Open Praxis, vol. 10 issue 3, July–September 2018, pp. 221–235 (ISSN 2304-070X)

OPEN PRAXIS
INTERNATIONAL COUNCIL FOR OPEN AND DISTANCE EDUCATION

Cheating and Plagiarism in E-Assessment: Students' Perspectives

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Abstract

The aim of this study was to identify students' perceptions on cheating and plagiarism and trust in e-assessment according to their assessment experience and mode of learning as well as exploring their concerns in e-assessment. Participants were 952 students from two public universities in Turkey and Bulgaria. The study was designed as a cross-sectional survey. A questionnaire consisting of closed and open-ended questions was applied to collect data. Descriptive statistics, t-test, ANOVA and thematic analyses were performed. According to the results, no significant difference was found on students' perceptions towards cheating and plagiarism and their feelings of trust in e-assessment regarding students' prior e-assessment experience. However, there was a significant difference on students' perceptions towards cheating and plagiarism and their feelings of trust in e-assessment regarding the mode of learning they are involved in. In addition, students' concerns about e-assessment were explored in details in the paper.

Keywords: e-assessment, cheating, plagiarism, students' perspectives, higher education

Introduction

The assessment of learning is a key element of an instructional design process, as it enables improvement of teaching and learning by providing feedback on the whole process (Haladyna, 2002). Learning assessment can be defined as process where learners' achievement and progress are measured (Gikandi, Morrow & Davis, 2011; De Villiers, Scott-Kennel & Larke, 2016). Developments in information and communication technologies have had a profound influence on the methods used in assessment and have provided new opportunities for conducting electronically-based assessment, otherwise known as e-assessment, on student learning via computers, laptops and mobile devices (Hillier, 2014; Stödberg, 2012; De Villiers, Scott-Kennel & Larke, 2016). E-assessment practices have many advantages, such as providing more accessible, flexible, efficient and convenient assessment experiences for learners, teachers and institutions (Attia, 2014; Sorensen, 2013; Pedersen, White & Smith, 2012; De Villiers, Scott-Kennel & Larke, 2016). Research has shown that most students have positive attitudes towards e-assessment and are willing to take part in e-assessment practices (Attia, 2014; Dermo, 2009; Sorensen, 2013).

However, despite its many advantages, e-assessment has some disadvantages as well. For example, there are arguments in the literature that suggest the use of technology for assessment makes cheating and plagiarism easy (Bartley, 2005; Rowe, 2004; Gathuri, Luvanda, Matende & Kamundi, 2014). Students and teachers frequently express their concerns about the cheating and plagiarism that can result from e-assessment and this concern is limiting the widespread use

Reception date: 15 April 2018 • Acceptance date: 26 June 2018
DOI: https://doi.org/10.5944/openpraxis.10.3.873

of e-assessment (Mellar, Peytcheva-Forsyth, Kocdar, Karadeniz & Yovkova, 2018; Hillier, 2014). To overcome this problem, a number of authentication and authorship checking systems have evolved over time to ensure secure authentication (Peytcheva-Forsyth, 2017). The TeSLA system (An Adaptive Trust-Based E-Assessment System for Learning), which is currently being developed as part of a project funded by the European Commission, is one of these authentication and authorship checking systems. This study was conducted within the context of the TeSLA Project. Hillier (2014) claims that students' concerns, which are typically noted before the implementation of any e-exam solution, are conspicuously absent from the literature. Therefore, this study aimed to investigate students' preliminary perspectives regarding cheating and plagiarism in e-assessment before testing the TeSLA system.

