

GENDER-BASED ATTITUDES OF TEACHER TRAINING STUDENTS TOWARDS CYBER THREATS

KNYTL Martin, CZ

Abstract

This paper focuses on teacher training students' gender-based attitudes towards selected cyber threats. First, the context of cyber threat and its role in contemporary education is provided. This is followed by the sub-results of a research survey focused on the attitudes and experiences of teacher training students towards selected forms of cyber threats. Among the forms of cyber threats, risk phenomena such as cyber-bullying, cyber grooming, sexting, cyberstalking and hate speech were selected. The results show slight gender differences among teacher training student attitudes towards the selected cyber threats. However, females highlight a slightly higher level of the need for cybersecurity in the items examined.

Keywords: cyber threats, cyberspace, teacher training students, digital competence

GENDEROVĚ PODMÍNĚNÉ PŘÍSTUPY STUDENTŮ UČITELSTVÍ K VYBRANÝM KYBEROHROŽENÍM

Resumé

Príspevok sa zameruje na genderové prístupy študentů učitelství k vybraným formám kyberohrožení. Nejprve je uveden kontext tématu kyberohrožení a jeho role v současném vzdělávání. Následují dílčí výsledky výzkumného šetření, které se zaměřilo na přístupy a zkušenosti studentů učitelství s vybranými formami kyberohrožení. Mezi formy kyberohrožení byly zvoleny rizikové jevy, jako jsou kyberšikana, kybergrooming, sexting, cyberstalking a hate speech. Z výsledků vyplývají pouze mírné genderově podmíněné rozdíly mezi studenty učitelství k přístupu k vybraným kyberohrožením. Nicméně ženy vyzdvihují částečně vyšší míru potřeby kyberbezpečnosti ve zkoumaných položkách.

Klíčová slova: kyberohrožení, kyberprostor, studenti učitelství, digitální kompetence

Introduction

The use of modern digital technologies has been a common part of everyday life for many years. Technology is used in a variety of ways, at work, at school, in public institutions, but also at home. One of the most common activities using a smartphone, tablet, laptop (or other modern technology) is online communication. This is a type of social communication that lacks the non-verbal component of communication, so the messages received may be distorted in some respects. This distortion can, however, be partly compensated for by video chats or the now very well-known emoticons. The importance of emoticons, though, is very subjective for each recipient and sender of an online message.

Closely related to online communication and the potential for misrepresentation of received messages are the negative psychological aspects elaborated by Suler (1998). The negative

aspects in question include limited perception, more frequent restriction to written text, identity flexibility, altered perception, status equality, transcendental space, temporal flexibility, writability, and the disinhibition effect or dropping of inhibitions in cyberspace. The existence of the negative aspects of cyberspace develops a space for various cyber threats that can interfere with the psychosocial plane of the person or the user of cyberspace and modern technologies.

Generation Z, people born roughly between 1997 and 2012, and Generation Alpha, people born after 2013 (cf. Dimock, 2019), are among the generations that have already been born into the age of modern technology and using it comes naturally to them. However, these generations are the most vulnerable social groups to cyber risks. This fact should highlight the importance of addressing cyber threats not only in the family environment but also in the field of education. Thus, the subject of this paper is to link two levels, which are the selected cyber threats and approaches to them from the perspective of future teachers.

1 Cyberthreat and its place in education

All trends related to modern technologies and cyberspace should be of interest not only to specialists but also to parents and teachers. It is parents and teachers who play an important role as socialising agents and who should play a key and guiding role in dealing with digital technologies and cyberspace. Through formal and non-formal education, children and pupils should have the opportunity to develop the necessary digital competence leading to the development of digital literacy, or the development and acquisition of media literacy, which can be considered superior to digital literacy.

The need for cyber threat education is reinforced by the fact that imaginary scissors are being opened among a select group of parents and teachers who have been in teaching practice for several years. We can talk about digital natives and digital immigrants, i.e. people born into the world of technology and people who have been using technology since a certain age. The imaginary scissors represent the risk of a digital gap, which is detected between the generations (digital natives and digital immigrants) in everyday use of digital technologies, and online communication, education, etc. The question is how to ensure adequate preparation of current generations to work effectively with modern technologies and use them safely.

One way to develop the current generation of cyberspace users is to educate teachers in this field. For future teachers, it can be considered an advantage that current full-time teacher training students belong to the aforementioned Generation Z. They are no strangers to modern technologies, and it is about finding ways to strengthen the digital competence they will pass on to their pupils.

The issue of cyber threats certainly has a firm place in strategic and conceptual materials in education. It is expected that it will also be reflected in the curricula of teacher-oriented higher education. There was a major change in Czech education in 2021, when the Ministry of Education, Youth and Sports issued new framework curricula for primary education and grammar schools. The changes consisted of revisions to these programmes in the area of information technology and the introduction of a new digital competence that a graduate of a given level of education should be equipped with.

