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Training 21st Century English Language Teachers in Turkish Context: Development of a Technology-Enhanced Measurement Curriculum

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Abstract

A case study that included 26 English Language teacher candidates was designed to develop an evidence-based measurement curriculum in Turkey, examining teacher candidates' experiences on the newly developed course and taking remedial actions to update the syllabus if needed. Data was collected using multiple sources: a pre-course survey, a weekly discussion board on Edmodo and a post-course survey. Survey data obtained from rating-scale items was analyzed using descriptive statistics and data visualization packages embedded in R. Open-ended survey data and discussion board data were content-analyzed using MaxQDA software. The results revealed that students had limited awareness regarding assessment for learning concepts and digital tools that could be used for assessment for learning purposes at the beginning of the course. Course content, in-class activities and projects helped them develop hands-on skills in developing sound language assessments as well as raised their awareness with respect to the importance of computer-based language assessment.

Keywords: Digital literacy, Language assessment, Computer-based assessment, Language assessment literacy, English language teaching

Introduction

Digital literacy is an important 21st century skill for teacher candidates. The idea of literacy practice in the 21st century has been dramatically impacted by the technological revolution and globalization, which highlights the necessity for educators to implement effective teaching strategies that include or blend traditional and emergent literacies (Yang et al., 2022). They can discuss the learning material in greater depth and provide more sophisticated knowledge in the context of daily life (Comeaux, 2002). Technology improves teaching and assessment capacities and opens doors for growth and variety in how learners are evaluated, including textual communication skills, cooperation, teamwork, and reflective thinking (Eyal, 2010; Liang & Creasy, 2004). Additionally, by assigning assessment activities and allowing students to progress at a speed that suits their needs, digital environments can address the diversity of learners (Alderson, 2000). The use of digital technologies in assessment becomes even more important for domains where performance-based skills (i.e., speaking) are at the forefront, necessitating English Language Teaching (ELT) teachers to utilize technology to design and conduct effective performance-based assessments. However, the Turkish ELT programs' curriculum lacks supporting teacher candidates to gain the needed skills for planning and implementing technology-enhanced assessment.

Since English is the most widely used language for commerce and international communication, many non-English speaking nations have long been affected by English on a global scale, and Turkey is no

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exception (Balıkcıoğlu Akkuş & Altay, 2023). Consequently, it has become necessary to adopt modern educational policies and procedures in order to stay up with the most recent advancements in foreign language education. Learning English is viewed as a necessity for university students to achieve academic success and to have better career chances in the future, along with the rise in partly-English and fully-English departments in higher education (Doğançay-Aktuna & Kızıltepe, 2005). As a result, there is a lot of work being done to help learners acquire the language skills they need and to enhance their communicative and linguistic proficiency, but this process is not without its challenges (Balıkcıoğlu Akkuş & Altay, 2023).

It is clear that technology is employed in every course in educational settings nowadays. Technology, which is employed in many courses for various reasons and methodologies, not only enhances the lectures for students but also has a good impact on their achievement. The student whose course achievement rises also has a favorable view of their learning, gets more engaged in class, and gains self-assurance towards learning. The ability to acquire knowledge in only a few seconds is one of technology's greatest contributions to learning environments. In addition to books, like in traditional teaching, platforms with various software and features based on the internet are also used to gain the knowledge and skills linked to numerous themes in different classes; nevertheless, it is also crucial to note that this method of learning is not the only one (Arslan, 2023).

According to Vähäsantanen (2015), curriculum change is viewed as a dynamic and multifaceted reality in teachers' professional lives. To effectively support the objectives of curriculum reform, EFL teachers must continuously improve their professionalism (Jiang and Zhang, 2021). However, the cultivation of teachers' new roles as well as ongoing learning are both essential to the professional growth of EFL teachers (Jiang, 2022; Lei & Medwell, 2022; Lei & Xu, 2022; Tao & Gao, 2017; Vähäsantanen & Eteläpelto, 2009; Yang, 2015).

Uzun (2016) explained that teacher training programs (TTP) in Turkey have undergone extensive investigation and modification since institutions and faculties of education were established. This has resulted from the innovative approaches to and models of teaching that have been suggested by the trends and findings of the time. However, despite a willingness to adopt international patterns, the Turkish educational system has had significant issues bridging theory and practice.

The challenges to technology integration that instructors perceive have been the subject of numerous research (Atman Uslu, 2022). According to Mercader & Gairin (2020), barriers such as a lack of education, ignorance of digital technology teaching methods, a lack of planning, an excessive workload, a lack of time, the generational divide, technophobia, a lack of evaluation and incentives were given priority by university teachers. According to a study done with Indonesian instructors, there are significant challenges, including a lack of expertise and experience in ICT education, a lack of time and resources, and a bad Internet connection (Muslem et al., 2018).

This study intends to investigate the development of a technology-enhanced measuring curriculum for training English language instructors for the twenty-first century in Turkey. As technology presents several chances to improve teaching efficacy, engage students, and promote authentic language acquisition, its integration into language instruction has grown in importance (Greenier et al., 2021). However, effective technology integration calls for teachers to have a firm grasp of both language pedagogy and technological resources (Jiang, 2022).

The suggested curriculum places a strong emphasis on the measuring side of teaching languages, acknowledging the crucial role that evaluation and assessment play in determining how best to teach and keeping track of student progress (Lei, 2022). It seeks to provide English language instructors in Turkey with the knowledge and abilities required to successfully plan, carry out, and assess technologically enhanced exams.

This curriculum intends to enable instructors to use technology in their teaching practices while also assuring the validity, reliability, and fairness of assessment procedures by addressing the unique demands and challenges faced by English language teachers in the Turkish setting (Arslan, 2023). The curriculum is made to give instructors awareness of a range of technology resources and tools that might

improve measurement, enabling them to build fun and interactive tests that accurately reflect students' language (Atman Uslu, 2022).

In conclusion, developing a technology-enhanced measuring curriculum for English language instructors in Turkey is an essential first step in preparing teachers for the opportunities and difficulties of the 21st century. Teachers can use technology to develop relevant evaluations that support good language learning outcomes by including it in the measurement process. This curriculum aims to empower English language instructors by giving them the knowledge and abilities they need to successfully navigate the digital world and deliver high-quality instruction to their students in a society that is continually changing (Arslan, 2023).

Curriculum Innovation in ELT

The term "curriculum evaluation" is a set of actions used to gather data on how policies, programs, curricula, courses, educational software, and other instructional resources operate and have an impact on students (Gredler, 1996). The creation, implementation, and maintenance of curricula depend on curriculum evaluation. The goal of curriculum assessment is to ascertain the advantages and disadvantages of the curriculum before implementation as well as the efficiency of its delivery following implementation. The health of education and its programs depends on evaluation (Ornstein & Hunkins, 2014). Moreover, Posavac and Carey (2003) explain six purposes of program evaluation which are to:

a. assess unmet needs,
b. document implementation,
c. measure results,
d. compare alternative programs,
e. provide information to maintain and
f. develop quality and detect negative side effects.

