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SELECTED PAPERS BOOK

A number of selected papers presented at CSEDU 2024 will be published by Springer in a CCIS Series book. This selection will be done by the Conference Co-chairs and Program Co-chairs, among the papers actually presented at the conference, based on a rigorous review by the CSEDU 2024 Program Committee members.

FOREWORD

This book contains the proceedings of the 16th International Conference on Computer Supported Education (CSEDU 2024). This year, CSEDU was held in Angers, France, from May 2 - 4, 2024. It was sponsored by the Institute for Systems and Technologies of Information, Control and Communication (INSTICC). CSEDU 2024 was also organized in cooperation with the International E-Learning Association.

CSEDU is a yearly meeting place for presenting and discussing new educational tools and environments, research conducted with educational technology, best practices and case studies on innovative technology-based learning strategies, and institutional policies on computer supported education, including open and distance education. CSEDU provides an overview of current technologies and upcoming trends, and promotes discussion about the pedagogical potential of new educational technologies in the academic and corporate world. CSEDU seeks papers and posters describing educational technology research; academic or business case studies; or advanced prototypes, systems, tools, and techniques.

CSEDU 2024 received 202 paper submissions from 46 countries, of which 28% were accepted and published as full papers. A double-blind paper review was performed for each submission by at least two, but usually three or more members of the International Program Committee, composed of established researchers and domain experts.

The high quality of the CSEDU 2024 program is enhanced by the keynote lectures delivered by distinguished speakers who are renowned experts in their fields: Birgit Lugin (Julius-Maximilians-Universität Würzburg, Germany), Alejandra Martínez-Monés (Universidad de Valladolid, Spain) and Zach Pardos (Berkeley School of Education, United States).

The conference is complemented by a Special Session on Educational Knowledge Management, chaired by Christine Lahoud, Marie-Helene Abel, and Lilia Cheniti Belcadhi, a Special Session on Automatic Item Generation, chaired by Gregor Damnik, a Workshop on Extended Reality and Serious Games for Education and Learning, chaired by Valerio De Luca and a Special Session on Computer Supported Music Education, chaired by Luca Andrea Ludovico.

All presented papers will be available at the SCITEPRESS Digital Library and will be submitted for evaluation for indexing by SCOPUS, Google Scholar, The DBLP Computer Science Bibliography, Semantic Scholar, Engineering Index, and Web of Science / Conference Proceedings Citation Index.

As recognition for the best contributions, several awards based on the combined marks of paper reviewing, as assessed by the Conference and Program Committees, and the quality of the presentation, as assessed by session chairs at the conference venue, are conferred at the closing session of the conference.

Authors of selected papers will be invited to submit extended versions for inclusion in a forthcoming book of CSEDU Selected Papers to be published by Springer, as part of the CCIS Series. Some papers will also be selected for publication of extended and revised versions in a special issue of the Springer Nature Computer Science Journal.

The program for this conference required the dedicated effort of many people. Firstly, we thank the authors, whose research efforts are recorded within. Next, we thank the members of the Program Committee and the auxiliary reviewers for their diligent and professional reviewing. We would also like to deeply thank the keynote speakers for their invaluable contribution and for taking the time to prepare their talks. Finally, a word of appreciation for the hard work of the INSTICC team; organizing a conference of this level is a task that can only be achieved by the collaborative effort of a dedicated and highly capable team.

We wish you all an exciting and inspiring conference. We hope to have contributed to the development of our research community, and we look forward to having additional research results presented at the next edition of CSEDU, details of which are available at <https://csedu.scitevents.org>.

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Shifting from Traditional to Alternative Assessment Methods in Higher Education: A Case Study of Norwegian and Italian Universities

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Keywords: Higher Education, Traditional Assessment Methods, Alternative Assessment Methods.

