The Role and Beliefs of P.E. Teachers and Students in Digital Teaching Resources: A Study Combining Qualitative and Quantitative

Junfeng Wang[1], Shipeng Ding[2], Baoning Wang[3], Feilong Wu[1, 4*]

[1]*Department of Physcial Education, Xi'an Aeronautical University, Xi'an, 710000, Shanxi, China*

[2]*Faculty of Teacher Education, Lishui University, Lishui, 323000, Zhejiang, China*

[3]*Security management, Xi'an Aeronautical University, Xi'an, 710000, Shanxi, China*

[4]*Graduate School, Jose Rizal University, Manila Philippines, 0900*

**Corresponding Author.*

Abstract

The rapid development of ICT and digital education resources (DER) has brought opportunities for the digital construction of school P.E., and has been quickly introduced into the P.E. environment. P.E. teachers effectively integrate DER into P.E. practice and play its due role and value. The goal of this research is: P.E. teachers endow the value and significance of DER in practice teaching, and innovate P.E. teaching methods and models. Based on qualitative and quantitative methods, necessary information resources were obtained through special interviews and questionnaire surveys. Chinese elementary school P.E. teachers and students participated in this interview and survey. The results show that P.E. teachers attach great importance to integrating DER into classroom practice. Whether it can achieve the quality of P.E. is still uncertain. This is also closely related to the digital ability of students. According to the survey, students have a strong interest in sports DER, which can better stimulate students' interest and enthusiasm in learning. An important conclusion obtained from the survey of teachers and students is: DER has important significance and practical value in the practice of P. E.. It not only improves the quality of P.E., but also promotes and promotes the in-depth integration of sports, ICT and DER to achieve HyFlex P.E. mode.

Keywords: *ICT, DER, P.E. teachers, role and value, quality, in-depth integration*

I. Introduction

The digital education system is an inevitable product of social development. It is one of the ways for global and information-based teaching. It makes it convenient for P.E. teachers to introduce and use DER. Especially in the context of the COVID-19 health crisis, DER is forced to introduce virtual classroom , In order to replace the traditional education model, during this period a large number of DERs are continuously open to meet the teaching purposes and needs of all levels and various types of education resources are designed and released in digital form (including content transmission, transformation of the teaching environment, Stimulate learning experience, promote students' curiosity, cultivate student skills and conduct effective assessments, etc.) [1-3]. In the current social and cultural fusion and collision, skills such as coordination, effective communication, digital habits and development, big data, identity, problem solving, critical, creative, and divergent thinking are essential abilities, especially DER and The deep integration of ICT has further promoted the complementation and integration of knowledge. Use in the P.E. environment can enable teachers to obtain the teaching resources they want, and quickly transfer these knowledge and skills to students. Teachers only need to be responsible for designing the digital P.E. process and fostering student autonomy through the deep integration of DER and ICT. The ability to acquire knowledge and skills. Under such digital P.E. models and methods, students can construct their own knowledge framework through communication and collaboration, independent learning and teacher assistance, thereby stimulating students' exploration and curiosity [4-7]. In the context of the COVID-19 global health crisis, UNESCO and SLIBNU successively issued several instructions and guidelines on flexible learning (Handbook on Facilitating Flexible Learning during Educational Disruption; Guidance on Flexible Learning during Campus