Sorensen (2013) and Jordan (2011), in their studies, highlight the importance of understanding students' perceptions of e-assessment. In parallel to this, Dermo (2009) found that while there is an abundance of research on teachers' attitudes toward e-assessments, there is very little on students' views towards them. Certain challenges exist in relation to student verification, authorship and authentication checking in e-assessment (Harmon, Lambrinos & Buffolino, 2010). Cheating and plagiarism is regarded as a greater concern compared to traditional paper-based assessment (Pedersen, White & Smith, 2012; Rowe, 2004; Xu & Mahenthiran, 2016). Some of the types of cheating and plagiarism that have been examined in the literature with regards to e-assessment include impersonation, taking materials into exams, looking at others' answers and ghostwriting (Apampa, Wills & Argles, 2011; Bartley, 2005; Mellar et al., 2018). Clearly, these forms of cheating and plagiarism have a negative impact on the validity and reliability of the e-assessment process as well as students' trust in e-assessment (Dermo, 2009). In this context, the purpose of this study is to identify students' perceptions on cheating and plagiarism and trust in e-assessment according to their assessment experience and mode of learning as well as exploring their concerns in e-assessment, the results of which shall serve to guide the design, development and implementation of the TeSLA system in particular and other authentication and authorship checking systems in general.

E-Assessment

Various interchangeable terms have been used to describe the utilisation of ICTs for the assessment of student learning; these include, computer-based assessment, computer-assisted assessment, e-assessment and online assessment (Attia, 2014; JISC, 2007). Among these, the term e-assessment is the most broadly applied, covering a range of activities in which digital technologies are used in assessment" (JISC, 2007, p.6). Therefore, the term e-assessment has been used in this study. The Joint Information Systems Committee (JISC) in the United Kingdom defines e-assessment as "the end-to-end electronic assessment processes, where ICT is used for the presentation of assessment activity and the recording of responses" (JISC, 2007, p.6). As De Villiers, Scott-Kennel & Larke (2016) indicate, e-assessment is based on traditional assessment techniques but facilitated via online processes and digital tools.

Modes of Learning

Modes of delivery in learning can be face-to-face, blended or fully online/distance (Bates, 2015). Face-to-face learning is a form of learning where the instruction and course activities take place in a classroom; online learning is a form of educational delivery in which learning takes place primarily via

the Internet; and blended learning is a pedagogical model combining face-to-face classroom teaching and the innovative use of ICT, blending online and face-to-face delivery (Gaebel, Kupriyanova, Morais & Colucci, 2014). Distance education is a generic term for different organizational forms of education in which students and teachers are separated in time and place; it includes online learning, blended learning and traditional modes of distance education in which printed or online materials are used (Owusu-Boampong & Holmberg, 2015).

The TeSLA Project

The TeSLA project (An adaptive trust-based e-assessment system for learning), which is being developed as part of the Horizon 2020 Project, aims to create a system integrated in virtual learning environments to support authentication and authorship checking in e-assessment. The consortium is composed of 18 partners, including 8 universities, 3 quality agencies, 4 research centers, and 3 companies. The TeSLA system involves authentication (face recognition, voice recognition and keystroke dynamics) and authorship (forensic analysis for writing style and plagiarism detection) checking instruments which can be used in all e-assessment models to prevent cheating and plagiarism (Mellar et al., 2018; Noguera, Guerrero-Roldán & Rodríguez, 2016). This study is not an evaluation of the instruments, however, an investigation of students' perspectives on cheating and plagiarism in e-assessment before using the TeSLA system.

Students' Perspectives on Cheating and Plagiarism in E-Assessment

Cheating in the context of e-assessments can be broadly defined as "all deceptive or unauthorized actions" (Bartley, 2005, p.25), while plagiarism is described as the "reproduction and presentation of others' work, without acknowledgement, or the attempt to receive credit for the idea or words of others" (Bartley, 2005, p.27). Existing research focusing on student perspectives on the use of e-assessment has shown that most of the students have positive attitudes towards e-assessment and are willing to take part in e-assessment practices (Attia, 2014; Dermo, 2009; Ferrão, 2010; Sorensen, 2013). However, research has also shown that some students have dissatisfaction with their e-assessment experience due to certain factors such as level of study, achievement or prior experience with e-assessment (Dermo, 2009; Sorensen, 2013). Dermo (2009) and Attia (2014) found that students at the postgraduate level are satisfied with their e-assessment experience, while Ferrão (2010) found that failing students tended to be more conservative about the use of e-assessment methods than passing students. According to Hillier (2014), students with prior experience in taking e-exams and with a higher level of technical proficiency tended to favor computerized exams. However, these studies mainly focus on e-assessment in general while only a very limited amount of the research has addressed students' concerns and perspectives on cheating and plagiarism in e-assessments. In one of the few studies that have been conducted on this matter, Lee-Post and Hapke (2017) administered a survey to online undergraduate students and found that more than 45% of the students regarded cheating to be easy in an online classroom; nearly all of them reported that they had never attempted impersonation. However, 30% said that if they were given the opportunity, they would cheat. Consequently, several factors may impact students' perspectives, such as their success levels, prior experience with e-assessment, level of education or the mode of learning. Therefore, more research is needed on the perspectives of students on cheating and plagiarism to better inform e-assessment planning.