Peacock (2009) claims that establishing a causal link between expectations and results is no longer the only emphasis of program assessment. Instead, it is increasingly used to make program decisions based on a range of systematic data collecting and analysis methods that are related to effectiveness, efficiency, value, and appropriateness.

The Council of Higher Education (CoHE) decided on, reorganized, and introduced ELTTP in Turkey in the 2006–2007 academic year. The package program is used consistently throughout Turkey's English Language Teaching (ELT) Departments, despite possible minor variations in course titles, content, and methods among various universities. The technical courses in the proposed curriculum were designed to advance knowledge in the specialized field of English language (EL) instruction. Thus, the technical courses concentrated on additional EL education-related topics (such as linguistics, pragmatics, syntax, discourse analysis, etc.) as well as on related fields that could aid in the implementation of EL teaching and/or learning (such as computers, English literature, scientific research methods, testing and evaluation, materials development, etc.). The development of 21st-century skills that may be strongly linked to successful ICT use can naturally be anticipated to benefit from and be assisted by these types of courses. There are 18 total technical courses throughout the whole curriculum (49 credits-75 ECTS). Sixteen instructional courses make up the entire program's total (59 credits-81 ECTS).

Since the CoHE revised the curricula of the education faculties in 2018 to be responsive to the shifting demands and needs of the social, educational, and political domains as well as local, national, and international requirements, the current ELT program has been in use. The new program comprises a great number of obligatory and a few elective courses. The program's components include general

knowledge, field knowledge (linguistic competence), teacher education (pedagogic competence), and teaching practice. The new curriculum (Seferoğlu, 2006) appears to place greater emphasis on teaching technique and practice components than the previous one, which was in operation from 1998 until 2006. The courses have a total of 175 class hours, of which 143 hours are spent on theory-based coursework and 32 hours on practice-based coursework such as teaching techniques, computer skills, unique teaching methods, and so on.

Essential Characteristics of English Language Teachers

According to Nunan (2003), an ideal teacher should have the following four types of essential qualities: a general level of education, subject competence (a certain level of English proficiency is required), professional competence (such as planning and management skills), and positive attitudes and beliefs. In addition, Selvi (2010) mentioned cultural competency among the teaching competencies and subject skills should be attained to a greater degree before joining the faculty so that trainees may focus more on learning how to teach English and spend less time studying English.

Shulman (1987) recommends creating three more knowledge domains in addition to these three, namely knowledge of learners and their characteristics, knowledge of educational environments, and understanding of educational purposes (as cited in Grenfell & Jones, 2003). Technology should be incorporated into the curriculum, according to Nunan (2003). In this approach, teacher candidates might be informed about contemporary technology and their instructional applications. Nevertheless, the curriculum (Karakas, 2012) covers these areas of expertise excessively.

The distribution of pedagogical and linguistic courses may change because only three elective courses are available at the institutions' discretion, but language assessment courses are unaffected because elective courses are primarily made up of field-related subjects. As a result, the general distribution of the courses in the standardized program would remain roughly the same. If more technologically informed educational processes are incorporated in the courses that will teach both innovative knowledge of the subject and how these may be embedded in creative classrooms, teachers can increase both their pedagogical abilities and also their technical skills.

Some Studies on Educational/Language Program Evaluation

Early studies focused on debating certain ideological, social, and political issues, helping aspiring language teachers find the best and most suitable training programs, or creating new models that adopted preexisting program evaluation models and modified them for the evaluation of educational and language programs (e.g., Collins, 1992; Grosse & Benseler, 1991; Lynch, 1990). Interest in this field has grown as the potential of evaluation and assessment has been identified and proven in educational environments. There has been an enormous amount of research into the evaluation of educational programs, both internationally (e.g., Angell et al., 2008; Dunworth, 2008; Fox & Diaz-Greenberg, 2006; Harris, 2009; Lee et al., 2008; Llosa & Slayton, 2009; Lozano et al., 2002; Lozano et al., 2008 Luke & Britten, 2007; Peacock, 2009; Rivera & Matsuzawa, 2007; Rolstad et al., 2005; Romeo & Dyer, 2004; Sullivan, 2006) and in Turkey (e.g., Biyik, 2007; Coskun, 2009; Er, 2006; Erdem, 2009; Güven & Demirhan Iscan, 2006; Oguz, 2009; Uslu, 2006; Yildiz, 2003; Yilmaz, 2005; Zehir Topkaya & Kücük, 2010). None of the aforementioned studies, however, looked at the ELTTP from the perspective of the current study, that is, whether the program meets and satisfies the needs of the teacher trainees and to what extent each course in the ELTTP has been helpful in terms of the sufficiency and efficiency of the lecturers/instructors, the contents of the given courses, and their practicality. In order to fill this vacuum in the literature, the current study explores these elements from the perspective of the students.

Curriculum Innovation and ICT Integration in Language Assessment

Turkey made various changes to its educational system to improve educational monitoring. ICT integration into instruction was one of the main goals of the 2005-launched curriculum reform

initiatives, which attracted the attention of numerous stakeholders while significantly altering the whole national curriculum. One language testing and assessment (LTA) course is being offered as a required course at the eighth semester of the fourth year of undergraduate education, and a measurement and evaluation course (MEC) related to general testing and assessment in education is being taught in Turkish in the sixth semester, according to the curriculum created and revised in 2009 by the CoHE in Turkey.

Currently, it appears that there is no parallelism between the semesters in which the ELTEC and MEC are taught when looking at the course catalogs of EL teacher education programs in Turkey. Intriguingly, some universities (such as Bahçeşehir and Maltepe Universities) only include a measurement and evaluation course taught in Turkish, where terms and principles of testing and assessment in education are taught in general, not specifically relating them to language teaching and learning, while other universities (such as Boğaziçi and Istanbul Bilgi Universities) offer specific language testing and assessment courses. The language assessment literacy development of pre-service EFL teachers and the teacher educators who are in charge of preparing these future EFL teachers to conduct accurate and appropriate assessment practices when they start their careers are likely to face difficulties as a result of these inconsistencies among the EL teacher education programs in Turkey. In order to fully understand ELTEC in Turkish EL teacher education programs, it is important to include the perspectives of ELTEC instructors and pre-service EFL teachers. This will help to create a thorough image of the organization.

Aiming to fill this gap, we initiated an elective course titled "Computer-Assisted Educational Measurement" that can be modeled by other ELT programs. This study has two purposes: a) Presenting curriculum development stages for the program and b) conducting an impact analysis to revise the curriculum and take remedial actions if needed. To address these objectives, the following research questions were examined:

***Pre-course questions**:*

1. To what extent were the student teachers aware of the various digital tools in language assessment at the beginning of the course?

2. What are the student teachers' perceptions regarding the potential drawbacks of using computers and digital tools in order to design language assessments?

3. What are the initial survey results suggested for the elective course curriculum? How is the final course curriculum that was designed based on stakeholder data?