Closures) in March and April this year. It also summarizes teaching methods and cases including webcast, online interaction, MOOC learning, video-based flipped teaching, and group learning. From the perspective of online and flexible, the design, method, and content are introduced. Related ideas such as tools, activities, evaluations, etc., serve as corresponding references for teacher and student curriculum teaching under the influence of the epidemic. At this time, the suspension of classes to adapt to the epidemic is to cut in from the perspective of biasing online and distance education. Fortunately, with the development of science and technology, infinite possibilities have been brought to various fields. Teachers use science and technology teaching to promote education to make great strides. The epidemic period is the best proof. However, in the post-epidemic era, education has been fully shifted to offline teaching, and there is indeed little involvement in blended teaching (such as China). However, in the post-epidemic era, education has been fully shifted to offline teaching, and there is indeed little involvement in blended teaching (such as China). Although DER has a large number of resources in databases (such as MOOCs), it is rarely used for teaching in offline teaching, or teachers are not aware of the application value of these DERs (only during the epidemic), that is to say, ICT is used for The education system has not been effectively carried out (returning to the original education status quo). ICT and DER have not been regarded as transformative educational resources and have not become a reality in the education field, especially in P.E. [8, 9]. Area-Moreira proposes two educational models in response to this situation, one is a teacher who has full experience in using science and technology or has received education information technology training, and the other is a teacher who occasionally uses educational technology or focuses on traditional teaching. Coupled with the rejection of the use of new technologies, inconvenience and lack of corresponding training, this is the main reason why educational technology has not been fully developed and bloomed in the P.E. classroom [10]. This is also the reluctance of P.E. teachers to integrate ICT and DERs into P. E.. Although ICT applications and DER acquisition and overall classroom design have increased challenges, they need to screen DER to find materials that suit the characteristics of students, so that they can effectively teach students in accordance with their aptitude. Therefore, the role of the P.E. teacher is developing and changing subtly. It is not a system library that blindly imparts knowledge, but a student-centered designer and guide of the overall classroom [11].

1.1 The belief and role of P.E. teachers and scientific teaching knowledge

Belief believes that a fact or must become a fact. Judgments, opinions, or perceptions of things are closely related to personal experience, emotions and cognition, and determine people's behavior (attitude).The role is the final effect of a certain object as a means and tool in a certain process in a certain time (or no) and a certain space (or no).P.E. teachers play an important role in the integration of ICT and DER, which is related to the application of this technology in P.E., because they are the decision-makers and implementers of P.E. classrooms, and important leaders in the mastery and management of the classroom. Therefore, investigating the beliefs and functions of teachers and students is to understand the attitudes and viewpoints of P.E. teachers and students in teaching and learning in practice.

Warshaw proposed a model of the relationship between belief, attitude and behavior, which directly affects the effect of education, thus assessing that the use of information technology will ultimately lead to changes in behavior and attitudes. Mishra proposed the TPACK (Technical Teaching Content Knowledge) model. First, the teacher must have a sufficient understanding of the topic being discussed. Second, we must master scientific teaching methods so that they can be implemented in the teaching process. Third, teachers must know how to use the knowledge of educational information technology. Fourth, students have assessment and feedback on the content implemented in the classroom. In this model, teachers have mastered the TPACK model to help integrate new technologies into the classroom. In this way, the relationship between TPACK and the Technology Acquisition Model (TAM) can be established, which can effectively overcome the teacher’s internal psychological barriers. Therefore, measuring and evaluating P.E. teachers’ beliefs and effects on the integration of ICT and DER, as well as students’ feedback, play an important role in P.E. practice.

1.2 Questions raised

Based on qualitative research, it is to understand the views of primary and middle school P.E. teachers and the degree of emphasis on the integration of ICT and DER in teaching practice. Based on quantitative research to understand students' feedback (acceptance) on the implementation of ICT and DER in P.E., the following questions are specifically raised:

(1) How do teachers and students view the use of DER in P.E. classrooms?

(2) What impact do teachers and students think of the use of DER?

(3) What is the role and purpose of teachers using DER in the education process?

(4) What are the teachers' attitudes and viewpoints on integrating DER in practical teaching? What are the students' attitudes towards DER (feedback teaching effect)?

II. Materials and methods

2.1 Method

Investigate teachers' narratives of DER based on qualitative methods, so as to understand PE teachers' attitudes and views on the integration of ICT and DER. Quantitative analysis is used to investigate the feedback effect of students' use of the integration of ICT and DER in P.E. (that is, the student's point of view).