Research Questions

The purpose of this study is to identify students' perceptions on cheating and plagiarism and trust in e-assessment according to their assessment experience and mode of learning as well as exploring their concerns in e-assessment. The study aims to answer the following research questions:

1. Is there a significant difference in students' perceptions towards cheating and plagiarism in e-assessment regarding students' e-assessment experience?
2. Is there a significant difference in students' feeling of trust in e-assessment regarding students' e-assessment experience?
3. Is there a significant difference in students' perceptions towards cheating and plagiarism in e-assessment regarding the mode of learning they are involved in?
4. Is there a significant difference in students' feeling of trust in e-assessment regarding the mode of learning they are involved in?
5. Do the students have any concerns that there might be an increase in cheating and plagiarism if the face-to-face forms of assessment were to switch to online assessments at their university?

Method

As the aim of this study is to determine students' perspectives on cheating and plagiarism in e-assessment, it was designed as a cross-sectional survey. Cross-sectional research design is used in quantitative research to describe the attitudes, opinions, behaviors, or characteristics of the population at one point in time by applying a survey to a sample or to the entire population of people (Creswell, 2012).

Participants

The study participants included 952 students from two public universities in Turkey and Bulgaria. Both universities are partners in TeSLA project and took part in the pilot testing of TeSLA instruments. 35.2% of the participants were male whereas 49.6% of them were female. 7.4% did not prefer to say and 7.9% of them did not respond to this item. 22% of the participants were from associate degree programs, 61% were from undergraduate degree and 16.8% were from graduate degree programs.

Data Collection and Analysis

The data for the first four research questions was collected via a questionnaire consisting of five closed five-point Likert scale questions. For the fifth research question, a closed question with three options (Yes/No/I don't know) was asked along with an open-ended question which intended to explore students' concerns about an increase in cheating and plagiarism if the face-to-face forms of assessment were to switch to online assessment. These questions in the questionnaire were part of a larger survey consisting of 13 questions to investigate various aspects of e-assessment and the demographics of students was also collected. The questionnaires were administered online in Google Forms and Survey Monkey. The reason for using Google Forms and Survey Monkey was their availability and familiarity for the two universities in the study. Prior to the analysis of the data obtained from the study, the skewness and kurtosis coefficients were examined in order to determine the appropriateness of the parametric tests. Results of the analysis showed that the skewness coefficient was .341 and the kurtosis coefficient was found as .080. According to these values, the data was normally distributed, and descriptive statistics, t-tests and ANOVA were performed on the basis of the research questions. SPSS 21 was used for quantitative data analysis. The responses to

the open question in the questionnaire were analysed thematically. The categories for the analysis were developed from the literature and according to the responses given for the question "Do you have any concerns that there might be an increase in cheating and plagiarism if the face-to-face forms of assessment were to switch to online assessments at the university?" Then, the data was explained and interpreted.

Findings

In this section, the findings related to the research questions are presented.

Is there a significant difference in students' perceptions towards cheating and plagiarism in e-assessment regarding students' e-assessment experience?

The first step in seeking the answer to this research question was to determine whether or not the students had experience in online assessment, with the question "Have you ever taken a course for which all the assessment has been conducted online? (e.g., MOOC, language certificate, driver's license)" T-tests were performed to determine whether there is a significant difference between the means of two samples - those with experience and those without experience of e-assessment (I1.1-It is plagiarism if I help or work together with a classmate in an individual activity and the work we submit is similar or identical and I1.2-It is cheating if I copy-paste information from a website in a work developed by me without citing the original source). Furthermore, the impact of the e-assessment experiences of students on their cheating and plagiarism perceptions was examined (Table 1).

