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TPACK FRAMEWORK FOR DEVELOPING TRANSFORMATIVE ENGLISH LEARNING MOOC

This study aims to examine the opportunities related to implementing the TPACK (Technological Pedagogical Content Knowledge) framework in order to develop English Language MOOCs. The authors' chosen research design is descriptive interpretative with a quantitative approach to data analysis using SPSS version 28. A total of 38 language instructors, aged 20 to 39, employed at two private universities in Kazakhstan comprised the sample. The researchers used a structured survey, adapted from Koehler and Mishra, that asked participants about their perceived TPACK, or technological pedagogical content knowledge. The results identified the need for a larger scope of professional development aimed at developing teachers' pedagogical and content knowledge as well as technical skills. Instructors also recognized the need for personalized instruction and flexible teaching in the classroom to meet the needs of learners. Even with highlighting the value of TPACK in creating better learning experiences, there were still suggestions for further research for how to deal with current issues. In conclusion, this research study indicates that there is a need to integrate TPACK, technological pedagogical content knowledge, within a language course design framework that will assist with developing digital literacy and effective learning for language education and project an inclusive learning environment.

Keywords: technology integration, massive online courses, pedagogical knowledge, content knowledge, digital literacy.

Introduction

Within the last seven years, MOOCs have adopted social learning, gamification, adaptive technologies to potentially increase student engagement, efficiency, and personalization levels significantly [1, p. 60]. However, the effective creation of MOOCs for the purposes of English language learners requires considering critical pedagogical principles and teacher technological knowledge, hence the need to consider the TPACK framework. This is particularly relevant in post-Soviet countries like Kazakhstan, which has sought to improve English proficiency through MOOCs [3, p. 744]. In order to accomplish a particular goal, teacher training requires obtaining innovative approaches, adequate contemporary digital resources, and an Internet connection. When implementing TPACK framework there are several factors that must be carefully considered that are level of utilizing technology, interaction of various knowledge areas during technology integration, and teacher characteristics [5, p. 520]. This paper throws light on the benefits and challenges English instructors face when developing ESL MOOCs through the TPACK framework [6, p. 1]. The integration of TPACK in MOOC development allows the development of digital literacy and language skills [7, p. 105], and thus forces teachers to make instructional modifications through the use of technology in building appealing learning environments [8, p. 20]. Implementing TPACK makes instructors understand technology integration as a process of interplay between technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK) [10, p. 78]. The TPACK development is essential for transforming teaching and learning with digital technologies, especially in foreign language teaching [9, 11, p. 47]. Although initially developed to inform face-to-face classroom instruction, the TPACK framework informs instructional design in digital learning environments [12, p. 41]. Teaching TPACK in a more integrated fashion throughout the subject rather than in a class dedicated solely to TPACK appears more effective because studies show teachers need additional opportunities to put TPACK into practice [13]; [14, p. 680]. MOOCs support the learning of the English language worldwide [15, p. 63], and online social networks bring about even more opportunities for the learning of a language [16]. Recent research shows a great effect that TPACK has on language acquisition, especially EFL [17, p. 134]; [18, p. 25]; [19, p. 3]. MOOCs are now capable of spreading pedagogical knowledge along with disciplinary knowledge, especially in STEM and teacher education disciplines [20, p. 1125]. As much as both the concepts of TPACK and MOOCs have so far been beneficial, proper institutional and implementation

approaches do need to be considered. TPACK can enhance MOOC effectiveness; however, challenges exist with MOOCs because the learners of MOOCs are highly diversified, thus needing inclusive education approaches. The most well-known MOOCs are developed in the English language, even though non-native speakers may have limited access to those.

Materials and methods

This research addresses the following research question:

1 What are the challenges and opportunities with the use of the TPACK guidelines when English LMOOC?

Research Design: The current research is of a descriptive and interpretative nature, employing a quantitative approach to data analysis (Creswell, 2009). Descriptive statistics for quantitative aspects such as averages, medians, and standard deviation were calculated using SPSS version 28 for data analysis.

Sampling and Instrumentation

The present study's sample consists of 38 language instructors aged 20 to 39 years' old who teach English at two private institutions in Kazakhstan. They were all active in providing lessons via LMS. The researchers used a non-probability sample method to determine how in-service teachers gain and utilize technological pedagogical content knowledge (TPACK) during their program. The main research instrument was a structured survey adapted from Koehler, M., and P. Mishra (2009). It is divided up into four sections, each with a concluding statement. The first section's items asked participants to select options based on their age, while the second, third, fourth, and fifth sections' items asked participants to rate using a 5-point Likert scale, from strongly agree to strongly disagree, to identify how well they understood the material being taught using the appropriate pedagogical methods and technologies.

