Authentication of teaching and testing during COVID-19

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Abstract :

Authentication is an essential part in the online education system in general and higher education in particular especially during covid-19 scenario in which the entire assessment process sometimes depends on online testing/assessment. Online testing usually depends on mutual trust which is nowadays considered as a very important factor for effective teaching, testing and assessment. Authentication is generally related to teaching, testing with special reference to the authorship checking system. The focus of this study is on the relevance of authentication of teaching and testing, and some possible measures to check the online system to prove that the online mode of teaching/testing is trusted, and the performance of the learners can be assessed equally good as the traditional learning modes. The study is conducted on the students of King Abdulaziz university which has been fully online during the COVID-19 except the main exams. It explores whether there is a doubt prevailing among the teaching staff regarding online/virtual teaching/testing as well as a growing perception on the need of e-authentication presuming the testing in particular is not free from errors. Apart from the researchers' personal observation and practical experience, data is elicited from a self-developed questionnaire. The results indicate that e-learning can't be fully and blindly trusted as authentication of learners is not very easy. There is always a possibility of 'unfair' means in the process of online testing which can not be easily minimized or removed due to digital limitations.

IndexTerms - **authentication; COVID-19; online learning, traditional teaching, testing, assessment**

1. Introduction

Globally, the COVID-19 has affected the whole socio-economic and educational scenario. Although strict measures are being adopted by nearly all affected nations, schools and colleges have been mostly closed, and virtual/online learning is being implemented for safety measures. It has been noticed that remote online delivery and testing/assessment appeared to be quite new and challenging for many schools especially in villages and towns of deprived areas around the globe. Despite the fact that King Abdulaziz University has been well equipped in technology for not less than a decade, it also faced many academic challenges in general and authentication of testing in particular. For example, invigilated assessments are often considered as better, secured and systematic than online testing. Hence, it is important to remember that in the given situation of the pandemic, there remains no option.

1.1. Academic integrity

Academic integrity (AI) can be conceived as something opposite to academic dishonesty. AI is closely related to honesty, trust, fairness, respect, responsibility, and courage. It can be considered as the guiding principle in education in addition to a choice to act responsibly and honestly.

1.1.1.Why to authenticate AI ?
There are many reasons for authentication. Following could be some of them: to maintain fairness in teaching and testing. In addition, maintaining trust and credibility is also crucial for successful teaching and testing. Trust in academic qualifications is an essential requirement. When a student or a school does not exactly follow the principle of academic integrity, that trust is broken which leads to complications and disputes. Developing mutual respect for others is one of the aims for running a system smoothly. Students need to understand the educational principles and accept the ideas, words or work of others, therefore they need to cite and refer to them in order to give respect to others' significant contributions.

1.1.2.What to authenticate
Technically speaking, authentication is initially nothing but verification of identity. Examples include username/password and biometrics. However, from the linguistic viewpoint, it is the process or action of proving or validating something/someone to be true, genuine, or real.

1.1.3.Authenticating Teaching
Despite facilities of recording the online sessions on the blackboard (BB), there is no foolproof technique to confirm if the instructor is actually teaching, or able to accomplish teaching goals. A teacher might do exercises, cover up syllabus/syllabi, engage class for 50 minutes, but authentication is a challenge. On the other hand, self-assessment may certainly work, but only a few cares.

1.1.4.Authenticating learning
In a less interactive scenario, it is really a challenge to authenticate if learning has taken place. Only a few students respond, and the rest of them are actively passive (with no mikes), while the teacher can better check online activity mostly by oral responses/vivas for testing language skills. (Oxford university says

Feedback is useful in both on and offline teaching. Some of the benefits of the feedback face to face teaching follow:
-face to face feedback (instant),
-humor and instant reaction (in physical teaching)
-delivery of an idea, and face impression
-difficulty level and student's gesture
These things are usually missed in online teaching which are sometimes extremely important.

1.1.4. Authenticating testing
Testing is used to examine/measure someone's knowledge of something that has been taught. It requires quantitative data so grades are important.

1.2. Issues related to authentication

1.2.1. Testing, assessment and evaluation differentiated

Invigilated testing, often considered as more secure, is not an option especially in formative assessment in the current situation. Therefore, detecting any online cheating is significantly challenging. As a result, teaching and testing or testing based teaching may not be reliable or authentic.

1.2.2. Invigilated vs online testing

In an online testing /remote Invigilation, at all times the invigilator is in touch with the candidate by video, audio, remote screen share and instant messaging. The whole process is recorded and can be reviewed at a later time by the examination board.

1.2.3. Take-Home Exams under Current COVID-19 Condition

Many universities have opted for using an alternative mode of student assessment during the COVID-19 pandemic. Among the types of practical assessments that may be moved to online assessment are: laboratory-based practicals (e.g. language skills (vivas). The suggested alternatives for these practical assessments include video-based uploads using Cloud technology; online simulation-based tasks; submitting online portfolio; real-time observed practicals/vivas via Zoom or Blackboard Collaborate.