All the changes that have been and are still being made concerning the revision and modernisation of the Framework Educational Programmes are based on the Strategy for the Education Policy of the Czech Republic until 2030+, which was issued by the Ministry of Education, Youth and Sports in 2020. Digital technologies are the subject of the first strategic objective, which focuses on education within the framework of competences needed for active civic, professional and personal life. It is stated that the education system will strive to actively respond to the dynamic environment and times, i.e. to increase the level of digital skills and computational thinking, in other words, digital competences. In the context of the cyber threat, it is mentioned that the education system will strive for critical and responsible use of digital technologies, but also for safety in cyberspace and dealing with potential problems. As the Strategy states, these aspects are part of digital education (Ministry of Education, Youth and Sports, 2020).

The Framework Curriculum for Primary Education is the key document of compulsory education in the Czech Republic. The newly introduced digital competence has expanded the aims of this education to include guiding pupils in the safe and critical use of the digital environment in various aspects of life. In the description of digital competence, cyber threat can be found in the sense that pupils understand the importance of digital technologies for human society, can reflect on the risks of its use, and also try to prevent situations that threaten the security of devices and data and endanger physical and mental health. What can also be considered significant is that the pupil should know and be able to act ethically in cyberspace (Ministry of Education, Youth and Sports, 2021a). The Framework Curriculum for Secondary Schools adds to the ability to act ethically in cyberspace through the aspect of consideration and respect for other people who are also in the digital environment (Ministry of Education, Youth and Sports, 2021b).

The progressive implementation of changes in the context of the use of digital technologies in education has also led to changes in the Framework of Educational Programmes for Secondary Vocational Education. Across the different types of secondary education, a cross-cutting theme entitled 'People and the digital world' is included from 2023 onwards, which incorporates the knowledge and skills that students should be equipped with within the field of health education into the digital competence framework. The knowledge and skills that include preventive and active health and safety care when using digital technologies. Furthermore, it is also necessary to guide pupils to be aware of current developments in the field of cyber security (Ministry of Education, Youth and Sports, 2023).

Excluding documents related solely to education, in the Czech environment, one of the most important documents is the National Strategy for Primary Prevention of Risky Behaviour in Children and Youth for the period 2019-2027, which names specific forms of cyber threats in comparison to the Framework Educational Programmes. According to this strategy, cyberthreats include cyberbullying and other risky forms of communication through multimedia, threats, and addictive behaviour, e.g. in the form of netholism. Other online risks can also be found, but these are not explicitly expressed in the strategy. They can be partly found in the individual annexes of *the Methodological Recommendation on Primary Prevention of Risky Behaviour in Children, Pupils and Students in Schools and Educational Institutions*, which was issued by the Ministry of Education, Youth and Sports in 2010 and is gradually being updated.

As seen from the previous text, the topic of cyber threats is part of or is gradually being implemented in education at the primary and secondary school levels. What can be partly considered disappointing is the fact that, apart from the aforementioned National Strategy and Methodological Recommendation, specific forms of cyber-threats are not present in any educational programme. These are only general formulations.

Despite the general formulations regarding digital competence, it must not be denied that the issue is being actively addressed. It can therefore be assumed that higher education as the highest educational instance is already responding or will respond to the development of digital education in undergraduate teacher training. A deeper study of teacher education programmes would certainly confirm this assumption. It may also be added that the development of digital competences is not new at the European level either. Already in 2017, the European Commission published a document called Digital Competence Framework for Educators (DigCompEdu for short), which responds to the rapidly changing times regarding digital technologies. At a general level, cyber threat is part of the sixth area, specifically in the competences of digital communication and collaboration, digital content creation and responsible use of digital technologies (Redecker, 2017). Cerny (2023) in his publication DigCompEdu: Teachers' Digital Competencies from Theory to Practice, very successfully elaborates on the different digital competencies and names the topic of cyber threats specifically. It is a text that helps to give cyber threats a concrete educational framework.

As already mentioned, the digital world is no stranger to current teacher education students at universities, as a high percentage of them are full-time students. These full-time students are therefore classified as Generation Z, whose lives are linked to moving in cyberspace and using digital technologies. This argument is not the only one that came to conduct the research investigation, part of which is presented in the following text.

2 Teacher training students' approaches to selected cyber threats

In 2021, a research investigation was conducted by the author focusing on the attitudes and experiences of teacher training students with selected forms of cyber threats. Among the forms of cyber threats, risk phenomena such as cyberbullying, cyber grooming, sexting, cyberstalking and hate speech were selected. These are cyberthreats that are not technical by nature, but non-technical, consisting of digital communication. These phenomena can be characterised as follows:

- cyberbullying - deliberate, targeted, aggressive and repetitive behaviour in cyberspace, where the perpetrator of the behaviour wants to harm, humiliate or humiliate the selected victim;
- cyberbullying - manipulative behaviour by a cyberspace user who seeks to induce trust in a victim and subsequently induce a face-to-face encounter that may result in sexual abuse of the victim;
- cyberstalking - dangerous stalking using modern digital technologies,
- sexting - the electronic creation, sending and sharing of erotic material in the form of written messages, photographs or videos;
- hate speech - hate speech against other users of cyberspace because of their faith, gender, sexual orientation, ethnicity and other characteristics (cf. Kopecky, 2013; Whitty & Young, 2017).