In examining Table 1, it can be seen that there is no significant difference in means between the groups of the students who have experience in e-assessment and those who haven't (responses to I1.1 and I1.2) regarding their perceptions towards cheating and plagiarism.

Is there a significant difference in students' feeling of trust in e-assessment regarding students' e-assessment experience?

For this question, it was first important to identify whether or not the students had experience in online assessment, with the question "Have you ever taken a course for which all the assessment has been

Table 1: The Impact of E-Assessment Experiences of Students on Their Cheating and Plagiarism Perceptions

	Experience in a course in which all assessment has been conducted online	N	Mean	Std. Deviation	sd	t	P
I1.1-It is plagiarism if I help or work together with a classmate in an individual activity and the work we submit is similar or identical	**Yes**	275	2,97	1,356	938	,552	,581
	No	665	2,92	1,301			
I1.2-It is cheating if I copy-paste information from a website in a work developed by me without citing the original source	**Yes**	275	3,61	1,347	938	–,311	,756
	No	665	3,64	1,283			

Although the total sample size was 952, due to missing values the sample was recorded as 940 for this analysis.

conducted online? (e.g., MOOC, language certificate, driver's licence)". T-tests were performed to determine whether there is a significant difference between the means of two samples - those with experience and those without experience of e-assessment (I1.1-It is plagiarism if I help or work together with a classmate in an individual activity and the work we submit is similar or identical and I1.2-It is cheating if I copy-paste information from a website in a work developed by me without citing the original source). Furthermore, the impact of the students' e-assessment experiences on their trust in e-assessment was examined (Table 2).

In examining Table 2, it can be seen that there is no significant difference between the means of the groups of students who have experience in e-assessment and the students' who haven't regarding their feeling of trust in e-assessment.

Is there a significant difference in students' perceptions towards cheating and plagiarism in e-assessment regarding the mode of learning they are involved in?

In the scope of the study, the questionnaire was applied on three different groups of students, who were distinguished according to the mode of learning in the programmes they were attending, namely, the face-to-face mode (F2F), the distance education mode (DE), and the blended mode. They were asked to fill in two items in a five-point Likert scale; "I3.1" (It is plagiarism if I help or work together with a classmate in an individual activity and the work we submit is similar or identical) and "I3.2" (It is cheating if I copy-paste information from a website in a work developed by me without citing the original source). ANOVA was used to analyze the responses of the students based on their groups. On the results of this analysis, Tamhane's T2 post-hoc test statistics was applied to determine the sources of significant difference found among the groups.

As can be seen in Table 3, for Item I3.1 the differences between the group means are statistically significant [$F(2\text{-}937)= 7{,}098$; $p<0.05$]. Similarly, the data gathered from item I3.2 was also found to significantly differ between the groups [$F(2\text{-}937)= 61{,}393$; $p<0.05$]. Post-hoc test statistics were used to compare and determine the sources of this significant difference found among the groups. The findings are presented in Table 4.

When Table 4 is examined, the agreement level of the distance education group regarding item "I3.1" (It is plagiarism if I help or work together with a classmate in an individual activity and the work we submit is similar or identical) is significantly lower (2.80 ± 1.38) than that of the face-to-face learning group (3.15 ± 1.2). The agreement level of the distance education group regarding item "I3.2" (It is cheating if I copy-paste information from a website in a work developed by me without citing the original source) is significantly lower (3.25 ± 1.37) than that of the face-to-face group and the blended learning group (4.16 ± 0.98).

Table 2: The Impact of Students' Online Course Experiences On Their Trust in E-Assessments

	Experience in a course in which all assessment has been conducted online	N	Mean	Std. Deviation	sd	t	P
I2.1- I would trust an assessment system in which all assessment occurs online	**Yes**	**275**	**3,47**	**1,147**	939	1,810	,621
	No	**666**	**3,32**	**1,135**			

Although the total sample size was 952, due to missing values the sample was recorded as 941 for this analysis.

