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# Are 'Online Tests' Realistic in Sri Lanka?

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# Are 'Online Tests' Realistic in Sri Lanka?

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**Abstract:** Educational, Vocational Training, and Professional Institutions in Sri Lanka are facing a challenge in subjecting an ever increasing number of off-campus students to tests for the purpose of gauging their progress in academic programmes and for assessing their successful completion. Experience in the developed world, particularly those connected with Massive Open Online Courses (MOOCs), makes 'Online Assessment' appear promising as a viable alternative to conventional testing.

A critical success factor in the migration towards 'Online Assessments' within the Sri Lankan education system would be the inclination of the senior academic staff of higher educational institutions towards such migration. Consequently, a critical assessment of this inclination would be of interest to those who advocate this migration.

A survey was conducted among the academic community in the Sri Lankan higher educational institutions on the present and the future use of Online Tests for the assessment of students, with the aim of ascertaining as to how realistic it would be to embrace Online Testing in Sri Lanka at national level. The survey dealt with the personal disposition of the senior academic staff towards Online Tests, the infrastructure and facilities available, and the challenges envisaged in the transition.

This paper presents the analysis of the data gathered through the survey and the conclusions drawn from them.

**Keywords:** **online test, conventional test, academic dishonesty.**

## 1. Introduction

Assessments form an important part of the Sri Lankan education system. Due to severe competition for limited opportunities, students tend to be examination oriented during their learning phase and this places a challenge on the examiners to formulate tests that could detect the possession of actual knowledge rather than mere reproduction of memorized content. This is particularly the case in respect of secondary and higher education. Also due to the limited resources available in the campuses of higher educational institutions there is a strong and increased demand for distance learning and a corresponding tendency for institutions to offer it. The off-campus student population of institutions that offer courses in high demand often outnumber the in-campus student population by several orders of magnitude (See Table 1).

Consequently, testing this large number of students pose many logistic problems for the institutions.

The use of online testing is increasingly being considered as an option to cope with the large number of candidates. The Department of Examinations of Sri Lanka which is the government instrument for evaluation and testing of candidates has formally announced its intention to embrace online assessment [2]. However, the use of on line testing is still not widespread.

**Table 1: Student statistics of the 'University of Colombo School of Computing'**

| Student category | Number in year 2016 |
|---|---|
| Internal Undergraduates | 1821 |
| External students for DIT, HDIT and BIT | 4121 |

(Source: UCSC Annual Report [1])

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The key players who could influence the decision of an institution to opt for online assessment to assess students would be the academic staff of the institutions who function as examiners. In order to assess their inclination towards online testing as a viable mode of student assessment, a survey was conducted among academics of higher educational institutions in Sri Lanka, covering both state owned and private institutions. The objective of the survey was to identify technical and human related issues concerned with the deployment of online testing both of which are equally important when engineering the deployment of online tests. The survey covered the experience of the examiners in conducting online assessments, the availability of facilities and tools and the opinions of the examiners regarding the challenges that could be anticipated.

## 2. History of Online Testing in Sri Lanka

Many institutions in Sri Lanka use eLearning to deliver either the whole or part of some of their programmes. All the national universities now use Learning Management Systems (LMS) and some of them deliver eLearning courses. The Open University of Sri Lanka which could be regarded as the premier state institution in the island for distance learning also has eLearning in its academic portfolio [3].

A few notable initiatives for the introduction and promotion of eLearning in Sri Lanka are given in Table 2.

**Table 2: Notable eLearning Initiatives in Sri Lanka**

| Year | Institution | Initiative |
|---|---|---|
| 2002 | University of Colombo School of Computing (UCSC) | National eLearning Centre (NeLC) |
| 2003 | Open University of Sri Lanka | Distance Education Modernization Project (DEMP) |
| 2006 | University of Colombo School of Computing (UCSC) | eBIT (online version of BIT degree programme) |
| 2006 | Ministry of Education - Sri Lanka | SchoolNet |
| 2011 | Information and Communication Technology Agency (ICTA) of Sri Lanka | eSri Lanka |