The following text is focused on the partial results of the mentioned research investigation. The research problem throughout the survey was the attitudes and experiences of teacher training students with selected forms of cyber threats. For the presented results, the research problem implies a sub-research objective, which was to find out what attitudes teacher trainees have towards selected cyberthreats due to their experience with the phenomena.

The research survey was based on a quantitative research approach, where the method of interviewing and the technique of online questionnaire were chosen. The questionnaire consisted of a total of 26 items and for the purpose of this paper, 5 items are presented using gender-related items. The data collection using the online questionnaire was performed using the online tool Google Forms and the snowball sampling method. The results presented are processed using JASP statistical software.

2.1 Characteristics of the research cohort

The research cohort consists of teacher training students within the available sample. The questionnaire was administered to a total of 436 respondents and no respondent was excluded from the research population. In terms of gender, 267 females (61.2%) and 169 males (38.8%) participated in the survey. In terms of age, the research cohort consists of students in the age range of 20-45 years. The average age of the respondents is 24 years. The research population is represented by both full-time and combined students. Concretely, there are 371 full-time students (85.1%) and 65 respondents of combined studies (14.9%) from 8 Czech universities. All types of teacher education programmes are represented in the research cohort, including bachelor's, master's and post-master's programmes.

2.2 Selected results of the survey

The research results presented in this paper introduce teacher training students' attitudes towards forms of cyber threats such as cyberbullying, cyber grooming, sexting, cyberstalking and hate speech. Two items focus on the attitudes of teacher training students towards both, the nature of the dangers of these phenomena to society and students in primary and secondary education. The respondents were asked to rank the phenomena in order of their dangerousness. The following three items already focus on the attitudes of teacher training students about their behaviour in cyberspace, self-education and helping others to be safe in cyberspace. The prerequisite for these three items was the existing experience with the selected online risk phenomena. This condition was met by all respondents.

Respondents answered the questionnaire items using a five-point scale. The first two items relating to hazard were represented as follows: 1 = lowest hazard, 5 = highest hazard. The other three items were answered as follows: 1 = strongly disagree, 2 = somewhat disagree, 3 = neutral position, 4 = somewhat agree, 5 = strongly agree.

Table 1 Teacher training students' approaches to the danger of phenomena for society – cyberbullying

		Cyberbullying					Total
		1	2	3	4	5	
Gender	Men	0	48	8	31	82	169
		0,0 %	28,4 %	4,7 %	18,3 %	48,5 %	100,0 %
Gender	Women	0	18	35	78	136	267
		0,0 %	6,7 %	13,1 %	29,2 %	50,9 %	100,0 %
Total		0	66	43	109	218	436
		0,0 %	15,1 %	9,9 %	25,0 %	50,0 %	100,0 %

Table 1 presents the respondents' attitudes towards the issue of cyberbullying and its danger to society. As the data shows, a total of 218 respondents (50%) consider cyberbullying to be a highly dangerous phenomenon, while at the same time, no respondent believes that cyberbullying is not dangerous to society. In terms of gender, women and men have the same opinion about the danger of cyberbullying, with almost 50% of all men (82) and almost 51% of women (136) considering cyberbullying to be the most dangerous risk phenomenon. The overall danger rating for cyberbullying is on average 4.1.

Table 2 Teacher training students' attitudes towards the danger of phenomena for society – cybergrooming

		Cybergrooming					Total
		1	2	3	4	5	
Gender	Men	19	14	67	22	47	169
		11,2 %	8,3 %	39,6 %	13,0 %	27,8 %	100,0 %
Gender	Women	24	30	64	65	84	267
		9,0 %	11,2 %	24,0 %	24,3 %	31,5 %	100,0 %
Total		43	44	131	87	131	436
		9,9 %	10,1 %	30,0 %	20,0 %	30,0 %	100,0 %

The average value of cybergrooming danger from the respondents' point of view is 3.5. A consistent number of 131 respondents consider cybergrooming to be both highly and moderately dangerous. Men perceive cybergrooming most as a medium danger to society (67; 39.6%), whereas women consider cybergrooming as a highly dangerous phenomenon (84; 31.5%). However, concerning cyberbullying, a certain proportion of women consider cybergrooming less dangerous than cyberbullying.

Table 3 Teacher training students' attitudes towards the danger of phenomena for society – sexting

		Sexting					Total
		1	2	3	4	5	
Gender	Men	44	44	33	44	4	169
		26,0 %	26,0 %	19,5 %	26,0 %	2,4 %	100,0 %
Gender	Women	64	66	55	65	17	267
		24,0 %	24,7 %	20,6 %	24,3 %	6,4 %	100,0 %
Total		108	110	88	109	21	436
		24,8 %	25,2 %	20,2 %	25,0 %	4,8 %	100,0 %

Another phenomenon to rank the danger to society was sexting. On average, respondents considered sexting to be less dangerous. The average value is 2.6. Most respondents are inclined to think that sexting is dangerous at a value of 2, 110 respondents overall (25.2%). Almost the same number of respondents think that sexting is dangerous at a value of 4 (109 respondents; 25%) and least dangerous at a value of 1 (108 respondents; 24.8%). Gender differences show almost the same results as the overall attitude towards sexting. Men were most likely to answer at 1, 2 and 4. 44 respondents (26%) answered the same. The approach to dangerousness from the perspective of women replicates the overall results. Most women indicated dangerousness at value 2 (66 respondents; 24.7%), followed by value 4 (65 respondents; 24.3%) and value 1 (64 respondents; 24%).