Abstract: The background of this study is the growing focus on so-called “student-active” or “student-centered” learning and teaching methods, which have demonstrated to improve students’ learning outcomes and soft skills. However, despite the benefits of these methods, much university teaching still relies on final high-stakes summative examinations, which may lead to students’ lack of engagement in learning activities during the semester and increased focus on the preparation for the final exam. This paper is aimed at exploring the traditional and alternative assessment methods used in higher education in Norway and Italy and focuses on two research questions: (1) What are the different types of student assessment involved at universities in Norway and Italy? and (2) What are the benefits and challenges related to alternative assessment formats in higher education when compared to the traditional ones? To answer the first question, the assessment forms used in selected units at a university in Norway and Italy were mapped out. To answer the second question, six university instructors with experience in alternative assessment were interviewed. The results contribute to a better understanding of the factors motivating instructors to transition to alternative assessment, as well as possible barriers for the implementation of alternative assessment.

1 INTRODUCTION

International efforts in higher education (HE) reflect a widespread recognition of the need for educational systems to evolve, underscoring a global movement towards more interactive and student-centred learning environments, especially at the HE level, which seems to lag behind other educational levels in this respect (Børte et al., 2023). Across the globe, educational institutions are exploring innovative teaching methods and assessment strategies that go beyond traditional approaches (Fraser, 2019; Puranik, 2020).

These global trends reflect a growing consensus that education should not only focus on knowledge acquisition but also on developing critical thinking and problem-solving skills (Hitchcock, 2022).

In Norway, much focus has been put on so-called “student-active learning and teaching methods” which require HE institutions to break away from one-way communication by the teacher and employ more practical methods such as cases, discussions,

and participation in research (Meld. St. 16, 2020-2021). The same is true for Italy, where the creation of Teaching Learning Centres and Digital Education Hubs is at the core of the NRRP (the Next Generation EU-funded National Recovery and Resilience Plan) effort. This should be the major impulse towards a transformation in Italian’s HE teaching practice after several laws and guidelines that served as precursors, such as “Reform of university and research” (Legge 30 dicembre 2018, n. 145), “Guidelines for the quality of university teaching” (Ministero dell’Università e della Ricerca, 2019), “Guidelines for the evaluation of university teaching” (ANVUR, 2020) and “Report on the quality of university teaching” (ANVUR, 2021, periodically published).

However, both in Norway and Italy, despite a continuous and ongoing debate among HE institutions’ leadership, previous research suggests that high-stakes final exams are still the most used form of TA (Gray & Lazareva, 2022; Grion & Serbati, 2019). Relying on final high-stakes summative exams as the basis for grading may limit

students' opportunities to demonstrate their knowledge and skills holistically, which can lead to reduced motivation to engage in learning activities and increased focus on exam preparation.

This paper focuses on two research questions: (1) What are the different types of student assessment involved at universities in Norway and Italy? (RQ1) and (2) What are the benefits and challenges related to alternative assessment formats in higher education when compared to the traditional ones? (RQ2)

The paper is structured as follows. Section 2 provides a brief overview of related research and introduces the background of this study. Method is outlined in Section 3. Section 4 presents the results of the study, which are further discussed in Section 5. Finally, Section 6 concludes the paper.

2 BACKGROUND AND RELATED RESEARCH

Research in HE has demonstrated that student-active learning methods have the potential to foster higher-order thinking skills, including analysis, synthesis, and evaluation thus improving students' learning outcomes (Komulainen et al., 2015). The design of those approaches is also beneficial for the development of soft skills, such as collaboration, presentation, and assessment (Godager et al., 2022). Students perceive these methods as motivating and supportive of knowledge acquisition (Langsrud & Jørgensen, 2022).

As the education landscape evolves towards more interactive and student-centered learning environments, it is crucial to adapt assessment methods accordingly (Gibson & Shaw, 2011; Hand, Sanderson & O'Neil, 2015). Relying solely on traditional assessment (TA) approaches such as multiple-choice questions or final exams with short answers falls short when it comes to evaluating skills development, critical thinking, and problem-solving abilities (Bryan & Clegg, 2019).

To ensure that assessment practices are effective, it is essential to be mindful of the principles of constructive alignment. This means that teaching activities and assessment tasks should directly support the intended learning outcomes, and the type of assessment employed should be influenced by the desired learning outcomes (Biggs, 2014).