***Post-course questions**:*

4. Which digital assessment tools do the student teachers plan to use in their future teaching?

5. What does the student teachers' survey data suggest in terms of student perception change through the semester?

6. What remedial actions should be taken on the course curriculum and activities for a similar course?

Methods

Research Design

This study employed a single case study approach to examine teacher candidates' experiences on a newly developed course. Case studies help researchers deeply understand similar cases such as a class, course, school, or a community (Cohen et al., 2007). The study was conducted over the course of the

2021-2022 academic year after obtaining ethical approval from the institutional research board. The course titled "Computer-Assisted Educational Measurement" was offered for the first time as an elective course in the ELT program at a public university that can be modeled by similar ELT programs in the future. The course's main objective was to train ELT teacher candidates in using technology while assessing second language skills effectively in different language domains.

Participants

The study included 26 sophomore (equivalent to the 3rd year in the program) ELT teacher candidates who were identified through convenience sampling at a public university. They were admitted to the program based on a nationwide standardized large-scale assessment. Despite not having previously enrolled in any digital literacy or technology courses within the program, the participants successfully completed the fundamentals of assessment course, which is a standard, mandatory course offered in College of Education programs in Turkey. The convenience sampling approach was chosen due to its suitability for the research context. This particular approach was selected because one of the researchers had the opportunity to offer the course within the ELT program with the aim of designing an innovative and need-based course. Thus, the researchers were able to access a readily available pool of participants who were directly involved in the program, enhancing the relevance and practicality of the study's findings. 11 (42.3 %) of the students were female and 15 (57.7 %) of the students were male. Before the semester started officially, all sophomore ELT teacher candidates in the department were invited to participate in a pre-course survey. After analyzing survey data, the researchers finalized and announced the course syllabus to the faculty's course offering catalog. The course syllabus is presented in Appendix A. All the sophomore ELT students (n=26) registered for the elective course. In addition, one student from the Psychological Counseling Department registered for the course due to his personal interest in the subject matter.

Course Procedure

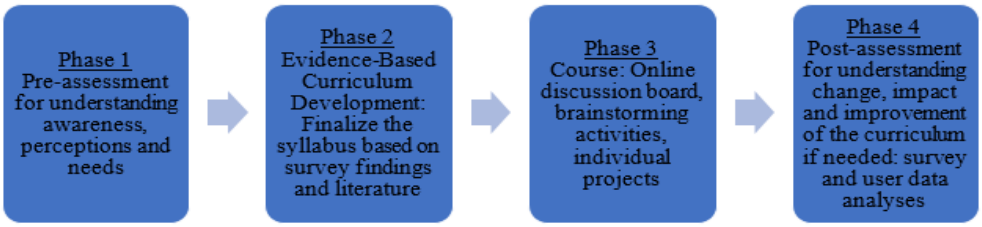
The class met weekly at a regular time through Zoom (2022) since it allowed file-sharing, group activity in small rooms, interaction with peers and with the instructor as well as effective video-conferencing. The course instructor, whose expertise is assessment and measurement, offered this specific class for the first time due to the existing gap in ELT teacher education programs. The class was held over 13 weeks by following a traditional flipped learning approach. Each week, the instructor posted course materials that included short tutorials, videos, articles, and a discussion board question relevant to the associated week's topic. The discussion board activity consisted of an integral part of the formative assessment in the class since it promoted students to conduct their own research before coming to class, reflect on the topic and interact with their peers. The rubric that was used to evaluate students' performance on the discussion board is presented in Appendix B. The synchronous course activities included Kahoot and Edmodo quizzes, pools over Edmodo, and brainstorming activities on Zoom, followed by the weekly lecture.

Data Collection and Analysis

The data collection and analysis procedures can be dissected into four phases as presented in Figure 1. First, students' initial perceptions, needs and awareness were examined through a pre-course survey and an initial discussion board activity. Their course participation, engagement with the subject matter and changing expectations were tracked through weekly discussion board activities, two large-scale projects, and self-evaluation activities. In the last phase of the study, course effectiveness, student change and prospective updates on the curriculum were evaluated through post-course surveys and learning management system (LMS) user data. The details of each study phase are presented below.

Figure 1

Phases of the Study



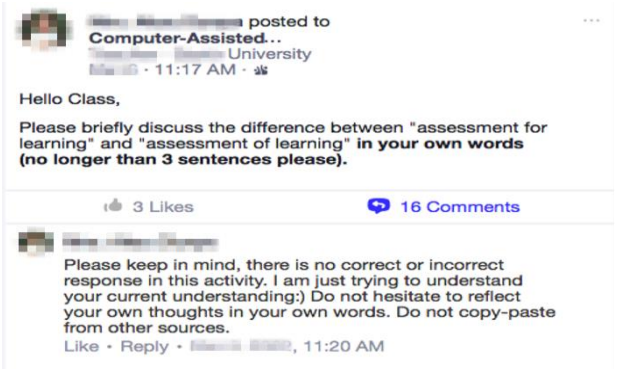
Diagnostic Assessment for Evidence-Based Curriculum Development: Data Collection and Analyses

A survey was designed and implemented before the semester started to understand students' awareness, perceptions and needs in terms of computer-assisted language assessment. The survey consisted of a total of 26 rating-scale items asking about students' previous computer-based assessment (CBA) experiences and expectations from the course. The design of the survey was informed by existing literature on computer-assisted language assessment in order to determine the key elements of the concept. Once the survey items were developed, they underwent expert reviews conducted by two specialists, including a measurement expert and a language expert. These efforts contributed to the content validity evidence.

The data was collected by the teaching assistant through the course LMS before the instructor introduced herself in order to eliminate any social-acceptability bias effect. Data analyses included the calculation of item-by-item descriptive statistics. In addition, a discussion board activity was held before the first week in order to understand what some key concepts such as CBA and assessment for learning (AfL) refer to the students, as seen in Figure 2. The qualitative data obtained through the discussion board was content-analyzed in order to enrich the survey results. The trustworthiness of qualitative data is a crucial aspect and can be ensured through various methods, including triangulation (Stahl & King, 2020). In this study, triangulation of qualitative data sources was employed to establish consistent and identifiable patterns related to the research questions. By observing similar outcomes across multiple data sources, such as discussion board data, self-assessment data and open-ended survey data, it was possible to enhance the trustworthiness of the findings. The triangulated results from the diagnostic assessment and the open-ended survey data helped the finalization of the course syllabus.

Figure 2

First Discussion Board Query for Finalizing Syllabus



Formative Assessment: Data Collection and Analyses

Students' progress and changing perceptions as measures of course effectiveness were tracked through a weekly discussion portal, an extensive midterm project on Padlet and self-assessment. Discussion

board data was extracted to MaxQDA (VERBI Software, 2019) and analyzed using content analysis. A midterm project was completed on Padlet by each student and their performance was evaluated based on an analytical rubric with 3 performance criteria and 4 number of performance levels (see Appendix B). The development of the rubric was guided by the course objectives and further validated through an external expert review from the assessment field. Students also completed a self-assessment form (see Appendix C) to elaborate on their own progress critically. Self-assessment data was collected periodically and analyzed using MaxQDA as supplemental evidence for RQs 4, 5, and 6.