Validity and Reliability of the Survey

Cronbach's alpha (=0.960) for 28 questionnaire items was used to confirm the items' reliability.

Ethical Considerations Every participant was provided with information on the goals and purposes of the study and willingly took part. The survey ensures the respondents' privacy and confidentiality.

Results and discussion

The data interpretation comprises the display of tables created using SPSS and Google Forms to visually convey the study's results and conclusions.

Table 1 – Participant Demographics

Variable	**n = 38**	**percentage %**
Age		
20-24	5	13.2
25-29	7	18.4
30-34	16	42.1
35-39	10	26.3

As shown in Table 1, 13.2 % of the participating teachers are between 20-24 years, 18.4 % fall between 25-29 years, and 42.1 % between 30-34 years; the remaining 10 below 35 years old. The mean age for the participants is 31 years with an average teaching experience of 11 years.

Table 2 – TCK (Technological Content Knowledge)

	n	**Min**	**Max**	**Mean**	**SD**
I can resolve technological problems	38	1	5	2.84	0.94
It is easy for me to learn technology	38	1	5	2.68	0.94
I improve my understanding on various types of technologies	38	1	5	2.84	1.04
I regularly indulge with the technology	38	1	5	3.21	1.32
I am aware of with different types of technologies	38	1	5	2.63	0.88
I have sufficient technical abilities to utilize it	38	1	5	3.18	0.97

The statistics demonstrate very minor differences between people and reasonable levels of agreement. Respondents often demonstrate moderate agreement leaning toward dissent when it comes to their ability to tackle technology problems independently (mean 2.84) and stay up with evolving technologies (mean 2.84). On the other hand, there is a moderate consensus concerning the frequency of playing with technology (mean 3.21) and having the technical ability necessary to use it effectively (mean 3.18). Participants show moderate agreement with a trend toward disagreement on the ease of learning technology (mean 2.68) and their comprehension of diverse technologies (mean 2.63). These findings indicate that in order to develop technical proficiency and keep up with new technology, participants' awareness, confidence, and knowledge must be addressed.

Table 3 – PK (Pedagogical Knowledge)

	n	Min	Max	Mean	SD
I am familiar with students' evaluation in a classroom	38	1	5	3.61	1.19
I know how to adapt my teaching styles according to students needs	38	1	5	4.08	0.91
I can update my teaching style to fit to various learners.	38	1	5	3.47	1.26
I can assess student learning in different ways	38	1	5	4.03	0.81
I can utilize a variety of teaching techniques in a classroom	38	1	5	3.92	0.84
I am familiar with common student knowledge and mistakes	38	1	5	3.79	0.96
I am familiar with planning and dealing with classroom management	38	1	5	3.92	0.84

The survey results show that participants have a moderate to strong level of agreement in adapting teaching styles to different students (mean 3.47), evaluating student performance (mean 3.61), being familiar with student knowledge and mistakes (mean 3.79), and managing classroom (mean 3.92). This indicates a widespread agreement and consensus on these points. The survey also demonstrated the significant agreement regarding the revision of teaching depending on the students' needs (average value 4.08), the assessing the students learning in different ways (average value 4.03) and the use of diverse teaching techniques (average value 3.92). Overall, the data reveals that the teachers are mostly aware of different teaching practices and quite responsive to adapting teaching practices to learner needs.

Table 4 – TPK (Technological Pedagogical Knowledge)

I can select the best technologies that boost my teaching methods	38	1	5	4.28	0.83
I can choose the best technologies that increases students' understanding of a lesson.	38	1	5	4.16	0.75
My teacher education made me understand more the impact of technology use on teaching instructions	38	1	5	3.59	1.28
I critically consider technology use in my classroom	38	1	5	3.32	1.11
I am familiar with adapting technology use to various instructional tasks	38	1	5	3.79	0.79

I can select needed technologies that boost my teaching abilities	38	1	5	4.16	0.89
I am aware of techniques of how to combine content, digital technologies and teaching methods.	38	1	5	3.79	1.02
I can assist colleagues in managing the use of content, technologies and teaching skills at my school.	38	1	5	4.47	0.88
I know how to choose technologies that enhance the content of the lesson.	38	1	5	3.97	0.81

According to Table 4 participants agree they can select the best technologies in their class instruction (4.28) along with understanding that selection of best technologies can boost the learners' retention (4.16). As well, participants are capable of selecting technologies that improve the content, teaching skills and student retention. They also strongly believed that they could be responsible for the use of various teaching methods, resources and technologies (average 4.47). These results demonstrate the potential advantages of using the TPACK framework into an English language learning MOOC course, allowing for successful technological integration, pedagogical techniques, and content delivery. However, it is critical to address the issues related to critical assessment of technology role and its impact on the instruction.

