

**Proceedings of  
2019 8th International Conference on  
Educational and Information Technology**

**ICEIT 2019**

**March 2-4, 2019**

**Cambridge, UK**

**ISBN: 978-1-4503-6267-2**

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# Technology Based Activities to Develop 21<sup>st</sup> Century Skills in the Foreign Language Classroom

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## ABSTRACT

In this paper, I explore the ways to develop 4 C's skills: communication, collaboration, critical thinking and creativity. They are regarded as the core 21<sup>st</sup> century skills. However, they are still understated and implicitly present as educational strategies in the syllabi for foreign language courses in the Republic of Belarus. Therefore the instruments for their development need to be explored. This requirement could affect the efficiency of the development of communication, collaboration, critical thinking and creativity skills. Bearing it in mind, the present study proposes oral and written speech activities that help to achieve this goal in the foreign language classroom. The activities are designed for per-intermediate, intermediate and advanced levels of English and are technology based. In the era of Web 2.0, both teachers and students are immersed in various web tools. That is why it is illustrated how to carry out the application of technology: YouTube, Google Forms / Slides / Docs, Meeting Words, Coogole, Kahoot, Padlet, Video Notes, Vizia and Edmodo. Pilot study results revealed that the suggested exercises are effective for the development of 4 C's skills.

## CCS Concepts

•Social and professional topics → Professional topics  
•Computing education → K-12 education.

## Keywords

Technology based activity; web tool; 21<sup>st</sup> century skills.

## 1. INTRODUCTION

Setting objectives and choosing effective ways to meet them have always been a challenge in language education. Due to the information technology, the 21<sup>st</sup> century requires neither memorization of lexis and grammar structures by monotonous drilling, nor oral and written reproduction of topics in the foreign

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ICEIT 2019, March 2–4, 2019, Cambridge, United Kingdom

© 2019 Association for Computing Machinery.

ACM ISBN 978-1-4503-6267-2/19/03...\$15.00

<http://doi.org/10.1145/3318396.3318404>

language classroom. Instead, quite specific skills should be developed. So, the dot.com generation could be successful in future jobs, social activities and everyday life. Thus, the outcome of their education is seen as 4 C's competences or skills: communication, collaboration, critical thinking and creativity [1].

Despite substantial research which describes the ways to develop each skill, it remains unclear what criteria to use to design and assess the activities that are aimed at the development of 4 C's skills as a whole integrative unit. Additionally, the attempts of scholars and practitioners to tell about the benefits of numerous information technologies in the foreign language class sometimes create a mosaic picture of their use in the development of the above skills. Consequently, these factors need to be examined in more detail. The analysis of the syllabi for foreign language courses for schools and universities in Belarus reveals that 4 C's skills are understated and are implicitly presented as educational strategies [2]. Moreover, the instruments – activities and web tools that are necessary to develop these skills – remain unspecified. These are the main reasons to do this research.

Research questions include: What are the criteria to design and assess an activity that is aimed at the development of 21<sup>st</sup> century skills? What web tools are applicable to develop communication, collaboration, critical thinking and creativity skills? What activities are effective to develop these skills?

On the whole, the present study contributes to a better understanding of the nature of 21<sup>st</sup> century skills – communication, collaboration, critical thinking and creativity, – and elaborates on the criteria to design technology based activities that serve for these skills development in the foreign language classroom.

## 2. RESEARCH METHODOLOGY AND STUDY LIMITATIONS

The present mixed method of research will be aimed at the elaboration of technology based activities to develop 21<sup>st</sup> century skills in the foreign language classroom. The study will be based on the theories of interpersonal communication, cooperative learning and creativity, critical thinking theory and the principles of a technology supported learning environment.

The multistage evaluation design will be used in the study. According to Creswell, it is a type of design which includes the phases of needs assessment, conceptualization, design of an instrument, test of the final product and its evaluation [3]. In this study, an analysis of the nature of 21<sup>st</sup> century skills will allow to single out criteria which are necessary to design and assess activities aimed at the development of 4 C's skills in the foreign

language classroom. Using the obtained criteria, oral and written speech activities as instruments to develop such skills will be suggested. After approbation of these activities in educational institutions across the country, a survey of English teachers involved in the pilot study will be done. The survey will help to evaluate the approbated exercises closed (ranking) and open ended questions via Google Forms. The reasons for collecting quantitative and qualitative data are to explore the strengths and shortcomings of the activities from different perspectives, identify the characteristics of the least effective activities, and, presumably, find the ways of their modification in order to meet the specific didactic conditions.