(Source: Work of Mozelius, Hewagamage, and Hansson [4])

As indicated by the work of Mozelius, Hewagamage, and Hansson [4], 2002 is the year of initiation of formal eLearning in Sri Lanka. Significantly, the gradual use of online testing is evident only around 2006. Moselius et al [4] mention that in the eBIT, MCQ type online testing had been used for formative assessment. A conference paper by Sarveswaran, Perera, and Fernando about the evolution of eLearning at the University of Moratuwa since 2002 [5] states that quizzes had been successfully used in some courses during 2006. However, there is no evidence of final or summative assessment of students being done online by any institution in Sri Lanka. Even institutions that use online assessment to gauge student progress during the course, prefer to use paper and pencil tests for the final assessment.

This indicates that even institutions that possess the capability to deliver eLearning have not opted for online testing for summative assessment. Institutions appear to be reluctant to rely solely on ICT enabled tests for formal assessment of students.

## 3. Practices in Other Parts of the World

When researching the practicability of 'online tests' in Sri Lanka, it is pertinent to examine 'online tests' as practiced elsewhere in the world.

In the developed world, online testing is technologically mature and its deployment is not constrained by technology. Its use is also not limited to the academic sphere. It is used in other equally serious applications such as recruitment and citizenship eligibility assessment. There are many 3rd party service providers who are outsourced by leading employers and hiring agents to test applicants online. Many developed countries such as UK and Canada with large influx of immigrants use online tests at certain stages of immigrant assessment for grant of citizenship.

When examining the evolvement of 'online tests' in academic institutions in particular, a two stage transition could be noted: the transition from traditional Pencil and Paper Tests (PPTs) to Computer Based Tests (CBT) and then the maturing of CBT to online tests. It is important to realize that a CBT is not necessarily a remotely administered test. It is in essence a test administered using a computer. Alabi, et al, [6] cite the advantages of CBT over PPT as the

ability to automate assessment, ability to eliminate human factors such as bias by examiners and the ability to make the tests adaptive and non-linear to match candidates' performance.

CBT are usually conducted in a proctored environment using the infrastructure of the institution administering the test. Even in Sri Lanka there are several institutions affiliated to institutions and professional bodies overseas, that employ this method of assessment. The CBT may be online in the sense that it is rendered via Internet or private network instead of the test residing in the computer node allocated to the candidate. However, since the candidates must be physically present at the proctored location, this type of CBT are subject to the same logistic constraints of PPT.

The modern perception of an online test is a test rendered via the Internet which the candidate can undergo from his/her comfort zone. This underpins the 'remote administration' of the test. This is an advantage which is reaped in addition to all the advantages of CBT. The important consequence is that the institution is freed from the logistic constraints connected with conducting the test in a proctored environment. This is particularly relevant in the case of institutions having a large student population where it is impossible to use a proctored environment. This is the factor that has driven the need for online tests worldwide more than any other advantages of CBT.

The emergence of Massively Open Online Courses (MOOC) has strengthened the need for remote testing. In MOOCs the courses themselves are essentially online. The student population is very large and widespread There are over a dozen MOOCs that are extremely popular and massively subscribed in the world today and they all use online testing of candidates. Work of Costello et al [7] deal with ways of making online tests in MOOCs more effective.

The widely cited disadvantage of online tests is having to deal with academic dishonesty on the part of the candidates. Candidate authentication and preventing him/her from indulging in fraudulent practices during the test remains a problem for all institutions using online testing. There are many forms of fraudulent practices commonly encountered within the candidate populations of online tests [8]. Jeffrey R. Young [9] concludes that preventing students from claiming to possess knowledge they do not have is the most formidable challenge in online testing. The work of Joni Adkins et al [10] contains some of the earliest recommended practices to counter cheating at online tests. Remote proctoring although technologically possible is not an option as it is not practically deployable at each candidate site.

Accordingly, even in other parts of the world, online testing is not as widespread as online learning, the reason being the inadequacy of measures to prevent academic dishonesty.

