DEVELOPING A FRAMEWORK FOR THE INTEGRATION OF 21ST CENTURY LEARNING AND INNOVATION SKILLS INTO PRE-SERVICE ELT TEACHERS' PRACTICUM

Research Article

Hasan Bedir [iD]

University of Çukurova

hbedir@cu.edu.tr

Hasan Bedir is a graduate of ELT Department Faculty of Education, Çukurova University. He completed his MA and Ph.D at the same university. He is studying on Teacher Education and 21st Century Skills. He is specifically teaching Educational Research Methods, Teaching English to Young Learners and Material Evaluation and Development at undergraduate level, Critical Thinking in ELT at MA and Current Trends in Teacher Education at Ph.D. He is currently doing research on education for sustainable development (ESD).

DEVELOPING A FRAMEWORK FOR THE INTEGRATION OF 21ST CENTURY LEARNING AND INNOVATION SKILLS INTO PRE-SERVICE ELT TEACHERS' PRACTICUM

Hasan Bedir
hbedir@cu.edu.tr

Abstract

Research has shown that teacher education programs are ineffective in preparing teachers for 21st century skills so there exists a need for professional development to improve teachers' knowledge and practices which improve student learning outcomes. Teachers' Professional Development (PD) has been intriguing researchers in the 21st first century more than the previous century since the skills students need to learn in preparation for further education are more sophisticated in this century. This paper aimed to develop a framework to integrate 21st century learning and innovation skills (4Cs) into pre-service ELT teacher education curriculum framework for 21st century learning and skills. The framework was developed through a full evaluation of the related research and analysis of a 12-week teaching practicum data. It was intended to be a guide for those who are developing professional development programs for 21st century skills. The developmental process revealed positive casual relations between the framework developed and the probability of having positive and significant results. Regarding the focus of the framework, we also observed more positive outcomes for the intervention of 21st century skills, mainly learning and innovation skills due to the active participation of the pre-service teachers.

Keywords: Pre-service teacher professional development, 21st century learning and Innovation Skills, 4Cs

1. Introduction

Education in the 21st century places much more emphasis on gaining the necessary skills to learn and sustain learning. This requires policymakers to develop education systems based on not to 'fill-up' students with particular kinds of existing knowledge, but to increase students' ability to learn by enabling them to gain such skills as critical and creative thinking, collaborate and communicate well with others (4Cs). The changes have also been felt in teaching and teacher education, and teachers are expected to be problem solvers and capable of recognizing and weighing diverse perspectives (Sprott, 2019). Many countries have reformed their education system and reconstructed their curriculum to change teachers' traditional pedagogic practices to those required for teaching and learning in the 21st century. Reform efforts in many instances focus on teaching, teacher preparation and teacher training since teachers' creativity for innovative pedagogical practice has become one of the teacher's fundamental competences. Teachers need to be experts in professional problem-solving, who are highly informed about such matters as subject knowledge and pedagogical knowledge (Ball et al., 2008).

It has become inevitable that 21st-century learners must be equipped with new knowledge and skills necessary throughout life for successful adaptation to a changing world. These skills are" critical, creative thinking, collaboration and communication skills" and can be accomplished by implementing a framework for curriculum aligned with the needs of

individuals living in a global society. The Partnership for 21st Century Skills (P21) (2008b) plays a vital role in promoting 21st-century competencies. They claim that in order to catch up with rapidly changing world students should have such skills as critical and creative thinking, collaboration and communication. They are often used to pave the way to profound understanding of 21st-century learning and innovation skills (Urbani et al. 2017). However, the implementation of these skills into actual classrooms is not certain due to the complexity of the definitions.

Table 1. *Definitions of 21st-century skills* (Michaels et al., 2015).

Critical Thinking	Critical thinking is the ability to effectively use higher-order thinking skills to plan, teach, and reflect on instructional practice while integrating and applying theories of teaching, learning, and development.
Creativity	Creativity is the ability to develop, choose, and integrate novel, unconventional, and innovative approaches to teaching and learning.
Communication	Communication is the ability to successfully use interpersonal skills and components of literacy (reading, writing, speaking, and listening) to contribute to teaching, learning, and development.
Collaboration	Collaboration is the ability to work productively and equitably while valuing others in diverse educational settings.