Summative Assessment: Data Collection and Analyses

Data was collected via a post-course survey and an extensive semester project for the summative assessment part of the study. Students responded to the survey, which was composed of 27 rating scale items and three open-ended items. In a similar manner to the construction of the pre-course survey, expert reviews from the same two experts were employed to ensure content validity. The final project required each student to prepare a 12-week syllabus for an imaginary technology-enhanced language course that could be taught in K-12. The students were asked to design their syllabus so that each week would include at least one computer-based formative assessment activity (i.e., discussion board, forum, presentation, self or peer assessment using technology) embedded into the class. Analyses of survey data using descriptive statistics (i.e., frequencies, percentages) and data visualization packages ("ggpubr", Kassambara, 2020; "ggplot2", Wickham, 2016) in R (R Core Team, 2022) consisted of the evidence for student change, improvement, and course effectiveness.

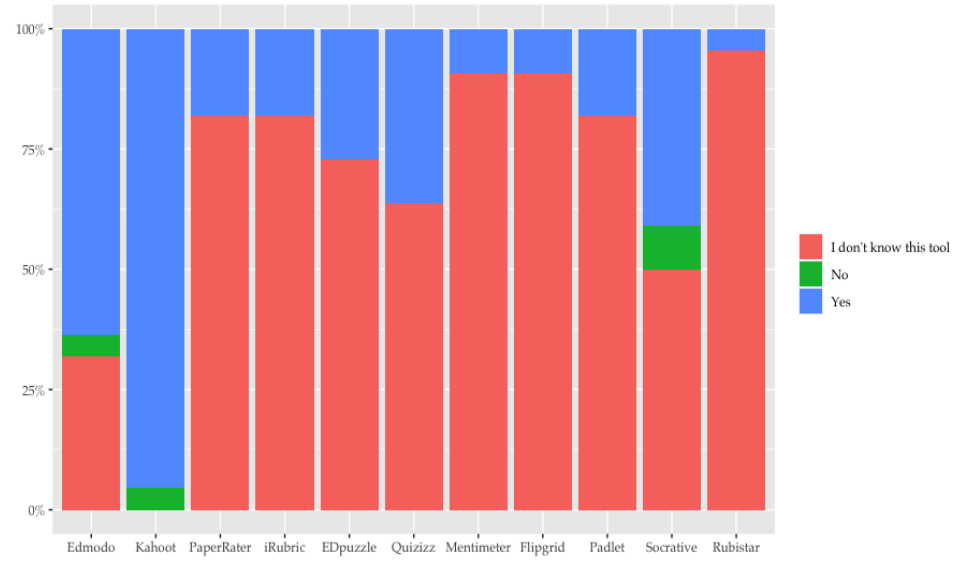
Results

Results with Respect Pre-Course Questions

The first research question was examined based on survey data (n=22) and the results were summarized in Figure 3 below. As seen in Figure 3, most students were aware of Kahoot (95%) and Edmodo (63%) as tools for digital language assessment. However, tools such as Rubistar (95%), Flipgrid (91%) and Mentimeter (91%) were known by almost none of the students despite their practicality in formative language assessment and rubric design.

Figure 3

Students' Digital Tool Awareness at the Beginning of the Course



Students' perceptions regarding computer-based language assessment were further elaborated through a discussion board activity where the instructor asked the students to discuss the potential drawbacks of CBA in their context (RQ2). As presented in Table 1, the teacher candidates' discussion data revealed four initial codes: computer literacy, software-hardware issues, cheating, and lack of interaction.

Table 1

Perceived Drawbacks of CBA

Themes	Codes	Keywords
Differential opportunity	Computer literacy	Judgmental peers, experience, familiarity
	Software and hardware issues	Power shortage, rural areas, connectivity, camera, and microphone
	Random error	Easier cheating
Traditional habits	Lack of interaction	Human-mediated assessment, human-by-human interaction

As summarized in Table 1, the identified concerns can be categorized into two primary themes: disparate access and traditional practices and habits. Participants expressed their concerns regarding uneven access to technology, varying levels of digital literacy, and potential sources of error that pose risks to online assessments, such as cheating. Additionally, they traditionally viewed human-mediated assessments as more beneficial than computer-mediated assessments.

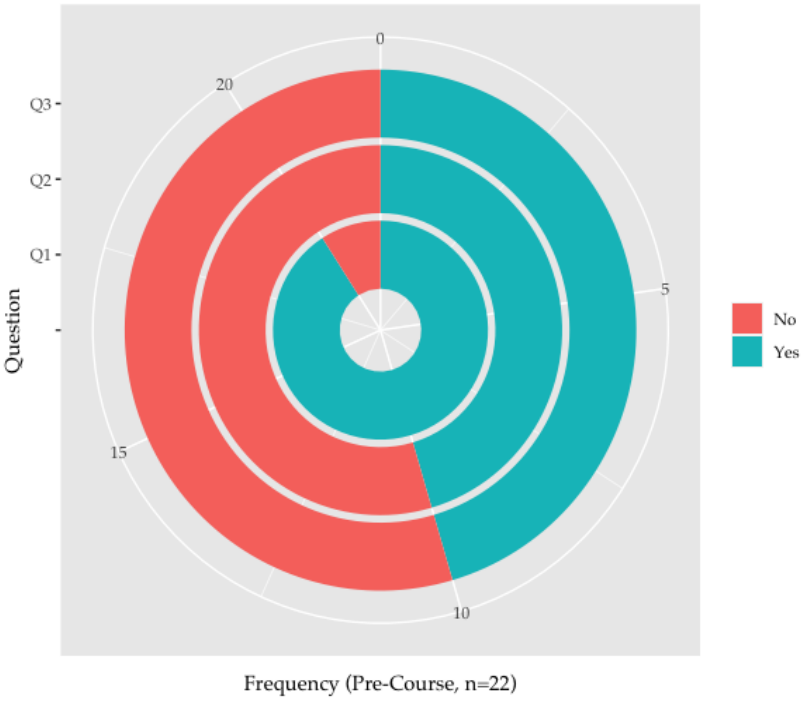
Specifically, teacher candidates presented their worries in computer-assisted language assessment due to variations in their access to and readiness to utilize technology. Furthermore, they perceived computer-assisted language assessment as challenging to implement across various language domains, primarily due to the inherent nature of the construct being measured. One student stated that:

S5: "The language learning and assessment process, which is especially communication-oriented, will still be a disadvantage with computers since there is no interaction as in the classroom."

Students' responses to the potential drawbacks alerted the instructor to introduce various computer-based tools for assessing different language skills (especially in more interactive skills such as speaking and listening) and help students experience them throughout the course. The third research question was examined first by elaborating students' previous experiences and formal preparation related to computer-assisted assessment. As seen in Figure 4, almost 91% of the course-takers had taken a computer-based language exam earlier. Yet, more than half of them (54.5%) had not taken any assessment-related course before.

Figure 4

*Students' Previous Assessment-Related Experiences**



*Q1: Have you ever taken any computer-assisted/based exam (e-YDS, TOEFL, online test etc.) ?

Q2: Have you ever taken any assessment or measurement-related course, seminar or webinar?