## 4. Methodology

The survey was based on information gathered through an online questionnaire to be answered anonymously. 50 senior academics from among those serving in the local universities, the National School of Business Management (NSBM), the National Institute of Business Management (NIBM), and the Sri Lanka Institute of Information Technology (SLIIT) were identified through convenience sampling from the contact information provided in the respective web sites. All selected academics were in the grade of lecturer or above. In the NIBM the selected academics were in the class of consultant/lecturer. The selected academics were provided a link via email to access the questionnaire online. The link was kept accessible for 14 days and one round of reminders was also dispatched via email. A total of 37 responses were received.

## 5. The Questionnaire

The questionnaire contained a total of 16 questions, 9 of them being objective questions with the remainder being open ended to varying degrees.

The first section of the questionnaire dealt with the 'general disposition of the examiner towards online assessments'. The second section covered 'Infrastructure and Facilities' of the examiner's institution for conduction of online tests while the third section focused on 'Fraudulent Practices by Candidates during Online Tests'.

Since the terms 'Online Test' and 'Conventional Test' had been used extensively in the questionnaire, it was deemed appropriate to clarify the meaning of these terms within the context of the survey. Accordingly, the

definitions of these terms were given right at the beginning of the questionnaire. An 'online test' was defined as a test administered remotely with the aid of Information and Communication Technology via the Internet or other network, which the candidate may undergo from his/her comfort zone. A 'conventional test' was defined as the familiar 'paper and pencil' type of test conducted for a group of candidates simultaneously within a proctored environment.

The respondents were also informed at the outset that the response collection would be anonymous. Consequently, there was no provision for the respondents to withdraw or to supersede a submission already made.

## 6. Response Analysis

### 6.1 Disposition towards online assessments

The respondents were asked whether they have ever conducted an online test for the assessment of students. 14 out of the 37 respondents stated that they have. This provided the means to classify the respondents into an 'Experienced Group' and an 'Inexperienced Group' in online testing.

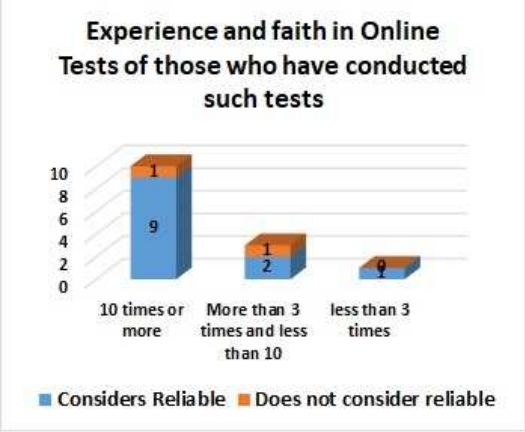


**Fig 1: The Experience of those who have conducted Online Tests and their faith in them**

The number of times the members of the experienced group had conducted online tests and the faith they place on online tests as a reliable mode of assessment were also gathered. The findings are depicted in Figure 1.

As seen from Figure 1, of the 14 comprising the group experienced in online testing, 10 have conducted online tests at least 10 times. Of the remaining 4, only 1 has conducted them less than 3 times. Altogether 12 of the 14 consider online tests as being reliable which includes 9 of the most experienced. Significantly, the least experienced single respondent has also expressed faith in online tests.

The responses of the 23 respondents comprising the inexperienced group who have never conducted an online test when asked as to whether they contemplate using 'Online Tests' in the near future and whether they consider such tests as being reliable, are depicted in Figure 2.

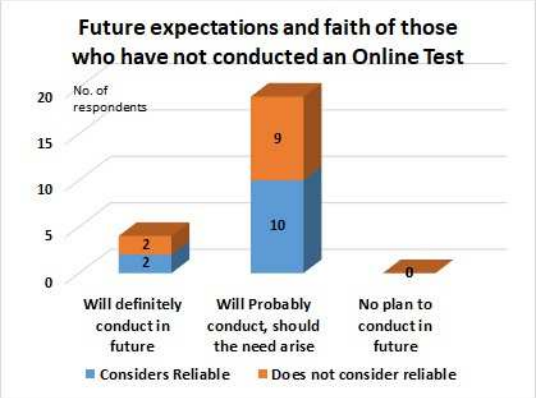


**Fig 2: The future expectations and faith in Online Tests of those who have never conducted them**

As seen from Figure 2, of the 23 respondents comprising the 'inexperienced group', 4 had expressed their definite intention to conduct online tests in the near future while the remaining 19 had stated that they would probably do so if the need arose. Accordingly, all of them have the inclination for online testing while 12 of them consider online tests as being reliable.

