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Digital assessment – how does it challenge local practices and national law? A Norwegian case study

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ABSTRACT

The traditional exam has a strong holding within Norwegian higher education and is very often the preferred way of assessing students. Digital technology opens up for alternatives to the traditional exam, but so far focus has predominantly been on exchanging pen and paper with personal computers within the traditional framework. Digital alternatives may come in conflict with existing law governing teaching and assessment at university, as the law was written at a time when digital technology did not exist. We present data from a workshop in which 48 individuals from 11 institutions, academics as well as administration, were asked to identify and discuss challenges related to the introduction of digital alternatives. A case study strategy was considered appropriate as this gave us the opportunity to collect information from representatives from many universities and university colleges across Norway. Lack of knowledge about alternatives to the traditional exam, and lack of knowledge as to how digital technology may be used in assessing students were the kind of challenges most often mentioned. Assessment practices may be rooted in an assessment policy, but data from a survey (29% response rate) indicate that there is little awareness concerning this issue within Norwegian higher education institutions.

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Introduction

In recent national policy documents dealing with higher education in Norway (e.g. White Paper 16 (2016–2017)) we witness a change of focus towards active learning, the use of formative assessment (more feedback), and focus on ensuring that teaching and learning activities and assessment are aligned with learning outcomes (constructive alignment). This development is paralleled by research which has demonstrated the advantages active learning techniques, and active learning environments, have over traditional lecture-based teaching (Mazur 2009; Deslauriers, Schelew, and Wieman 2011; Wieman

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2014; Freeman et al. 2014; Kinsella, Mahon, and Lillis 2017; Stover and Ziswiler 2017; Hyun, Ediger, and Lee 2017). Research also testifies to the positive effects of formative assessment as an alternative to summative assessment (e.g. Wiliam 2011; Evans, Zeun, and Stanier 2014; Bhagat and Spector 2017). However, as far as our institutional practice is concerned, the change is not as obvious. Summative assessment and written exams are, in many cases, still the preferred alternative. There is, however, one noticeable change. Nowadays exams come in a digitized shape, the main difference being that students may use their laptops instead of pen and paper. The same set of rules and regulations still applies. They are closed-book/closed-web exams with invigilation. The most common solutions used by Norwegian higher education institutions are Inspira Assessment and WISEflow, and every semester tens-of-thousands students across Norway hand in their exam via these systems. At the University of Bergen, a middle-sized university with approximately 17,000 students, more than 60% of all exams are digital (using Inspira Assessment). As one critic has pointed out, this is merely re-inventing the typewriter as long as students cannot access the internet (Raaheim 2016a, 2018).

When teaching and learning activities change, we need to consider existing assessment practices, and perhaps rethink the way we assess students. The fact that we have introduced a set of learning outcomes draws in the same direction. It is far from obvious that all learning outcomes related to knowledge, skills, and general competences may be equally well assessed using the same method or form of assessment. Digital technology opens new possibilities and alternatives as far as assessment is concerned, but they do not come without questions. Some old questions related to validity, reliability, transparency, but also plagiarism, and some new questions related to national laws and institutional regulations. New forms of assessment may come in conflict with students' right of appeal against a grade.

In 2016, The Norwegian Agency for Digital Learning in Higher Education (NADLHE), now DIKUT, announced a programme on digital assessment. Successful applicants could receive funds for projects in which alternatives to the traditional in-house, pen and paper, written exam was implemented. The announcement made clear that projects which only aimed at exchanging the traditional exam with a digital alternative were not welcomed (<https://norgesuniversitetet.no/digital-vurdering>). As part of this programme on digital assessment we, the NADLHE's expert group, organized several meetings and workshops with varying themes related to digital assessment.