Table 3: Analysis of Variance Results on Comparison of the Cheating and Plagiarism Perception Scores of the Three Groups

		N	Mean	Std. Deviation		Sum of Squares	df	Mean Square	F	Sig.
I3.1-It is plagiarism if I help or work together with a classmate in an individual activity and the work we submit is similar or identical	DE	532	2,80	1,378	**Between Groups**	24,295	2	12,147	7,098	,001
	F2F	335	3,15	1,196	**Within Groups**	1603,616	937	1,711		
	Blended	73	2,92	1,278	**Total**	1627,911	939			
	Total	940*	2,93	1,317						
I3.2-It is cheating if I copy-paste information from a website in a work developed by me without citing the original source	DE	532	3,25	1,373	**Between Groups**	184,198	2	92,099	61,393	,000
	F2F	335	4,16	,980	**Within Groups**	1405,644	937	1,500		
	Blended	73	4,05	1,079	**Total**	1589,841	939			
	Total	940*	3,64	1,301						

*Although the total sample size was 952, due to missing values the sample was recorded as 940 for this analysis.

Table 4: The Results of Tamhane's T2 Post-Hoc Tests Applied to Determine the Source of the Cheating and Plagiarism Perception Scores

	(I) Group	(J) Group	Mean Diff. (I-J)	Std. Error	Sig.
I3.1	DE	F2F	–,344*	,089	,000
		Blended	–,115	,161	,856
	F2F	DE	,344*	,089	,000
		Blended	,228	,163	,417
	Blended	DE	,115	,161	,856
		F2F	–,228	,163	,417
I3.2	DE	F2F	–,910*	,080	,000
		Blended	–,807*	,140	,000
	F2F	DE	,910*	,080	,000
		Blended	,103	,137	,836
	Blended	DE	,807*	,140	,000
		F2F	–,103	,137	,836

Is there a significant difference in students' feeling of trust in e-assessment regarding the mode of learning they are involved in?

In order to test the fourth research question, students were asked to respond to item "I4.1" (I would trust an assessment system in which all assessment occurs online). ANOVA was used to analyze the responses of the students based on their groups. On the results of this analysis, post-hoc test statistics were applied to determine the sources of significant difference found among the groups.

As seen in Table 5, for item 4.1 the differences between the group means were statistically significant. [F(2-938)= 8,379; p<0.05]. Tamhane's T2 post-hoc test statistics were used to compare and determine the sources of this significant difference found among the groups. The findings are presented in Table 6.

When Table 6 is examined, the responses provided to item "I4.1" (I would trust an assessment system in which all assessment occurs online), the trust shown by the face-to-face learning group to e-assessment is significantly higher (3.57 ± 0.96) compared to that of the distance education group (3.25 ± 1.24).

Table 5: Analysis of Variance Results On the Comparison of the Scores Obtained by the Three Groups on Trust in E-Assessment

		N	Mean	Std. Deviation		Sum of Squares	df	Mean Square	F	Sig.
I4.1 - I would trust an assessment system in which all assessment occurs online	DE	532	3,25	1,239	Between Groups	21,447	2	10,724	8,379	,000
	F2F	335	3,57	,964	Within Groups	1200,527	938	1,280		
	Blended	74	3,28	1,014	Total	1221,974	940			
	Total	941*	3,36	1,140						

*Although the total sample size was 952, due to missing values sample was was recorded as 941 for this analysis.

Table 6: The Results of Post-Hoc Tests Applied to Determine the Source of Trust in E-Assessment Scores

	(I) Group	(J) Group	Mean Diff. (I-J)	Std. Error	Sig.
I4.1	DE	F2F	–,319*	,075	,000
		Blended	–,036	,130	,990
	F2F	Online	,319*	,075	,000
		Blended	,283	,129	,088
	Blended	Online	,036	,130	,990
		F2F	–,283	,129	,088

Do the students have any concerns that there might be an increase in cheating and plagiarism if the face-to-face forms of assessment were to switch to online assessments at their university?

The students were given three options in answering this question: "Yes", "No" or "I don't know". 918 students answered this question, which is shown in Table 7.

According to Table 7, the number of students who think there might be an increase in cheating and plagiarism if the face-to-face forms of assessment were to switch to online assessments are less than those who do not anticipate an increase. Another noticeable result is that half of the distance education students (50%) did not have any idea about it. This can be due to a lack of e-assessment experience in their previous courses.