24 of the 37 respondents, thus a majority, consider online tests as a reliable mode of testing and they are equally distributed between the experienced and the inexperienced groups.

Diverse responses were obtained from the respondents to the open ended question as to why they either think or don't think that online tests are reliable. Nevertheless, they could be grouped into several classes.

Of the 23 respondents who consider online tests as being reliable, 11 have cited reasons related to logistics, convenience, and speed while 6 have cited reasons connected with technology and the consequently less room for human error. A single respondent has cited better security as the reason for reliability.

Of the 13 respondents who do not consider online tests as being reliable, 9 have cited reasons related to academic dishonesty on the part of the candidates. One respondent has cited the reliability of the enablers such as electricity and communication.

The respondents were asked to select 3 reasons from among a set of prompts as to why they would prefer online tests over conventional tests and vice versa. In both cases, the respondents were permitted to suggest one additional reason if necessary to make up 3 reasons.

Following were the prompted reasons for preference for online tests over conventional tests:

- Ability to test a large number of candidates.
- Ability to automate scrutiny and generate results immediately.
- Better ability to maintain confidentiality of test material.
- Freedom from logistic issues associated with conventional tests.
- Flexibility for candidate to take the test at a time of his/her preference.
- Ability to apply time constraints strictly.
- Ease of record keeping and archiving.
- Kind on the environment.

The responses received are depicted in Figure 3.

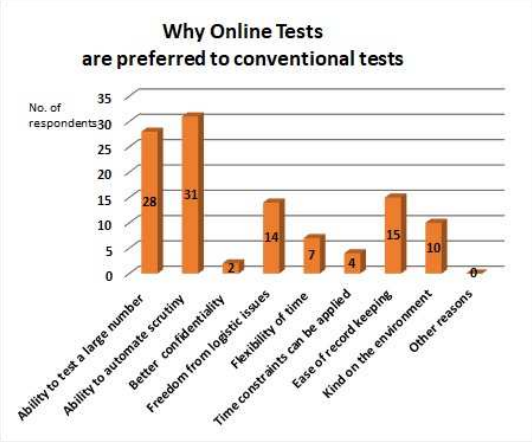


**Fig 3: Rating of reasons as to why Online Tests are preferred to conventional tests.**

As seen from Figure 3, the 'ability to automate scrutiny' has the highest preference, followed by the 'ability to test a large number' and 'ease of record keeping'. 'Freedom from logistic issues' rated as the 4th with 14 preferences is also noteworthy. No reason other than those prompted had been cited by any respondent.

Following were the prompted reasons for preference for conventional tests over online tests:

- All candidates may not have the means to access the test online
- All candidates may not have the competence to undergo an online test
- There is no way to authenticate the candidate
- Candidates may cheat during the test
- Candidates may not have confidence about the reliability of an online test
- Problems in the communication channel and other external factors may affect the quality of the test being administered
- Problems in the communication channel and other external factors may affect the accuracy of the candidate's response

The responses received are depicted in Figure 4:

