adhering to copyright rules in personal or professional remits (4 items), and considering the impact on their own professional identity and future teaching careers when posting images or videos of themselves on social media (2 items).

Data analysis

The data collected through the online survey was exported into SPSS 26 for data analysis. Statistical analysis was carried out on the nine questionnaire items included in this study. The

selection of questionnaire items was confirmed by means of Bartlett's test of sphericity and the KMO sampling adequacy index. The Measure of Sampling Adequacy value was good and confirmed that the items presented a sufficient intercorrelation and a satisfactory level of internal reliability and validity, as shown in Table 2. This means that when the nine selected questionnaire items are brought together, they make up an adequate and satisfactory data set despite being taken from a larger set of survey data.

Table 2: Measure of Sampling Adequacy

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.711
Bartlett's Test of Sphericity	Approx. Chi-Square	5890.14
	Df	136
	Sig.	.000

Three factors were extracted with *eigenvalues* of 1 or greater, which together explain 63.84% of the total variance, as shown in Table 3 below.

Table 3: Method of extraction: analysis of main components

Component	**Initial auto values**			**Sums of the saturations to the extraction square**			**Sums of the saturations to the rotation square**		
	Total	% of the variance	% accumulate	Total	% of the variance	% accumulate	Total	% of the variance	% accumulate
1	3.061	34.007	34.007	3.061	34.007	34.007	2.813	31.253	31.253
2	1.629	18.104	52.111	1.629	18.104	52.111	1.676	18.625	49.878
3	1.056	11.735	63.846	1.056	11.735	63.846	1.257	13.968	63.846
4	.929	10.325	74.171	1.044					
5	.888	9.871	84.042	1.018					
6	.855	9.505	93.547	.998					
7	.343	3.806	97.352						
8	.133	1.482	98.834						
9	.105	1.166	100.000						

The study of the commonalities represents values higher than 0.562, which leads us to state that all the variables contained in the study are explained by the extracted components. It is then necessary to maximise the explanation of this variance with the least number of factors, an aspect that will determine the total number of elements to extract as displayed in Table 4.

Table 4: Rotated factorial structure and communalities

Items	Factor			Communalities
	1	2	3	
Before I post videos on social media, I consider whether it might have an impact on my teaching career	.864			.794
Before I post images on social media, I consider whether it might have an impact on my teaching career	.848			.772
When I share videos of friends on social media I ask for consent	.823			.779
When I share images of friends on social media I ask for consent	.783			.716
Rate your competence: applying copyright rules online		.769		.667
Rate your competence: applying privacy rules online		.682		.616
Can you republish an image downloaded from an image-sharing service on the internet (such as Instagram, Pinterest)?			.673	.605
Who owns the copyright on an assignment produced by a pupil at school?			.619	.587
A pupil has created a text with images copied from Wikipedia. Can the pupil publish the text with the images on the internet (e.g., on Facebook or blog)			.592	.562

To analyse the internal consistency of the nine selected items, Cronbach's Alpha was used, offering a coefficient over 0.707, which indicates good reliability of the instrument, according to the criteria of Hair et al. (2010). In addition, a standardised alpha with a value of 0.725 also indicates the validity of the adapted survey instrument.

Limitations

The survey was completed through self-reporting by the participants, and we acknowledge the limitations of using such a measure of digital competence. To counter this, some of the items selected were devised to elicit responses about specific targeted questions about their knowledge or practice as other researchers facing similar limitations (Engen et al., 2014; McGarr & McDonagh, 2021; Tondeur et al., 2017).

This study presents results for three groups of pre-service teachers from a total of three ITE institutions in Malta, Norway, and Spain and cannot be generalised to a whole population in all or any of these countries. Comparisons between the country groups also have to be interpreted with caution due to features pertaining to the sample sizes and the linguistic, cultural, and curricular diversity across the three countries.

Results

Based on the Exploratory Factorial Analysis, we identified three items that loaded together formed a factor related to professional identity, privacy, consent and social media; another two items were grouped into a second factor related to perceived competence in applying privacy and copyright rules online; the remaining three items were grouped into a third factor dedicated to stated knowledge about copyright. These factors have also been integrated into the research questions and will be expanded upon in the tables of descriptives in the presentation of results in the following sections: (i) professional identity and social media; (ii) perceived competence in copyright and privacy; and (iii) stated knowledge about copyright. These three factors also feed directly into the research questions and will be discussed following the presentation of the results. To analyse each of the three factors, tables are provided with the mean, standardised deviation, skewness and kurtosis for each country. At the end of each table, we added the p-value, which in all cases is $p < 0.05$, and therefore statistically significant for all items.