The next step was to ask the students to provide arguments for their answers in an open ended question and 647 students answered this question. Some key categories/notions derived from the data analysis of students' responses to this question which form three fundamentally different views about the impact on e-assessment on cheating and plagiarism increase: *optimistic view (n=311), pessimistic view (n=236) and neutral view (n=371)*. These categories base their principles on the predominant students' view in regards to their perceptions of cheating and plagiarism in e-assessment. *The optimistic view* is based upon the students' understanding that moving from face-to-face education/assessment to distance education/e-assessment, raises no concerns, whatsoever, in regards to increase of misuse of cheating and plagiarism. These are the students who chose the respond "No" to the related question. *The pessimistic view* is characterized by the understanding that the implementation of e-assessment will create an even more favorable environment for cheating and plagiarism. These are the students whose answer is "Yes" to the related question. *The neutral view* reflects the students' views who do not have a clear idea about the consequences of switching to e-assessment in terms of cheating and plagiarism. They are the students who responded "I don't know" to the related question.

Data demonstrates that 37,61% of the students in face-to-face and 45,90% of them in blended forms of education, share the opinion that cheating and plagiarism will not increase, if e-assessment is introduced and implemented, i.e. they share the optimistic view. However, 50% of the students in distance education mode have a neutral view; they are not clear about the consequences of switching from face-to-face assessment to e-assessment. In the open-ended answers, the arguments of the students in face-to-face, blended and distance education groups were similar to each other. They are presented below.

Optimistic view

33,88% of the students expressed optimistic view as shown in Table 7. The students, who study in blended courses, express the view that *the availability of specialized technologies* for authentication

Table 7: Students' responses according the mode of learning

	DE		F2F		Blended		Total	
	F	%	F	%	F	%	F	%
Yes	104	19,62	112	34,25	20	32,79	236	25,71
No	160	30,19	123	37,61	28	45,90	311	33,88
I don't know	266	50,19	92	28,13	13	21,31	371	40,41
Total	530	100	327	100	61	100	918	100

and plagiarism, is an optimistic sign. Students provide examples, such as, using video surveillance (camera) and plagiarism detection software (optimistic-technological approach). Justification of a reason for optimism would be *the combination of the face-to-face and the e-assessment,* according to two of the students (optimistic-pedagogical approach):

> If in parallel with e-assessment some of the face-to-face assessment is used, as the later could serve as a means of identifying cheating with online assessment.
>
> There are software programs that detect copied text from the Internet and students (if they are aware of this fact) will not be plagiarizing. For other forms of cheating, additional control by the evaluators is required.

The students' arguments in favor of this view between the representatives of face-to-face, blended and distance courses were similar. Some students from face-to-face and distance education courses share their trust in "electronic systems" and plagiarism detection software:

> The technological solutions used in online assessment will determine any incident of cheating or plagiarism in a faster and more secure way. This will improve the reliability of online assessment.

An important factor here, as well, is the expressed belief in the human factor – the teacher. According to one of the students, "Professors are competent enough to differentiate and depict the cheating." According to majority of the students in this group, the introduction and implementation of e-assessment will not contribute in any way to the increase of the attempts to cheat within the processes of assessment. In support of the optimistic view, some students also highlight arguments such as "flexibility of e-assessment and evaluation" and "the control of the time during an online exam" generally presented by the online environment:

> Online assessment saves time for students, who for some reason cannot take the exam at the university's premises. There is a possibility of plagiarism, of course, but I think it is significantly diminished, because of the time constraint set explicitly up for an exam to end – [strict exam time duration].

At the same token, the study makes note of the expression of another significant insight, in particular, that students would not risk their final mark/s, if they were fully aware of the existence of an electronic system being able to identify plagiarism (i.e., the preventive role that anti-plagiarism and authentication technologies can play):

> I do not think that the rate of cheating will increase as the students will avoid this behavior knowing that the programs will reveal if the individual had cheated or not.

Another view shared by face-to-face and distance education students is that most of the students' aim is "learning", so they will not attempt to cheat:

> No cheating would occur as I believe that every student tries to learn.

The expressed optimistic view towards e-assessment of some of the students is based on their experience of face-to-face assessment, where "there are always means to copy or cheat".