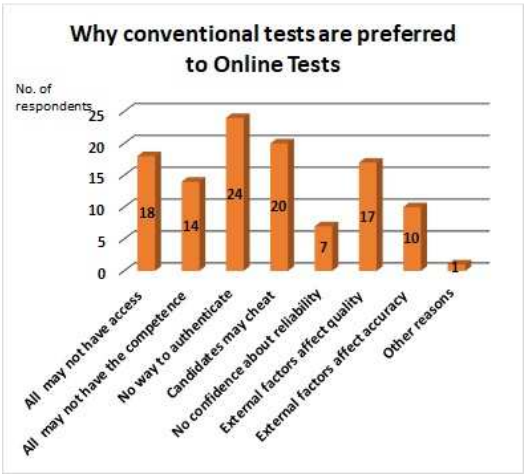


**Fig 4: Rating of reasons as to why conventional tests are preferred to online tests**.

As seen from Figure 4, the 'inability to authenticate candidates' has the highest rating with 24 preferences, followed by the 'room for candidates to cheat' and 'all candidates not having access'. 'External factors affecting the quality of the test' rated as the 4th with 17 preferences is also noteworthy. In addition to the prompted reasons, one respondent had cited the additional reason of 'difficulty to test certain aspects through Online Testing'.

29 respondents had answered the open ended question as to 'What they like most about Online Tests?'. The responses could be summarized into the following:

- Freedom from logistic issues
- Speed and convenience
- Cost saving when number of candidates is large
- Ease of record keeping

30 respondents had answered the open ended question as to 'What they dislike most about Online Tests?'. These could be summarized into the following:

- Academic dishonesty of candidates
- Technical issues
- Limitations in using for certain types of tests.
- High costs, particularly the capital costs

The above results indicate that the majority of the academic community prefer and are likely to support endeavours to deploy online testing. While the majority of them do not have wide experience in conducting online tests, all of them are well aware of its merits and demerits. Among the reasons around which reservations about Online Testing are centered, the 'room for academic dishonesty on the part of the candidates' figure above technological and other reasons.

### 6.2 Infrastructure and Facilities

36 respondents had answered the question whether they have the necessary tools for the construction of an online test at their disposal. Figure 5 depicts the responses.

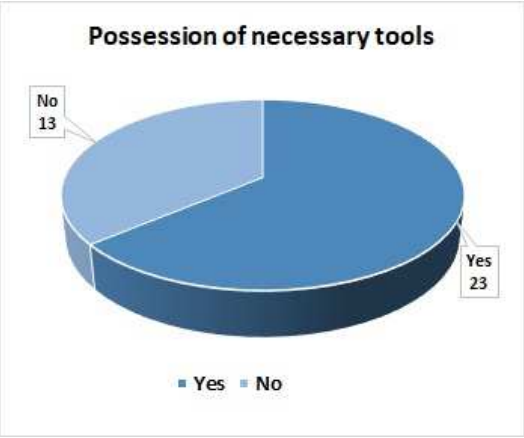


**Fig 5: Fraction of respondents possessing the tools to construct Online Tests**

However, not all respondents who have the necessary tools have conducted Online Tests, as depicted in Figure 6:


**Fig 6: Fraction of respondents having the necessary tools and having conducted Online Tests**

The institutions of the majority of the respondents have the necessary 'Infrastructure and Facilities' to deploy Online Tests, as depicted in Figure 7.

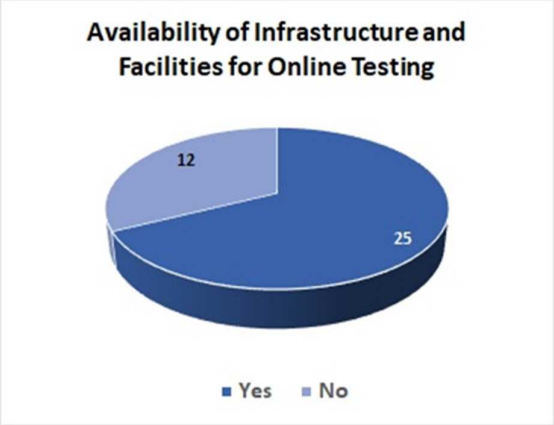


**Fig 7: Availability of Infrastructure and Facilities in the institution to deploy Online Testing**

However, since there is no information to correlate the respondents and the institutions due to the anonymity of the responses, it is not possible to generalize the above observation over institutions. In actual fact there could be significant disparities between the facilities in different institutions.

Only 2 respondents who possess the tools for constructing Online Tests have indicated that their institutions do not have the infrastructure for the deployment of the tests.