These are the skills most often cited when referred to as the 4Cs of 21st-century learning. They have rapidly been recognized as attributes that separate students who are prepared for more and more complex life and work environment in the 21st century, from those who are not. Taking into account the role of these skills in this age, the OECD Education 2030 (OECD, 2018) stakeholders have worked together to translate the transformative competencies and other key concepts into a set of specific constructs (e.g. creativity, critical thinking, responsibility, resilience, collaboration) so that teachers and school leaders can better incorporate them into curricula.

In recent years, a growing number of countries have reconstructed their national education curricula to accommodate 21st-century skills. Not many instructional strategies are explicitly offered teachers to adapt and develop their teaching for these skills though it is often suggested that pedagogical strategies such as collaboration and creativity can be embedded across the curriculum. However, keywords and concepts are often used to emphasize the need to "educate for new industry, commerce, technology and economic structures; the need for new social interaction and communication skills; the need for imagination, creativity and initiative; the need to learn and continue to learn throughout employment; the need to maintain national and cultural values; and the need to operate in an increasingly international and global environment" (Binkley et al. 2012, p. 34). As shown in Table 2, some of the countries have already developed frameworks and have directed their national educational goals or aims to 21st-century learning considering the need for additional resources, training and support to adapt to these new pedagogical approaches.

Table 2. *The most common frameworks for the 21st-century skills/competences*

Framework	Main focus	Countries involved
Partnership for 21st century skills	Identification and definition of 21st-century skills/competences	U.S.A
	Implementation issues	
	Considerations for assessment	
En Gauge	Identification and definition of 21st-century skills/competences	U.S.A
	Implementation issues	
Key competences for lifelong learning. European Reference Framework	Identification and definition of 21st-century skills/competences	European Union member states
New Millennium Learners: DeSeCo	Identification and definition of 21st century skills/competences	OECD countries
National Educational Technology Standards	Identification and definition of ICT competences	USA, Norway, Costa Rica, Malaysia, Japan, Australia, Philippines, Micronesia, Korea, Turkey and more
ICT competency Standards	Identification and definition of ICT competences	United Nations
Assessment and Teaching of 21st century skills	Considerations for assessment	Australia, Finland, Singapore, United States, Costa Rica, Netherlands and Russia

Source: Voogt, J., P., Roblin, P. N. (2012, p. 304). A comparative analysis of international frameworks for 21st-century competences: Implications for national curriculum policies.

Studies have revealed that the sustainability of these skills is questionable since the stakeholders involving policymakers, schools and teachers do not actively participate in an overall debate about these skills (Voogt & Pareja, 2012). The authors suggest the studies which shed light into a deeper understanding of whether or not these frameworks imposed any changes in curriculum policies and educational practices across various countries (p. 305). These are (a) 'Key competences in Europe. Opening doors for lifelong learners across the school curriculum and teacher education' (Gordon et al., 2009); (b) '21st century skills and competences for new millennium learners in OECD countries' (Ananiadou & Claro, 2009) and (c) the Second Information Technology in Education Study (SITES) (Kozma, 2003; Law et al., 2008).

2. Pre-service teacher professional development for the 21st-century skills

Teacher education and professional development (PD) can be defined as two faces on the same coin which means that professional development is a complimentary part of teacher education to ensure teachers are fitting in the targeted skills. Along with core courses in the program, effective professional development enables teacher candidates to improve their knowledge, skills and dispositions. Thus, pre-service teacher professional learning development has become a fundamental issue to support the increasingly complex skills students need to learn in preparation for an unknown future in the 21st century. To face the unknown future, pre-service teachers must not only develop their understanding of how particular approaches are used but they must also be resilient enough to adapt and apply them to different learning and teaching situations.

Educators have been looking into ways which can equip teachers with the necessary skills to help students compete in this global society. What knowledge is of most worth" (Spencer, 1884) for the teachers in the current century has been associated with learning and adapting 21st-century skills. The four most common skills within the scope of this study are creativity and innovation, critical thinking, collaboration, and communication. They are presented as "Meta Knowledge which is about knowledge of the process of working with foundational knowledge including Core content knowledge, ICT knowledge and Cross-disciplinary knowledge" (Kereluik et al 2013, p. 130).

Thus, the 21st century, pre-service teacher education programs should strongly consider 21st-century learning and innovation skills, namely 4Cs, which enable pre-service teachers to achieve basic competencies in their future teaching experience. There has been much effort in the teacher education field to reorient education towards 21st-century skills. However, many of these efforts have tended to engage with in-service teacher education, and they have not succeeded in reorienting initial teacher education or mainstreaming 21st-century skills across pre-service teacher education programmes.