The questions that teachers will be invited to answer:

1. Your name and surname, school / college / gymnasium / university, and its location.
2. What activity was approbated?
3. How many students were involved in the activity?
4. To what extent did the activity help to develop communicative skills? (Rank from 1 to 5.)
5. To what extent did the activity help to develop collaborative skills? (Rank from 1 to 5.)
6. To what extent did the activity help to develop critical thinking skills? (Rank from 1 to 5.)
7. To what extent did the activity help to develop creativity? (Rank from 1 to 5.)
8. What barriers did the learners or the teacher face when doing exercises, if any?
9. What would you change in the activity, if anything?
10. Suggest a better activity instead, if you think it should be changed.

The results of the study rely on the in-depth analysis of the data elicited from the survey. In total, there were five respondents – school and university teachers of English, the number of learners was 85.

There were numerous limitations of our study. Some were limitations of resources and time. The study was limited in the quantity of foreign language teachers and English learners whom I could involve in the pilot study: many teachers have poor understanding of how web tools could be implemented in the classroom activities and the students need more developed IT competence – these are some of the reasons why many teachers started action research (13) but did not complete it (8). Also, the research was limited in the number of technology based activities to teach 4 C's skills because of the curriculum demands. Another limitation was that not everybody in the class had a similar level of English to fully understand the task. In addition, the approbation was not yet possible in traditional classrooms where PC's and smart phones were not available for every student.

### 3. BACKGROUND OF THE RESEARCH

#### 3.1 Definition of 21<sup>st</sup> Century Skills

The term “21<sup>st</sup> century skills” refers to a growing global movement for redefining the goals of education to meet the demands of the new epoch. Traditionally, the four language skills were seen as a goal in the foreign language classroom: reading, writing, listening, and speaking [4]. Nowadays, these skills remain as the core objectives, but no longer are considered the final outcomes in foreign language education. Instead, 4 C's skills – communication, collaboration, critical thinking, and creativity – receive their priority as the core 21<sup>st</sup> century skills [5].

Communication means the ability to convey and receive messages based on the three modes of communication; interpersonal, or two-way interaction with someone else; interpretive, the ability to understand and interpret a one-way aural or written text; and presentational, the ability to present information in either a written or oral format. These modes reflect how people communicate in real life [5]. Passov argues that communication in language education is achieved by means of modeling real life situations and using speech-and-thought activities which are focused on the communicative purpose [6].

Collaboration is defined as “the activity of working together to create or achieve the same thing, or a product of this” [7]. In education, collaboration implies interaction among individuals to produce a product and involves negotiations, discussions and accommodating others' perspectives [8]. According to Smith and MacGregor, collaboration results in deeper information processing [9]. While working together, students build new understanding by challenging others' ideas and defending their own. An indispensable element to collaboration is that all those involved in a collaborative task must contribute more or less equally [10].

Critical thinking requires independence in thought. It implies the development of high order thinking skills, such as analyzing, evaluating and creating [11]. Additionally, critical thinking requires students' reflection on their work. For this reason the teacher can provide guidelines for the standards the learners are to focus on [12].

Robinson states that creativity is a process of having original ideas that have value [13]. He stands on the point that creativity is now as important as literacy. It presupposes generating something inventive. In foreign language education, creativity means novelty not only in form, but mainly the content of student's speech. Creativity rests on the principles of using heuristics, constraints, random, association, divergent thinking and withholding information [14].

#### 3.2 Criteria to Design and Assess an Activity

On the basis of the highlighted characteristics of communication, collaboration, critical thinking and creativity, I suggest the main criteria that can help foreign language teacher to design and assess an activity for the development of 4 C's skills.

Communicative purpose, real life situation and interaction of students are markers of communication. Collaboration results in equal participation of students, their turn taking and negotiation of ideas. Critical thinking presupposes independent and reflective thinking and, also, high order thinking skills development. Creativity is reflected in originality of the content or both the content and form of speech (Table 1).