Table 4 Teacher training students' attitudes towards the danger of phenomena for society – cyberstalking

		Cyberstalking					Total
		1	2	3	4	5	
Gender	Men	4	56	44	33	32	169
		2,4 %	33,1 %	26 %	19,5 %	18,9 %	100,0 %
	Women	40	117	65	33	12	267
		15,0 %	43,8 %	24,3 %	12,4 %	4,5 %	100,0 %
Total		44	173	109	66	44	436
		10,1 %	39,7 %	25,0 %	15,1 %	10,1 %	100,0 %

On average, all respondents consider cyberstalking to be more dangerous than sexting. However, the difference is only 0.2, with the average for cyberstalking being 2.8, while the average for sexting is 2.6. In the case of cyberstalking, the highest number of respondents indicated that it was dangerous at a value of 2 (173 respondents; 39.7%). A similar level of dangerousness is also evident by gender, with the highest number of men (56 respondents; 33.1%) and women (117 respondents; 43.8%) indicating that it was dangerous at a value of 2.

Table 5 Teacher training students' attitudes towards the danger of phenomena for society – hate speech

		Hate speech					Total
		1	2	3	4	5	
Gender	Men	102	7	17	39	4	169
		60,4 %	4,1 %	10,1 %	23,1 %	2,4 %	100,0 %
	Women	139	36	48	26	18	267
		52,1 %	13,5 %	18,0 %	9,7 %	6,7 %	100,0 %
Total		241	43	65	65	22	436
		55,3 %	9,9 %	14,9 %	14,9 %	5,0 %	100,0 %

According to the respondents, hate speech is the least dangerous phenomenon for society. The average value of the dangerousness of hate speech is 2.0. As the results in Table 5 show, more than half of all respondents (241; 55.3%) consider hate speech to be the least dangerous phenomenon for society. Both women (139; 52.1%) and men (102; 60.4%) have a higher than average attitude towards the low dangerousness of hate speech.

Table 6 Teacher training students' attitudes towards the danger of phenomena for society – summary

Form of cyber threat	Overall mean	Total	Men	Women
Cyberbullying	4,1	5 218 50,0 %	5 82 48,5 %	5 136 50,9 %
Cybergrooming	3,5	3, 5 131 30,0 %	3 67 39,6 %	5 84 31,5 %
Sexting	2,6	2 110 25,2 %	1, 2, 4 44 26,0 %	2 66 24,7 %
Cyberstalking	2,8	2 173 39,7 %	2 56 33,1 %	2 117 43,8 %
Hate speech	2,0	1 241 55,3 %	1 102 60,4 %	1 139 52,1 %

Table 6 summarises the results in terms of hazard assessment, with columns 3-5 showing the selected hazard value, absolute frequency and relative frequency. A comparison of the results concerning all options and frequencies shows that males and females consistently rate the dangerousness of given forms of cyber threats as follows: 5 = cyberbullying, 4 = cyber grooming, 3 = cyberstalking, 2 = sexting, 1 = hate speech. Cyberbullying is considered the most dangerous form of cyberthreat, while hate speech in cyberspace is considered the least dangerous from the perspective of teacher training students.

Table 7 Approaches of teacher training students to the danger of phenomena for pupils – cyberbullying

		Cyberbullying					Total
		1	2	3	4	5	
Gender	Men	0 0,0 %	4 2,4 %	50 29,6 %	14 8,3 %	101 59,8 %	169 100,0 %
	Women	0 0,0 %	17 6,4 %	38 14,2 %	73 27,3 %	139 52,1 %	267 100,0 %
Total		0 0,0 %	21 4,8 %	88 20,2 %	87 20,0 %	240 55,0 %	436 100,0 %

Overall, 240 respondents (55%) consider cyberbullying to be a highly dangerous phenomenon for pupils. In terms of the mean variable, cyberbullying is at 4.3. Respondents rate cyberbullying as highly dangerous regardless of gender. In relative frequency, males (101 respondents; 59.8%) even rate cyberbullying more dangerous for students than females (139 respondents; 52.1%).

Table 8 Approaches of teacher training students to the danger of phenomena for pupils – cybergrooming

		Cybergrooming					Total
		1	2	3	4	5	
Gender	Men	23	21	28	53	44	169
		13,6 %	12,4 %	16,6 %	31,4 %	26,0 %	100,0 %
	Women	21	23	59	76	88	267
		7,9 %	8,6 %	22,1 %	28,5 %	33,0 %	100,0 %
Total		44	44	87	129	132	436
		10,1 %	10,1 %	20,0 %	29,6 %	30,3 %	100,0 %

Respondents as a whole assign a high hazard rating of 5 (132 respondents; 30.3%) to cybergrooming as well as to cyberbullying. However, the average is lower than for cyberbullying, with a value of 3.6. In the case of cybergrooming, gender differences can be observed. Women (88 respondents; 33%) consider manipulative behaviour to lure them to a personal meeting more serious than men (53 respondents; 31.4%).