3. Context of the Study

Turkey has been reconstructing the National Education Curriculum to improve teacher education. One of the largest projects of teacher education was developed with the collaboration of Council of Higher Education CoHE and Ministry of National Education MoNE and the Project was funded by the World Bank between 1994-1999 aimed to fill the theory-practice gap placing more emphasis on teaching methods. The reform movements planned and governed by (MoNE) in collaboration with (CoHE) in 1998, 2005 and 2017 pave ways for the profound changes in pre-service teacher education programs in Turkey. CoHE set the four quality standards which pre-service teachers must develop throughout their education: Content and pedagogic knowledge; Planning, teaching, classroom management and communication; Monitoring, assessment and reporting as well as such lifelong professional requirements as reflectivity, flexibility, objectivity.

Revising the previous standards, the MoNE introduced and implemented, the Teacher Generic Competencies in 2005, which met both the international expectations and provided a guideline for teachers in their subject area teaching. They consisted of six main areas of competency which must be developed by all teachers regardless of their department and 31 sub-competencies and 233 performance indicators. The six main generic competencies are Personal and Professional Values-Professional Development, Knowing the Student, Learning and Teaching Process, Monitoring and Evaluation of Learning and Development, School-Family and Society Relationships, and Knowledge of Curriculum. With the latest reconstruction, MoNE introduced professional knowledge and professional skills for all

content area teacher competencies. There have been a great number of studies on teacher competences with respect to studies in education, development of teacher education, and language teacher education in particular (Atmaca, 2017; Kök, Çiftci & Ayık, 2011; Kızılaslan, 2011; Seferoglu, 2007).

The current English language teacher education program is a restructured model of the previous ones. The instructional structures were grounded in an eclectic mix of instructional strategies so that learners could learn English as a medium of communication, rather than a school subject. The concepts related to 21st-century learning in the curriculum are "Critical thinking, Entrepreneurship, Problem-solving, Communication, Collaboration, Decision making, Innovative thinking, Doing Research, ICT" yet there are no assessment policies or teacher training programs specifically targeted to these skills (ELT Curriculum, 2017).

We designed a professional development course which aimed to help pre-service teachers. Reeves (2004) suggests that teachers transform educational accountability from "a destructive and unedifying force to a constructive and transformative force in education." (p. 6). Thus, we aimed to develop a comprehensible PD framework to provide pre-service teachers a context so that they could become aware of 4Cs, examine the logic behind them and integrate them into their classroom practices in the school-based practicum and the on-campus coursework during the 2017-2018 academic years. On-campus coursework activities were mainly on the sustainable theoretical background in learning and practicing the 4Cs. The extended content of practicum provided a variety of hands-on experiences where pre-service teachers can experience and apply the 4Cs into their classroom practices.

Course activities involved such approaches as inquiry-based, reflective learning, collaborative learning approaches to make them aware of the 21st-century learning and skills that should map out their future, lifelong teaching career. Richards (2015) points out that PD is "maintaining the interest, creativity, and enthusiasm of teachers in their profession" (p. 695).

We established enduring objectives to be able to develop a framework whereby pre-service teachers will be able to:

•raise their awareness of 21st-century learning and skills to enhance teaching and learning.

•to become aware of the role of 21st-century learning and skills on personal/professional productivity, and communication.

•combine pedagogical principles with the 4Cs to improve the learning experience for their students.

•develop a foundation to support the development of 4Cs skills to satisfy the requirements of society and life.

•to develop a set of instructional strategies that enables them to develop learning environments and experiences that support practicing the 4Cs for the diverse needs of students.

•to plan and design, and evaluate the lesson plans including the integration of the 4Cs

•to reflect on their teaching practices, and to share ideas, problem-solve, and build commitment to further use of the 4Cs with their peers.

•to develop assessment techniques (formative and summative) to gauge student understanding of 4Cs skills.

4. Methodology

A three-phased- sequential mixed methods action research study design was utilized in this study. The methods were integrated by first taking the evidence derived from quantitative data, secondly obtaining the reflections and actions of focus group and lastly peer observations of teaching practicum. The method helped the researcher develop the framework within pre-service teacher education context cycles of observations, interviews, reflection, planning and action. The quantitative data collected from 124 ELT pre-service teachers' shed light into the development of the framework (Creswell & Plano Clark, 2011).