Background

In a historical perspective, we may, as Myyry and Joutsenvurta (2015) describe, distinguish between a testing culture and an assessment culture. Central to the testing culture is an educational approach where instruction and testing are central activities, and where the two are seen and treated as separate activities. The same way 'the lecture' has been something that symbolizes university, the traditional exam has played an important part in informing the outside world that university candidates have been approved, and that they are fit to serve the community. It may also be argued that the traditional exam was a sensible arrangement in that it served to guarantee that established knowledge was preserved and carried on. An assessment culture is, on the other hand, characterized by what Meer and Chapman (2015) describe as learning-oriented assessment, where focus

is on the learning elements of assessment assisting students to become reflective practitioners, and to develop higher order cognitive skills. Here focus is on the formative aspects of assessment, as formative techniques are expected to support student motivation and achievement (Nolan 2011; Wiliam 2011; Carnell 2016).

As demonstrated by Wieman and colleagues, students learn more when they are actively engaged with course content (Deslauriers, Schelew, and Wieman 2011; Wieman 2014; Freeman et al. 2014; Kuo and Wieman 2016). Wieman demonstrates how this may be done within the frames of the traditional lecture, whereas others show how activity best is promoted using the flipped classroom technique (McCallum et al. 2015; Ryan and Reid 2016; Hyun, Ediger, and Lee 2017; DeLozier and Rhodes 2017). As argued by Jakobsen and Knetemann (2017), team-based learning (TBL) may be an effective way to structure flipped classroom to promote positive student outcomes. Previous studies have shown that students perform better when enrolled in TBL classes in subjects like biology (Carmichael 2009), medicine (Vasan, DeFouw, and Compton 2011), architecture (Epsey 2008), and physiotherapy (Jeno et al. 2017).

Assessment practices within an institution may, or may not, be guided by an assessment policy. The purpose of such a policy is to equip stakeholders with criteria for self-evaluation as a basis for future educational improvements. A recent case study of assessment policies across five international research universities (Gynnild 2017), identified three basic considerations: feasibility, purpose, and assessment framework, and six assessment principles: Alignment, authenticity, fairness, reliability, transparency and validity. The term feasibility refers to a basic administrative issue, while purpose refers to the question of 'what for' – should assessment be summative, formative or a combination of both. Assessment framework refers to criterion-based versus norm-based assessment. As argued by Gynnild (2017) no single template applies to generate an assessment policy. Local conditions always have to be taken into consideration. Policies can inform assessment design, and particularly serve as a validating tool in instances of quality assurance by providing distinct foci to inform evaluation procedures. An assessment policy is a set of guidelines applicable to assessment within a particular institution (Gynnild 2017). This set of guidelines points to and explains the underlying principles in assessment, and may be followed by an assessment guide which describes different assessment methods. As discussed by Raaper (2017) an assessment policy may or may not have a direct impact on assessment practices, and may also have a potential negative backside. Depending on social and cultural context an assessment policy, and assessment practices, not only discipline students but may also discipline academics, making their assessment practices and decisions highly controlled and constrained (Raaper 2017, 335). An assessment policy may want to take into consideration the need for introducing a capability focused curriculum as described by Baillie, Bowden, and Meyer (2013), thereby promoting ideas and practices related to sustainable assessment.

According to Baillie, Bowden, and Meyer (2013) our higher education institutions have to change the way they plan and conduct their curricula as society changes, and as the need for transferable skills gradually becomes more important. We need to move from a content focused towards a capability focused curriculum in order for students to develop a critically, problem-solving ability (knowledge capability), they claim. One strategy is to involve students in authentic tasks and to let them assess themselves in addition to being assessed by others, as '... knowledge capability ... is achieved through *experience*

of variation, rather than merely having varied experiences' (233). Such learning-oriented assessment is at the core of what has been referred to as sustainable assessment in some recent studies (Beck, Skinner, and Schwabrow 2013; Meer and Chapman 2015; Adesemo-woa, Oyedele, and Oyedele 2017). Sustainable assessment moves beyond summative and formative assessment by positing that students should be more actively involved in their own assessment, both in identifying and creating grading criteria, and in assessing themselves; assessment *as learning* (Lindberg-Sand and Olsson 2008).