1.3. Other issues

1.3.1. Technological Issues

Assessment restrictions are difficult to be imposed as students are faced by multiple technological and academic issues.

1.3.2. Contract Cheating

'Contract cheating' is an unethical activity in which a student takes help of other students/teachers/tutors etc in completion of their work.

1.4. Alternative forms of student assessment

1.4.1. Open book exam: a remedy

Since most students collaborate in cheating in online quizzing or testing, it is better to increase the difficulty level of the question like the open book exam (with limited time) so the students can't complete the exam even if they cheat from the book or other sources. Only those who know the answer will be able to finish the test in time.

1.4.2. Vivas (oral testing) may be the best method (not the only method) of testing language skills. Such oral testing can even be successfully performed via virtual learning especially during COVID. Since the activity will be video monitored, cheating opportunities will be almost zero.

1.4.3. Other suggested alternatives:

-video-based uploads using Cloud technology,

-online simulation-based tasks, (Some teachers used to employ in physical settings earlier).

-submitting online portfolio,

-real-time observed practicals/vivas via Zoom or Blackboard Collaborate

1.4.5. Testing vs assessment

Due to limitations of testing, it is better to do assessment which is not only quantitative or grades oriented. An overall assessment is needed to include nearly all the criteria. Assessment is the process of collecting information about students from diverse sources so that educators can form an idea. Inclusion of portfolio, tasks etc. Teachers' professionalism and honesty are required to succeed in assessment. It is concerned with the students' performance. In other words, one assesses an individual but evaluates a program, a curriculum, an educational system, etc.

1.5. How to deal with authentication issues

Recent social distancing protocols have resulted in a complete shift to online education including testing/assessment. This change has been accompanied by an increased concern about whether the learning products being assessed are those of the students enrolled in the study program. This concern about students' academic honesty in relation to assessment is not new as it also applies to assessment carried out in face-to-face learning programs. However, the sudden and pressing need to convert hitherto classroom-based curriculum assessments to on-line assessments in this time of social distancing underscore the responsibility that educational institutions need to use processes that will help to authenticate that the work submitted is that of the students enrolled.

1.6. Solutions for Student Authentication

Assessment in higher education largely relies on examinations, projects and papers (extended writing), portfolios of evidence, quizzes, and reflective homework.

1.6.1. Examinations

The first step is to question whether examinations are the best solution for the particular assessment. Examinations are useful to ascertain the accuracy of the students' knowledge building, particularly for large class cohorts. Multiple choice questions (MCQs) can also be used to assess higher order thinking, in terms of the application of knowledge to novel situations. One limitation is that MCQ exams do not foster the development of elaborated problem solving, weighing evidence for an informed personal opinion or enhanced written communication skills. Furthermore, the major concern of exams is the prevention of cheating and ensuring that the online examinations are completed by the student being assessed.

1.6.2. Possible solutions

Students are required to complete and submit an online attendance form using personalised entry codes to take a test or an exam. To take the exam, students are supposed to apply for this code prior to the examination. Like any other personalised code, it will be a moral binding on them not to disclose it to any other person. Establishing this authentication strategy will involve detailed work by the higher education institutions to establish the system to ensure a smooth and efficient examination process. This identification process occurs prior to the commencement of the examination (Bailie and Jortberg, 2009, p.200). Expert advice was given by Orrell (2020) to redesign assessment.

1.6.3. Using trained proctors who can use student photographs to verify the person sitting the exam using webcams. This can be a mere initial identification or a full invigilated recording of the student during the exam. One of the problems to be anticipated with this process is that some students may not have the technology or the quality of internet access to support this process.

1.6.4. Using open book examinations gives students the confidence to undertake examinations and discourage cheating. In this age of accessible information on the internet, it has become more important that students know where to access accurate information and how to use it appropriately. Open book exams support the notion that students need to be discerning in the information they use.

1.6.5. Build a bank of exam questions that selects questions in random order for each student and limits the time for students to provide the answer. The unique order of questions discourages collusion between students who may be undertaking the exam in close proximity.

1.7. Essays and Projects

Essays have very little value beyond educational processes. They are only a product of, and for, education systems, especially universities. As such, they have become a commonly accepted practice because everyone has done them in their own education. Like exams there is a need to question why we use them.

There are three significant problems associated with extended writing of essays and projects. Students can pay for others to write them (hired writing). Plagiarised published work is another issue in addition to paraphrasing of already published works. Carroll (2009) contends that plagiarism is a real threat to learning.

In addition, extended writing is challenging for teachers to assess. There is always the risk of personal subjectivity of the assessor, and the time taken to undertake it is expensive.