Pessimistic view

25,71% of the students expressed pessimistic view as shown in Table 7. These are the students who expressed their arguments in regards to an increase of the possibilities for cheating and plagiarism

in e-assessment, justify their opinion mainly upon the opportunities that technology provides for copying information and communication, when the exam is conducted without any supervision and/or form of control.

Students, undertaking blended courses, express their pessimistic view solely on their experience during the time of taking tests within the e-assessment environment. The common feedback in this regard is that students are *"conducting conversations among themselves during an online test"* and that *"the availabilities to transcribe/copy is greater, because of weaker control during the time of an online/e-assessment".* The study also identifies another notion, i.e., *"the trend of copying and misuse of identity [misrepresentation by somebody else or false identity], which will increase"* which is also reported by the distance education and face-to-face students. The advantages of face-to-face assessment are also grounded as arguments against e-assessment, namely *that "live or face-to-face personal contact makes it easier to determine whether someone is cheating. Sometimes the body language and the timbre of one's voice, displays the scam."* In addition to it, some of the students from both distance education and blended education underline strongly their doubts about the objectivity of e-assessment.

Despite the fact that students undertaking face-to-face courses, have no or little experience in e-assessment, many of them are well informed about it and seriously argue in defense of their pessimism in regards to the implementation of e-assessment in their courses. As a major cause of an increase of cheating and plagiarism, the students state the following arguments – the possibility of: *"multiple people being able simultaneously to complete the online test and to write responses, distributing them to other colleagues"*, *"representing somebody else – false identity", "the possibility of having a competent person within the discipline to sit next by or close to the computer, so therefore assisting the students in the process of taking the exam "*, the use of *"mobile devices, free internet access"*, and having an access to an *"external sources of information hence being able to plagiarize"*. This cohort, as well as the group of students in the blended form of education, justify their pessimism as an argument against the merits and benefits of the face-to-face assessment, for instance, the presence of an invigilator during an examination and the presence of personal verbal contact with the teacher.

In general, the main concern of the students in this group is that the lack of control in online assessment will stimulate students who are "massively cheating and plagiarizing" anyway to do it more and more often as the lack of control will facilitate and make it easier for them:

> Yes, I would be worried, because there will be many people, who will abuse and take advantage of the e-assessment.
>
> I think the lack of face to face communication will be encouraging for cheating and plagiarism if the necessary precautions are not taken during online assessment. The online assessment environment may fail to check the resources the participant is using at that moment.
>
> We have multiple-choice exams so it will be easy to cheat if there is no system to prevent cheating.

It should be noted as well, that in students' opinions, there is also a great danger of theft of assessment data and the possibility of it being manipulated:

> Because the technology is constantly evolving and I'm a bit concerned about the fact that the system can be hacked and data taken from it, so therefore misused or being used in a scam.

The Neutral View

40,41% of the students expressed neutral view as shown in Table 7. The students from face-to-face and distance education that share the neutral view say that they cannot anticipate the consequences

as the increase of cheating will depend on some factors such as the honesty and personality of the users or reliability of the prevention systems. Some students reported that they did not have any idea because they had no such experience:

> It is hard to make an anticipation before experiencing it.
>
> It depends on the reliability of the system. There might be misleading acts since the technology is highly developed now.
>
> It depends on the attitudes of the parties that does the assessment and that is being assessed.
>
> We do not have assignments for assessment, so I do not have any idea.

Discussion

This study aimed to identify students' perspectives on cheating and plagiarism in e-assessment. According to the results, no significant difference was found in means between the groups of the students who have had experience in e-assessment before and those who haven't regarding their perceptions towards cheating and plagiarism and their feelings of trust in e-assessment. However, there was a significant difference according to the mode of learning the students are involved in on their perceptions towards cheating and plagiarism and their trust in e-assessment. Students enrolled in distance education had lower perceptions than students from other groups about cheating and plagiarism and lower trust in e-assessment. These less favorable perceptions of the distance education students towards cheating and plagiarism can be attributed to the differences in the assessment format of their exams, which largely involve multiple-choice questions. As a result, these students have little or no experience in assessment activities that require preparation of an assignment and therefore, probably did not have a clear idea about what constituted cheating and plagiarism in activities like written assignments. These findings suggest that there is a need to provide more support and information to students regarding what constitutes cheating and plagiarism, regardless of the dominant assessment activity type in their courses, in order to establish and maintain a strong culture of academic integrity in the learning society, as learning is lifelong, not limited to higher education and classrooms alone.