Table 9 Approaches of teacher training students to the danger of phenomena for pupils – sexting

		Sexting					Total
		1	2	3	4	5	
Gender	Men	50	37	19	43	20	169
		29,6 %	21,9 %	11,2 %	25,4 %	11,8 %	100,0 %
	Women	36	72	47	89	23	267
		13,5 %	27,0 %	17,6 %	33,3 %	8,6 %	100,0 %
Total		86	109	66	132	43	436
		19,7 %	25,0 %	15,1 %	30,3 %	9,9 %	100,0 %

The prevalence of sexting by pupils represents quite different attitudes of respondents compared to other items. Although sexting is rated relatively highly dangerous overall (value 4), with an average of 2.9, there are gender differences in respondents' answers. While more females (89 respondents; 33.3%) lean towards a danger value of 4, more males (50 respondents; 29.6%) lean towards a value of 1, i.e. very low danger. It should be noted that the danger level of sexting is practically high, as this act may violate the criminal law not only for the person who requests the erotic materials, but also for the person who is willing to create and send the erotic materials. Sexting is a major problem when it is committed by persons under the age of 18. The age limit in the Czech education system therefore corresponds to primary and secondary school pupils. Moreover, the high rating of sexting by women may also be influenced by the fact that women are more likely to be victims of sexting than men.

Table 10 Approaches of teacher training students to the danger of phenomena for pupils – cyberstalking

		Cyberstalking					Total
		1	2	3	4	5	
Gender	Men	9	80	44	36	0	169
		5,3 %	47,3 %	26 %	21,3 %	0,0 %	100,0 %
	Women	34	139	86	8	0	267
		12,7 %	52,1 %	32,2 %	3,0 %	0,0 %	100,0 %
Total		43	219	130	44	0	436
		9,9 %	50,2 %	29,8 %	10,1 %	0,0 %	100,0 %

The overall danger rating for cyberstalking is 2, with an average of 2.4. This attitude is held by 219 respondents (50.2%). The danger rating is the same by gender. The value of 2 was selected by the highest number of respondents of all, with 139 respondents (52.1%) for women and 80 respondents (47.3%) for men.

Table 11 Approaches of teacher training students to the danger of phenomena for pupils – hate speech

		Hate speech					Total
		1	2	3	4	5	
Gender	Men	87	27	28	23	4	169
		51,5 %	16 %	16,6 %	13,6 %	2,4 %	100,0 %
	Women	176	16	37	21	17	267
		65,9 %	6,0 %	13,9 %	7,9 %	6,4 %	100,0 %
Total		263	43	65	44	21	436
		60,3 %	9,9 %	14,9 %	10,1 %	4,8 %	100,0 %

Hate speech in cyberspace is mostly considered to be a very low-risk phenomenon (263 respondents; 60.3%), with an average of 1.9. This is the same for women and men. Most women (176 respondents; 65.9%) and men (87 respondents; 51.5%) consider hate speech to be of low danger.

Table 12 *Approaches of teacher training students to the danger of phenomena for pupils – summary*

Form of cyber threat	Overall mean	Total	Men	Women
Cyberbullying	4,3	5 240 55,0 %	5 101 59,8 %	5 139 52,1 %
Cybergrooming	3,6	5 132 30,3 %	4 53 31,4 %	5 88 33,0 %
Sexting	2,9	4 132 30,3 %	1 50 29,6 %	4 89 33,3 %
Cyberstalking	2,4	2 219 50,2 %	2 80 47,3 %	2 139 52,1 %
Hate speech	1,9	1 263 60,3 %	1 87 51,5 %	1 176 65,9 %

Table 12 shows that, based on averages, cyberbullying is the most dangerous phenomenon for students, followed by cybergrooming, sexting and cyberstalking. Respondents attribute the lowest danger to hate speech. In terms of the overall absolute and relative frequencies, the dangerousness follows the same sequence. Focusing on gender and the dangerousness rating reveals the fact that there are differences between respondents. While women rate the level of dangerousness from highest to lowest as follows: cyberbullying, sexting, cybergrooming, cyberstalking, hate speech, men rate the dangerousness as follows: cyberbullying, cybergrooming, cyberstalking, sexting, hate speech.

By comparing the results in Tables 6 and 12, it can be concluded that males rate the danger of selected forms of cyberthreats equally for society and students. Women rate the danger of the cyberthreats differently for society and differently for pupils. The main difference can be observed for sexting, where female respondents consider it more dangerous for pupils than for society.