2.2 Participants

A total of 25 P.E. teachers (70% males and 30% females) participated in the qualitative research. The average age of the respondents was 46 years old, the youngest age was 26, the oldest age was 60, the shortest was 3 years, and the longest was 35 years. . A total of 230 middle school students participated in the quantitative study. Most of them are from working-class families. The school is located in four middle schools in a certain city in northeastern China. Each sports class is about 25-30 people. The reason for choosing these schools is that members of the research team used to work as external P.E. teachers in this school. The school is equipped with digital displays and smart TVs that can be connected to computers and tablets, and can be used for projection teaching and learning.

2.3 Apparatus

Data is collected through open-ended interviews and student survey feedback questionnaires. The student feedback questionnaire is sent to students on the spot after class to answer, and statistical analysis is carried out through SPSS20.0; the interview content consists of two parts, the first part is demographic characteristics; the second part is composed of 4 open-ended questions. The problem is guided by:

(1) Do you think DER should have P.E.? Why?

(2) Based on your teaching experience, what impact do you think the use of DER has on student education? Does this teaching model or method have a positive or negative effect? Why?

(3) As a P.E. teacher, can you elaborate on how you apply DER? How did you get it?

(4) What are the difficulties in using DER in P.E.? How effective is the teaching? How accepted are students?

2.4 Procedure

The data was collected by the research team personally. The research team was authorized by the school, and they visited the school's P.E. teachers from March to April 2021. Interview recordings are allowed under the condition of anonymity as requested by the participants, which conforms to the ethical standards of the Declaration of Helsinki. In order to obtain interview information, induction and deductive processing were carried out, and minor modifications were made according to the suggestions given by experts. The research team coded according to narratives, questions and theoretical conceptual frameworks, processed audio according to NVivo software, and classified them according to the identified content. They were divided into 4 topics. Program analysis promoted the process of result analysis. At the same time, according to the Likert five-level scale, the students'on-site feedback was investigated, and the students' attitudes and opinions were statistically analyzed.

III. Results

The research results discuss different topics based on the percentage of absolute frequency (AF, %). In addition, for more in-depth analysis, we also provide reference mean and standard deviation (MSD).

3.1 Theme 1: How do P.E. teachers view DER

3.1.1 The importance of DER in P.E.
The first topic discusses the reasons why PE teachers are involved in DER in practical courses (Table 1).

Table 1 The importance of DER in the classroom in P.E.

Code	AF (%)	M ± SD
1. Technical Education	35.6	0.56 ± 0.53
2. Stimulate students' interest	28.9	0.44 ± 0.54
3. Teaching process	20.0	0.36 ± 0.52
2.Variety	15.6	0.32 ± 0.35

Code 1 Technical education refers to the application of modern science and technology in education, because modern technology is applied to many areas of social development and citizen life. Therefore, schools should pay attention to the prerequisites for students to integrate into society in the future. Examples are as follows:
In this technological world, we live in an Internet-based social environment, and education is the same, so you must strengthen yourself and not fall behind (respondent).

Code 2 Emphasizes the teacher's beliefs, in other words, through DER and ICT, students' interest in learning can be stimulated:

I always believe that DER plays a vital role in P.E.. It can effectively arouse students' interest and make students more like P.E.. And the students are also very interested in DER, so their attention is very concentrated, fully engrossed, and can better interact with the students (respondents).

Code 3 Mainly collects the investigator's narrative that DER helps students learn:

Yes, students are more accustomed to learning sports skills, which will better motivate them and cultivate their sports habits. They not only put the way of thinking on paper and pen, but also put it on their bodies to make them healthier happy growth (respondent).

Code 4 Because sports items or other content are rich, it is more conducive to the development of students' hobbies and abilities:

We have many DENs for students to choose from, and these are not available in traditional classrooms. You can do many things (such as video, music, etc.) in sports classrooms (respondents).

3.1.2 Integration of DER in P.E.
Table 2 describes the narrative about DER integration.

Table 2 The integration effect of DEM in P.E.

