JTH

https://jthkkss.com/
e-ISSN 2805-4431
DOI: https://doi.org/10.53797/jthkkss.v4i2.3.2023

Perceived Value of Digital Literacy Skills: Case of Edcrunch Trainees

Begimbetova, G. A[1,2*], Retnawati, Heri[1], Triyono, Mochamad Bruri[1], Kassymova G. K[2], Imangalieva, A. D[3] & Baimurza N. N[3]

[1*]Yogyakarta State University. 55281 Yogyakarta, INDONESIA

[2]Abai Kazakh National Pedagogical University. Almaty 050010, KAZAKHSTAN

[3]General Secondary School 19. Almaty 050010 Almaty, KAZAKHSTAN

*Corresponding author email: begimbetovaguldana227@gmail.com

Available online 23 December 2023

Abstract: This article explores digital literacy within the context of Spiritual Renaissance and the "Digital Kazakhstan" education initiatives, focusing on the experiences of participants in the EdCrunch Academy Training program. Our study, encompassing the initial cohort of 41 trainees in Kazakhstan, utilizes a mixed-method approach. Qualitative data was gathered through Zoom interviews, while quantitative data was collected using a Google Forms rating scale. Participants enrolled in the EdCrunch program primarily sought both professional development and learning innovative teaching methods, including the integration of educational apps into their lessons. The respondents' ratings on the "Transferability of pedagogical skills to the classroom" and "Content related to educational technology/apps" yielded satisfaction levels with respective logits of -0.37 and -0.61. However, the platform's structure and content organization received lower ratings, with logits of 0.63 and 0.36, indicating dissatisfaction. Furthermore, trainees continue to apply pedagogical skills gained through EdCrunch, particularly utilizing educational technology tools such as Wordwall, Kahoot, and Quizlet to create interactive tasks, which fosters their students' engagement and motivation during classes.

Keywords: Digital literacy, EdCrunch, teacher training, innovation, grounded theory, student engagement

1. Introduction

The mastery of scientific and pedagogical bases of innovative activity and teaching practices is crucial for the development of the future generation of New Kazakhstan. President Kassym Zhomart Tokaev has emphasized the importance of education and proposed reforms to align it with the demands of the 21st century (Rydchenko et al., 2023). Highly skilled teachers play a pivotal role in the development of fair and efficient educational systems, as evidenced by top-performing countries in international assessments like PISA (Meroni et al., 2015).

In response to the need for modernizing the education system, Kazakhstan launched the "Rukhani Zhangyru" (Spiritual Renaissance) program in 2019, focusing on human capital development, research, innovation, and internationalization. Additionally, the "Digital Kazakhstan" program was initiated in 2020 to accelerate the country's transition to a digital economy and improve digital literacy in education.

In this article, we explore the significance of digital literacy, teacher training, and innovation in Kazakhstan's education system. By examining the EdCrunch former trainees' experience and how the pedagogical skills learned from that training, this research issues the sampled participants' rating on how that program enhances their Kazakhstani students' engagement and provides them with the 21st century skills.

Since the integration of innovative practices, carrying out research on continuous professional development (Srinivasacharlu, 2019; Wermke, 2016; Lloyd & Payne, 2012) and access to international training programs like EdCrunch is essential in improving the quality of education in Kazakhstan (Mârza, 2020; Brown & Lally, 2017). These initiatives provide teachers with the necessary tools and knowledge to navigate the challenges of the 21st-century classroom and enhance student learning outcomes. Future research should focus on evaluating the effectiveness of these programs and exploring their long-term impact on teacher practice and student achievement.

*Corresponding author: begimbetovaguldana227@gmail.com

As far as research questions are concerned, the following guided this study: a) what are the reasons for teachers to attend the Edcrunch Academy training program? b) to what extent were the EdCrunch Academy program trainees satisfied by the overall structure and organization of the course? and d) to what extent are the EdCrunch Academy program trainees putting into practice what they learned? This article examines digital literacy in the context of Spiritual Renaissance and the "Digital Kazakhstan" education programs, where to explore indicators such as teachers' perceptions of the training structure, their utilization of learned strategies, and the overall impact of the program on student outcomes.