Q3: Have you ever used any computer-assisted/based assessment tool for your teaching?

Despite lack of enough formal preparation in terms of assessment and measurement, the discussion board data revealed that the students were able to define CBA appropriately:

S1: "The delivery and assessment processes completed through computers"

Few students viewed CBA as a cure for pandemic conditions:

S2: "Computer-based assessment should be used for online education, especially during a pandemic."

while a large number of students stated that computer-based language assessment is a necessity for 21st century teachers:

S3: "In order to grow as skilled prospective teachers, learning skills for conducting computer-based assessment is crucial for our generation of teachers, so it represents a necessity to me."

Another discussion board activity that was designed to deeply investigate students' understanding of the purpose of formative assessment revealed that students had a novice understanding of these two distinct concepts. Some students defined AfL as a process that could only be conducted during class time while only few students were able to distinguish their purposes appropriately:

S4: "Assessment for learning is done throughout the teaching period to identify necessary improvements and adjustments and to observe students' progress. Assessment of learning is done at the end of the teaching period to evaluate students' understanding of the taught subject"

Given the evidence based on both survey and discussion board data, the researchers concluded that the students were aware of the concept of CBA although many of them perceived that CBA could be used for summative assessment solely. In addition, students had noticeable misconceptions on AfL and formative assessment concepts. This finding urged the researchers that the syllabus must have emphasis

on the use of computer-based/assisted strategies for formative assessment and AfL in language classrooms.

As a result of the interpretation of multiple data sources, four stages were planned to form the syllabus. In the first stage, students were going to be prepared to use CBA in their future teaching by presenting the rationale to adopt computers for assessment. Then, students were going to be trained to develop technological as well as assessment literacy through activities, group projects, self-assessment, and systematic feedback. Each week in the syllabus included hands-on activities for this purpose. Then, two extensive projects (one midterm and one final) were added to the syllabus to transform the students into confident users of computers for assessing different language skills by considering methods to ensure validity and reliability. Therefore, a student who completed this course would be a competent user of technology who could integrate assessment and digital skills for designing effective language assessment. Table 2 provides an overview of the primary tools and technologies employed in the course content, aligning them with the designed rubric. These tools significantly enhanced the assessment capabilities, particularly in terms of formative assessment/AfL, as highlighted in Table 2.

Table 2

Major Tools Utilized for AfL in Class

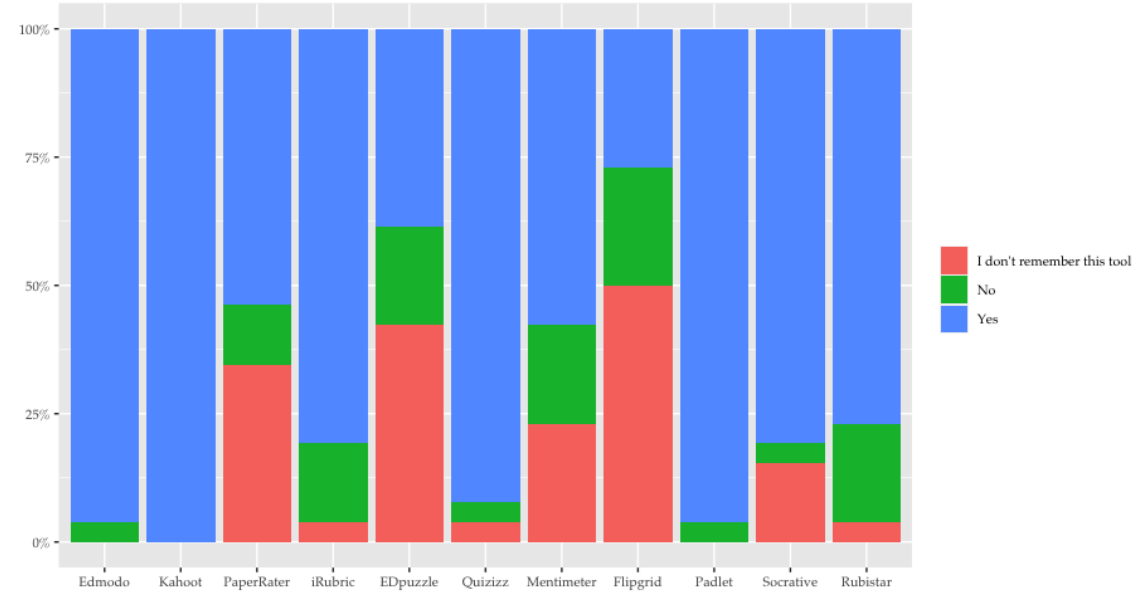
Tool	Which aspect of formative assessment was the tool utilized for?
Edmodo	Discussion board activity, self and peer assessment
Kahoot	In-class quizzes, end-of-class recap, gathering feedback and course evaluations
PaperRater	Peer and self-assessment of writing
iRubric	Creating and editing rubrics for performance assessments
EDpuzzle	Conducting quizzes embedded into instructional videos
Rubistar	Creating customizable rubrics for performance assessment
Padlet	Creating personal and group digital boards, , creating e-portfolios, brainstorming, discussion board activity, peer assessment
Mentimeter	Live quizzes, creating word clouds and concept maps,

Results with Respect to Post-Course Questions

The students were exposed to various Web 2.0 tools, websites, and computer programs to design sound assessments in different language skills during the semester. As seen in Figure 5, among the tools practiced throughout the semester, students found Padlet (96.2%) the most effective, followed by Quizizz (92.3%) and iRubric (80.8%). It is noticeable that before taking the course, most of the students were not aware of the tools that were found the most effective (see Figure 5) at the end of the course (n=26).

Figure 5

Students' Perceptions on the Effectiveness of the Tools



The RQ5 (What does the students' survey data suggest in terms of student perception change through the semester?) was examined through pre and post-survey results and participation statistics for each formative assessment activity. The same set of 13 survey questions was presented to the students before and after the semester. The common questions in both survey forms can be seen below in Table 3.