According to Wiggins (1990), the principles of authentic assessment need assignments that prompt students to apply their newfound knowledge by performing, creating, or producing something that

reflects the complexity of real-world scenarios. By incorporating these theoretical frameworks into alternative assessment methodologies, educators can better align evaluation practices with desired learning objectives, leading to more profound comprehension and more precise evaluations of student competence.

Furthermore, in the last year, the use of artificial intelligence (AI) in HE, such as for essay writing, has further complicated the concept of final exams, forcing institutions and instructors to rethink the way of assessing students' products (Agostini & Picasso, 2023; Rudolph, Tan & Tan, 2023). Some universities have temporarily returned to traditional pen-and-paper exams while searching for a way to redesign student assessment. Alternative assessment (AA) and innovative methods are needed in this conjuncture to address the rising complexity of the educational landscape (Bryan & Clegg, 2019).

This paper aims to provide a better understanding of both TA and AA methods, as well as explore some of the possible barriers for the implementation of AA methods in Norway and Italy. Additionally, the paper aims to identify the factors that motivate instructors to transition from TA to AA. By discussing the findings from the two countries, this paper aims to contribute to a better understanding of the complexities involved in shifting from TA to AA methods.

3 METHOD

This section outlines the methods of data collection and analysis used in the study and addresses some of the study's limitations.

3.1 Data Collection

To answer RQ1, the assessment forms used at a Faculty of Business and Law at one university in Norway and a Department of Economy and Management at one university in Italy were mapped out. This choice was made because the two units were comparable in terms of the subject areas that were covered by the course offers. In addition, the two units were not too different in terms of size. To map out the assessment forms, the course syllabi available online were analysed (total N=378).

To answer RQ2, semi-structured interviews with six university instructors were carried out (three in Norway and three in Italy). The informants were chosen using the snowball sampling method. The key criteria (besides the informants' availability and willingness to participate) was the informants having

experience with alternative assessment methods in HE. The interview guide consisted of three sections: background questions focusing on the informants' teaching experience, informants' experiences with traditional assessment (TA) formats, and informants' experiences with alternative assessment (AA) formats. Table 1 presents an overview of the informants' teaching background (the informants were assigned fictitious names).

Table 1: Informants' teaching background.

Informant	Years of experience teaching at university	Subject area
Markus (Norway)	20+	ICT, human-computer interaction
Henrik (Norway)	20	History
Walter (Norway)	3	Religion, philosophies of life and ethics
Giulia (Italy)	21	Economy and management
Cecilia (Italy)	26	Economy and management
Sara (Italy)	10	Education

This project was approved by NSD (Norwegian Centre for Research Data). The interviews were audio recorded and manually transcribed afterwards.

3.2 Data Analysis

To analyse the interviews, the content analysis method was employed. The inductive approach was chosen as the objective was to explore and understand the phenomenon rather than draw any generalizations (Forman & Damschroder, 2008). One of the benefits of qualitative content analysis is that the lack of a theory-led hypothesis makes it possible to learn from the informants without imposing predefined categories on them (Hsieh & Shannon, 2005).

3.3 Limitations

An important limitation that must be considered when discussing the results of this research is that even though many courses in Norwegian universities employ final high-stakes summative exams, many instructors make use of compulsory assignments that students must complete during the semester to be able to sit for the exam. Such compulsory assignments may be of the formative character (e.g., students working on the same project throughout the semester

with feedback from the instructor and peers). This information is not always available in the course description published online. In Italy, there is no such type of compulsory assignments for most of the courses, except for some mandatory attendance courses that might implement a similar approach if clearly stated in the syllabus.

It must also be mentioned that the data were collected for the academic year of 2022. With the arrival of ChatGPT in late 2022, many instructors made modifications to the assessment formats in the following year.

4 RESULTS

To answer RQ1, this section presents an overview of the assessment forms used at a Faculty of Business and Law at a university in Norway, where 132 course syllabi were analysed, and a Department of Economy and Management at a University in Italy, where 246 course syllabi were analysed (see Table 2).

Table 2: An overview of assessment forms used in selected units at universities in Norway and Italy.