2. Literature Review

The constant modernization of technology and organizational practices is essential for the success and development of educational institutions (Trushkina & Rynkevych, 2020). In line with this, the Ministry of Education of the Republic of Kazakhstan, in collaboration with the EdCrunch academy program, has organized professional development opportunities for teachers to familiarize themselves with international research and best practices. This initiative aims to enhance teachers' lesson design skills, incorporate modern content and teaching technologies, and improve the overall quality of education (EdCrunch Academy, 2022).

Research supports the positive impact of in-service training on the development of a sense of achievement among educators (Siriattakul et al., 2019). Therefore, Kazakhstan's efforts to encourage teachers to undergo training align with scientific evidence and can contribute to improving the performance of Kazakh high schools in international assessments like PISA (Gritsova et al., 2021).

The EdCrunch academy program, available globally, offers valuable insights and resources for teachers in Kazakhstan. It equips educators with the knowledge and skills necessary to navigate the evolving education landscape. The program covers various topics, including technology integration in resource-constrained environments, culturally responsive teaching practices, meeting the needs of diverse students, and fostering collaboration among colleagues from diverse backgrounds.

The effectiveness of training programs like EdCrunch can be measured by examining how teachers apply what they have learned in their classrooms. Studies indicate that practical knowledge-oriented training, particularly in the area of digital literacy, leads to immediate and relevant learning outcomes (Fauth & González-Martínez, 2021). Therefore, investigating the implementation of acquired knowledge and skills among Kazakh teachers who have undergone the EdCrunch Training program can provide valuable insights into the program's success and impact. By studying these factors, we can gain a comprehensive understanding of the effectiveness and relevance of the EdCrunch program for Kazakhstani educators.

Edcrunch started in 2014 as effort to demonstrate to the Russian government officials that Russians were lagging in terms of educational technologies. It started as a basic platform that hosted basic courses mainly studied regular Russian universities. It was inspired by Standard's Coursera and then it grew up gradually to be learning platform and one of the biggest organizer of educational technologies annual conferences (EdCrunch, 2023).

3. Methodology

A mixed-methods approach was used in this study. The population comprised the first cohort of EdCrunch Academy program trainees in Kazakhstan. As far as the sample is concerned, participants who consented to be respondents are forty-one (n=41). Qualitative data were collected through interviews whereby three secondary school teachers from different schools in Almaty gave interviews via Zoom talking about their experiences during their nine months as EdCrunch trainees. The quantitative data were collected through a rating scale Google Forms.

The data were analyzed through descriptive statistics using Winsteps 3.75.0 (License Key: CHJ29RRU54KX-MW) and following Creswell and Poth (2016) interpretative patterns or themes using the Atlas.ti 22 software.

To set criteria for categorizing the modified Likert scale ratings like "Very Satisfied", "Satisfied", "Dissatisfied" and "Very Dissatisfied," the researcher used the guide from Wagiran (2015), as presented in Table 1.

Table 1: Categorizing the four-category rating scales

No.	Interval	Category
1	(Mi -3SD)>X>(Mi – 1.5 SD)	Low/Bad/Never
2	(Mi -1.5SD)>X>Mi	Average/Rarely
3	Mi>X> (Mi +1.5SD)	High/Good/Often
4	(Mi + 1,5SD)>X> (Mi +3SD)	Very High/Very Good/Always

Source: Adapted from Retnawati; 2016; Wagiran 2015

Whereby:

Mi: ideal mean (obtained by summing up the high and low ratings and then dividing by 2)

SDi: Standard Deviation (obtained by high rating minus low rating and then dividing by 6; 6 being the number of standard deviations considered from -∞ up to -∞ in a normal distribution)

4. Results

To be sure of the instrument consistency in measuring the trainees' perceptions of the EdCrunch Digital program, a reliability index was calculated and under α=0.05, the Cronbach Alfa was 0.78, which falls into the "very reliable" index (Djemari, 2017).

4.1 Reasons for Taking EdCrunch Program

Next in these series of results under this section are about the reasons for taking the Edcrunch training course. There were three options for the respondents to choose from and their choices are recapped in Table 2.