Code	AF (%)	M ± SD
5. Perfect integration	20.9	0.18 ± 0.27
6. Hybrid flexible courses	38.5	0.36 ± 0.48
7. Supplementary integration	27.2	0.38 ± 0.54
8. Group integration	13.4	0.21 ± 0.41

Code 5 Perfect integration is a P.E. activity realized by DER and ICT.

We should combine sports teaching materials with digitization, informatization, and intelligence, as well as the perfect integration of the Internet of Things, computers, smart TVs, monitors, computers, etc. (Respondents)

Code 6 Hybrid Flexible Course (HyFlex) is a teaching mode that combines face-to-face (F2F) and online learning (online learning). The content and activities of the course can allow students to participate in (in person), Obtain or participate in synchronously online and asynchronously online. The hybrid flexibility model focuses on the flexibility of learning choices, provides a student-directed multi-modal learning experience, and makes the way the course is carried out more diverse:

We believe that hybrid flexibility can promote teachers to rethink and reconstruct how students can effectively participate and interact with teachers, content, and classmates. (Respondents)

Code 7 DER and ICT as supplementary elements of teaching in P.E., its purpose is to enhance and expand the teaching content, not the main purpose of achieving the teaching goal.

DER and ICT are important supplements to P.E., allowing students to learn more about sports related information, documentaries, etc. (Respondents)

Code 8 Illustrates the grouping integration, because students are restricted by the age and number of students:

Even if children play an important role in the education stage, we will not use DER and ICT, because this is not conducive to their shaping and training. In elementary and middle schools, students' desire to explore, control, radiate thinking, and hobbies are more important. (Respondents)

3.1.3 The influence of DER on the learning process in P.E.
Table 3 describes the implementation of DER in P.E.

Table 3 The impact of the implementation of DER in P.E. on the learning process.

Code	AF (%)	M ± SD

9. Encourage the process	52.4	0.66 ± 0.62
10. Respond to the classroom	22.2	0.28 ± 0.36
11. Stimulation and excitation process	25.4	0.36 ± 0.43

Codes 9 and 11, it is more meaningful for students to participate in the classroom during the motivating process. The description is as follows:

Students pay more attention to DER in the P.E. classroom and actively study. With the assistance of teachers, through group interactive exercises, not only can the interaction, mutual help and mutual assistance between students and between teachers and students be enhanced, but also the excitement of students' learning will be increased. It can stimulate and cultivate students' self-esteem, self-confidence, and self-improvement. (Respondents)

Code 10 Mainly describes how P.E. teachers can obtain more resources to improve the quality and effectiveness of P.E.:

DER collects elements that can not be found on the Internet or other means, which helps to cultivate and develop their skills and abilities, which is positive and has a positive effect. (Respondents)

3.2 Theme 2: use effect

Table 4 illustrates the effect of using DER and ICT in P. E..

Table 4 The effect of implementing DER and ICT in P.E.

Code	AF (%)	M ± SD
12. Sports knowledge and skills	72.5	1.42 ± 1.55
13. Evaluate the effect	4.8	0.09 ± 0.12
14. Effectiveness of teaching skills	5.9	0.05 ± 0.42
15. The function and effectiveness of the teaching profession	16.8	0.13 ± 0.43

Code 12. Our research found that sequence codes related to sports knowledge and skills are the most frequent (72.5%):

When we learn sports knowledge and skills, I have some sports videos for teaching.
They have to introduce some sports or skills, because I have assigned them homework and problems, and they have to search for information on the Internet of Things. (Respondents)

Codes 13 and 14. It is worth mentioning that the frequency of P.E. teachers in describing the effects of assessment and teaching skills is low, as described below:

In Tai Chi teaching, we use new techniques to evaluate learning effects. There are 2 Taijiquan classes every week. They interact with each other and between teachers and students. We use the rules stipulated by Taijiquan for evaluation. (Respondents)

Code 15. The teacher explained the use of electronic equipment and DER to enrich P.E. curriculum resources, as follows:

I will use them to expand my knowledge reserve and communicate with friends. In my work, I will also use these resources to enrich my course content. (Respondents)

3.3 Theme 3: survey on the satisfaction of P.E. teachers using DER and ICT in teaching

Table 5 and Table 6 mainly shows the satisfaction survey of the effect of DER's integration into P.E. practice, and the coding of different satisfaction and dissatisfaction generated by the use of ICT, mainly due to the following 8 reasons:

Table 5 The degree of satisfaction of integrating DER and ICT in P.E.