Another finding from the study was that distance education students had lower trust in e-assessment than the students who attend face-to-face courses. According to the studies in the literature, students are willing to take part in e-assessment (Attia, 2014; Dermo, 2009; Ferrao, 2010; Sorensen, 2013). However, Lee-Post and Hapke (2017) found that more than 45% of their online graduate students regarded cheating as being easy in an online classroom, and 30% of the students in their study reported that if they were given the opportunity, they would cheat. Similarly, some of the students who responded to the open-ended question in the present study were sensitive to the subject of cheating and plagiarism and clearly expressed their positions and arguments on the issue. Although there was a greater percentage of optimistic views than pessimistic views, one fourth of the students are pessimistic about the implementation of e-assessment, regardless of their experience with it. These findings are consistent with those from the study conducted by Dermo (2009), who found that the positive feelings of students were only slightly stronger than the negative feelings about the validity, practicality, security and reliability aspects of e-assessment. According to Dermo (2009), this result demonstrates that the students had concerns, and these concerns cannot be ignored.

However, despite their pessimism, students were aware about the factors influencing the cheating and moreover, that these factors were not entirely confined to the form of assessment. The students also emphasized the teachers' ability to identify cheating and plagiarism and their control of the assessment process, in terms of both variants of the assessment types - the human factor in face-to-face assessments and the technological factor (electronic system and specialized software and hardware

for plagiarism detection and authentication of students) governing the process of e-assessment. Without question, authentication and authorship systems enhance the trust in e-assessment and decrease pessimistic perceptions about cheating and plagiarism in e-assessment. These findings support the development and implementation of authentication and authorship systems like the TeSLA. According to some researchers, technology makes cheating and plagiarism easy (Bartley, 2005; Rowe, 2004; Gathuri et al., 2014), however, it may also help prevent cheating and plagiarism (Mellar et al., 2018). Therefore, it is important that the preconceptions and concerns of students be addressed by planners and system designers (Hillier, 2014).

On the other hand, the optimistic view of reducing the cheating and plagiarism within the process of implementing e-learning and e-assessment was predominantly based on the following dynamics, as explicitly demonstrated by the study: a) the belief in technology and the availability of specialized software to detect cheating and plagiarism; b) the preventive function of these technologies (student knowledge, awareness of their existence and their unwillingness to discredit themselves and their studies); and c) the combination of electronic and face-to-face forms of assessment.

Conclusion and Suggestions for Future Studies

In conclusion, while most of the students are willing to accept e-assessment practices, some have concerns about cheating and plagiarism and a low degree of trust in e-assessment, which should not be ignored. The reasons for their concerns should be investigated in more detail and addressed by the teachers, administrators and practitioners, all of whom are the responsible authorities for guiding the design and implementation of authorship and authentication systems. This study focused on the perspectives of students before the implementation of e-assessment. In future studies, perspectives on cheating and plagiarism and trust in e-assessment can be investigated after an e-assessment practice. In addition, the association of students' perspectives with other factors, such as level of study, field or achievement, can be explored.

This study has some limitations. The intention of this study was to gather preliminary data regarding the perspectives of students on cheating and plagiarism in e-assessment. Therefore, the data was collected via a questionnaire. In future studies, qualitative data with one-to-one interviews or focus groups among students can be conducted or self-reports of students can be used in addition to the quantitative data to have an in-depth analysis about the concept.

The participants in this study were from two different countries, however, the intention of the study was not a cross-national study; so experience of students with e-assessment and their perceptions of cheating and plagiarism was not explored by nationality. In future studies, cross-national or cross-cultural comparisons can be done to explore national or cultural aspects of cheating and plagiarism in e-assessment from students' point of view.

Acknowledgment

This work is supported by the H2020-ICT-2015/H2020-ICT-2015 TeSLA project 'An Adaptive Trust-based e-assessment System for Learning', Number 688520.

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