Table 2: Reasons for training at EdCrunch

No.	Reasons	Recurrence
1	Professional development	21
2	Learning new ways of teaching	16
3	Improving traditional teaching skills	0

By analyzing the recurrence of choice, 21 out of 37 chose "Professional development." Then 16 out of 37 said they followed the program to for learning new ways of teaching. No one was interested in improving their traditional teaching. Next, the research inquired about the program participants' overall degree of satisfaction in terms of the learning platform structure and content organization as illustrated in Table 3.

Table 3: Item measures in logits

Entry number	Total score	Total count	Measure	Model S. E.	Infit		Outfit	
					MNSQ	ZSTD	MNSQ	ZSTD
1	120	36	.63	.30	.66	-1.3	.63	-1.5
2	123	36	.36	.31	.73	-1.1	.63	-1.5
3	130	36	-.37	.34	1.69	2.1	1.77	2.3
4	132	36	-.61	.36	1.73	2.1	1.05	.3
Mean	126.3	36.0	.00	.33	1.20	.4	1.02	-.1
S. D.	4.9	.0	.51	.03	.51	1.6	.47	1.6

To determine the level of satisfaction, to minimize the standard error of measurement, the categorical data from Likert Scale are transformed into a logistic continuum or scale -4 to +4. The logits are then divided into four equal units, to which the satisfaction categorization is as shown in Table 4.

Table 4: Categorization of the satisfaction level

Rating scale	Interval	Category
4	$-4 \leq X < -2$	Very satisfied
3	$-2 \leq X < -1$	Satisfied
2	$-1 \leq X < 1$	Dissatisfied
1	$1 \leq X \leq 4$	Very dissatisfied

Given the item measure in logits for Table 4, the "*overall structure and organization of the course*" and "quality of content" fall in the "Dissatisfied" category; they refer to item 1 and 2 respectively with .63 and .36 logits, located in the $-1 \leq X < 1$ category in Table 4. On the contrary, item 3 and 4 have -.37 and -.61 logits and are in the "Satisfied" category. Note that item 3 is about whether "Transferability of pedagogical skills learned into the classroom" and item 4 about "Content on the use of educational technology/Apps." It appears to be that the trainees were served with a long menu of contents, but they just picked up two and stuck to them until they are still applying related skills in their daily teaching practices.

4.2 Results from the Qualitative Data

The qualitative analysis of interviews with three teachers who attended the EdCrunch Training Program revealed several interrelationships of patterns. Although there were only three teachers interviewed, from those interviews, the researcher obtained important insights leading to the answers to the guide questions. The data reduction started with coding and the relational patterns led to the answers she sought for. Fig. 1 show the coding patterns leading.

Name	Grounded	Density	Groups
aa.Creative tasks	8	1	[Edcrunch content]
aa.Task dealines	2	1	[Edcrunch content]
aa.Trainig period	3	0	[Edcrunch content]
Apps	7	1	[Edcrunch content]
assess students	3	1	[Edcrunch content]
Certification	2	1	[Edcrunch organizations]
Edcrunch support	6	0	[Training Impact]
Edcrunch Training Impact	5	0	[Training Impact]
External motivation	3	2	[motivational ground]
Feedback for tasks	5	1	[Edcrunch content]
Internal motivation	6	2	[motivational ground]
Motivation	3	3	[motivational ground]
Profession	3	4	[personal info]
Satisfaction	4	1	[Edcrunch organizations]
Self-info	3	1	[Edcrunch organizations]
Traing usefullness	10	4	[Training Impact]
working place	3	1	[personal info]

Fig. 1: The coding patterns leading to research question answers

Given the research questions, the thematic analysis rotated around three main themes: a) reasons for taking the training: What motivated the teacher to take the course and to continue the program till the end, b) satisfaction: How the trainees were satisfied by the course content and its organization, and c) applying the skills learned: How the trainees are applying what they learned during that training program.

4.2.1 Motivation

The aspect of motivation or the reasons for taking the course were both external and internal: external/extrinsic motivation and internal/intrinsic motivation: the teachers were suggested by the school principal to take the course. But given the content of the course, and the topics it covered, the teachers finally felt that the skills could be useful. They shifted from external motivation to intrinsic: they started relating the training to their professions as “teachers” and not “employees” on a given school. They how they continued the training that took a long time compared to other training programs they took in the past. The direct quotes in Fig. 2, token of the accounts already made on this aspect of the motivation of having taken the course.