Table 13 Safer behaviour of teacher training students in cyberspace

Risk phenomenon	Gender	1	2	3	4	5	Total
a) regardless of the risk phenomenon in cyberspace	Men	0 0,0 %	32 18,9 %	46 27,2 %	52 30,8 %	39 23,1 %	169 100,0 %
	Women	0 0,0 %	8 3,0 %	108 40,4 %	101 37,8 %	50 18,7 %	267 100,0 %
	Total	0 0,0 %	40 9,2 %	154 35,3 %	153 35,1 %	89 20,4 %	436 100,0 %
b) context of cyberbullying	Men	38 22,5 %	14 8,3 %	22 13,0 %	37 21,9 %	58 34,3 %	169 100,0 %
	Women	22 8,2 %	6 2,2 %	95 35,6 %	97 36,3 %	47 17,6 %	267 100,0 %
	Total	60 13,8 %	20 4,6 %	117 26,8 %	134 30,7 %	105 24,1 %	436 100,0 %
c) context of cybergrooming	Men	38 22,5 %	0 0,0 %	45 26,6 %	48 28,4 %	38 22,5 %	169 100,0 %
	Women	22 8,2 %	0 0,0 %	132 49,4 %	85 31,8 %	28 10,5 %	267 100,0 %
	Total	60 13,8 %	0 0,0 %	177 40,6 %	133 30,5 %	66 15,1 %	436 100,0 %
d) context of sexting	Men	27 16,0 %	20 11,8 %	27 16,0 %	36 21,3 %	59 34,9 %	169 100,0 %
	Women	20 7,5 %	22 8,2 %	101 37,8 %	77 28,8 %	47 17,6 %	267 100,0 %
	Total	47 10,8 %	42 9,6 %	128 29,4 %	113 25,9 %	106 24,3 %	436 100,0 %
e) context of cyberstalking	Men	39 23,1 %	16 9,5 %	52 30,8 %	28 16,6 %	34 20,1 %	169 100,0 %
	Women	26 9,7 %	9 3,4 %	139 52,1 %	63 23,6 %	30 11,2 %	267 100,0 %
	Total	65 14,9 %	25 5,7 %	191 43,8 %	91 20,9 %	64 14,7 %	436 100,0 %
f) context of hate speech	Men	35 20,7 %	3 1,8 %	58 34,3 %	28 16,6 %	45 26,6 %	169 100,0 %
	Women	31 11,6 %	2 0,7 %	95 35,6 %	62 23,2 %	77 28,8 %	267 100,0 %
	Total	66 15,1 %	5 1,1 %	153 35,1 %	90 20,6 %	122 28,0 %	436 100,0 %

Table 13 presents the results of the questionnaire item regarding the safer behaviour of teacher training students in cyberspace due to their experience with the mentioned forms of cyber threats. As already mentioned, all respondents have at least some experience with the given risk phenomena in cyberspace.

The results declare a relatively stable attitude of respondents towards their own safer behaviour, i.e. they behave safer in some cases and not in others. In the context of safer behaviour regardless of online risk phenomena, most respondents indicated a neutral attitude

(154; 35.3%), followed by 153 respondents (35.1%) who reported minor behavioural changes towards safety. The mean response for the first item was 3.7, i.e. safer behaviour. Concerning gender, women are mainly neutral towards safety (108; 40.4%), while for men the most frequent response was "rather agree" towards safer behaviour in the internet environment. However, it can be concluded that a positive attitude towards safer behaviour in cyberspace prevails among more than 50% of both women and men, regardless of the risk phenomenon.

Undoubtedly, safer behaviour of women and men in cyberspace due to experience can be observed in cyberbullying. Overall, a rather agreeable attitude towards safer behaviour prevails (134 respondents; 30.7%). A difference can be observed between men and women, with most women leaning towards safer behaviour in the context of cyberbullying (94; 36.3%), whereas most men reported a completely safer attitude in the context of cyberbullying (58; 34.3%).

Safe behaviour in cyberspace for cybergrooming has similar results to the overall approach to safer behaviour. Overall, most respondents reported a neutral attitude (177; 40.6%), with women also most likely to hold a neutral attitude in terms of frequency (132; 49.4%). Men are more likely to be in favour of safer behaviour for cybergrooming (48; 28.4%).

In the case of the highest frequencies, higher differences can be observed for sexting. While the highest number of men favoured a completely safe behaviour (59; 34.9%), women were more neutral towards behaviour change about sexting (101; 37.8%).

Safe behaviour concerning cyberstalking and hate speech shows that women and men were most likely to report neutral attitudes towards changes in online behaviour. However, the sums of the individual frequencies for the responses "4" and "5" declare that both men and women are in favour of changes in online behaviour when experiencing cyberstalking and hate speech.

Table 14 *Self-education of teacher training students in the field of cybersecurity*

Risk phenomenon	Pohlaví	1	2	3	4	5	Total
a) regardless of the risk phenomenon in cyberspace	Men	63 37,3 %	41 24,3 %	31 18,3 %	33 19,5 %	1 0,6 %	169 100,0 %
	Women	67 25,1 %	65 24,3 %	79 29,6 %	54 20,2 %	2 0,7 %	267 100,0 %
	Total	130 29,8 %	106 24,3 %	110 25,2 %	87 20,0 %	3 0,7 %	436 100,0 %
b) context of cyberbullying	Men	40 23,7 %	35 20,7 %	54 32,0 %	23 13,6 %	17 10,1 %	169 100,0 %
	Women	48 18,0 %	73 27,3 %	65 25,5 %	70 26,0 %	8 3,0 %	267 100,0 %
	Total	88 20,2 %	108 24,8 %	122 28,0 %	93 21,3 %	25 5,7 %	436 100,0 %
c) context of cybergrooming	Men	42 24,9 %	62 36,7 %	33 19,5 %	30 17,8 %	2 1,2 %	169 100,0 %
	Women	68 25,5 %	85 31,8 %	73 27,3 %	38 14,2 %	3 1,1 %	267 100,0 %