The qualitative data provided the pre-service teachers' perceptions on 4Cs. The focus group with nine participants involved in the development of the framework. Interview questions and working materials used in each session were based on the development process of the framework and the feedback given at the previous meeting. The themes and how they were designed related to pre-service teacher professional development d be designed were developed in collaboration with the participants and documented during the group interview sessions.

4.1.The Participants

The participants were pre-service English language teachers from the Faculty of Education of a state university in Turkey. A total of 124 participated in the study for the needs analysis, 27 (21.77%) were male and 97 (78.23%) were female. The ages of the participants ranged between 22-24. Following the needs analysis study, nine pre-service teachers participated in the focus group. In line with previous research for pre-service teachers, females were overrepresented.

4.2.Data Collection and Analysis

Data were collected using a questionnaire including open-ended and closed-ended questions developed by reviewing published literature. With 11 closed-ended questions, the participants were asked to choose their preferences on a three-point Likert scale (Agree, Neither Agree or Disagree and Disagree) and 5 open-ended questions aimed to find out their ideas on the 4Cs. Borg (2006a) regards questionnaires and interviews among the most common methods for eliciting teachers' beliefs and attitudes. The questionnaire data provided a descriptive overview of the pre-service teachers' preferences and experiences with 21_{st}-century skills, which served a basis for policy and intervention of the 4Cs. The open-ended questions were used to collect information about their thoughts, beliefs and feelings about 4Cs. In addition, semi-structured interviews, observations, collection of lesson plans and written reflections were also conducted during the framework development process.

The quantitative data were analysed using SPSS 22,0 for the frequencies and percentages of the responses. The quantitative data analysis served as a needs analysis. All the interviews were videotaped and transcribed verbatim for qualitative analysis. Interview transcripts were first openly coded to identify relevant codes. Content analysis was used for the verbatim responses given to open-ended and interview questions. The qualitative codes and quotations were used to develop the framework.

4.2.1. Development of the Professional Development Framework for the 4Cs

The purpose of the framework was to serve as a guide for the systemic integration of the 4Cs into the curriculum (Table 3). It inspires creative problem-solving for the teacher candidate and develops effective curriculum and instructional methods that support intervention as well as enrichment opportunities for all students. It is a learner-centered framework based upon constructivist-developmental theories of cognitive development which asserts that teacher go through specific developmental stages. The developmental stages were

therefore grounded on the models of teacher education suggested by Michaels et al (2015) and Crandall & Miller (2014). The former consists of three phases: (a) personal development (pre-servicee teachers' capacity to understand and apply these skills in multiple contexts, not limited to educational settings), (b) applied development (continued building of individual capacity as preservice teachers, while facilitating the skill development within their students during supervised teaching fieldwork), and (c) PD (continued development of these skills with students, colleagues, parents, and administrators as in-service teachers) (as cited in Urbani et al, 2017, p. 29). The latter presents the five characteristics of effective teacher PD as stated by Crandall & Miller (2014, p. 632). The authors indicate that effective teacher PD "involves learning opportunities over an extended period of time; engages teachers in deepening and extending skills; challenges teachers' assumptions about learning; involves teachers in talking with one another; has administrative support."

The strategies in the framework were divided into 12 weeks, which aimed to provide pre-service teachers with the co-learning process to blend theory and practice: (1) needs analysis; (2) raising awareness on the 4Cs (3) expand knowledge of the 4Cs; (4) expand teaching skills of the 4Cs; (5) review and reflect on teaching; (6) get feedback from experts; (7) observe best practices; (8) collaborate with other teachers; (9) arrange for peer observation; (10) document the teaching; (11) develop assessment tools; (12) plan future experiences with the 4Cs. It is important that the teacher educator act as a facilitator coaching pre-service teachers to make decisions about their own PD (Richards, 2015). The centre of the framework was giving critical feedback on lesson plans observing and coaching them to improve their pedagogic practice on the 4Cs.

The purpose of the developmental stages was to engage pre-service teachers in learning experiences designed to expand their understanding of the 4Cs, pedagogical tools, and assessment necessary to successfully teach the integration of these skills into their actual teaching. The activities consisted of lectures, learning activities, developing/refining lesson plans, teaching experiences, reflections, and discussions. They, then, engaged in learning activities that were designed for them to apply their understanding of the 4Cs to authentic tasks (Collins, 2006).