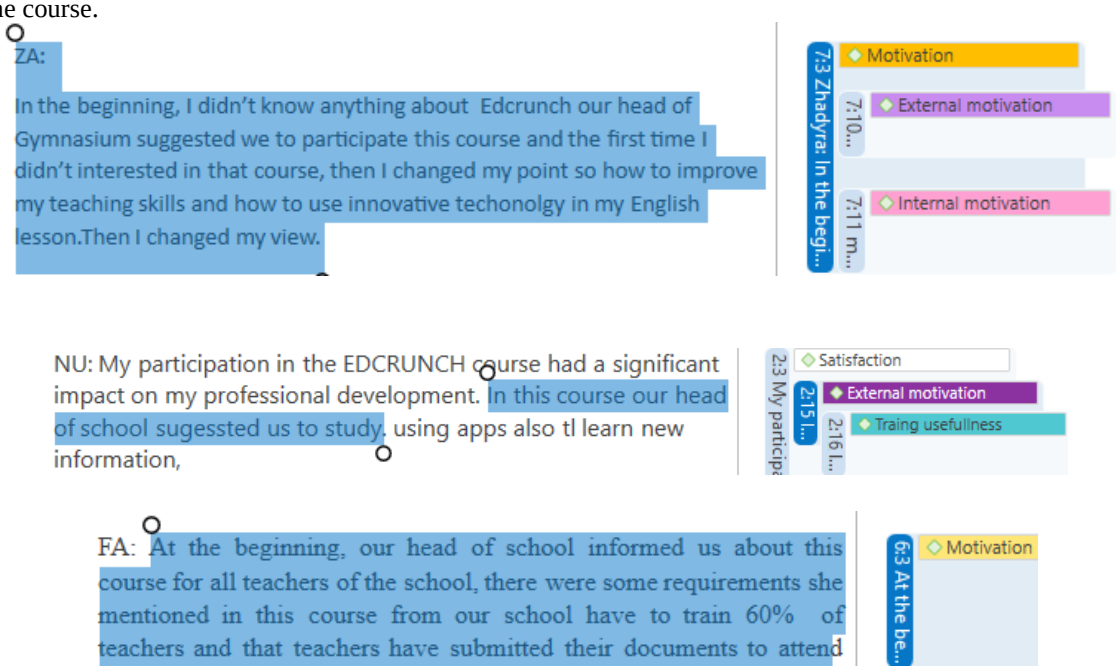

Fig. 2: The coding of motivation

As it appears in those quotes, all began with external motivation from school principals. The school headmasters themselves felt obliged to announce that course to their staff due to a note from the Ministry of Education. But upon starting the training, the teachers related it to themselves; they took the program not as an obligation to follow but as part of their professional actualization: they shifted from external motivation to intrinsic motivation.

4.2.2 Satisfaction

The EdCrunch course participants acknowledged that it was an added value on their professional experience. To guide our reasoning on this matter, the EdCrunch former trainees' satisfaction can be tracked through two aspects: a) integrating educational technologies in their daily teaching practices, and b) enhanced pedagogical practices/teaching skills.

The EdCrunch Training Program played a vital role in enhancing participants' technological integration skills. The teachers acknowledged that the program introduced them to the latest educational technologies and provided hands-on training in utilizing digital platforms and resources effectively. Fig. 3 shows EdCrunch program well-structured organization satisfied teachers. One participant remarked, "*I used to struggle with incorporating technology into my lessons, but the program showed me practical ways to integrate it seamlessly*."