Professional identity and social media

The first factor identified through the factorial analysis compiles four questions that illustrate the pre-service teachers' awareness of the potential impact their actions may have on their professional identity when using social media and posting media (images or video) online and whether they consider privacy rules and seek consent before they post videos or images of their friends on social media. The results in Table 5 are presented across the three groups of participants hailing from the different institutions. The mean scores are measured according to the Likert scale responses and range from 1 to 5, where 1 denotes 'always' and 5 'never'. The standard deviation values for the 4 survey items presented show that the data is least spread out for Malta, followed by Norway, and then Spain, resulting in a greater dispersion of scores. The kurtosis is high for the Malta scores on the first and second items related to considering their teaching career when posting videos and images online and may denote lack of variation in the answers by the respondents.

Table 5: Descriptives of professional identity, privacy and consent when posting on social media

Items	Mean			Standardised deviation			Skewness			Kurtosis			p-value X^2
	Spain	Norway	Malta	Spain	Norway	Malta	Spain	Norway	Malta	Spain	Norway	Malta	
1. Before I post videos on social media, I consider whether it might have an impact on my teaching career	2.65	1.78	1.35	1.340	.889	.727	.331	1.218	2.469	-1.128	1.358	6.637	.000
2. Before I post images on social media, I consider whether it might have an impact on my teaching career	2.54	1.84	1.39	1.335	.907	.778	.492	1.149	2.452	-.990	1.128	6.636	.000
3. When I share videos of friends on social media I ask for consent	2.67	1.74	1.77	1.289	.861	.948	.283	1.126	1.698	-1.083	.817	2.624	.000
4. When I share images of friends on social media I ask for consent	2.66	1.81	1.64	1.316	.901	.984	.263	1.193	1.521	-1.168	1.247	2.098	.000

The first question in this factor indicates that when posting videos online, most Maltese pre-service teachers consider whether it would impact their professional teaching career (75.7% always and 16.9% almost always). The Norwegian pre-service teachers report that they would frequently do so (45.5% always, 38.2% almost always), whilst less Spanish pre-service teachers consider the potential impact of posting a video on social media (24.3% always, 28.5% almost always). It is noteworthy that 11.6% of Spanish students admitted that they 'never' considered whether a social media video post could impact their future teaching careers, while only 1.1% of Norwegian students and 0.7% of Maltese students registered this response. The results for the second question

follow a similar pattern as the previous question, with most Maltese pre-service teachers reporting they would always consider their profession when posting images online (74.3% always, 16.9% almost always), followed by Norwegian pre-service teachers (41% always, 41.8% almost always) and Spanish counterparts being the least likely to consider their professional career (always 26.7%, almost always 31.5%). This pattern is further confirmed in that around 6% of Spanish pre-service teachers reported that they would never consider their profession when posting either videos or images online as compared to approximately 0.7 to 1.4% of Maltese and Norwegian respondents.

When posting videos of friends on social media, Maltese and Norwegian pre-service teachers reported similar behaviours. The majority of Maltese participants reported that they would always/almost always request their friends' consent before posting videos of them on social media (58.1% always, 28.4% almost always). The Norwegian pre-service teachers also reported a high level of awareness of this responsibility (47.1% always, 37.4% almost always) as opposed to the Spanish pre-service teachers, where only 22% reported always asking for consent and 29.1% almost always. Thus, only 22% of Spanish students reported that they would always request permission to post videos on social media compared to 58.1% of Maltese and 47.1% of Norwegian students. The results were very similar for the final item in this factor cluster featuring sharing images of friends on social media. The Maltese and Norwegian responses were similar in that they more often asked for consent before posting images of friends on social media (48.6% and 43.5%), stating that they always did this, in contrast with the Spanish respondents (23.8%). Despite more Norwegian and Maltese pre-service teachers acknowledging their responsibility in always requesting consent when posting images or videos of friends online than the Spanish pre-service teachers, it was noted that overall, the highest frequency was 58.1% and lowest 22%.