University in Norway	University in Italy
Written school examination format (47,8%)	Written school examination format (52,3%)
Portfolio assessment (20,5%)	Oral assessment (23,5%)
Term paper/project examination format (14,4%)	Portfolio examination (14,7%)
Take-home examination (9,1%)	

To answer RQ2, the interview transcripts were analysed. The analysis was done in three rounds: (1) Each of the two researchers coded three of the interviews and summarised the results in the form of a concept map with excerpts from the interviews as examples; (2) The researchers compared and discussed the results, eliminating repetitions, reformulating the names of some of the categories and codes, and merging the categories and codes each of us has developed; (3) Each of the two researchers went back to the interview transcripts comparing the content of the interviews against the coding scheme and suggesting final minor edits to fine-tune the overview of the results. As a result, four main categories were distinguished: (1) the problem of definitions, (2) traditional assessment (TA) forms, (3) alternative assessment (AA) forms, and (4) the

informants' general reflections. Categories 2 and 3 were further divided in several sub-categories. Below, each of the categories is discussed in detail, and sub-categories are presented.

4.1 The Problem of Definitions

One of the issues that Norwegian informants repeatedly mentioned was how to define which assessment formats are to be considered traditional and which ones can be called alternative. For example, one of the informants reflected that a written exam may be both traditional or alternative depending on what kind of questions the students are asked, whether the question is aimed at memorising and reproducing the knowledge or, on the other hand, applying the knowledge and creating something new. In contrast, Italian informants never challenged the interviewer's assumption of what is traditional and what is alternative assessment in their contexts. They seem to be comfortable with these definitions and distinguish them without overlap and ambiguity.

The different informants also had different thoughts when it came to students having access to all resources during the exam. Some informants considered it a usual and rather traditional practice, while others viewed it as something more innovative.

4.2 Traditional Assessment Forms

This category included three sub-categories: examples of TA forms, benefits of TA forms, and challenges related to TA forms. Each sub-category is presented below.

4.2.1 Examples of Traditional Assessment Forms

The informants had various examples of TA formats they have employed in their teaching, such as written exams, multiple-choice tests, online quizzes/tests, continuous assessment tests (CATs), project reports, demos, plenary presentations, oral exams, student lectures, questions and answers (Q&A), short essays, long essays, and digital written home exams (i.e., those where students produce linear texts).

4.2.2 Benefits of Traditional Assessment Forms

A major benefit that was mentioned by most of the informants is that the TA formats set clear boundaries for the students and help them focus on the parts of the syllabus that are of key importance. For example,

Markus noted: "... when they know they have a traditional exam, like a sitting written exam, they really tend to prepare a lot [...], at least it really forces the students to study to learn what they have to learn; it sets very clear limited boundaries of what they should learn".

Thus, there was an agreement among the respondents that TA forms are straightforward to design, manage, and grade. This is especially relevant for large classes and becomes even more efficient when it is possible to involve technology for automated grading. Sara said: "You can assess knowledge, and you can easily scale up to 200 students; one of my courses has 200 students. You can easily scale up to 100 students this kind of questions, and if you use the technology, for example the online computer-based assessment, you can actually get the automatic correction, so that's for sure a very effective way to assess knowledge".

TA forms are seen as an effective way to assess factual knowledge, ensure that all students have studied the course material, as well as prevent free riding in group work. One of the informants noted that written exams can be a good format for evaluating students' reflection as well.

4.2.3 Challenges Related to Traditional Assessment Forms

A major challenge related to TA forms reported by the informants was students focusing primarily on what is going to be on the exam, which increases the risk of students just memorising, only doing the minimum required input to pass the exam and likely forgetting the material soon after the exam. Cecilia maintained that: "... students should not just have to process concepts and repeat things back, especially at master's level, but also in the bachelor's, know-how, and to know how to do is key. That's it. This is my point of view."

Time limitation was described as another challenge. One of the informants discussed that what a student can demonstrate during a set time frame (e.g., a 30-minute oral examination, or a 4-hour written exam) is extremely limited, which often makes it challenging to claim that the student's competence was assessed in a fair way. Another issue is the limitations introduced by the chosen format itself. Here, the informants mentioned students struggling with dyslexia or writing in general, or experiencing anxiety during oral examinations which reduces their performance overall.