In response to the question "Given your present facilities and resources (including human resources), what is your estimate of the 'per candidate cost' of testing 'online'?", 20 respondents had estimated that it would be less than that of a conventional test while 16 had indicated that they have no idea. Only 1 respondent had estimated that Online Testing would be costlier. These are depicted in Figure 8 separately for the inexperienced and the experienced groups.

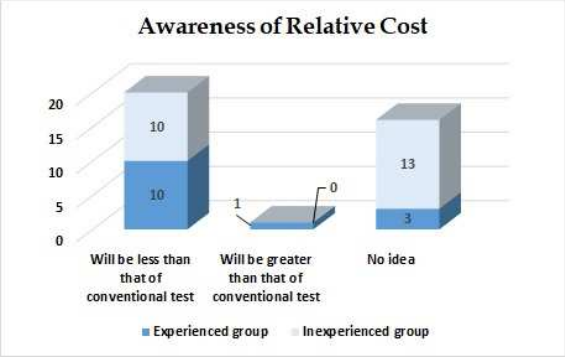


**Fig 8: Awareness of the relative cost of online and conventional testing**

Asked to identify the immediate challenge "If they were to decide on migrating immediately from conventional tests to online tests", the respondents were prompted with the following:

- Acquisition of necessary equipment/software
- Human resources
- Resistance from staff normally deployed in work connected with conventional tests.
- Resistance from prospective candidates
- Training on the development of 'online tests'
- Policy formulation
- Convincing the management hierarchy
-

The respondents were also given the option of identifying any challenge other than the above. The responses are depicted in Figure 9:

It would be seen that 'acquisition of necessary equipment/software' is rated as the most formidable immediate challenge. 'Resistance from candidates' follows second. 'Training on the development of online tests' and 'Policy formulation' are the other challenges identified as being significant. 'Human resources' not being identified as an immediate challenge by all but one respondent is noteworthy. In addition, one respondent has submitted the 'reliability of the infrastructure' as an immediate challenge.

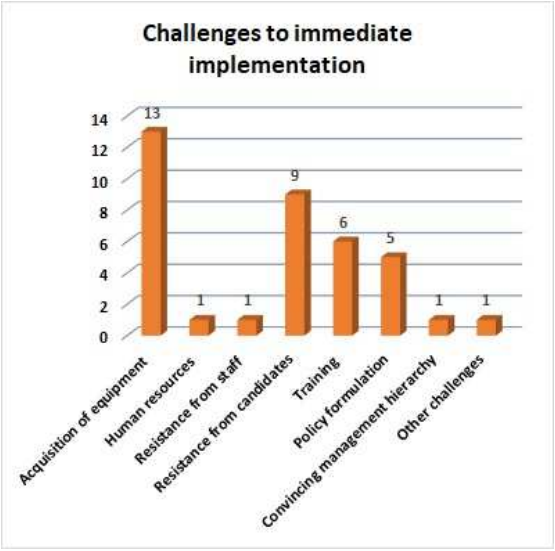


**Fig 9: The rating of challenges to immediate implementation**

The above results indicate that a significant fraction of the academic community possess the tools required for the construction of 'Online Tests'. There is good correlation between the 'respondents possessing the tools for test development' and 'their institution having the infrastructure and facilities for test deployment'. Respondents with experience in online testing and those without, appear to be in broad agreement in their 'relative cost awareness' regarding online testing and they estimate that it is less than that for a conventional test.

However, immediate implementation of 'Online Tests' appear to be constrained mainly by lack of equipment/ software. Resistance from candidate community is also anticipated.

### 6.3 Fraudulent practices by candidates during 'online tests'

When posed with the direct question "whether the respondents envisage dishonesty and/or fraudulent practices during tests on the part of a significant fraction of the total candidate population if 'Online Testing' were adopted in their institutions", 25 respondents had answered 'Yes'. Figure 10 depicts the distribution of these 25 among the experienced and the inexperienced groups.