A consistent pattern of responses to the four questionnaire items was reported for the descriptives in this first factor by the three participating groups of pre-service teachers. Thus, to sum up this factor related to the professional identity cluster of questions, it seems that the Maltese pre-service teachers report that they are more cognizant of the potential impact posting videos or images online may have on their future professional career. The Norwegian pre-service teachers also have a good level of awareness. On the other hand, the Spanish pre-service teachers' responses display less awareness of the potential impact of their online and social media behaviour in posting videos and images of friends on social media without requesting their consent as well as the impact on their own professional careers.

Perceived competence in copyright and privacy

The second data factor includes two questions related to the participants' self-reported competence in applying privacy and copyright rules online. Table 6 presents results across the three groups from the three different institutions. The mean scores are used to a range of 1 (very good competence) to 5 (very poor competence).

Table 6: Descriptives of perceived competence in applying copyright and privacy rules

Items	Mean			Standardised deviation			Skewness			Kurtosis			p-value X^2
	Spain	Norway	Malta	Spain	Norway	Malta	Spain	Norway	Malta	Spain	Norway	Malta	
1. Rate your competence: applying copyright rules online	3.43	3.00	2.99	.998	.806	.965	.098	-.032	.198	-.657	-.097	-.372	.000
2. Rate your competence: applying privacy rules online	2.90	2.58	2.72	1.076	.862	1.082	.098	.155	.359	-.565	-.363	-.484	.000

In relation to perceived competence in applying copyright rules online, there are relatively small differences across the three institutions according to the mean score, where for all institutions the neutral option of 'neither good nor poor' is the most selected response for this item (49.3% Norwegian students, 39.9% Maltese students and 36% Spanish students). Similarly, applying privacy rules online yielded the neutral answer as the most selected response for all institutions (mean scores close to 3: 37.7% Norwegian students, 30.4% Maltese and 34.6% Spanish). A substantial number of students from all three countries report their competence as poor or very poor in applying copyright (Maltese 28.4%, Spanish 46.3%, Norwegians 25.5%) and privacy rules (Maltese 23%, Spanish 27.7%, Norwegian 14.4 %).

The findings for factor two indicate that participants in all three institutions report a lack of certainty or knowledge in relation to applying copyright and privacy rules online, with Spanish pre-service teachers perceiving their competence in applying copyright rules online as weaker when compared to Maltese and Norwegian students. Furthermore, students from all participating institutions tend to rate their competence in privacy slightly higher than their competence in copyright.

Stated knowledge about copyright

The third factor presented in Table 7 refers to stated knowledge about copyright through three questions on students' knowledge of personal issues, such as republishing images from social networks, or professional issues, like use of images from websites or copyright ownership of students' work at school.

Table 7: Descriptives of stated knowledge about copyright

Items	Mean			Standardised deviation			Skewness			Kurtosis			p-value X^2
	Spain	Norway	Malta	Spain	Norway	Malta	Spain	Norway	Malta	Spain	Norway	Malta	
1. Can you republish an image downloaded from an image-sharing service on the internet (such as Instagram, Pinterest)?	.302	.515	.324	.460	-.061	0.470	.863	-.061	.758	-1.259	-2.007	-1.445	.000
2. Who owns the copyright on an assignment produced by a pupil at school?	.619	.778	.622	.486	-1.346	.487	-.491	-1.346	-.507	-1.764	-.189	-1.767	.000
3. A pupil has created a text with images copied from Wikipedia. Can the pupil publish the text with the images on the internet (e.g., on Facebook or blog)?	.293	.249	.243	.455	1.164	.431	.914	1.164	1.209	-1.169	-.649	-.545	.000

The first question in the third factor relates to republishing images on a personal basis and shows that more Norwegian students choose the right answer ('Yes, but only if the image is licensed for free use' - mean score of 0.51) when compared to the Maltese (mean score 0.324) and Spanish (mean score 0.302) students. Maltese and Spanish students (33.8% and 36.8% respectively), answer that all images from image-sharing services can be republished online without the need for permissions or licences. Over one-fifth of the students from each institution chose the 'I don't

know' response option (Norway (26%), Malta (22.3%) and Spain (20.1%), confirming lack of knowledge about copyright rules and sharing images that are not licensed for free use.