Table 1. Criteria to design and assess an activity

Skill	Criterion
Communication	Communicative purpose, real life situation, interaction
Collaboration	Equal participation, turn taking, negotiation
Critical thinking	Independent thinking, high order thinking skills development, reflective thinking
Creativity	Originality of the content / content and form

### 3.3 Technology to Develop 4 C's Skills

In this study, a web application supported learning environment was proposed to develop 21<sup>st</sup> century skills [15]. The analysis of technology that is widely used in foreign language education allows us to select the internet resources and tools which are helpful to teach communication, collaboration, critical thinking and creativity skills. This list can be presented but not limited to: (1) YouTube; (2) Video Notes; (3) Vizia; (4) Google Docs; (5) Meeting Words; (6) Coogle; (7) Google Slides; (8) Google Forms; (9) Kahoot; (10) Padlet and (11) Edmodo. All of them have been developed for free and open use, provide friendly user interfaces and powerful functions, and were well-received by teachers and students.

YouTube (<https://www.youtube.com/>) is a vast resource of authentic and educational videos which foreign language teacher is free to use on any conversational topic in accordance with the lesson objectives. Two web applications are of great value whenever the video serves as a source to provide instruction in and out of the class: Video Notes (<http://www.videonot.es/>) and Vizia (<https://vizia.co/>).

Video Notes makes it easy to make notes when watching and listening to the text: it is possible to stop the video, write down a question or remark, and later on reproduce exactly the same sequence which one needs.

Vizia is another tool to combine with YouTube materials: the teacher utilizes the application to type and insert his / her questions on the content of the video in the appropriate places.

Google applications are available for those users who created accounts; its options – documents, forms and slides – are effective tools to develop 21<sup>st</sup> century skills. Google Docs facilitate participants' interaction allowing students and the instructor to create a team innovative product. The remarkable feature of Google Slides consists in giving differentiated instruction: the groups of learners receive the tasks of the appropriate level of complexity, which are presented in different slides. Google Forms provide an online questionnaire service; the tool is helpful to make a poll and get statistics that later are used in class discussions. For the same reason, Kahoot (<https://kahoot.com/>) also has a practical value.

Meeting Words (<http://meetingwords.com/>) is a web tool that helps to create a collaborative text with a little bit fewer technical functions in comparison with Google Docs; though, it allows every student to choose a colour to print in and therefore be easily identified among other writers. Another web tool that is particularly beneficial for a collaborative visual project is Coggle ([www.coggle.it](http://www.coggle.it)): it serves to create collaborative mind maps which are examples of collective creativity.

Padlet (<https://padlet.com/>) is an e-wall to share students' projects and opinions, post them in one place for further discussions.

An exceptional place in this list of suggested technology is given to Edmodo ([www.edmodo.com](http://www.edmodo.com)), an educational platform that allows the teacher to make a poll, a quiz or set up problem situations for discussion, etc.

The highlighted features of the selected technology resources and applications are kept in mind when designing speech activities to satisfy the learners' needs in the 21<sup>st</sup> century. The suggested methodological instrument makes it possible to set up the tasks according to different levels of English.

## 4. RESULTS OF RESEARCH

### 4.1 Technology Based Activities

As far as in face-to-face and through media conversations people are involved in receptive and productive speech, it is logical to suggest activities to practise oral (listening and speaking) and written (reading and writing) speech in the foreign language classroom. The examples below are designed for pre-intermediate, intermediate and advanced levels of English.

Each activity is followed by a reflective stage where students are recommended to write a cinquain about the topic of the lesson: this task contributes to the development of critical thinking skills. E. g., "Sightseeing", "Technology", "Pollution", "Bear / Masha", "Fisherman" and "Advice". Alternatively, writing a "diamond poem" can be organized. Also, a reflective exercise is helpful in the stage of presentation: while watching the video students fill in the table noting "what I know", "what is new", "what I thought differently" and "what I don't understand".

### 4.2 Technology Based Oral Speech Activities

#### 4.2.1 Pre-Intermediate Level Oral Speech Activity

*Preparation:* The teacher inserts questions into the video guide from the YouTube channel [16] by means of Vizia. E.g., "How is this sight called?", "How far can you see from the London Eye?" Also, the teacher prepares a list of reasons for and against visiting the London Eye which is used when necessary (e. g., interesting / scaring).