Finally, another limitation reported by the informants lies in the fact that TA formats focus

primarily on content rather than students' skills, applied knowledge or critical thinking.

4.3 Alternative Assessment Forms

This category included three sub-categories: examples of AA forms, instructor's motivation to employ AA, and instructor's experiences of AA. Each sub-category is presented below.

4.3.1 Examples of Alternative Assessment Forms

Various examples were discussed by the informants, such as different forms of portfolio assessments, peer teaching, writing blogs (with less structure provided by the instructor), students grading their own exams, students developing an assessment instrument (e.g., questionnaire), roleplay, students recording themselves teaching with a 360 camera, group projects, participation in expert seminars, presentations, online quizzes/tests, peer feedback, and creating a digital story. In the latter, the students were required to use a combination of Creaza and PowerPoint to discuss a challenging classroom situation using the theories from the course syllabus. Some other examples of digital tools used for AA were Moodle (as a platform to facilitate AA activities) and Google Drive, which was used both for collaboration and submissions.

Another example of AA which was mentioned by Markus is drop-in examinations, where a student could themselves select and book a time slot at the instructor's office to take the exam. Then, random questions would be given to the student from a large question database, and if the student was not satisfied with the result, it was possible to retake the exam at a later point of time during the semester. Markus discussed that even though he did not employ the drop-in examination himself, he borrowed the element of flexibility from this examination format into his own teaching. Namely, he chose to pay less attention to the deadlines during the semester and instead let the students choose themselves which portfolio assignment to start with and when to deliver during the semester.

Another example described by Henrik was an individualized exam, where the instructor let the students choose from four formats (Q&A, giving a lecture, three short essays or one long essay). Yet another informant talked about personalising the exam topic based on students' practical experiences.

4.3.2 Instructor's Motivation to Employ Alternative Assessment

Here, both factors related to intrinsic and extrinsic motivation (Ryan & Deci, 2000) were mentioned. When it comes to the former, the informants reflected that they wanted to individualise the exams for the students to help them better understand and apply concepts, as well as demonstrate a better performance in the exam situation. Giulia reported her willingness to let the students to really connect with the matter of the course: "[...] the goal was more to work on learning to use these things. Not so much learning to repeat them, so this was my transition and leaving them a bit more free to experiment because, for example, in the first year I don't give them companies [as case studies], I tell them «Choose the one you want», and so it seemed to me to give them a motivation linked to passions too, someone tells me «My uncle has a tavern», I say «Okay, do your uncle's company»".

Another commonly reported reason is related to the instructors noticing that specific students struggle with specific formats such as oral examination or written exams. For example, Markus reflected: "I had some students in the class... and my classes are usually small... some students are very clever when it comes to being creative. Then I give them a written exam and they are hardly getting 60% or 50-something % because I was asking them in the way they weren't used to think or create. It made me very sad the first three years, why students aren't doing well... They didn't fail per se, but they didn't do well. And they were clever." Henrik said: "[...] there are students I have experienced who come to oral examinations, when this is the only option, being extremely nervous and, of course, this influences their performance and the grade, and it's not fair. There are also students who have dyslexia or, you know, other difficulties that, you know, are kind of a brake in their performance either in oral examinations or written examinations, when you only follow one traditional method of assessing the students".

However, factors related to extrinsic motivation were also mentioned: Walter was asked to develop an AA format involving digital tools as part of the course description when he overtook the course.

4.3.3 Instructor's Experiences of Alternative Assessment

There was a general agreement among the informants that AA formats are overall more expensive as they imply more workload for the instructor during the

semester. In addition, AA forms can be rather difficult to manage. For example, not all colleagues in the group may be comfortable with AA formats or employing new digital tools in their assessment. Moreover, the IT systems used at the university may not be designed to support AA forms. For example, the system may require the instructors to specify one deadline for the students to deliver the exam by – while some AA forms may imply that students are free to choose a date during the semester themselves or deliver parts of the assessment continuously during the semester. In a similar way, it may be difficult to individualise the exam where students can choose the format of the examination, because the IT system would normally require the instructor to specify one format (e.g., an oral examination). AA forms, therefore, often require closer collaboration with the exam and/or administration unit at the university.