Table 3

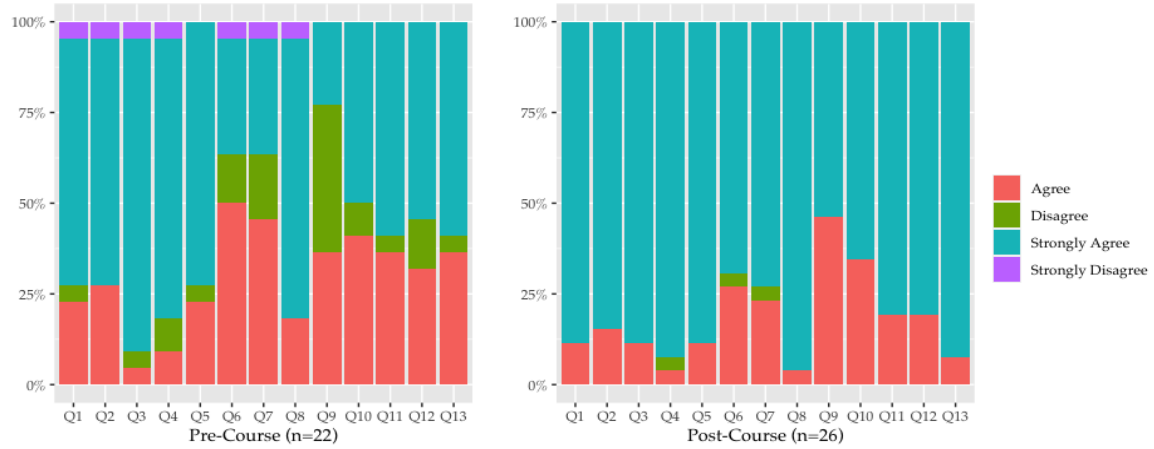
Survey Items

#	Item
1	Using the computer-assisted/based assessment will improve my work.
2	Using the computer-assisted/based assessment will enhance my effectiveness.
3	I could complete an exam or homework task using the computer.
4	I could complete an exam or homework using the computer if someone showed me how to do it first.
5	I can navigate easily through the Web to find any information I need.
6	Computer-assisted/based assessment tools that I know have clear instructions.
7	Computer-assisted/based assessment questions that I have seen are easy to answer.
8	Computer-assisted/based assessment tools that I know will be useful for my teaching.
9	My personal preparation for the computer-assisted/based is sufficient.
10	My performance expectations for the computer-assisted/based assessment are high.
11	Using computer-assisted/based assessment tools (online exams, online assignments, etc.) makes my learning enjoyable.
12	Using computer-assisted/based assessment stimulates my curiosity.
13	Using computer-assisted/based assessment will lead to my exploration.

Figure 6 depicts the change in students' perceptions throughout the semester. The largest change occurred on questions thirteen (Using computer-assisted/based assessment will lead to my exploration) and eight (Computer-assisted/based assessment tools that I know will be useful for my teaching). The general tendency of the change occurred towards positive regarding computer-based assessment, as seen in Figure 6.

Figure 6

Students' Perceptions Before and After the Semester



An important objective of designing this study and collecting data from different sources was to update the syllabus if needed. RQ6 (What remedial actions should be taken on the course curriculum and activities for a similar course?) served for this purpose. Analyses of discussion forums and open-ended survey data revealed that students found the course extremely effective, useful and practical for learning time-saver applications. They suggested that integrating more applications and tools for language assessment into the syllabus would improve the course content:

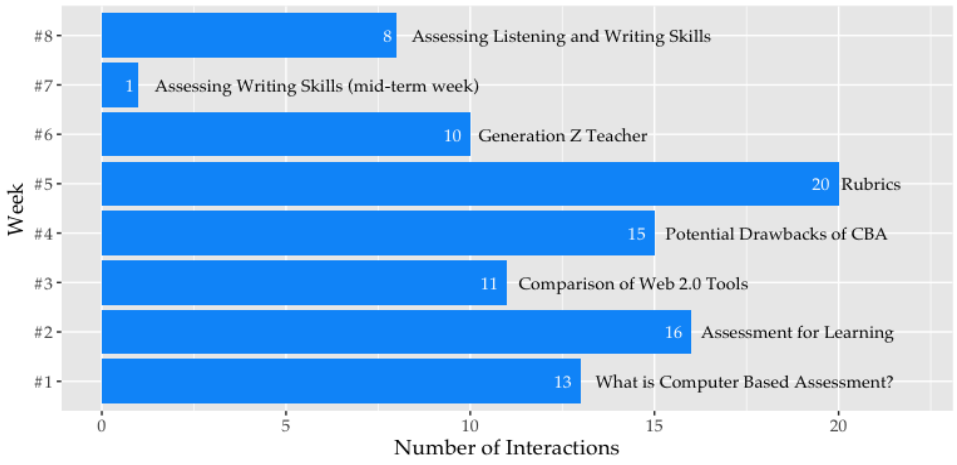
S7: "I will have the opportunity to create reliable activities for the students where both they are engaged and have fun, and I have the ease of evaluation, which is quite practical and time-saving."

S8: "The course would be improved by Integrating more tools, applications or websites to use. "

The discussion board data, as summarized in Figure 7, revealed that students' most interacted with the topic of rubrics as followed by AfL concepts. Therefore, these two topics should be covered more in the syllabus. Given the students' misconceptions on AfL at the beginning of the course and their interest in the topic on virtual discussion, it should be concluded that there would be a separate week on the syllabus allocated for the theory and applications of the AfL concept. That particular week might include strategies for AfL in language classrooms as well as similarities and differences between formative assessment, summative assessment and AfL.

Figure 7

Students' Interaction with Discussion Topics



Discussion

Assessment and Measurement courses are mandatory in Teacher Education programs in Turkey. A standard, theory-dominated curriculum was used for every undergraduate program although each program, particularly the applied ones such as ELT, Physical Education Teaching, Visual Arts Teaching are supposed to have differing needs and strategies in terms of assessment. As Atman Uslu (2022) stated, despite the latest changes in the curriculum of ELT in 2018, there is still a gap fulfilling the needs of the 21st century language teacher candidates' digital assessment literacies. The present courses are very limited in number and still lack a technology-integrated curriculum and practice for assessment. To fill this gap, the purpose of this study is to design an evidence-based second language assessment curriculum, apply it and evaluate its effectiveness through various data types.

The goal of the course was to help student instructors comprehend the advantages of implementing ICT in their future English classes. In order to promote technology-assisted assessment courses in EFL instruction, the course's student teachers were supposed to develop a variety of technology capabilities and pedagogical knowledge. The fact that they themselves had a positive experience with technology in the course of their language learning may be one of the most significant reasons for prospective teachers to incorporate technology as a part of their future teaching practice. In order to help Turkish EFL student teachers successfully apply their unique language testing experiences to their future careers as EFL teachers, this course attempted to first give students valuable personal language assessment experiences using ICT.

This study aims to offer both a local view on language assessment literacy (LAL) implementation in the Turkish EFL educational context and a worldwide perspective on LAL. In this study, Turkish EFL student teachers who had taken technology-integrated courses showed a desire to use novel teaching methods going forward. The students, teachers in particular, could recognize that their experience in their language classes motivates them to integrate technology in their actual teaching environments. This finding supports Arslan (2023) in that using digital tools in their teaching and assessment practices motivated students. They could also understand how educational technology has affected how languages are learned and taught (Schmid & Hegelheimer, 2014). The possibility and driving forces for future change for LAL would be provided by their views on the effects of integrating ICT and digital technologies during the prospective teacher preparation period (Atman Uslu, 2022; Jiang, 2021; Schmid & Hegelheimer, 2014).

As Arslan (2023) states, more possibilities should be provided for aspiring teachers to use ICT in the classroom. To successfully integrate technology, future teacher educators in EFL subjects need to update university curricula. This finding is in line with Lei (2022) since he claims that technology integration is crucial in teacher education curricula. Future teachers should learn how and why to employ technology to better their own language learning and future instruction in prospective teacher education courses (Arslan, 2023; Atman Uslu, 2022; Compton, 2009; Jiang, 2022). Institutions of higher learning that offer bachelor's degrees in education ought to include at least a training course in the foundations of educational technology because incorporating technology into classroom instruction can aid EFL students (Arslan, 2023; Atman Uslu, 2022; Masood, 2010).