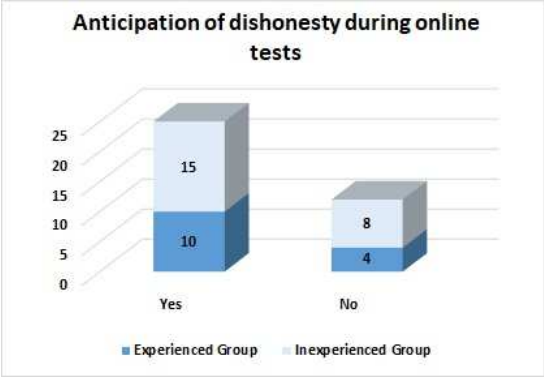


**Fig 10: Respondents' anticipation of 'dishonesty and/or fraudulent practices if 'Online Testing' were adopted.**

That the majority of both the experienced and the inexperienced groups envisage that candidates would indulge in fraudulent practices if online testing were adopted, is a very significant observation.

The survey respondents were prompted with the following list of fraudulent practices and were asked to select all that they would anticipate if online tests were adopted by their institutions.

- Impersonation
- Multiple accounts (candidate having additional fake accounts to undergo trial runs of the assessment)
- Candidate collaborating with a competent colleague to get real time assistance while undergoing the test
- Candidate using parts of test captured by colleagues who underwent the same test earlier
- Candidate looking up material while answering

The provision was also given for them to suggest any other fraudulent practice that they are aware of, if they wish. The responses are depicted in Figure 11:

As seen from Figure 11, the possibility of 'candidate collaborating with a competent colleague to get real time assistance while undergoing the test' is rated as the highest.


**Fig 11: Rating of anticipated fraudulent practices by candidates during 'Online Tests'**

'Impersonation' and 'Looking up during the test' are also ranked high. 'Using parts of test captured earlier' (or 'tapping' as it is called) is also anticipated with high occurrence. It is also pertinent to note that 'Multiple Accounts' is a special case of 'tapping'. One respondent had submitted 'hacking of question banks' as an additional fraudulent practice that could be anticipated.

When posed with the leading question "whether they think that cheating at 'online tests' could be prevented using appropriate technology?", 23 respondents had answered 'Yes, to some extent' while 7 had answered that it can be 'prevented completely'. Figure 12 depicts the distribution of these responses among the experienced and the inexperienced groups.

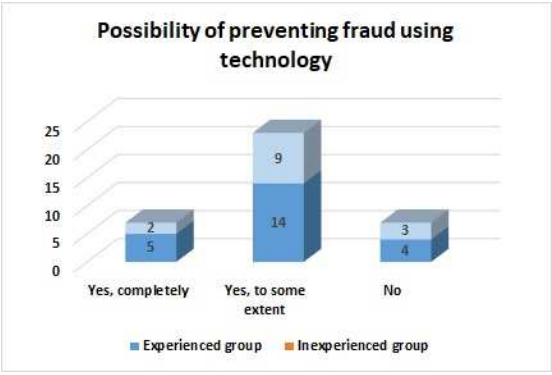


**Fig 12: Possibility of preventing fraud during 'Online Tests' using technology**

As seen from Figure 12, the majority of both groups believe that technology can be used to prevent cheating to some extent.

The above results also indicate that the majority of the academic community believe that there is a high possibility of academic dishonesty on the part of candidates if online testing were adopted. They also appear to have a good understanding of the types of fraudulent practices that could be expected. They are also aware of the capability and limitations of technology in curbing them.

## 7. Conclusions

From the analysis of the responses gathered from this survey, it could be concluded that the academic community who play the role of examiners in Sri Lankan higher education institutions are likely to welcome any endeavour to adopt Online Testing. The majority of them are equipped to construct online tests while their institutions possess the necessary infrastructure to deploy the tests. They anticipate a high degree of academic dishonesty from the candidates while undergoing online tests. The engineering of the deployment of online tests would come against challenges based on both technological and human factors. Lack of human resources is not envisaged as a challenge which indicates that most institutions possess the expertise for construction and deployment of online tests. The academic community are in a good position to manage the transition and are aware of the role of technology in ensuring its effectiveness.

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