Moreover, mastering a new assessment format is also learning. Thus, this can be seen as “stealing” time from working on the course content itself. Here, Walter discussed specifically the digital story exam and reflected on various challenges related to that format. First, the time limitation made it difficult for the students to properly discuss the subject. In addition, many students did not focus enough on presenting their story in an engaging way; instead, they read the script monotonously. Walter said: “[...] transitioning from the written to oral format is more demanding than one might think. Most students who completed this assignment most likely had written down the whole script at first and then read it out loud while recording the PowerPoint presentation. [...] And then the whole oral presentation sounds like there is someone just sitting down and reading which is not engaging to listen to. It becomes more monotonous than it could have been”. In addition, formalities such as structure and proper referencing seemed to have taken much of students’ focus.

While the informants reflected that with AA the students had a very good performance overall and that AA seems to contribute to the development of students’ soft skills, some of the informants also mentioned that they have had to step away from the AA formats due to the limitations discussed above.

4.4 General Reflections

This section presents other reflections made by informants that did not fall under any of the categories mentioned above. First, some of the informants reflected that all assessment formats can be good if they are designed and implemented as an organic part of the learning process, which reflects the concept of

constructive alignment (Biggs, 2014). What is of key importance here is that assessment should target both content knowledge and metacognitive knowledge (i.e., help students understand how they learn). Thus, as Markus noted, one of the issues where more research is needed is how to create good exam questions and how to assess students’ soft skills such as collaboration and critical thinking.

The informants also note that it is good practice for students to experience various assessment formats and demonstrate their competence in different ways, and not only through the traditional written linear texts or oral Q&A type of examination.

One major challenge that Walter discussed is the increased focus on grading criteria which may lead to increased instrumentalism in teaching and learning: “One is often caught in the expectation that one must be in line with something... such as what the sensor or the one who created the exam assignment thought when they gave that assignment; so, one is going to try to sort of approach as close as possible the objectives that the assignment creator thought of [...], there is a kind of an expectation that one who created the objective already has an idea of how all students should reach that objective. And this implies a certain form of instrumentalism, doesn’t it, where everything in one way or another is in the instructor’s or teacher’s head (or the one who created the task) and then everything is about how close the student can approach this understanding in one way or another [...]”. According to Walter, this is a challenge especially because students are often expected to show more independence in their reflection and discussion of their own standpoints.

The informants also reflected that AA can be “messy” and, therefore, it requires good planning. It is also important to communicate to students why this specific form of assessment is going to be used. Some other issues that informants raised concerned involving AI in assessment in a good way. Some of the informants reflected that there is a need for improving tools for teacher and peer feedback, and this is where more research is needed on the use of AI for semi-automated feedback.

5 DISCUSSION

The results of this research project demonstrate that TA is prevalent in HE in Norway and Italy. Both countries share similar issues when it comes to student assessment (e.g., administrative issues and instructor workload), but Norway seems to have a wider variety of AA assessment methods in place. AA

often depends on the individual instructors' motivation and requires extra work hours to design and implement. This aligns with earlier research reporting on such barriers for AA in HE as policy barriers, institutional change, and resources (Gray & Lazareva, 2022). While there was an overall agreement among the informants on the pedagogical benefits of AA methods (e.g., improved student performance and the development of students' soft skills), some of the informants also admitted that they have had to step away from using the AA methods due to such limitations as increased workload.

Moreover, the informants also supported the view that there is a need for teachers' professional development, clearer university guidelines and flexibility. According to the informants, AA often requires an even closer collaboration with the exam and/or administration unit at the university, as well as the IT department, which adds to the extra workload. This trend seems to be global, underlining how efforts for active learning and AA should be supported by the institution at different levels such as at the administrative and organisational one (Griffith & Altinay, 2020; Ujir et al., 2020). Experiences in other countries, such as the Netherlands, Denmark, Singapore, and the USA, suggest that strong organisational support, specific program management and custom curriculum development might be needed to allow a wide and sustainable adoption of active teaching and AA methods (Li, 2022; Tan, 2021).