	Total	110 25,2 %	147 33,7 %	106 24,3 %	68 15,6 %	5 1,1 %	436 100,0 %
d) context of sexting	Men	35 20,7 %	54 32,0 %	31 18,3 %	30 17,8 %	19 11,2 %	169 100,0 %
	Women	47 17,6 %	90 33,7 %	58 21,7 %	60 22,5 %	12 4,5 %	267 100,0 %
	Total	82 18,8 %	144 33,0 %	89 20,4 %	90 20,6 %	31 7,1 %	436 100,0 %
e) context of cyberstalking	Men	55 32,5 %	32 18,9 %	43 25,4 %	38 22,5 %	1 0,6 %	169 100,0 %
	Women	71 26,6 %	67 25,1 %	71 26,6 %	52 19,5 %	6 2,2 %	267 100,0 %
	Total	126 28,9 %	99 22,7 %	114 26,1 %	90 20,5 %	7 1,6 %	436 100,0 %
f) context of hate speech	Men	35 20,7 %	54 32,0 %	20 11,8 %	49 29,0 %	11 6,5 %	169 100,0 %
	Women	51 19,1 %	86 32,2 %	70 26,2 %	41 15,4 %	19 7,1 %	267 100,0 %
	Total	86 19,7 %	140 32,1 %	90 20,6 %	90 20,6 %	30 6,9 %	436 100,0 %

The question of self-education on selected cyber threats (due to experience) or education in cyber security is included in Table 14. Looking at option a), i.e. without considering the risk phenomenon, but also other options, it is clear that the majority of respondents tended to disagree. In other words, student teachers are more likely not educated in cybersecurity, even though they have experience with these phenomena.

Looking at the highest frequencies, major differences between men and women can be observed for self-education regardless of online risk phenomena, in the context of cyberbullying and partly for cyberstalking. Men do not educate themselves to the same extent as women.

When it comes to cybergrooming, sexting and hate speech, the approaches of both genders are relatively the same. The predominant approach is one in which both men and women tend to be uneducated about cybersecurity.

Table 15 *Teacher training students help to other people in the field of cyber security*

Risk phenomenon	Gender	1	2	3	4	5	Total
a) regardless of the risk phenomenon in cyberspace	Men	1 0,6 %	30 17,8 %	27 16,0 %	81 47,9 %	30 17,8 %	169 100,0 %
	Women	8 3,0 %	19 7,1 %	63 23,6 %	127 47,6 %	50 18,7 %	267 100,0 %
	Total	9 2,1 %	49 11,2 %	90 20,6 %	208 47,7 %	80 18,3 %	436 100,0 %
b) context of cyberbullying	Men	16 9,5 %	19 11,2 %	43 25,4 %	52 30,8 %	39 23,1 %	169 100,0 %
	Women	6 2,2 %	3 1,1 %	87 32,6 %	144 53,9 %	27 10,1 %	267 100,0 %
	Total	22 5,0 %	22 5,0 %	130 29,8 %	196 45,0 %	66 15,1 %	436 100,0 %
c) context of cybergrooming	Men	16 9,5 %	37 21,9 %	54 32,0 %	41 24,3 %	21 12,4 %	169 100,0 %
	Women	7 2,6 %	32 12,0 %	116 43,4 %	90 33,7 %	22 8,2 %	267 100,0 %
	Total	23 5,3 %	69 15,8 %	170 39,0 %	131 30,0 %	43 9,9 %	436 100,0 %
d) context of sexting	Men	15 8,9 %	17 10,1 %	38 22,5 %	61 36,1 %	38 22,5 %	169 100,0 %
	Women	6 2,2 %	26 9,7 %	91 34,1 %	117 43,8 %	27 10,1 %	267 100,0 %
	Total	21 4,8 %	43 9,9 %	129 29,6 %	178 40,8 %	65 14,9 %	436 100,0 %
e) context of cyberstalking	Men	16 9,5 %	16 9,5 %	53 31,4 %	43 25,4 %	41 24,3 %	169 100,0 %
	Women	5 1,9 %	26 9,7 %	81 30,3 %	133 49,8 %	22 8,2 %	267 100,0 %
	Total	21 4,8 %	42 9,6 %	134 30,7 %	176 40,4 %	63 14,4 %	436 100,0 %
f) context of hate speech	Men	16 9,5 %	26 15,4 %	39 23,1 %	67 39,6 %	21 12,4 %	169 100,0 %
	Women	5 1,9 %	18 6,7 %	65 35,6 %	128 47,9 %	21 7,9 %	267 100,0 %
	Total	21 4,8 %	44 10,1 %	134 30,7 %	195 44,7 %	42 9,6 %	436 100,0 %

Table 15 presents the results of teacher training students' attitudes towards helping others in the area of cyber security in relation to selected cyber threat phenomena. It is evident that the highest frequencies are consistent for items related to cyberbullying, cybergrooming, sexting, and hate speech, but also related to the item "regardless of the risk phenomenon in cyberspace." With the exception of cybergrooming, most men and women indicated that they were able to help others in some way in the realm of cybersecurity due to their experience with online risk phenomena. For cybergrooming, women and men are predominantly neutral.