A wide range of instruments was used to assess the pre-service teachers' performances during their practicum. The instruments are open-ended questions, performance assessment tasks, interviews, peer evaluation rubrics, and observation checklists:

Self-Evaluation: Pre-service teachers were asked to reflect on their progress and their strengths and weaknesses in embedding the 4Cs into their teaching.

Open-ended questions: Pre-service teachers were asked to write their perceptions on 21st-century learning and the 4Cs.

Performance Assessments: Performance assessments were administered when they were asked to develop lesson plans and to respond to a teaching scenario that involves the implementation of 4Cs skills.

Semi-structured interviews: Pre-service teachers were interviewed about the advantages/disadvantages of the tasks they were undertaking and the PD events they attended.

Observations: They were conducted to directly observe pre-service teachers' performance of using the 4Cs at a given time point and to track the development of them over time. They were conducted both in classrooms and during the sessions.

Table 3. A 12-Week Professional Development Framework for 4Cs

Week (W)	Procedures	Instruments and Tools Used
W1	Assessing pre-service teachers' current understanding and comfort with 4Cs.	Questionnaire with close- and open-ended questions
W1	Introductory meeting, explanation on the planned Research and the Presentation of concepts of 4Cs (Concept Training)	Lecture supported with Multimedia
W2	Class discussion of 4Cs	Observation
W2	Individual interviews on 4Cs	Semi-structured interviews
W3	Readings on 4Cs Inquiry based learning	Informal interviews
	Focus group discussions on the 4Cs presented in the first week and the interview questions. Development is more effective if the participants having similar aims to participate collectively	Observation
W3	Analyzing Progress in order to identify growth and pinpoint where additional development and training will be needed. Providing good examples of the integration frameworks of the 4Cs	Open-Ended Questions
W4	Development Projects: Developing Lesson plans for the application of the 4Cs. Self-directed, inquiry-based learning.	Checklist
W5	Feedback on Lesson Plans: Feedback for individual as well as for program	Semi-structured interviews
W6	Free Week They need time to develop, absorb, discuss, and practice new knowledge	--------
W7	Macro Teaching I	Observation
W7	Feedback on Macro teaching	Checklist, peer evaluation

W8	Revising Lesson Plans	Lesson plans Observation forms of macro teachings
W8	Teaching practice I	Classroom observation: Mandatory for pre-service teachers undergoing the scientific-pedagogical evaluation.
W9	Monitoring: technical and pedagogical support in many different ways. Supporting the development of some activities in lesson plans due to the doubts and difficulties that persisted in exploring and complementing 4Cs features with other tools. Feedback session on teaching practice and focus group discussions to supporting pre-service teachers with all the specific and necessary help for the effective integration of 4Cs	Lesson plans and individual interviews to trigger critical reflection on the implementation process
W9	Monitoring: Feedback on pre-service teachers' impact on student learning. The perceptions of pre-service teachers were important to proceed with adjustments. They were advised to attend a workshop conducted in an international conference (CUELT Conference) which would contribute to their PD development	Semi-structured interviews Self-evaluation of performance and progress
W10	Teaching Practice II	Classroom observation: Mandatory for pre-service teachers undergoing the scientific-pedagogical evaluation.
W10	Appraisal meetings	Classroom observation: Using Rating Scale and Rubric to assess pre-service teachers' skills, knowledge and attitudes towards 4Cs Post-observation meeting: to provide opportunities for reflection and collaboration to promote growth and improvement

W11	Assessment: Formative assessment aimed	Peer evaluation: implemented via the completion of a Rubric which makes explicit the teacher's implementation of 4Cs contribution to the achievement of the objectives, particularly those regarding the improvement of the students learning outcomes
	at obtaining feedback from pre-service teachers and become aware of their needs and expectations	
	at monitoring training progress and verifying that pre-service teachers are in the tendency of using 4Cs.	
W12	Assessment: Feedback collected from pre-service teachers	Semi-structured interview based on four dimensions:
		(1) the relationship between the training process and teaching practices,
		(2) perceptions about the importance of integrating 4Cs in their teaching practices,
		(3) the way 4Cs was integrated in the teaching practices and its implications,
		(4) main constraints/difficulties
		and the positive conditions that facilitated the integration of 4Cs in the teaching practices.
		Periodically obtained from the answers to specific
		questions about the instructional practices of the 4Cs

5. Discussions and Conclusions

The PD framework targets pre-service ELT teachers, but it can also be used by all pre and in-service K12 content area teachers. It was designed as a PD opportunity to enhance teachers' knowledge and skills to integrate the 4Cs into their classroom instruction. The framework has blended a variety of teacher education models as opposed to using a single model such as top-down and bottom-up models (Richards, 2015). It intended to encourage pre-service teachers to be active rather than passive, which enables them to clarify, question, consolidate, and appropriate new knowledge.