Another important aspect to note is that the informants in this research project have experience with teaching in different subject areas. This may have contributed to the fact that different understandings of what AA entails were reported. This demonstrates that there is more work to be done for HE instructors to reach a common understanding of the types of student assessment. Moreover, in courses taught by several instructors, extra effort may be necessary for all the instructors involved in teaching and assessment to have a positive view on the AA method that is being used, as well as an appropriate level of training if there is a new digital technology involved.

Finally, there has been a growing interest among university instructors regarding the role of AI in assisting them. This enhanced interest highlights the perceived advantages of using AI to streamline time-consuming tasks in AA methods. With such assistance, it is possible that AA methods and constructive alignment will become more sustainable (Agostini, 2024).

6 CONCLUSIONS

This paper presents the results of an explorative research project aiming to map out and describe the different traditional and alternative assessment forms used in HE in Norway and Italy, as well as discuss the benefits and challenges related to AA formats in HE when compared to the traditional ones. To answer RQ1, the assessment forms used at the Faculty of Business and Law at a university in Norway and the Department of Economy and Management at a university in Italy were mapped out (see Table 2). To answer RQ2, semi-structured interviews with three university instructors in Norway and three university instructors in Italy were carried out. There was an agreement among the informants participating in the study that TA forms are easy to design and administrate. While TA forms are suitable for assessing students' factual knowledge, they may not always be well-suited for addressing students' skills, applied knowledge, or critical thinking. Moreover, time and format limitations may make it challenging to fairly assess students' competence. The informants' intrinsic motivation to individualise the assessment format for their students was often the main drive to implement AA. While the informants reported positive experiences with AA overall, especially in terms of student performance and the development of students' soft skills, several of the informants admitted that they had to step away from AA due to the increased workload related to the design and administration of AA.

The results of the interviews suggest several potential areas for future research, such as (1) reaching a common understanding of what "traditional" and "alternative" assessment entails, (2) exploring the potential of AI technology in assisting instructors in AA methods, (3) developing assessment methods that would target both students' content and metacognitive knowledge, and (4) exploring in what ways the formulation of the grading criteria may affect students' performance in different types of assignments and exams.

This research project primarily describes the results and outlines some similarities and differences in HE in Norway and Italy. In the future, we aim at carrying out comparative research, which will imply a closer analysis of the Norwegian and Italian education systems and, more specifically, assessment culture in HE. This will make it possible to initiate a deeper and more nuanced discussion around HE student assessment in the two countries.