The ability to help, either partially or completely, is declared by around 40% of both men and women interviewed.

Gender differences with respect to the highest frequencies can be observed for cyberstalking. While most men reported a neutral attitude towards helping others with cyber security for cyberstalking (53; 31.4%), women were most likely to hold a more agreeable attitude (13; 49.8%). Regardless of the highest relative frequencies, it is evident that 58% of women agree with their ability to help others with cyberstalking, whereas the figure for men is 49.7%. It can be concluded that women are more prepared to help.

Generally, the results declare a neutral to slightly agreeable attitude towards helping other people in the area of cybersecurity, with mean values ranging from 3.2-3.7.

Conclusion

Cyberspace is a specific borderless place that is both beneficial and unbeneficial, i.e. risky, for its users. A certain approach to the riskiness of cyberspace, respectively cyberbullying, cybergrooming, sexting, cyberstalking and hate speech is declared by the presented results of a research survey aimed at teacher training students. The results were presented as a whole, but also based on gender.

Considering the attitudes of teacher training students to the nature of the danger of the phenomena in question to society and also to pupils in primary and secondary education, the respondents' gender attitudes are consistent. For cyberbullying, cyberstalking and hate speech, both males and females have the same attitudes towards their dangerousness to society and students. The main differences between men and women are cybergrooming and sexting. More women than men consider cybergrooming to be more dangerous to society and pupils. With regard to sexting, women compared to men consider it more dangerous for pupils than for society.

The approaches of teacher training students regarding their behaviour in cyberspace, self-education and helping others to be safe in cyberspace are relatively gender balanced. Differences can only be observed for selected survey items and phenomena such as cyberbullying, sexting and cyberstalking.

In conclusion, there are only moderate gender differences in teacher training students' attitudes towards selected cyber threats. However, women show a slightly higher level of need for cyber security.

Acknowledgements

This article is supported by financial resources allocated by the Faculty of Education of the University of Hradec Králové to the project of specific research No. 2115/1260/1210 entitled *Cyber Threat in the Context of Undergraduate Teacher Training*.

References

- Černý, M. (2023). *DigCompEdu: Digitální kompetence učitelů od teorie k praxi*. Národní pedagogický institut České republiky.
- Dimock, M. (2019). *Defining generations: Where Millennials end and Generation Z begins*. Pew Research Center. <https://www.pewresearch.org/short-reads/2019/01/17/where-millennials-end-and-generation-z-begins/>.
- Ministry of Education, Youth and Sports (2019). *Národní strategie primární prevence rizikového chování dětí a mládeže na období 2019–2027*. https://www.msmt.cz/uploads/narodni_strategie_primarni_prevence_2019_27.pdf.
- Ministry of Education, Youth and Sports (2020). *Strategy for the Education Policy of the Czech Republic up to 2030+*. https://www.msmt.cz/uploads/brozura_S2030_en_fin_online.pdf.
- Ministry of Education, Youth and Sports (2021a). *Rámcový vzdělávací program pro základní vzdělávání*. Edu.cz. <https://www.edu.cz/rvp-ramcove-vzdelavaci-programy/ramcove-vzdelavaci-program-pro-zakladni-vzdelavani-rvp-zv/>.
- Ministry of Education, Youth and Sports (2021b). *Rámcový vzdělávací program pro gymnázia*. Edu.cz. <https://www.edu.cz/rvp-ramcove-vzdelavaci-programy/ramcove-vzdelavaci-program-pro-zakladni-vzdelavani-rvp-zv/>.
- Ministry of Education, Youth and Sports (2023). *Rámcový vzdělávací program pro obor vzdělání 18 – 20 – M/01 Informační technologies*. Edu.cz. <https://www.edu.cz/rvp-ramcove-vzdelavaci-programy/ramcove-vzdelavaci-program-pro-zakladni-vzdelavani-rvp-zv/>.
- Kopecký, K. (2013). *Rizikové chování studentů Pedagogické fakulty Univerzity Palackého v prostředí internetu*. Univerzita Palackého v Olomouci.
- Redecker, C., & Punie, Y. (ed.) (2017). *European Framework for the Digital Competence of Educators: DigCompEdu*. European Commission, JRC Publications Repository. DOI: 10.2760/159770.
- Suler, J. (1998). *The Online Disinhibition Effect*. Psychology of Cyberspace. <http://users.rider.edu/~suler/psycyber/disinhibit.html#game>.
- Whitty, M. T., & Young, G. (2017). *Cyberpsychology: The Study of Individuals, Society and Digital Technologies*. Wiley.

Contact

PaedDr. Bc. Martin Knytl, MBA, MCS
Institute of Social Studies, Faculty of Education, University of Hradec Králové, Rokitanského 62, 500 03 Hradec Králové III, e-mail: martin.knytl@uhk.cz