The second and third questions in this factor are linked to the professional teaching domain. As far as the intellectual property of students' own work is concerned, the positive asymmetry of the Norwegians' answers indicates a greater knowledge of this issue (copyright belongs to the pupil; mean score of 0.778), indicating that more than 77.8% Norwegian students that chose the correct answer when compared to the Maltese (mean score 0.622) and Spanish (mean score 0.619) students, who give almost identical results. The third question in this factor refers to knowledge about republishing text and images from Wikipedia (that images on Wikipedia are published under a free licence). The pre-service teachers had relatively similar answers as 29.3% of the Spanish students (mean score 0.293), 24.9% of the Norwegian students (mean score 0.249) and 24.3% of the Maltese students (mean score 0.243) selected the right answer. It is noteworthy that over 70% of all the participants do not know that Wikipedia images are published under a free licence.

Our findings indicate that Norwegian students are more knowledgeable in relation to issues related to copyright included in this study, such as ownership of the copyright of a pupil's assignment and the use of images/text from Wikipedia, than their counterparts in Malta and Spain. Participants from Malta and Spain, in contrast to their responses to other questions, obtained very similar results to this question. These findings give rise for concern as almost half the students from the three institutions do not have adequate knowledge in applying copyright rules online.

Discussion

The aims of this paper were to explore and gain insight into pre-service teachers' self-reported knowledge and awareness of digital competence in relation to cyberethics and behaving responsibly online across three countries. More specifically, whether pre-service teachers considered the potential impact on their professional identity when posting online, how they perceived their competence in copyright and privacy and how knowledgeable they perceived themselves in adhering to copyright. The findings were presented in the previous section through tables and accompanying text. These findings will be discussed below through the lens of the three research questions that are mapped onto the three factors identified through the exploratory factor analysis, namely: (i) professional identity and social media; (ii) perceived competence in copyright and privacy; and (iii) stated knowledge about copyright. The factors will be included as section headings to guide the focus of the discussion. A degree of overlap may be unavoidable in some instances as these are not independent features or characteristics. Elements of the professional identity will be reflected in the discussion related to perceived knowledge or competence in issues of copyright and privacy. To acknowledge this and to aid the discussion, the perceived competence in copyright and privacy will be discussed in the same section as stated knowledge about copyright.

Professional identity and social media

As pre-service teachers, the participants of this study were initiating the process of shaping their professional teacher identities as they progressed through initial teacher education programmes. Throughout this process, some pre-service teachers experience more tension between their personal identities and their developing professional identities (Beijaard et al., 2004; Engeness, 2021). Findings from our study indicate that the majority of Maltese respondents reported they would consider the impact on their career and would request consent from friends before posting images or videos on social media. Various reasons may contribute to this heightened awareness amongst the Maltese cohort, such as national campaigns and curricular provision in compulsory education promoting responsible and safe behaviour online; following a post-graduate master level ITE programme; and their higher age range. These variables may have afforded the Maltese pre-service teachers more personal maturity and exposure to an awareness of correct academic and ethical behaviour through having already read for an undergraduate degree. It may also be plausible that Maltese participants are more aware of the potential impact on their professional identity because of the socio-cultural scenario of Malta being a very small island where people know each other, and it is easy to look up and identify people online or on social media.

Overall, the participants from the three institutions display a lack of awareness of responsible behaviour related to whether they would post images or videos of friends on social media, than in view of posting images or videos that may have an impact on their own prospective teaching career. This response may indicate that the pre-service teachers are in the process of becoming aware of their new professional roles and responsibilities, despite this seeming to be lacking in other situations. It may also reflect a more casual approach to sharing media in their personal rather than professional capacity. Following Helleve et al. (2020), these findings further highlight the need for a more direct awareness of the transition ITE students experience from using social media in their personal capacity to becoming pre-service teachers where the boundaries between personal and professional domains may become blurry.