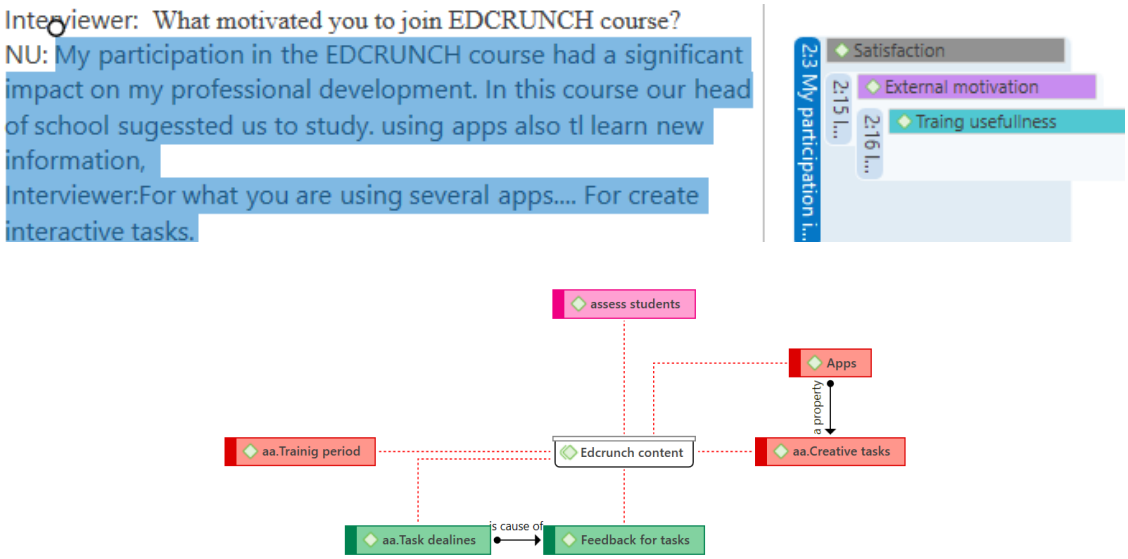

Fig. 3: EdCrunch program well-structured organization satisfied teachers

4.2.3 Enhanced Pedagogical Practices

Comparing themselves before and after the Edcrunch Training, all participants expressed a significant improvement in their pedagogical practices. After completing the EdCrunch Training Program, felt more confident in designing student-centered lessons and catering to individual students' learning needs. One participant mentioned: *"The program provided us with a fresh perspective on teaching. We learned how to incorporate active learning techniques and promote critical thinking among our students."* The teacher here acknowledges significant improvement in designing classes: they managed to shift from boring classes to technological-rich and interactive lessons.

Another participant highlighted the importance of differentiation, stating, "*The program taught us strategies to address the diverse needs of our students, enabling us to create inclusive and engaging learning environments."* This teacher also reports a new way of teaching that was consequent to the training program she followed. Before she did not perceive individual students' needs: but with technological incorporation into the teaching-learning process, she is now able to create an inclusive, rich, and conducive learning atmosphere.

4.2.4 Applying the Skills Learned

The last theme treated was whether the interviewees are still using the skills learned. They admitted to leveraging most of the skills now. The trainees agreed that they are still using the learned skills in creating interactive tasks in their teaching practices: Apps like Wordwall, Kahoot, and Quizlet became part of their educational technology tools. To this, they are satisfied to have changed the way they were teaching and adopted the new teaching approaches that integrate new teaching tools like educational technology Apps.

What is happening in their respective classes gives credits to that program too: "*Now, my students are more engaged and enthusiastic about learning."* Another participant noted, *"The training equipped us with the necessary skills to leverage digital tools and resources for personalized learning experiences."* This proves that teachers are applying the skills learned; which is consequential good teaching practices inherent to that program. Equally, this quote shows how teachers are happy with their decision to have borne with the training long period and finished the program successfully. The classroom atmosphere tokens a new mood that they did not experience before. They marvel at how their students are enthusiastic nowadays: when they reflect back on the reason behind that, they remark that it is thanks to the EdCrunch program they went through for nine months.