Code	AF (%)	M ± SD
16. Learning motivation	55.6	0.51 ± 0.62
17. Working status	29.4	0.28 ± 0.32
18. Teaching quality	10.7	0.13 ± 0.25
19. Sports classroom control	4.3	0.08 ± 0.17

Codes 16 and 17. Learning enthusiasm in the survey is one of the main reasons for the satisfaction of P.E. teachers (556%). Because this shows that the use of DER into the P.E. classroom enhances the enthusiasm of education and how to use it to promote and develop learning activities. The narrative is as follows:

This makes me very excited. Students are generally more motivated, which shows that DER has a great impact on students. (Respondents)

It is very easy to obtain and understand, and it feels very interesting, which of course makes the P.E. class more convenient and easy. The main reason is that the presentation form of the classroom is very effective, which greatly stimulates and stimulates the enthusiasm of students in learning, so that the work of P.E. becomes more comfortable and easier. (Respondents)

Code 18 and 19. P.E. teachers integrate DER into the classroom. They believe that the traditional teaching methods have been changed in P.E., which has improved or increased the value of teaching to a certain extent.

They generally believe that my teaching method is novel, very different from traditional P.E., and innovative. (Respondents)

In codes 20 and 23, one of the main reasons for the difficulty of time and basic equipment conditions, the narrative is as follows:

Because they need a lot of time to prepare for the preparation of materials and the collection of materials, which is very time-consuming; in addition, the problem of basic equipment hinders the development of P.E., because there is no good Internet of Things, and sometimes data loading is required. Long time or network interruption will greatly affect teaching. (Respondents)

Codes 21 and 22. In our survey, we found that students' digital abilities and certain behaviors caused dissatisfaction.

Teachers must fully prepare courses in order to make better use and use of resource courses. For example, in the practice session of sports theory, students sometimes go back to browse their favorite web pages, and it is difficult to concentrate on the course. Furthermore, some students do not know how to use digital technology, which limits the development of students' abilities to a certain extent. This finding is very uncomfortable. (Respondents)

Table 6 Dissatisfaction with the integration of DER and ICT in P.E.

Code	AF (%)	M ± SD
20. Time-consuming	12.3	0.45 ± 0.59
21. Student performance	10.2	0.13 ± 0.63
22. Digital skills	28.8	0.76 ± 0.87
23. Basic equipment conditions	48.7	0.48 ± 0.75

3.4 Theme 4: student feedback results of integrating DER in P.E.

This topic mainly discusses the feedback results of students on the integration of P.E. curriculum into DER (Table 7). Investigate the effect of DER used in P.E. from the perspective of students. This part is based on the Likert scale for quantitative research, and the Cronbach's Alpha is 0.869.

Table 7 Feedback of students' attitudes that incorporate DER in P.E.

Code	M ± SD	SE
1. Do you like the integration of DER and ICT teaching in P.E.?	4.17 ± 0.81	0.032
2. Compared with the traditional teaching mode, are you more information-based teaching mode?	4.01 ± 0.70	0.047
3. You are satisfied with the use of DER and ICT teaching methods in P.E. courses	3.77 ± 0.64	0.043
4. Do you think the school's information infrastructure is satisfactory?	3.34 ± 0.64	0.043
5. Do you like the information-based teaching environment	3.48 ± 0.90	0.059
6. Do you think teachers can accept the implementation of DER in the classroom?	3.60 ± 0.86	0.057
7. Do you think information learning is difficult?	3.69 ± 0.69	0.046
8. Are you proficient in operating information-based learning equipment	4.31 ± 0.76	0.051