Despite the ICT progress in Turkey, student instructors in the EFL educational context do not receive enough educational preparation about technology applications in their future teaching. This is in line with Uzun (2016) in that in today's technological world, it has utmost importance for the teachers to be digital literate. Most of the faculty in the department of EFL teacher education are not digital natives; hence, neither are they capable of using ICT nor are they interested in doing so (Arslan, 2023; Uzun, 2016). Additionally, during their years of academic study, student teachers themselves rarely encountered ICT integration (Uzun, 2016). For them to effectively employ technology in their future teaching, it was crucial to inspire and train them.

This course attempted to assist aspiring educators in preparing for their upcoming students who are digital natives by giving them valuable and instructive experience. This study may have ramifications for how this technology-integrated EFL student-teacher preparation course can identify and close the

gap between the present and future state of education and testing in terms of the use of technology in Turkish EFL classrooms. Turkish EFL student instructors may understand how technology has improved their English language learning and testing through the technology-integrated teacher training course, and these experiences and beliefs would then be incorporated into their future classrooms (Jeong, 2017).

The current syllabus was found effective in increasing students' technology-enhanced assessment skills and changing their perceptions, as evidenced by student data. However, it should be noted that the syllabus must be updated periodically since applications, tools, and technologies (i.e., natural language processing) are continuously developing/changing. For example, Edmodo, which has been a very popular and convenient tool for almost 15 years, has been shut down permanently as of September 2022 (Edmodo, 2022).

One key issue that affected students' perceptions of CBA was differential access to technology. The most recent literature on assessment in the pandemic also supports this finding (Kim & Padilla, 2020). Students who had inadequate access to technology, internet and computers struggled most in assessment during the pandemic. However, it is a fact that the problem is not related to the pandemic only since the issue was the same before the pandemic as well (Ahn & McEachin, 2017; Center for Research on Educational Outcomes [CREDO], 2015). The teacher education programs do not offer the necessary courses that includes digital assessment literacies. This need necessitated teacher education programs to offer this kind of course to fulfill their needs. Additionally, as students proposed, hardware and software accessibility should be reinforced in and out of the campus because technology-enhanced assessment must consist of two components equally for each student: hardware and adequate training to use them.

Another finding related to the students' concern about adopting CBA is that it is prone to cheating since it lacks real-time human interaction. However, the most recent studies stated that there is no difference in the perceived cheating behavior of the students in online and face-to-face education (Yazici et al., 2022). This empirical evidence challenges the perception that CBA inherently enables more cheating compared to traditional assessment methods. Thus, these findings contribute to alleviating concerns surrounding cheating in CBA by highlighting that it may not be a substantiated issue.

It is important to acknowledge and address certain limitations associated with the findings of the study. Firstly, it is crucial to recognize that this research is based on a case study, which inherently relies on specific contextual factors. Therefore, caution should be exercised when attempting to generalize the findings beyond the scope of this particular study. While the insights gained are valuable within the context in which they were obtained, further research is needed to validate and corroborate these findings across different educational settings.

Furthermore, it is crucial to highlight that the curriculum utilized in this study was newly developed and implemented within the specific institution. As is customary with any implementation, there may be aspects that require further refinement. The experiences and feedback gathered during the initial application of the curriculum will serve as invaluable input for future iterations of the course. Continuous improvements will be made in response to student feedback, advancements in technology, and their suitability for enhancing EFL assessment practices. This iterative process ensures that the curriculum remains responsive and adaptable, keeping pace with emerging trends in the field.

Conclusion

This study has shed light on the implementation of technology-integrated language assessment literacy (LAL) in the English as a Foreign Language (EFL) educational context while also providing a global perspective on LAL. The findings of this research highlight the significance of integrating technology into language teacher education in assessment, as evidenced by the enthusiasm and desire demonstrated by EFL student teachers who had undergone the technology-integrated assessment course.

The practical implications of this study are significant. Firstly, it is imperative for higher education institutions and policymakers in Turkey to recognize the importance of equipping EFL student teachers with adequate assessment literacy and digital skills. By incorporating technology-enhanced assessment courses into teacher education programs, educators can empower future teachers to effectively assess their students' language proficiency and make informed instructional decisions based on accurate and reliable assessment data. Furthermore, providing student teachers with technology-integrated courses offers them an opportunity to explore innovative teaching methods and utilize digital tools to enhance language learning experiences for their future students, particularly in the era of artificial intelligence.

Moreover, the findings of this study have implications for the global educational landscape as well. Language assessment literacy is not confined to the Turkish EFL context alone; it is a crucial aspect of language education worldwide. Therefore, the insights gained from this research can inform educators and policymakers in other countries to enhance the assessment literacy of their language teachers. Integrating technology into assessment courses can be a valuable strategy to foster the development of assessment literacy, as it not only enhances teachers' assessment competencies but also encourages them to embrace novel assessment approaches that promote active engagement and foster meaningful learning experiences for students.

Declarations

Conflict of Interest: The authors report there are no potential conflicts of interest to declare.

Ethical Approval: This study was approved by the Bartın University Rectorate Board of Ethics for the Social Sciences and Humanities (Date: 09.02.2023, Protocol number: 2023-SBB-0048).

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Appendix A

Computer-Assisted Educational Measurement

Course Code: GKS-021

Instructor: XXX

Course Objectives: Developing students' skills in digital assessment tools and computer-assisted language testing approaches that can be utilized in technology-enhanced ELT classrooms.

Week	**Topic**	**Pre-Course and In-class Activities**
1	Introduction to the course. Warming up to course materials and syllabus Introducing Edmodo (Sign-up, usage)	Sign up for the course on Edmodo
2	Introduction to language assessment: assessment types by purpose, formative and summative assessment methods	Participate in Edmodo Discussion
3	An overview of strategies for using technology while measuring language skills: Online quizzes, discussion boards, mind mapping, peer and self-assessment	Participate in Edmodo Discussion In-class: Develop an online quiz on Kahoot
4	Benefits and drawbacks of computer-based assessment Large-scale computer-based language testing programs: TOEFL iBT, IELTS, DuoLingo, PISA Foreign Language Assessment, Global Test of English Communication for Students	Participate in Edmodo Discussion
5	Performance assessments and rubrics: Rubric types, developing and revising rubrics using technology: ● Computerized Rubric Building Tools: i.e., RUBISTAR, iRubric	Participate in Edmodo Discussion
6	Assessing reading skills in computer-assisted environments: ● Web 2.0 Tools: i.e., Socrative, Mentimeter, Quizziz, Padlet, Edpuzzle	Participate in Edmodo Discussion
7	Assessing writing skills in computer-assisted environments: ● Web 2.0 Tools (i.e., Padlet, Blogger)	Participate in Edmodo Discussion