Comparing their application of the skills learned from EdCrunch and their past experience: they are noticeable differences. The teachers reported positive changes in student outcomes following their participation in the EdCrunch Training Program. They observed a noticeable increase in student motivation and active participation during class activities. One teacher shared her view as follows:

> *My students now take more ownership of their learning. They are eager to explore and collaborate with their peers. It's rewarding to see them develop critical thinking and problem-solving skills." Another teacher added, "The program helped me create a more inclusive classroom environment, and my students feel valued and supported. As a result, their overall academic performance has improved.*

So, in a few words, the external motivation transferred into intrinsic motivation all along the training. Then seriousness in tasks handing till the completion of the program yields impactful aspects like enhanced pedagogical practices and incorporation of technology in the teachers' daily classroom activities. The observed change from being lacking in terms of individual students' needs to being inclusive nowadays makes the teachers very satisfied with that training as shown in Fig. 4.

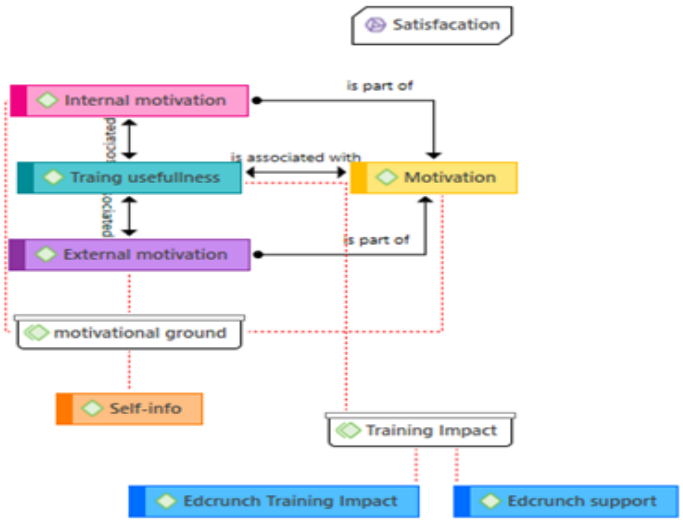

Fig. 4: EdCrunch training impact

5. Discussion

This section, we outline the answers to the research questions and position the research findings in the middle of the existing literature. The logic of reasoning is to show the triangulation of the results from the quantitative data and the qualitative ones.

Research question no. 1 sought to understand the reasons for teachers' participation in the EdCrunch Academy training program. In terms of motivation for taking the EdCrunch training program, the most prevailing was "Professional development" with 21 out of 37 traines reporting it was their main purpose; followed by "Learning new ways of teaching" as it was a choice for 16 out of37 trainees who attended the program. No one of the participants chose the "Improving traditional teaching skills" reason. Notice the intrinsic motivation: at this level it is hard to tell whether the motivation was entirely internal; which is why this aspect is completed by findings from qualitative data.

The results from the interviews also are the same: the teachers' motivation stemmed from external factors, such as school principals' recommendations and a directive from the Ministry of Education. However, upon commencing the training, the teachers developed a personal connection to the program, viewing it as an opportunity for professional growth and self-actualization. Therefore, the research question has been adequately addressed, revealing a shift from external motivation to intrinsic motivation among the participants.

The two main reasons for the respondents' participation into the EdCrunch training resonate with Kiyasov (2018) who observes that the EdCrunch is a platform whereby new approaches and technologies likely to transform the learning process can be found, seen in action, and discussed. The respondents' satisfaction on the pedagogical insights and innovative educational technology integration aspects of the EdCrunch training is also relevant Gorodovich et al. (2020) comment about that training. He observes that such program is an innovative educational project whereby someone finds like-minded professionals; people who are ready to collaborate while having the same objective of transforming the world education.

Research question No. 2 aimed to assess the level of satisfaction among the EdCrunch Academy program trainees regarding the overall structure and organization of the course. Rating the structure and content organization of the course,

the overall "structure and organization of the course" and "quality of content" fall in the "Dissatisfied" category. However, the "Transferability of pedagogical skills learned into the classroom" and "Content on the use of educational technology/Apps" resonated with the program trainees' needs or motivation and thus are in the "Satisfied" category.

Equally, the interviews related findings indicate that the participants expressed high levels of satisfaction in two key areas. Firstly, they reported integrating educational technologies into their daily teaching practices thanks to the training, which suggests that the program effectively facilitated their technology integration skills. Secondly, the participants perceived an enhancement in their pedagogical practices, with increased confidence in designing student-centered lessons and catering to individual students' learning needs. The positive feedback from the participants highlights their satisfaction with the program's impact on their teaching practices. Therefore, this research question has been effectively answered, confirming the trainees' satisfaction with the program.