9. Teacher's teaching attitude	4.15 ± 0.75	0.049
10. Teachers' expertise reserves	4.20 ± 0.69	0.049
11. Teacher's degree of curriculum preparation	3.75 ± 0.82	0.046
12. Is the teacher centered on students and students?	3.65 ± 0.77	0.055
13. Does the teacher inspire students to think and stimulate students' interest?	3.86 ± 0.70	0.051
14. Teachers use information teaching methods	3.91 ± 0.78	0.046
15. The teacher's organization and management of the classroom	4.03 ± 0.68	0.052
16. The teacher cares about students with learning difficulties	3.96 ± 0.65	0.045
17. Do teachers teach in accordance with their aptitude	3.86 ± 0.69	0.043
18. Does the teacher assign homework?	4.11 ± 0.50	0.046
19. The teacher's ability to analyze and solve problems	3.97 ± 0.19	0.033

From the above survey, we found that students have a positive attitude towards the integration of DER into PE classroom teaching, and students like the integration of DER into teaching very much. For example: do you like the integration of DER and ICT teaching in P.E. (4.17 0.81), whether you are more information-based teaching mode than traditional teaching mode (4.01 0.70), whether you like the information-based teaching environment (3.48 0.90), etc.

IV. Discussion

The research results of topic 1 show that the use of DER in the field of P.E. has a significant impact, which is consistent with the research of Ravasco et al. [12]. However, it is not common for P.E. teachers to use DER, and these values are less explored. However, with the continuous development of science and technology, it is necessary to introduce these resources in the field of P.E. to promote P.E., which not only can effectively stimulate and encourage, it is easier to improve the quality of P.E. and the realization of teaching goals. It is worth mentioning that teachers with TPACK ability are more inclined to integrate DER in the classroom, because they not only have better ability to implement the corresponding software and resources, but also they can overcome professional obstacles, explore and mine resources, and strengthen themselves , and the amount of knowledge reserves. But it needs to be particularly emphasized that every teacher has not reached a consensus on the integration of P.E. into DER, and their opinions are not unified.

Theme 2 mainly involves the use and important role of DER in the process of P. E.. The results show that the student-centered, P.E. teacher’s classroom tutor and facilitator, the teacher uses digital technology and information

teaching methods to achieve P.E. content innovation. Teachers participating in the survey said that although students expressed good enthusiasm for DER, but for teachers, the main teaching aids they use every day are DER and ICT. Sometimes they neglect the evaluation of teaching effect and practice courses in P. E.. Our research team found that the information-based teaching methods they used were only explained from the surface, and did not deeply explore and play the potential of digital technology and information-based teaching methods, thereby affecting the quality of teaching. However, the use of DER in school P.E. is not very uncommon. It is still carried out in the traditional way of teaching P. E.. The use of digital teaching resources has not been developed, as if it has not kept up with the pace of development of the times. In a survey, it was found that some schools do not use DER resources at all, or promote information-based P.E. courses to promote the development of teaching. They are still based on traditional physical teaching methods, and students' classes are noisy and boring.

Topic 3 is the satisfaction survey of P.E. teachers using DER. Teachers feel very satisfied with their enthusiasm for learning, followed by their working status. But the dissatisfaction is also very prominent, because P.E. teachers find that the use of digital resources is very time-consuming, and is limited by the conditions of basic equipment, and some teachers are relatively difficult to use the technology of the Internet of Things, and cannot operate the equipment well or effectively. Lack of corresponding training, this is one of the main difficulties and obstacles to the implementation of DER.

Topic 4 is a survey of students' use of DER for P.E. teachers. Research shows that students have a positive attitude towards teachers' use of digital resources and information technology, and students feel very novel and curious about new teaching methods, which can effectively stimulate and stimulate students' interest in learning.

The research is consistent with that proposed by Vanderlinde, Aesaert, and van Braak [13]. Although each teacher has different opinions and there are significant differences in the development of physical activities, this is consistent with the beliefs and roles of teachers. Teachers believe that it is very important to integrate DER in the P.E. classroom. Each teacher integrates these resources in a different way.