Table 5 – TPACK (Technology Pedagogy and Content Knowledge)

	n	**Min**	**Max**	**Mean**	**SD**
I know technology that can assist me in understanding native language	38	1	5	4.39	0.85
I know technologies I can use for discussions in English	38	1	5	4.19	0.81
I know technologies I can use for mastering listening skills	38	1	5	4.39	0.85
I know technologies I can utilize in enhancing writing skills	38	1	5	3.92	1.08
I know technologies I can utilize for improving reading skills	38	1	5	3.66	1.01
I can lead lessons that effectively blend technologies, social studies and teaching methods.	38	1	5	3.69	1.06

The study indicated that participants reached an agreement on technology that aid in comprehending the language's roots (mean 4.39), improving listening abilities (mean 4.39), and facilitating English discussion (mean 4.19). Research suggests

that the method could enhance conventional classroom education. Participants demonstrated a good grasp of utilizing technology for enhancing reading and writing abilities, with mean scores of 3.92 and 3.66. They also effectively combined social science, technology, and pedagogical methods, with a mean score of 3.69. This study suggests that the TRACK platform can enhance language skills and support learning across various subjects. The study revealed that individuals believed they could autonomously handle technology challenges and stay updated on the latest technical advancements. The statistics indicated that several respondents were uncertain about their ability to easily learn and comprehend various technologies. It highlights the need of enhancing participants' awareness, confidence, and knowledge to enhance their technical skills and keep up-to-date with technology.

Participants of the survey agreed on various teaching skills, including assessment of student achievement, adjusting techniques, and classroom organization. Special emphasis was placed on the fact that teaching should be approached considering individual and modular learning, using the assessment method of each student, as well as taking into account the learner needs. The second requirement was for educational institutions to be able to fit to the needs and preferences of students. Through more hands-on learning, participants were able to unlock their capabilities and made decisions about several other teaching strategies that could improve student academic performance, including aspects of the course such as content, teaching and the educational experience. Participants believed they could lead technology, content, and pedagogical alignment by demonstrating TPACK's benefits in ESL MOOCs. Both agreement and disagreement suggest that further research and solutions are needed to overcome barriers. The findings emphasize the need for customized professional development and education programs that address teachers' pedagogical and technical skills and students' needs. The results show that language instructors who build and conduct second language MOOCs can use TPACK effectively. These professors can teach students outside of class to encourage critical thinking, cooperation, and active engagement. Future studies should consider various approaches to acquire objective data.

In order to answer the research question 'What are the challenges and opportunities with the use of the TPACK guidelines when English LMOOC?' the opportunities and challenges are presented separately.

Opportunities:

High expertise in selection of technology. Participants revealed the capacity to choose the relevant technologies to enhance their instructional approaches as well as promoting the learner's knowledge. It means that teachers are aware of technologies and their types that activate students learning.

Assisting colleagues. with a score 4.47 teachers indicate their readiness to support their colleagues in incorporating pedagogical knowledge and technologies into their lessons suggesting that TPACK offers empowering atmosphere for professional development.

Diversified teaching strategies. The data shows that teachers are also aware that modifying teaching methods is crucial in order to accommodate learner needs.

Using technology in language learning. Participants concluded that knowledge of TPACK framework and its integration makes it more understandable in combining pedagogical approaches, technologies and content.

Challenges:

Limited critical assessment of technological tools in teaching. The score 3.32 indicates that teachers are not confident enough in critical examination of technology and its proper implementation for certain teaching objectives.

Insufficient knowledge of technological proficiency. While teachers retain moderate use of technology, the data (mean3.18) displays that there is still some doubt about how well teachers can adjust their teaching skills to new technologies (means 2.68 and 2.63).

Extensive professional development need. It is quite evident form the findings that more thorough professional development in utilizing technology in LMOOCs within the TPACK framework is still emphasized. Varied requirement of teachers should adequately be met.

Integration into specific curriculum. Although, teachers reveal a promising use of TPACK framework, the challenge remains in successful incorporation of the current practices in institutional objectives.

Conclusions

The research discusses the advantages and disadvantages of the TPACK model and how English language teachers might use it to create MOOCs. English teachers' technological knowledge and competency can be improved, but research shows they can embrace new technologies and overcome technological difficulties. The participants were excited to learn how technology could assist them meet both their own learning goals and demands of students.

Conducting this research is important for a number of reasons. The focus of the research is on ways to organize and conduct language classes to enhance instructors' digital literacy, as well as their linguistic competency. Language instructors have a great capacity in enhancing their teaching skills through integration and selection of the most appropriate digital technologies. These resources and best teaching practices are what they do. We recommend teachers, course developers, and programmers adopt the TPACK platform for constructing language learning MOOCs because it would make learning adaptive and scalable.