In sum**,** good and effective assessment encourages students to engage in their learning. Students engage in honesty in their assessment task where there is trust between the students and teachers and a shared understanding that assessment is a tool for learning not merely a measure of learning. The more that this way of thinking becomes the basis of an education program, the less students will need to be coerced into doing their own work with threats of detection and its consequences.

2 Methodology

The study utilized a mixed methods research design: it combines elements of qualitative and quantitative data collection and analysis. This study attempted to answer the following research questions (RQ):

i) Do teachers trust in online assessment in general?;

ii) What is the benefit of students' authentication in online testing/assessment?;

 and

iii)Does the use of specific authentication and plagiarism detection instruments affect teaching and testing?

2.1. Tools and Participants

A self made questionnaire (appendix-A) was circulated via google form among 150 KAU-teachers, but only 69 responses were received back. Five teachers were interviewed to get in-depth information through the interview schedule (Appendix-B). Content validity of the questionnaire was done with the help of 5 experts in the concerned fields and accordingly some statements were modified.

2.2. Data Collection and Analysis

Item-wise analysis

Five point scale' responses abbreviated: strongly agree (Sa), Agree (Ag), Undecided(Ud), Disagree(Da) and strongly disagree(Sd)

Table 1. questionnaire data summary

Sts.	Sa (%)	Ag (%)	Ud (%)	Da (%)	Sd (%)	findings
1	6	61	7	15	11	67% teachers confirm that online learning does not interest many students.
2	19	71	4	3	3	According to 90% of teachers, it is difficult for them to control the students of online/virtual learning.
3	29	60	3	4	4	Online testing is more challenging than teaching, as per the opinion of 89% of teachers.
4	-	14	9	58	19	Only 14% confirm that they support a full online testing system while 58% teachers disagree.
5	18	19	-	5	56	56% teachers strongly disagree that online testing is trusted by stakeholders as much as face-to-face testing.
6	39	29	7	14	11	Only 29% agree that cheating is easy in online testing while 39% strongly agree. In total 68% teachers agree.
7	14	61	9	7	9	Some 61% teachers agree in addition to 14% who strongly agree that The use of e-authentication for online testing will give an impression that the teachers do not trust the students
8	28	39	9	18	6	67% teachers in total are in agreement with the statement that e-authentication for online testing will minimise the chance of cheating.
9	24	49	5	14	8	73% teachers confirm that Authentication will enable me to believe in online testing and teaching.
10	17	55	8	12	8	72% respondents confirm that different authentication will increase the trust among teachers, parents, administration and students.
11	19	61	5	11	4	80% teachers agree in total that Authentication will build up confidence in testing effectiveness among concerned
12	31	51	2	11	5	Plagiarism detection instruments can enhance authentication further, according to 82% respondents.
13	16	63	9	11	1	79% teachers opine that they believe in changing the exam type/mode to ensure online testing more reliable.
14	7	53	14	23	7	60% teachers support the idea of introducing online/virtual open book testing

15	5	43	17	25	10	Video monitoring is important during online exams, say 48% of teachers.

Analysis of specific statements

Statement. 1- According to 90% teachers, it is difficult for them to control the students of online/virtual learning.
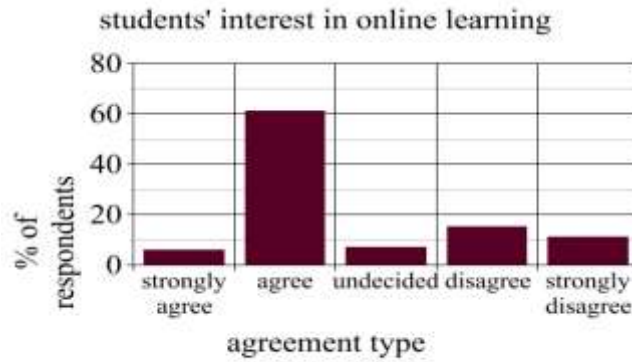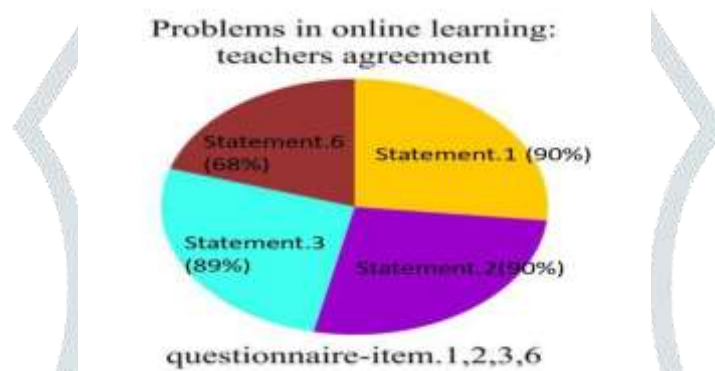

questionnaire-item.1

Figure 1.students' interest in online learning

Problems in online learning (statement.1, 2, 3, 6)