According to Jonsson (2014), involving students in identifying and creating grading criteria (rubrics) increases transparency and may have a positive effect on their learning. As shown by Rosa, Coutinho, and Flores (2016), digital technology opens possibilities for online peer assessment, promoting greater involvement and responsibility of students in their own learning. Wanner and Palmer (2018) argue that peer assessment is effective for improving students' own work, but students need training in giving feedback for such assessment to be effective. Liu, Li, and Zhang (2018) show how online peer assessment training, involving online discussions, has a positive effect on performance. Xiong and Suen (2018) argue convincingly for the use of peer assessment in MOOC's as a better alternative (at present) to formative assessments that rely on machine grading.

In recent years, we have seen some new opportunities in the area of assessment related to learning analytics (Hernandez-Lara, Perera-Lluna, and Serradell-Lopez 2018; Vieira, Parsons, and Byrd 2018). Systematic collection and analyses of different kinds of assessment data present new opportunities in formative assessment and adaptive learning, and ultimately provides us with an opportunity to customize individual learning modules. A key strategy will be an analysis of data from individual students' learning processes, including group discussions, analysis of video material, answers to various tests, etc. Such use of student- and assessment-data in learning analytics may help us in providing more adaptive learning processes for the students, both in terms of content and when it comes to teaching and learning methods.

The Norwegian context – from assessment to activity

Some 20 years ago, OECD described Norwegian higher education institutions as 'exam giving institutions' (OECD 1998). According to the OECD, too much emphasis was put on control of students, and on grades at the expense of teaching and learning activities. This criticism was dealt with in a comprehensive governmental report (Official Norwegian Report, NOU 2000, 14), which discussed the future of Norwegian higher education in light of the Bologna process. The report was followed by a White paper on higher education (White paper 27, 2000–2001), which ushered a full integration of the Bologna Declaration as signed by 29 ministers at the Ministerial Conference in Bologna in June 1999. This White paper marked the introduction of the Quality Reform of higher education in Norway. The White paper asked, among other things, for the use of more student-active teaching, and for the introduction of alternatives to the tradition exam. The Quality reform was subject to a national evaluation in 2006 by a group of experts commissioned by the Ministry of Education and Research. As described in one of the reports from this evaluation, students received more written feedback on their work after the reform, and alternatives to the traditional exam – in

particular portfolio assessment – had been introduced (Dysthe et al. 2006). These alternatives did, however, very often come in addition to a final written exam which, quite typically, counted more towards the grade.

As part of the Bologna-process, all higher education institutions in Norway have implemented a National Qualifications Framework for Lifelong Learning, based on the European Qualifications Framework for Lifelong Learning, in which a set of learning outcomes related to knowledge, skills and general competences have been written. A recent development has been the launch of White paper 16 (2016–2017) ‘Quality Culture in Higher Education’. Here it is stated that the Government will make it a requirement for all higher education institutions within 2019 to establish merit systems, which place value on work to develop good teaching. In the same White paper it is announced that the Government expects higher education institutions to use learning and assessment methods to support in-depth learning, and make sure that teaching and learning activities, as well as assessment methods, are aligned with learning outcomes.

Research approach

Digital exams have become popular within Norwegian higher education, but alternative assessment solutions, digital or not, are rather scarce. This led the NADLHE expert group on digital assessment to question what the barriers might be. In order to get an overview of the situation, we decided to use the opportunity to collect information from people who participated in a workshop organized by the NADLHE in May 2017. As Universities Norway (formerly known as the Norwegian Association of Higher Education Institutions) hosted a meeting in October 2017 with focus on national regulations related to assessment and grading, this gave us an opportunity to collect some further information. Such a case study strategy was considered appropriate as this gave us the opportunity to collect information from representatives from many universities and university colleges across Norway, academics as well as representatives from the administration. In the following we will present data from the workshop and some data from a survey which Universities Norway conducted as a follow up of their meeting.

Method

Workshop

In order to reach a better understanding of how the introduction of digital assessment is perceived by different parties within Norwegian higher education, as well as which challenges they believe exist, we invited representatives from these institutions to a workshop that would address these issues.

The announcement made clear that the maximum number of participants would be 50 and that we were aiming for a good mix of academics and representatives from the administration. In all, 48 representatives from 11 universities and university colleges across Norway participated, half of the participants were academics and half were representatives from the administration. A majority of the participants (31) came from the five traditional universities, six participants came from our new universities, and 11 participants came from university colleges of varying size from different parts of Norway.