In addition, the study aimed at enabling pre-service teachers to use research and theory to understand, improve and implement the 4Cs. A joint intention was to create a framework which could pave the way to PD of pre-service teachers on 21st-century learning and skills. It has similar intentions of the studies combining teacher education with forms of action research. The professional development framework developed in this study is social constructivist in design and includes a combination of theory and practice, hence the framework corroborates that teacher education based upon academic-oriented programs can simultaneously lead to professional practice. The 12 week-framework, though not a magical cure for all 21st-century education, can be a powerful tool supporting the transformation from 20th-century education to a very uncertain 21st century.

Several conclusions can be drawn from the data collected before, during and after the development process of the framework. In the initial stage, almost all of the pre-service teachers indicated that the Ministry of National Education (MoNE) was not doing well in its plans to integrate the 4Cs into curriculum or teaching. However, in the during stage of their practicum, the majority of the pre-service teachers commonly talked about how they changed their views and increased their interest on 4Cs;

"I thought 21st-century learning is integrating technology into teaching, but it is more than this"

"In order to teach well, we should learn the 4Cs well and how to integrate them into our teaching."

"I realized that the 4Cs plays a vital role in perceiving the world as a teacher I will change my students' vision."

"I read more about 21st century skills, 4Cs in particular."

The data obtained after the final stage of the framework development revealed that the PD framework gave a positive impact for the PD though some aspects in the program need to be improved in the future. The majority of participants viewed that weekly assignments such as readings on 4Cs, developing lesson plans, feedback on these assignments and field teaching practice to practice the 4Cs were helpful in preparing them to improve their instructional method of teaching.

"The processes in the framework helped me to become more aware of what stages I should go through to integrate for 4Cs in my teaching.

"The activities in the framework raised my awareness on becoming an innovative teacher."

"It has become a must for me to integrate the 4Cs into my teaching."

"I am now more determined, self-confident, and innovative to develop my lesson plan for 4Cs."

The most important weakness in the development stages of the framework stated by the participants is the supervision of teaching experience since they were given supervision only two times during their practicum. Darling-Hammond (2006) suggests that pre-service teachers be guided so that they can integrate their knowledge and skills into various educational contexts to provide their students with learning opportunities.

This study was carried out with one cohort of pre-service teachers within a single educational setting; hence the findings and the framework development process should be interpreted cautiously. We can interpret that the better prepared pre-service teachers during their university education and teacher practice on 21st-century learning, the more likely they will integrate them into their instruction. The challenge is the prerequisites of 21st-century

education, reviewing and revising curriculum, and ensuring teaching candidates are prepared to teach the 4Cs. Pre-service teachers were holding the idea that the National Education Curriculum did not go beyond providing content knowledge and preparing teachers to integrate the 4Cs into their content area. They also did not believe that the National Education Curriculum did not align instruction standards with those that embody 21st learning. However, professional development activities must be challenging to prepare pre-service teachers to adapt to the uncertain future since pre-service teachers cannot develop 4Cs if the education is merely grounded on their existing knowledge and skills. Therefore, it is extremely important that they develop such professional abilities as to become aware of and implement the 4Cs in their subject teaching. Barnett (2004) states that "there is always an epistemological gap between what is known and the exigencies of the moment… there can be no assurance that skills-even generic skills-appropriate to situations of the past or even the present will help one to engage with the future world in a meaningful way" (p. 259).