V. Conclusion

In the survey, the feedback from teachers and students determined the influence of DER on P.E. learning. In fact, teachers' narratives have shown that DER can stimulate and promote P. E.. Although teachers will be limited by time and basic equipment when using these resources, which will make teachers and students feel dissatisfied, and even cause a series of learning problems to some extent, there are significant differences in the degree to which different teachers use DER. This is also the lack of relevant information technology training for teachers.
The results of the study have certain limitations, because the study is only a partial survey and feedback from 4 blood primary and secondary schools, and does not represent a universal problem.

This research is dedicated to the integration of information resources, which allows us to discover new directions that help to establish P.E. science. This research has reached the desired goal, revealing the current state of education and the ideas and opinions in the informatization teaching, as well as the effect of students' integration of DER in the P.E. process, because students are the main body of learning, and teachers are serving students and making Students master scientific sports knowledge and skills.

References

[1] Alkhayat, L.; Ernest, J.; LaChenaye, J. Exploring Kuwaiti Preservice Early Childhood Teachers' Beliefs About Using Web 2.0 Technologies. Early Child. Educ. J. 2020, 48, 715–725.
[2] Castañeda, L.; Esteve, F.; Adell, J. Why rethinking teaching competence for the digital world? Rev. Educ. Distancia 2018.
[3] Liu, Z.; Jin, Y.; Liao, S.; Zhao, Z. Does the Quality of Digital Teaching Materials Matter? In Learning

and Collaboration Technologies. Design, Development and Technological Innovation; Zaphiris, P., Ioannou, A., Eds.; Springer: Cham, Switzerland 2018, 10924, 266–278.

[4] Blázquez, F.; Lucero, M. Los medios y recursos en el proceso didáctico. In Didáctica General; Medina, A., Salvador, F., Eds.; Pearson Educación: Madrid, Spain 2002, 185–218.

[5] Pérez-Ortega, I. Creación de Recursos Educativos Digitales: Reflexiones sobre Innovación Educativa con TIC. RISE 2017, 2, 244–268.

[6] Voogt, J.; Erstad, O.; Dede, C.; Mishra, P. Challenges to learning and schooling in the digital networked world of the 21st century. J. Comput. Assist. Learn. 2013, 29, 403–413.

[7] Roussinos, D.; Jimoyiannis, A. Examining Primary Education Teachers' Perceptions of TPACK and the Related Educational Context Factors. J. Res. Technol. Educ. 2019, 51, 377–397.

[8] Ertmer, P.A.; Ottenbreit-Leftwich, A. Removing obstacles to the pedagogical changes required by Jonassen's vision of authentic technology-enabled learning. Comput. Educ. 2013, 64, 175–182.

[9] Blackwell, C.K.; Lauricella, A.R.; Wartella, E.; Robb, M.; Schomburg, R. Adoption and use of technology in early education: The interplay of extrinsic barriers and teacher attitudes. Comput. Educ. 2013, 69, 310–319.

[10] Area-Moreira, M.; Hernández-Rivero, V.; Sosa-Alonso, J.J. Modelos de integración didáctica de las TIC en el aula. Comunicar 2016, 47, 79–87.

[11] Hayak, M.; Avidov-Ungar, O. The Integration of Digital Game-Based Learning into the Instruction: Teachers' Perceptions at Different Career Stages. TechTrends 2020, 64, 887–898.

[12] Ravasco, C.; Brigas, C.; Fonseca, C.; Mateus, J.; Bolota, U. Perceptions of ICT Use in Guarda's Primary Schools. In Proceedings of the 9th International Technology, Education and Development Conference, Madrid, Spain, 2–4 March 2015.

[13] Vanderlinde, R.; Aesaert, K.; van Braak, J. Institutionalised ICT use in primary education: A multilevel analysis. Comput. Educ. 2014, 72, 1–10.