The participants were put in twelve groups of four, and asked to discuss what they saw as challenges/problems if assessment were to be digitized in some form or other. The groups were asked to put their summary as bullet points before we had a discussion in plenary. These summaries, one from each group, were handed in at the end of the day and made available for the expert group. The summaries were analysed by way of systematic text condensation (Malterud 2012). As a first step, the summaries were read to get an overall impression and to identify specific themes. This was followed by a step where meaning units were identified for each theme, and a step where meaning units were coded and labelled.

Questionnaire

In October 2017 Universities Norway (UHR) arranged a one-day conference on assessment and grading, as the Ministry of Education and Research has decided that all grading shall be conducted on the basis of written guidelines. Representatives from different universities and university colleges across Norway were invited to present their routines and regulations related to grading of students. Other speakers, including a representative from the expert group on digital assessment, challenged the audience on questions related to reliability in grading, and the need for assessment practices to be rooted in an assessment policy. In all, 140 representatives from 23 universities and university colleges participated, 88 academics and 52 from administration. According to normal UHR procedures, all participants received a questionnaire via mail some days after the conference, and were asked to evaluate the programme. We, the expert group, were given permission to include a question related to assessment policy. As anecdotal evidence suggests that few, if any, Norwegian institutions have developed and introduced a clear assessment policy, we included the following question: Does your institution have a set of guidelines for assessment in terms of an assessment policy?

Results

In Table 1 we present an overview of the results of the analysis of answers from the workshop. The numbers in the right column represent the sum of meaning units identified for each theme. The groups discussed different digital solutions and how these challenged current practices. As can be seen from Table 1, 'lack of knowledge about alternatives' is

Table 1. Challenges related to the introduction of digital assessment.

Challenges coded and aggregated as units	Number of registrations
Lack of relevant knowledge concerning alternative forms of assessment, and/or on how to use digital technology in assessment	38
Lack of digital competence among academics and/or administrative staff	18
Major organizational changes causing lack of time to learn and to implement new digital solutions	18
No risk analysis/legal challenges	8
Lack of assessment policy within the institution	7
Lack of motivation among staff	5
Economic challenges/lack of resources	1
Lack of cooperation within and between organizations	1
Total	96

seen as a major challenge. This relates both to lack of knowledge about alternatives to the traditional exam, and lack of knowledge concerning how digital tools may be used as part of assessment. A more general lack of digital skills was also frequently mentioned. Whereas the former may be taken care of in terms of information about alternatives, the latter may prove more difficult as it requires effort and overcoming old habits.

In our institution we have little or no experience with digital assessment solutions. We use traditional exams.

We are not familiar with the digital opportunities (Inspira) and we need training in use and knowledge of the solutions.

We also notice that many point to the fact that our higher education institutions have seen some major changes over the last few years (the Bologna process and merging of institutions), and that this may have caused some fatigue among staff. Not only fatigue, but sometimes resistance against what is seen as top-down instructions and regulations.

Academics experience lack of motivation and are negative towards changes.

Lack of cooperation and professional competence.

Some groups also mentioned issues related to legal challenges: is it possible, within the existing law, to introduce alternatives?

We also asked the participants to express who they see as being responsible for responding to and solving challenges related to the introduction of digital alternatives. As can be seen from [Table 2](#), most participants see this as a managerial or leadership responsibility. Nearly one out of four express that there should be some national guidelines, and that Universities Norway, a cooperative body for accredited universities and university colleges, should take responsibility. Interestingly, relatively few experiences expressed challenges to be the personal responsibility of individual staff.

A total of 44 participants answered the UHR questionnaire. Of these 40 had answered our question, making it a low response rate of 29%. [Table 3](#) gives an overview of the answers. As can be seen from this overview, a majority among academics and representatives from administration answered in the affirmative.