This particular finding is similar to what users found in the massive open online courses (MOOC). Whereby Karpenko et al. (2019) found out that students were not satisfied with the quality of communication and individualization of learning. So, EdCrunch Academy Training program's structured and the course organization has some flaws that leave the trainees dissatisfied.

In the same perspective, research question No. 3 aimed to assess the extent to which the EdCrunch Academy program trainees applied the skills they learned during the training. As far as the technology integration in the teaching learning process is concerned, like the use of teaching-learning Apps, the program is well-rated by the research respondents. Participants admit to successfully incorporate the skills obtained from the EdCrunch program into their daily teaching practices. Specifically, they adopted various educational technology tools such as Wordwall, Kahoot, and Quizlet to create interactive tasks for their students. This integration of technology into their daily classroom activities signifies a successful transfer or adaptation of learning from the EdCrunch training into their pedagogical practices. Additionally, the participants reported positive changes in students' engagement, including increased motivation and active participation during class activities. Thus, the research question has been effectively addressed, demonstrating the practical application of the acquired skills by the former EdCrunch trainees.

This concords with other former EdCrunch trainees outside Kazakhstan. For instance, on the EdCrunch Academy Training Program Instagram account, *edcrunch_academy*, former trainees' feedback abounds: for instance, the following feedback on applying gamification related skills in the classroom held the researchers' attention:

> *Yes, I use gamification in my lessons, I use web devices, interactive worksheets, live worksheets, wordwall,net, quizzes. Gamification is a trend in Education*, (Translation from Russian into English: the researcher's).

6. Conclusion

The whole fact adheres to the Accreditation in Education perspective, Ministry of Education in Kazakhstan, that by blending traditional teaching and digital learning skills like those imparted in the EdCrunch Academic training program, a teacher can help learners to develop 21st-century skillslike critical thinking, communication, collaboration, and creative skills.

Given what the research results revealed, the following points can be concluded about the EdCrunch Academy training program for the thirty-eight trainees: a) the main reasons which pushed the trainees to take the training are professional development and learning new ways of teaching, So, the teachers were motivated by an opportunity of professional growth and self-actualization; b) the trainers were only "satisfied" with the EdCrunch Academy Training on the aspects of the "Transferability of pedagogical skills learned into the classroom" and "Content on the use of educational technology/Apps." As far as the platform structure and the course organization are concerned, the respondents are "dissatisfied"; and c) regarding whether the former EdCrunch trainees are still using what they learned in the training program, the research respondents admitted that they adopted various educational technology tools such as Wordwall, Kahoot, and Quizlet to create interactive tasks for their students and they still use these Apps even now.

The recommendations that can be made rotate around, for the program owners or other researchers, further researching on the the EdCrunch Academy training program platform structure/navigability and overall content organization to improve it. Other research can also collect data from a larger clustered sample picked from many countries and use the Kirkpatrick Evaluation Model to measure the trainees' reaction, learning, behavior, and results.

References

Accreditation in Education. (2018). *Moscow hosted the 5th EdCrunch Global Conference on Technology in Education*. https://akvobr.ru/konferenciya_po_tehnologiyam_edcrunch.html

Brown, K., & Lally, V. (2017). Myths, rhetoric and opportunities surrounding new teaching technologies: Engineering mathematics education. *EDCRUNCH Ural: новые образовательные технологии в вузе–2017.—Екатеринбург,* 2-10. *Scribbr.* http://hdl.handle.net/10995/54249

Creswell, J. W., & Poth, C. N. (2016). *Qualitative inquiry and research design: Choosing among five approaches*. Sage publications.