In addition, the current pre-service teachers must develop their own 4Cs in order to transfer these skills to their student to meet the needs of the 21 requirements. Urbani et al. (2017) suggest that the process of 4Cs development can be achieved if it is grounded on Collins' cognitive apprenticeship theory (2006) since it "focuses on teaching methods that include modeling, coaching, scaffolding, articulation, reflection, and exploration and is therefore applicable to teacher education" (p. 47). Professional development of pre-service teachers should be an education for an unknown future; hence we cannot depend on any existing knowledge and skills for developing student teachers and learners for it. Thus, 21st-century teacher education curricula must include future challenges and uncertainty that student teachers can face. Dede (2007) claims "guided inquiry, collaborative learning, mentoring, and apprenticeships to be more effective pedagogical strategies" (p. 17).

Today's classrooms are equipped with smart boards and Web 2.0 tools have become prominent since some are used freely to download and upload information. The Ministry of National Education in Turkey weighed in on the importance of including technology within the curriculum to meet the needs of 21st-century learners. In the ELT curriculum, the course, Educational Technologies and Materials Development, is tailored to equip student teachers with adequate technology literacy and classroom applications. However, equipping the classrooms with technology does not necessarily mean that teachers can use them effectively. Sutton (2011) suggests that "preservice teacher's technology training experience should remain useful and relevant once they are placed in their own classroom" (p. 39).

Follow-up action research studies with the preservice teachers in this study who will be teaching at different levels would help them to increase their knowledge on the 4Cs and integrate them into their instruction. This follow-up study could also examine the extent to which teachers and their students are meeting current expectations for 21st-century learning. In addition, further contextualized, longitudinal research should be carried out to understand whether the framework could be implemented in analogous pre-service teacher education settings around the world. This research should also investigate the views of university supervisors, mentor teachers at schools and the school students in different levels since the data obtained from these stakeholders can play a role in reviewing and reconstructing the framework.

Acknowledgement

References

Ananiadou, K., & Claro, M. (2009). 21st century skills and competences for new millennium learners in OECD countries. *OECD Education Working Papers*, No. 41, Paris, France: OECD Publishing.

Atmaca, Ç. (2017). English teachers' perspectives about teacher competencies in terms of professional identity. *Abant İzzet Baysal Üniversitesi Eğitim Fakültesi Dergisi*, *17*(4), 1641-1669.

Ball, D. L., Thames, M. H., & Phelps, G. (2008). Content knowledge for teaching: What makes it special? *Journal of Teacher Education*, 59, 389.

Barnett, R. (2004). Learning for an unknown future. *Higher Education Research & Development*, *23*(3), 247-260.

Binkley, M., Erstad, O., Herman, J., Raizen, S., Ripley, M., Miller-Ricci, M., Rumble, M. (2012). Defining twenty first learning skills. In Griffin, P., Mc Gaw, B., Care,E. (Eds.) *Assessment and teaching of 21st century skills* (pp. 17–66). Dordrecht:Springer.

Borg, S. (ed.) (2006a). *Classroom research in ELT in Oman*. Ministry of Education, Sultanate of Oman.

Collins, A. (2006). Cognitive apprenticeship. In R. K. Sawyer (Ed.), *The Cambridge handbook of the learning sciences* (pp. 47–60). Cambridge, UK: Cambridge University Press.

CoHE. (2018). *Öğretmen Yetiştirme Lisans Programları.* Retrieved from http://www.yok.gov.tr/documents/10279/41805112/AA_Sunus_+Onsoz_Uygulama_Yonergesi.pdf on December 16, 2018.

Crandall, J. & Finn Miller, S. (2014). Effective professional development for language teachers. In M. Celce-Murcia, D. M. Brinton, & M. A. Snow (Eds.). *Teaching English as a second or foreign languag*e (4th ed., pp. 630-648). Boston, MA: National Geographic Learning/Cengage Learning.

Creswell, J. W., & Plano Clark, V. L. (2011). *Designing and conducting mixed methods research* (2nd ed.). Thousand Oaks, CA: Sage

Dean, C.B., Hubbell, E.R., Pitler, H., & Stone, B. (2012). *Classroom instruction that works*. Alexandria: ASCD.

Darling-Hammond, L. (2006). Constructing 21st-century teacher education. *Journal of Teacher Education*, 57, 300–314. doi:10.1177/0022487105285962

Dede, C. (2007). *Transforming education for the 21st century: New pedagogies that help all students attain sophisticated learning outcomes.* Raleigh, NC: U.S. NCSU Friday Institute. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.603.6611&rep=rep1&type=pdf on January 16, 2019.

ELT Curriculum (2017). MEB, TTKB, 2017, Retrieved from http://mufredat.meb.gov.tr/ on 27-04-2018.