However, based on our own extensive knowledge of and experience in Norwegian higher education and an unsuccessful search for such policy statements on individual institutions' webpages, we decided to contact the 20 people who had answered that their institution had an assessment policy. As UHR had all respondents' email addresses, we sent them each an email asking them to provide links to the policy documents/statements at their institutions. These 20 respondents represented nine different institutions. We received seven responses, representing five different institutions. Three answered

Table 2. Whose responsibility is it to respond to and solve challenges related to the introduction of digital assessment?

Responsible party	Answer in per cent
Different levels of management/leadership are in charge	59,6
Universities Norway (UHR) should take responsibility	23,1
Shared responsibility between administration, technical staff and academics	17,3

Table 3. Does your institution have a set of guidelines for assessment in terms of an assessment policy?

	Academics	Administration
Yes	10	10
No	2	7
Don't know	3	8
Total	15	25

that they probably had misunderstood the original question and that they were not sure what an assessment policy is. Here is a sample response:

When I answered YES I was thinking of our routines for assessment of master courses which underlines that supervisors cannot take part in grading and that both internal and external examiner have to use specific forms that 'force' the examiners to assess 'all' aspect of the students' work. (And the system works well!). But – When I read your mail and your question, and read 'assessment policy' I must admit that I am not quite sure what is meant by 'assessment policy' – and should probably have answered NO to the original question ... Sorry!

Only one of the respondents was able to supply a link to an actual policy document, and that was just a draft. The others provided links to documents containing information about registering for exams, documents concerning UHR's description of what constitutes grades on the A–F scale, or other documents that deal with practical matters. No one sent what might be called an official assessment policy. The 13 of the original respondents who didn't respond to our follow-up request represented four additional institutions. One of those is the home institution of the first author, and it does not currently have an official assessment policy. The three remaining institutions, based on a search of their websites, do not appear to have assessment policies either.

Discussion

Despite evidence of the positive effects of student involvement in assessment, and calls for alternatives, the traditional exam has a strong holding within Norwegian higher education. One recent example is the Ministry of Education and Research's 'Award for excellent work on the quality of Norwegian higher education 2017'. The award was given jointly to all medical schools in Norway for their development of a national MCQ-test in medicine. The strong commitment our higher education institutions have in digitizing the traditional exam, points in the same direction. The summaries made by the participants in our workshop testify to the same conclusion. When asked what they saw as challenges related to the introduction of digital alternatives to the traditional exam, a large number of responses pointed to lack of knowledge. Lack of knowledge concerning alternative forms of assessment in general, but also lack of knowledge as to how digital technology may be used in assessing students, despite the fact that the research literature is full of alternatives. In the Norwegian context, Raaheim (2016a) has summarized much of this research literature, and provided 40 alternatives to the traditional exam.

Quite a few responses pointed to what one may describe as 'organisational fatigue'. Over a period of twenty years, our institutions have seen some massive changes, and professors as well as administration have had to respond to top-down reforms as part of an adoption to European standards. This has come on top of other organizational changes like merging of institutions and local re-organizations, and on top of increased

demands on research. This may, at least partly, explain why many feel lack of time to familiarize themselves with alternatives.

As pointed out by Andersson et al. (2017) we cannot rule out active resistance from academics, for example professors who resist educational reforms because they steal time from research. In that case it is quite interesting to notice that close to 60% (Table 2) answer that management/leadership are the once responsible for solving challenges related to the introduction of digital assessment, and that close to one out of four suggest that Universities Norway (UHR) should take responsibility. In other words; more top-down solutions. To the extent that one assumes that knowledge about, and the implementation of alternatives are the responsibility of administration, this may reflect an underlying understanding of what teaching is. Teaching at universities is expected to be research based. In the Norwegian context, definitions of research-based teaching are largely variations on the theme 'those who teach must have research competence', or 'teaching must be based on and be consistent with latest research results'. If we were to propose an alternative definition, namely that '... research-based teaching is teaching that is based on, and takes into consideration, what research has shown leads to good learning' (Raaheim 2016b, 34–35), knowledge about assessment becomes part of teaching and, consequently, the responsibility of the individual academics. Teaching and learning are scholarly activities, and both are closely related to assessment and understanding. As Felten (2013) argues, knowledge about, and experiences from such scholarly activities need to be shared in order to be understood as significant intellectual work in academia (see also Billot et al. 2017). There is, of course, an alternative and quite legitimate view saying that changes are most effective if and when they are implemented at a general level.