Copyright and privacy

Another dimension of cyberethics for pre-service teachers is upholding copyright rules and respecting intellectual property rights. These are two principles that professionals in the field abide by to ensure professional cyberethical practice. Moreover, knowledge of copyright and intellectual property rights is relevant for pre-service teachers, both in a personal capacity as university students, as they write assignments and research while reading for a degree, as well as in their professional remit of becoming teachers. This includes both acting as role models for their pupils as well as teaching their pupils what is legally and morally acceptable behaviour online, both with regards to copyright as well as privacy. As (Marín et al., 2021) hold, pre-service teachers' knowledge and skills in relation to safeguarding privacy in the use of social media is important in terms of acting as role models for their pupils in schools. Moreover, knowledge of copyright is crucial in an educational setting as teachers and pupils produce digital content for teaching and learning. Overall, when taken as one group, the respondents gauged their competence in privacy

slightly higher than their competence in copyright. Conversely, it can be argued that despite provisions for learning about copyright and privacy issues through local curricula in two of the participating countries, Malta and Norway, the pre-service teachers in our study did not report or exhibit adequate knowledge of these issues. This finding fits in well with Giæver et al. (2016) findings, where teachers tended to avoid engaging with the legal aspects of cyberethics entailed by copyright and privacy. Acting as role models for pupils in schools entails educators' responsible, moral and legal behaviour in safeguarding privacy and upholding copyright.

Conclusion and Implications

As natives of the digital era pre-service teachers may feel competent and knowledgeable about their use of digital technologies and confident in their use of social media. However, Engen et al. (2014) argue that the level of confidence does not necessarily tally with their competence. The current study confirms, as other studies have done (Kumar & Vigil, 2011; Marín et al., 2021), that despite being digital natives, pre-service teachers do not necessarily have the awareness, knowledge or competence to apply cyberethics in a professional domain such as education where copyright and privacy rules have to be upheld and respected.

Some of our findings appear to highlight a somewhat contradictory situation in which many participants claimed knowledge about copyright, but then provided the wrong responses to the question about sharing images/videos without obtaining prior consent. A lack of consistency is also observed between the knowledge they claim to have and their self-reported actions. This is not an uncommon finding in the literature dealing with the interplay between pre-service teachers' stated beliefs and knowledge and practices (Anderson & Maninger, 2007; Deng et al., 2014). Pre-service teachers, as future teachers, need to have the knowledge and competence to teach and guide their students through a safe and ethical digital life as well as being confident and aware of their own digital practices (Marín et al., 2021).

Teacher education needs to be sensitised to the differing levels of pre-service teachers' awareness of their professional digital identity. The findings also point clearly towards a lack of awareness, albeit to different degrees, among pre-service teachers of their online behaviour as private citizens or professional teachers. It is imperative that this potential mismatch between the personal and professional domains of identity and digital identity be taken into serious consideration in ITE due to possible consequences on their professional digital identity (Kelentrić et al., 2017). Furthermore, we argue that cyberethics, including a focus on professional digital identity, be integrated as a key dimension of ITE. There is a need for more research on whether pre-service teachers develop an increased awareness of their cyberethics online in a professional capacity by the time they graduate and through their first years of teaching.

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APPENDIX

Appendix A Participants by gender, age and country

In this table the number in each cell refers to the actual number of participants in the study cohort of each institution, the % refers to all the participants from each age range.

Gender	Age	Malta	Spain	Norway	TOTAL
Female	Under 20 (%)	2 (0.4%)	441 (77.9%)	123 (21.7%)	566 (100%)
	21-25 (%)	91 (34.6%)	67 (25.5%)	105 (39.9%)	263 (100.0%)
	26-30 (%)	14 (40.0%)	5 (14.3%)	16 (45.7%)	35 (100.0%)
	Over 30 (%)	9 (42.9%)	7 (33.3%)	5 (23.8%)	21 (100.0%)
	TOTAL Females (%)	**116 (13.1%)**	**520 (58.8%)**	**249 (28.1%)**	**885 (100.0%)**
Male	Under 20 (%)	0 (0.0%)	72 (73.5%)	26 (26.5%)	98 (100.0%)
	21-25 (%)	21 (18.3%)	24 (20.9%)	70 (60.9%)	115 (100.0%)
	26-30 (%)	5 (27.8%)	3 (16.7%)	10 (55.6%)	18 (100.0%)
	Over 30 (%)	6 (40.0%)	3 (20.0%)	6 (40.0%)	15 (100.0%)
	TOTAL Males (%)	**32 (13.0%)**	**102 (41.5%)**	**112 (45.5%)**	**246 (100.0%)**
Total	**Overall**	**148 (13%)**	**622 (55%)**	**361 (32%)**	**1131 (100.0%)**