The study stresses the necessity of providing English language teachers with resources and more thorough professional development to use technology effectively in their lessons. Teachers can utilize TPACK to improve digital English language learning by eliminating these issues and providing relevant materials and ideas. Today it is quite feasible to create an educational environment that would satisfy the demands of different groups of students and facilitate the process of language acquisition, especially with regard to the combination of technology with academic approaches to learning.

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ЖАОК ӘЗІРЛЕУ КЕЗІНДЕ ТЕХНОЛОГИЯЛЫҚ ПЕДАГОГИКАЛЫҚ МАЗМҰН ТУРАЛЫ БІЛІМ ЖҮЙЕСІНІҢ ИНТЕГРАЦИЯСЫН ЗЕРТТЕУ

Бұл зерттеудің мақсаты ағылшын тілді ЖАОК әзірлеу үшін TPACK моделін (технологиялық педагогикалық мазмұнды білу) енгізуге байланысты мүмкіндіктер мен мәселелерді зерттеу болып табылады. Авторлар SPSS 28 нұсқасын қолдана отырып, деректерді талдауға сандық көзқараспен зерттеудің сипаттамалық-интерпретациялық дизайнын таңдады. Іріктемеге Қазақстанның екі жекеменшік университеттерінде жұмыс істейтін 20-39 жас аралығындағы шет тілдерінің жалпы 38 оқытушысы кірді, олар Қашықтықтан оқытудың әртүрлі жүйелерін қолданатын тәжірибелі оқытушылар болды. Зерттеушілер келер мен Мишра бейімделген құрылымдық сауалнаманы қолданды, онда қатысушылардан TPACK туралы түсініктері немесе технологиялық педагогикалық мазмұн туралы білімдері сұралды. Нәтижелер технологиялық педагогикалық контент білімін дамытуға бағытталған кеңірек кәсіби даму қажеттілігін көрсетті. Оқытушылар сонымен қатар әр түрлі оқушылардың қажеттіліктерін қанағаттандыру үшін жеке оқыту және сыныпта икемді оқыту қажеттілігін мойындады. TPACK-тің жақсырақ онлайн оқыту тәжірибесін құрудағы құндылығы атап өтілгенімен, ағымдағы мәселелерді қалай шешуге болатыны туралы қосымша зерттеулер туралы ұсыныстар әлі де болды. Қорытындылай келе, бұл ғылыми зерттеу TPACK, технологиялық педагогикалық мазмұн туралы білімді цифрлық сауаттылықты дамытуға және тілдік білім беруді тиімді оқытуға, сондай-ақ инклюзивті оқыту ортасын құруға көмектесетін тілдік курс құрылымына біріктіру қажеттілігі бар екенін көрсетеді.

Кілтті сөздер: технологияларды интеграциялау, жаппай онлайн курстар, педагогикалық білім, мазмұндық білім, цифрлық сауаттылық.

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ИЗУЧЕНИЕ СИСТЕМЫ ЗНАНИЙ О ТЕХНОЛОГИЧЕСКОМ ПЕДАГОГИЧЕСКОМ КОНТЕНТЕ ПРИ РАЗРАБОТКЕ МООК

Целью данного исследования является изучение возможностей и проблем, связанных с внедрением модели TPACK (знание технологического педагогического контента) для разработки англоязычных МООК. Авторы выбрали описательно-интерпретационный дизайн исследования с количественным подходом к анализу данных с использованием SPSS версии 28. В выборку вошли в общей сложности 38 преподавателей иностранных языков в возрасте от 20 до 39 лет, работающих в двух частных университетах Казахстана, которые были практикующими преподавателями. Исследователи использовали структурированный опрос, адаптированный Келером и Мишрой, в ходе которого участников спрашивали об их восприятии TPACK, или знаний о технологическом педагогическом контенте. Результаты показали необходимость более широкого профессионального развития, направленного на развитие знаний технологического педагогического контента. Преподаватели также признали необходимость индивидуального обучения и гибкого преподавания в классе, чтобы удовлетворить потребности различных учащихся. Несмотря на то, что подчеркивалась ценность TPACK в создании лучшего опыта онлайн обучения, все же были предложения о дальнейших исследованиях того, как решать текущие проблемы. В заключение, это научное исследование показывает, что существует

необходимость в интеграции TPACK, знаний о технологическом педагогическом контенте, в структуру языкового курса, которая поможет в развитии цифровой грамотности и эффективном обучении языковому образованию, а также в создании инклюзивной среды обучения.

Ключевые слова: внедрение технологий, массовые онлайн курсы, знания педагогики, содержание обучения, цифровая грамотность

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