*Situation:* You came to London to study English and have to choose a tourist attraction to visit in a limited time. One of the choices is the London Eye.

*Task and procedure:* Watch the video guide about the London Eye. While watching it, answer the teacher's questions on the video.

Choose one of two groups (Group A: I want to visit the London Eye. Vs. Group B: I don't want to visit the London Eye) and suggest the reasons for your choice. In the discussion circle, evaluate the pros and cons, and come to an agreement. Keep in mind that each voice is valid.

*Analysis:* There is the communicative purpose (watch the video and answer the teacher's questions, suggest the reasons), the situation (English school in London), interaction (discuss in groups) in the activity. Also, the activity requires equal participation (each voice is valid), turn taking (for and against), negotiation (come to an agreement). Additionally, it stimulates independent thinking (choose one of the groups), high order thinking skills development (evaluate pros and cons). At last, originality of the content is expected (think of the reasons for your choice). So, the activity is aimed at the development of 4 C's skills.

#### 4.2.2 Intermediate Level Oral Speech Activity

*Preparation:* The teacher uses Google Slides to set up differentiated tasks to three groups of students in accordance with their learning needs.

Slide 1: the video for everyone to watch and make notes [17].

Slide 2: task to group A (Answer the questions – How many pieces of technology do you own? What are your favorite electronic devices? Do you think you could live without them? Why?).

Slide 3: task to group B (Answer the questions – What inventions influenced on technology most? What inventions promote technology in the 21<sup>st</sup> century?).

Slide 4: task to group C (Make your own video about technology for the dot.com generation).

*Situation:* Via Skype, you participate in the international on-line conference about the role of technology in people's lives.

*Task and procedure:* Watch the video about the effects of modern technology in Slide 1, make notes when necessary via Video Notes.

Thereupon, in groups A, B or C prepare your speeches for the on-line conference (the criteria: novelty of the content, logical structure, form of presentation). Group A is to do the task in slide 2; group B – in slide 3; group C – in slide 4. The rules for team work include equal participation, turn taking and negotiation. Then present your speech in class.

*Analysis:* This activity's communicative purpose is to watch the video, answer the teacher's questions and speak to the public; the situation is an on-line conference; the interaction takes place in groups A, B and C. The activity is collaborative (equal participation, turn taking and negotiation are requested). Besides, the activity develops independent thinking (answer problem questions, consider what the dot.com generation needs), high order thinking skills development (make your own video about technology). At last, as far as students do problem tasks the content is original. Thus, the activity can be used to develop communication, collaboration, critical thinking, and creativity skills in the foreign language classroom.

#### 4.2.3 Advanced Level Oral Speech Activity

*Preparation:* As examples, the teacher prepares problem questions on the video [18] and possible solutions to the problems which are caused by plastic bottles.

*Situation:* You want to participate in the international contest of youth innovations in social life. You choose the topic "What to do with plastic bottles on the planet?"

*Task and procedure:* Watch the video about plastic bottles, and think of problem questions about plastic bottles lives to discuss in class. While watching the video use Video Notes to write down your question.

In class, discuss the problems of utilizing plastic and brainstorm possible solutions. Use your notes as prompts, when necessary. Get into groups in accordance with your solution, do a project in collaboration (use Google Docs), and share it with others in the above situation.

*Analysis:* The communicative purpose is to brainstorm possible solutions, the situation represents an international contest of youth innovations in social life, the students interact when they discuss the problems of utilizing of the plastic. The activity requires equal participation (do a project in collaboration), turn taking (each solution is shared), negotiation (groups are formed according to the students solutions). Also, the activity needs learners' independent thinking (write down your question), high order thinking skills development (do a project). Besides, originality of the content is reflected (youth innovations in social life). To sum up, the activity can be useful to develop 4 C's skills.

### 4.3 Technology Based Written Speech Activities

#### 4.3.1 Pre-Intermediate Level Written Speech Activity

*Preparation:* The teacher prepares "a coogle" on the fairy-tale "Three bears" with some missing parts or / and contextual errors.