Freeman, D. (2001). Second language teacher education. In R. Carter & D. Nunan (Eds.*). The Cambridge guide to teaching English to speakers of other languages*. (pp. 72-79). Cambridge: Cambridge University Press.

Gordon, J., Halsz, G., Krawczyk, M., Leney, T., Michel, A., Pepper, D., Putkiewicz, E.,and Wisniewski, W. (2009). *Key competences in Europe. Opening doors for lifelong learner*

across the school curriculum and teacher education (Warsaw, Center forSocial and Economic Research on behalf of CASE Network). Retrieved from https://www.econstor.eu/bitstream/10419/87621/1/613705459.pdf on November 30, 2018.

Kereluik, K., Mishra, P., Fahnoe, C., & Terry, L. (2013). What knowledge is of most worth: Teacher knowledge for 21st century learning. *Journal of Digital Learning in Teacher Education, 29*(4), 127–140.

Kızılaslan, I. (2011). ELT student teachers' competence for teaching language skills: A qualitative exploration. *International Journal of Social Sciences and Humanity Studies*, *3*(1).

Kozma, R. B. (ed.) (2003). *Technology, innovation and educational change: A global perspective.* U.S.A: ISTE.

Kök, M., Çiftçi, M. and Ayık, A. (2011), Öğretmenlik mesleği özel alan yeterliklerine ilişkin bir inceleme, *Atatürk Üniversitesi Sosyal Bilimler Enstitü Dergisi*, *15*(1), p. 169-183.

Law, N., Pelgrum, W. J. and Plomp, T. (2008). *Pedagogy and ICT use in schools around the world. Findings from the IEA SITES 2006 study*. Hong Kong: Springer.

Michaels, R., Roshandel, S., Truesdell, E., & Urbani, J. M. (2015, June). Developing and assessing 21st-century skills across teacher education programs. *California Council on Teacher Education Newsletter*, pp. 36–37

OECD (2013a). *PISA 2012 Results: What Makes Schools Successful (Volume IV): Resources, Policies and Practices, PISA*. OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264201156-en.

OECD (2018). *The future of education and skills Education 2030*. Retrieved from https://www.oecd.org/education/2030/E2030%20Position%20Paper%20(05.04.2018).df on December 20, 2018

Partnership for 21st Century Skills. (2008b). *21st century skills, education, & competitiveness: A resource & policy guide.* Retrieved from http://www.p21.org/storage/documents/21st_century_skills_education_and_competitiveness_guide.pdf on December12, 2018

Reeves, D. B. (2004). *Accountability for learning: How teachers and school leaders can take Charge.* Alexandria, VA: Association for Supervision and Curriculum Development.

Richards, J. C. (2015). *Key issues in language teaching*. New York, NY: Cambridge University Press.

Seferoğlu, G. (2007). Teacher candidates" reflections on some components of a pre-service English teacher education programme in Turkey. *Journal of Education for Teaching, 32*(4), 369-378.

Spencer, H. (1884). *What knowledge is of most worth*. New York, NY: John B. Alden.

Sprott, R., A. (2019). Factors that foster and deter advanced teachers' professional development. *Teaching and Teacher Education*, 77, 321-331.

Sutton, S.R. (2011). The Preservice technology training experiences of novice teachers. *Journal of Digital Learning in technology Education*, *28*(1), 39-47.

Urbani, J., Roshandel, S., Michaels, R., and Truesdell, E. (2017). *Developing and modeling*

21st-century skills with preservice teachers (2017). Retrieved from https://scholar.dominican.edu/all-faculty/303 on December 26, 2018.

Voogt, J., & Roblin, N. P. (2012). A comparative analysis of international frameworks for 21st century competences: Implications for national curriculum policies. *Journal of Curriculum Studies*, *44*(3), 299–321.

Appendix 1

Key questions for semi-structured interviews

(1) How important do you think the 4Cs in education?
(2) What supports do teachers need to ingrate the 4Cs into language teaching?
(3) What is the difference between working in cooperation and in collaboration?
(4) Who is an effective communicator?
(5) What do you understand from Professional Development?
(6) What worked well and what did not work well in your lesson plan?
(7) What do you plan to change in your next lesson plan and classrooms teaching?
(8) How did you complete your assignments in this course?
(9) Have you had any difficulties when completing the assignments?
(10) How did you overcome these difficulties?