As some groups mentioned, new alternatives may come in conflict with existing national law, but also local institutional regulations. The law was implemented at a time when the typical teaching programme lasted one full year, or one full semester, followed by a – very often eight hour – written exam. Today, our teaching programmes have been modularized, with 7.5, 10 or 15 ECTS credits being the new norm. This means that students need to take four, three or two modules to earn a full semester, and twice the number to earn a full year. Many students use their right to appeal. Especially in subjects like law, where there is an extreme focus on grades both by students and by companies and employers outside the university. In case of an appeal, the department has to set up a new, impartial committee and this puts restraints on alternative solutions because of logistics, but also in terms of economic resources. If one would want to introduce a system of continuous assessment, e.g. using one's LMS, this would be close to impossible given a normal group of students and knowing that each assessment exercise releases a right to appeal and the right to retake the test in question. In some cases an institution's local regulations may put restrictions on alternatives which national laws do not. This is e.g. the case when a university in its 'Examination Regulations' state that assessment has to be in the form of 'end of course exams', 'written home assignments' or 'portfolio assessment'. Given the present state of affairs, lack of knowledge about alternatives may prove the easier challenge to overcome.

All of the above suggests a need for a more general discussion of assessment policy within our higher education institutions, a discussion that also has to touch on the need for a modification of parts of our national law. As indicated by the reply to our

question following the one-day conference on grading, the notion of assessment policy is not well known or widespread within our higher education institutions. Considering the replies from our workshop, a systematic exploration of how ICT can facilitate changes in curriculum and assessment ought to be part of this discussion. In Government White Paper 16 (2016–2017) ‘Quality Culture in Higher Education’ it is stated that all Norwegian higher education institutions are expected to introduce merit systems for pedagogical competence within 2019. As discussed by Andersson et al. (2017), this injunction has been met with much criticism and resistance from academic staff. Despite such criticism, universities are in the process of implementing such systems. The example provided by Andersson et al. is from the Faculty of Mathematics and Natural Sciences at the University of Bergen. Here selection criteria are based on the Scholarship of Teaching and Learning (SoTL) principles. We see the introduction of merit systems as an opportunity for higher education institutions to forge a strategy to support a cultural shift which includes both teaching and assessment practices. This way the combination of a top-down reform and institutional strategies may spark creative solutions and alternatives. Support and back-up from leaders at all levels is essential. One way of supporting the introduction of alternative assessment is to follow the example set by the University of Bergen. Here one has added a paragraph in ‘Regulations on admission, studies, assessment and degrees at the University of Bergen’ granting dispensation from current regulations until the end of the academic year 2020.

Conclusion

The traditional, individual written exam has a strong holding within Norwegian higher education, despite the fact that our authorities have encouraged changes in terms of teaching and assessment. The most obvious change as far as assessment is concerned, is the introduction of the digital exam. As data from our workshop indicate, lack of knowledge about alternative solutions, and lack of digital skills constitute key barriers to change. One strategy institutions may pursue in order to remedy the situation is to develop and implement an official assessment policy. We also suggest that institutions take advantage of the opportunity the introduction of a merit system provides to both highlight alternatives, and for individual staff to try out and systematically evaluate alternative assessment solutions.

Limitations

The present study draws on a relatively limited selection of data which means that we should show some caution as far as interpretation is concerned. However, as we were able to recruit a good mix of academics and administration representing both the old, traditional universities and smaller university colleges to our workshop, we have reasons to assume that their answers represent a larger picture and that they reflect the current state of affairs. As very few answered the question about assessment policy, and since we have not conducted a thorough investigation across all higher education institutions in Norway, we do not have a full overview of the present situation. We cannot rule out the possibility that some institution are in the process of developing an assessment policy or have already done so.

Disclosure statement

No potential conflict of interest was reported by the authors.

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