REFERENCES

- Agostini, D. (2024). Are Large Language Models Capable of Assessing Students' Written Products? A Pilot Study in Higher Education. *Research Trends in Humanities, Education & Philosophy*, 11, 38-60.
- Agostini, D., & Picasso, F. (2023). Large Language Models for Sustainable Assessment and Feedback in Higher Education: Towards a Pedagogical and Technological Framework. *Proceedings of the First International Workshop on High-Performance Artificial Intelligence Systems in Education Co-Located with 22nd International Conference of the Italian Association for Artificial Intelligence (AIxIA 2023)*. AIxEDU 2023 High-performance Artificial Intelligence Systems in Education, Aachen. <https://ceur-ws.org/Vol-3605/>
- ANVUR (2020). *Linee guida per la valutazione della didattica universitaria*. Roma, IT.
- ANVUR (2021). *Rapporto sulla qualità della didattica universitaria*. Roma, IT.
- Biggs, J. (1996). Enhancing teaching through constructive alignment. *Higher Education*, 32(3), 347-364.
- Biggs, J. (2014). Constructive alignment in university teaching. *HERDSA Review of Higher Education*, 1, 5-22.
- Børte, K., Nesje, K., & Lillejord, S. (2023). Barriers to student active learning in higher education. *Teaching in Higher Education*, 28(3), 597-615.
- Bryan, C., & Clegg, K. (Eds.). (2019). *Innovative assessment in higher education: A handbook for academic practitioners*. Routledge.
- Forman, J., Damschroder, L. (2008). Qualitative content analysis. In: Jacoby, L., Siminoff, L.A. (eds.) *Empirical Methods for Bioethics: A Primer*, pp. 39–62. Elsevier Publishing, Oxford.
- Fraser, S. (2019). Understanding innovative teaching practice in higher education: a framework for reflection. *Higher Education Research & Development*, 38(7), 1371-1385.
- Gibbs, G., & Simpson, C. (2004). Conditions under which assessment supports students' learning. *Learning and Teaching in Higher Education*, 1, 3-31.
- Gibson, K., & Shaw, C. M. (2011). Assessment of active learning. In *Oxford Research Encyclopedia of International Studies*.
- Godager, L. H., Sandve, S. R., & Fjellheim, S. (2022). Studentaktive læringsformer i høyere utdanning i emner med stort antall studenter. *Nordic Journal of STEM Education*, 6(1), 28–40.
- Governo Italiano (2018). Legge 30 dicembre 2018, n. 145. Riforma dell'Università e della Ricerca. *Gazzetta Ufficiale della Repubblica Italiana*.
- Gray, R., Lazareva, A. (2022). When the past and future collide: Digital technologies and assessment in Norwegian higher education. In S. Hillen, P. Wolcott, C. Schaffer, A. Lazareva, & R. Gray (Eds.), *Assessment Theory, Policy, and Practice in Higher Education: Integrating Feedback into Student Learning*, pp. 39-58. Waxmann Verlag.
- Griffith, A. S., & Altinay, Z. (2020). A framework to assess higher education faculty workload in US universities. *Innovations in education and teaching international*, 57(6), 691-700.
- Grion, V., & Serbati, A. (2019). *Valutazione sostenibile e feedback nei contesti universitari. Prospettive emergenti, ricerche e pratiche*. Lecce: PensaMultimedia.
- Hand, L., Sanderson, P., & O'Neil, M. (2015). Fostering deep and active learning through assessment. In *Accounting Education Research* (pp. 71-87). Routledge.
- Hitchcock, D. (2022). Critical thinking. In Edward N. Zalta & Uri Nodelman (eds.), *The Stanford Encyclopedia of Philosophy* (Winter 2022 Edition). Metaphysics Research Lab, Stanford University. Retrieved at: <https://plato.stanford.edu/archives/win2022/entries/critical-thinking/>
- Hseih, H.-F., Shannon, S.E. (2005). Three approaches to qualitative content analysis. *Qual. Health Res*, 15(9), 1277–1288.
- Komulainen, T. M., Lindstrøm, C., & Sandtrø, T. A. (2015). Erfaringer med studentaktive læringsformer i teknologirikt undervisningsrom. *UNIPED*, 38(4), 363–372.
- Langsrud, E., & Jørgensen, K. (2022). Studentaktiv læring i juridiske emner. *UNIPED*, 45(3) 171–183.
- Li, H. (2022). *Educational change towards problem based learning: An organizational perspective*. River Publishers.
- Meld. St. 16 (2020-2021). Utdanning for omstilling – Økt arbeidslivsrelevans i høyere utdanning. Kunnskapsdepartementet. <https://www.regjeringen.no/no/dokumenter/meld.-st.-16-20202021/id2838171/>
- Ministero dell'Università e della Ricerca. (2019). *Indirizzi per la qualità della didattica universitaria*. Roma, IT.
- Puranik, S. (2020). Innovative teaching methods in higher education. *BSSS Journal of Education*, 9(1), 67-75.
- Rudolph, J., Tan, S., & Tan, S. (2023). ChatGPT: Bullshit spewer or the end of traditional assessments in higher education?. *Journal of Applied Learning and Teaching*, 6(1).
- Ryan, R. M., Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary educational psychology*, 25(1), 54–67.
- Tan, O. S. (2021). *Problem-based learning innovation: Using problems to power learning in the 21st century*. Gale Cengage Learning.
- Ujir, H., Salleh, S. F., Marzuki, A. S. W., Hashim, H. F., & Alias, A. A. (2020). Teaching Workload in 21st Century Higher Education Learning Setting. *International Journal of Evaluation and Research in Education*, 9(1), 221-227.

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