	● Artificial Intelligence and Writing Assessment: Paperrater	
8	Assessing listening skills in computer-assisted environments: ● Web 2.0 Tools ● Podcasts (i.e., Listen Notes. Synth, Spotify) ● Text-to-Speech Read Aloud tools that can be plugged into Browser ● TeachVid: Using YouTube for Listening Assessment	Participate in Edmodo Discussion
9	Assessing speaking skills in computer-assisted environments: ● Web 2.0 Tools: FlipGrid, Padlet, Google Classroom ● Pronunciation tools (i.e., Accent Roise) ● Using Web and Phone apps for informal speaking assessment (i.e., WhatsApp)	Participate in Edmodo Discussion
10	Peer and self-assessment: Theory and application ● Online tools: i.e., Blogger, Twitter ● Web 2.0 Tools: i.e., Padlet, Edmodo	Participate in Edmodo Discussion
11	Rater-mediated assessments and rater effects in language testing	Participate in Edmodo Discussion
12	Introduction to computer adaptive testing	Participate in Edmodo Discussion
13	Recap and presentation of the final project	

Course Evaluation

- Midterm and final projects: You will be expected to complete two projects. The midterm project will include designing a virtual classroom on a web tool (Padlet) and will compose 30% of your final grade. The final project will include creating a 12-week technology-enhanced course syllabus. This will compose 60% of your final grade. The instructions will be posted later.

- Weekly discussion forum: Every week, the instructor will initiate to post a comment such as an issue of the week or just a pep talk in order to support students both for their academic challenges and for affective challenges. Then students will be encouraged to respond to the posting, and in turn, they could also initiate posting a new issue. Participation performance in this activity will be counted towards 5% of your final grade.

- Peer assessment practice: Each student will randomly be assigned to evaluate the midterm and final project of another student. Participation performance in this activity will be counted towards 5% of your final grade.

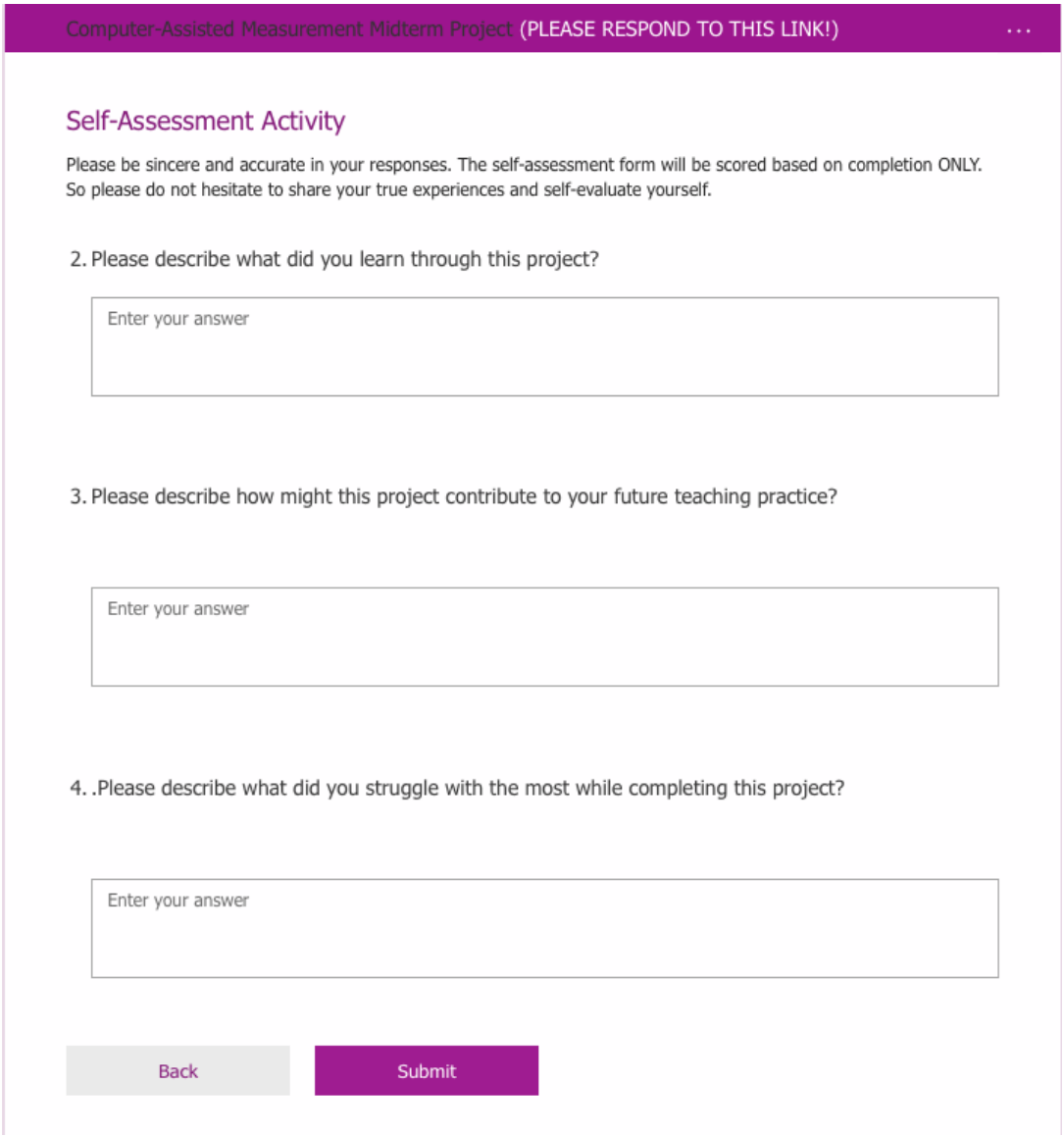
Appendix B

Discussion Board Rubric*

Criteria	**Excellent**	**Good**	**Fair**	**Poor**
Timeliness and quantity of discussion responses	Postings well distributed throughout the week	Just one posting a week well before the due date	Just one posting close to the due date	Just one posting after the due date
Responsiveness to discussion topics and demonstration of knowledge and understanding from assigned readings.	Readings were understood and incorporated into discussion as it relates to the topic.	Readings were understood and incorporated into discussion as it relates to the topic.	Little use made of readings.	Little or no use made of readings. Postings have questionable relationships to discussion questions and/or readings; they are non-substantive
The ability of postings to move discussion forward.	Two or more responses add significantly to the discussions (e.g., identifying important relationships, offering a fresh perspective or critique of a point; offers supporting evidence).	At least one posting adds significantly to the discussion.	At least two postings supplement or add moderately to the discussion	Postings do little to move discussion forward
Points	**4**	**3**	**2**	**1**

*Adapted from a rubric from Purdue Repository for Online Teaching and Learning

Appendix C


Computer-Assisted Measurement Midterm Project (PLEASE RESPOND TO THIS LINK!)
Self-Assessment Activity
Please be sincere and accurate in your responses. The self-assessment form will be scored based on completion ONLY. So please do not hesitate to share your true experiences and self-evaluate yourself.
2. Please describe what did you learn through this project?
Enter your answer
3. Please describe how might this project contribute to your future teaching practice?
Enter your answer
4. .Please describe what did you struggle with the most while completing this project?
Enter your answer
Back
Submit