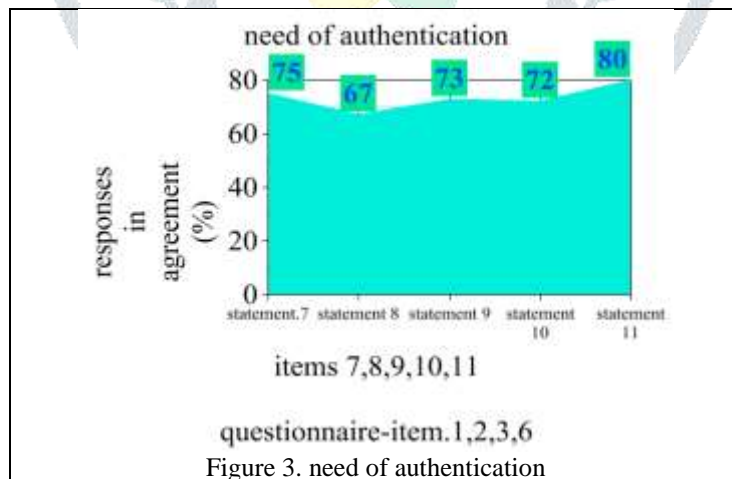Analyses of items 1,2,3 and 6 lead to the finding that there are problems in online teaching and testing.

questionnaire-item.1,2,3,6

Figure 2. problems perceived by teachers in online learning

Need of authentication

Based on the responses against the items 7,8,9,10,11, it is concluded that authentication is important, however, modes can be different.

questionnaire-item.1,2,3,6

Figure 3. need of authentication

Analysis of the interview

Most teachers admit that they are not happy with the online teaching/testing as most students are not having any interest in the online mode. They confirmed that there are many challenges faced by you during class control and interaction with students, especially class control. They don't usually trust online teaching/testing due to many reasons. One of the reasons is the possibility of cheating in testing. The teachers support the alternative mode of assessment rather than online testing. They were of the opinion that they are interested in shifting to normal routine teaching.

Research questions & Results

i) Do teachers trust in online assessment in general?;

Most of the teachers confirm that online teaching does not interest the learners.

ii) What is the benefit of students' authentication in online testing/assessment?;

There is a definite benefit of authentication in teaching/testing. It will ensure professionalism of teachers and integrity of students.

iii) Does the use of specific authentication and plagiarism detection instruments affect
the teaching and testing?

Based on data, it is found that specific authentication will at least verify the students and check plagiarism.

Conclusions

The study explored the challenges of online delivery and testing/assessment in the time of COVID-19. It is important to note how technology facilitating online delivery works. On the other hand, there are many challenges as well. In order to minimize the chance of cheating, multiple versions of exams can be designed. In addition, appropriate use of plagiarism detection software can help in the process a lot.

Assessment benchmarking has to be designed alongwith standard rubrics. Dynamic assessment activities help students understand the learning outcomes expected from them. In the COVID-19 context, it is essential to think about the limited resources available at the institutions or at homes.

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Appendix-A

Teachers' questionnaire
Name: (optional)……………….
College/Department……….…....   Experience:……………………...

S. N.	statement	Strongly agree	Agree	Undecided	Strongly disagree	disagree
1	Online teaching is not interesting for many students.					
2	Online/virtual teachers can't actually control the distance learners.					
3	Online testing is more challenging than teaching.					
4	I support a fully online testing system.					
5	To me, online testing is trusted by stakeholders as much as face-to-face testing.					
6	It is easy to cheat in online testing.					
7	The use of e-authentication for online testing will give an impression that the teachers do not trust the students.					
8	e-authentication for online testing will minimise the chance of cheating.					
9	Authentication will make me believe in the outcomes of my online testing.					
10	Different authentication will increase the trust among teachers, parents, administration and students.					
11	Authentication will build up confidence in testing effectiveness among concerned teachers.					
12	Plagiarism detection instruments can enhance authentication further.					
13	I believe in changing the exam type/mode to ensure online testing more reliable					
14	I am in favour of introducing online/virtual open book testing					

15	Video monitoring is important during online exams.					
	Any other ideas would you like to share	…………………………………………… ……………………………………				

Appendix-B (Interview schedule)

1- Are you happy with the online/virtual teaching outcomes?

2- Are there many challenges faced by you during class control and interaction with students?

3- Do you trust online testing? If yes/no, why?

4- Do you recommend an alternative mode of assessment rather than online testing only, and why?

5-Would you like to continue with this kind of teaching/testing even after covid-19. If yes/no, why?