Djemari, D. (2017). Penerapan Model Treffinger dengan Media Colorcard untuk Meningkatkan Prestasi Belajar Materi Operasi Hitung Bilangan Pecahan. *Briliant: Jurnal Riset dan Konseptual*, *2*(1), 1-6. http://dx.doi.org/10.28926/briliant.v2i1.35

EdCrunch. (2023). EdCrunch History. *Scribbr.* https://edcrunch.online/en/history

EdCrunch Academy (Kazakhstan). (2022). *Scribbr.* https://edcrunchacademy.kz/

Fauth, F., & González-Martínez, J. (2021). Trainee perceptions of instructional design in continuous online training and learning transfer. *Education Research International*, *2021*, 1-12. https://doi.org/10.1155/2021/3121559

Gorodovich, A. V., Krechetov, I. A., Kruchinin, V. V., & Perminova, M. Yu. (2020). An instrumental system for analyzing and assessing educational content. *Reports of Tomsk State University of Control Systems and Radioelectronics*, *23*(2), 81-88. *Scribbr.* https://cyberleninka.ru/article/n/instrumentalnaya-sistema-analiza-i-otsenivaniya-uchebnogo-kontenta

Gritsova, O. A., & Tissen, E. V. (2021). Quality Assessment of Online Learning in Regional Higher Education Systems. *Ekonomika Regiona= Economy of Regions*, *3*, 929-943. https://doi.org/10.17059/ekon.reg.2021-3-15

Karpenko, O. M., Lukyanova, A. V., Bugai, V. V., & Shchedrova, I. A. (2019). Individualization of learning: An investigation on educational technologies. *Journal of History Culture and Art Research*, *8*(3), 81-90. https://doi.org/10.7596/taksad.v8i3.2243

Kiyasov, N. M. (2018). EdCrunch: International Conference on New Educational Technologies. *Summary of Psychological Science and Education*, *23*(3), 1-90. *Scribbr.* https://psyjournals.ru/journals/pse/archive/pse_2018_n3.pdf#page=90

Lloyd, C., & Payne, J. (2012). Raising the quality of vocational teachers: continuing professional development in England, Wales and Norway. *Research Papers in Education*, *27*(1), 1-18. https://doi.org/10.1080/02671522.2010.483524

Mârza, H. (2020). Analiza comparativă asupra integrării TIC în educația ritmică/Comparative Analysis on ICT Integration in Rhythm Education. *Tehnologii informatice şi de comunicaţii în domeniul muzical*, *11*(2), 37-45. *Scribbr.* https://www.ceeol.com/search/article-detail?id=980680

Meroni, E. C., Vera-Toscano, E., & Costa, P. (2015). Can low skill teachers make good students? Empirical evidence from PIAAC and PISA. *Journal of Policy Modeling*, *37*(2), 308-323. https://doi.org/10.1016/j.jpolmod.2015.02.006

Retnawati, H. (2016). *Analisis kuantitatif instrumen penelitian (panduan peneliti, mahasiswa, dan psikometrian)*. Parama publishing.

Rydchenko, V., Malone, K. L., & Kerimkulova, S. (2023). Key Stakeholders' Perspectives and Experiences of 12-Year Schooling Reform in the Context of Kazakhstan: A Long-Term Pilot Implementation. *European Education*, *55*(2), 105-122. https://doi.org/10.1080/10564934.2023.2268590

Siriattakul, P., Saengchai, S., & Jermsittiparsert, K. (2019). The Mediating Role of Employee Engagement between Team and Co-worker Relation, Work Environment, Training and Development and Employee Performance. *International Journal of Psychosocial Rehabilitation*, *23*(4), 853-864. https://doi.org/10.37200/ijpr/v23i4/pr190414

Srinivasacharlu, A. (2019). Continuing Professional Development (CPD) of Teacher Educators in 21st Century. *Shanlax International Journal of Education*, *7*(4), 29-33. *Scribbr.* https://eric.ed.gov/?id=EJ1245169

Trushkina, N., & Rynkevych, N. (2020). Modernization of organizational culture of enterprises in the epoch of digital transformations. *Agricultural and Resource Economics: International Scientific E-Journal*, *6*(2), 144-173. *Scribbr.* http://are-journal.com/.../245

Wagiran. (2015). *Metodologi Penelitian Pendidikan (Teori dan Implementasi).* Deepublish. Yogyakarta.

Wermke, W. (2016). Continuing professional development in context: teachers' continuing professional development culture in Germany and Sweden (1st Ed.). In *European Perspectives on Professional Development in Teacher Education*, 21-39. Routledge.