*Situation:* A contest for the best "coogle" designer takes place in your school.

*Task and procedure:* Read the fairy-tale "Three bears". Then in teams correct the mistakes in the "coogle" and create your own piece of art on-line. Everyone is free to add an element to the "coogle". Variation: In teams, draw your "coogle".

In order to participate in the contest for the original "coogle" designer – when everybody agrees on the final "picture" – print your "coogle" and place it on the wall in the classroom. Kahoot is used to vote for one of them in class. The criteria to choose the winner may be: What is the funniest / most creative / most accurate / most detailed / most unexpected / most standard "coogle"?

*Analysis:* The communicative purpose is to read the fairy-tale and encode it in symbols, participation in school contest is a kind of situation, the students interact on-line while correcting mistakes in the "coogle". The activity requires equal participation (everyone is free to add an element to the "coogle"), turn taking (to be the most detailed and accurate), negotiation (everybody agrees). Besides, the activity needs learners' independent thinking (students have a choice to do their own "coogle"), high order thinking skills development (create your piece of art). Finally, the content is expected to be original (the criteria to choose the winner can vary: the funniest, most creative, unexpected, etc. "coogle"). That is why the activity is helpful to develop 21 century skills.

#### 4.3.2 Intermediate Level Written Speech Activity

*Preparation:* The teacher prepares recommendations for a change in the fairy-tale "The fisherman and his wife".

*Situation:* A contest for the best fanfiction takes place in your class.

*Task and procedure:* Reread the fairy-tale "The fisherman and his wife" and decide via Kahoot how you would like to change it (versions: the fisherman's wife is a beautiful kind woman / the fisherman has a daughter / the fisherman has a son). Get into groups and write a fanfic via Meeting Words (Choose a colour that you like to give a noticeable contribution to the whole work). Use the discussion bar to negotiate the plot of your story version: every idea is welcome to discuss. Then, place your fanfic on the Padlet wall. Read all the fairy tales and vote for the most fascinating fanfic (the poll can be done in Google Forms).

*Analysis:* There is the communicative purpose (write a fanfic), the situation (the fairy-tale "The fisherman and his wife"), interaction (use the discussion bar) in the activity. Additionally, the exercise demands equal participation (every idea is welcome to discuss), turn taking (choose a colour to give noticeable contribution), negotiation (change the fairy-tale). It stimulates independent thinking (voting), high order thinking skills development (create the most fascinating fanfic). Moreover, originality of the content is reflected (versions: the fisherman's wife is a beautiful kind woman / the fisherman has a daughter or a son). It results that the activity satisfies the criteria to achieve the goal.

### 4.3.3 Advanced Level Written Speech Activity

*Preparation:* The teacher chooses an article from a newspaper (advice column) on the theme of the lesson / an appropriate post in Facebook that presupposes writing a piece of advice in response.

*Situation:* You work for a newspaper in the UK / US. You are responsible for reading letters to the advice column and respond to them.

*Task and procedure:* Read the letter from the newspaper / e-paper advice column. Think, what the author needs in order to solve the problem and share your suggestion in group. In teams, prepare a draft of your response letter in Google Docs / Meeting Words; choose a colour to contribute equally. After discussions and improvements, post the final letter in Edmodo for evaluation.

Then, read all the advice letters and comment on one of the answers in Edmodo. In teams, take time to do corrections in your letter, when necessary. At last, vote for the most practical advice in the poll section in Edmodo. Compare the results of the poll and write a thank-you note to your mates.

*Analysis:* Firstly, there is the communicative purpose (write a response letter), the situation (work for a newspaper in the UK / US), interaction (team work) in the activity. Secondly, the exercise demands equal participation (to contribute equally), turn taking (share suggestions in your team), negotiation (correct or change). Thirdly, it stimulates independent thinking (think, what the author needs to solve the problem), high order thinking skills development (write a response letter to the newspaper / e-paper advice column, vote, compare the results of the poll, write a thank-you note). Fourthly, it is original in content (the most practical advice). That is why the activity is aimed at the development of 4 C's skills.

## 5. DISCUSSION

### 5.1 Pilot Study in Schools and University

The pilot study was necessary to determine whether the suggested technology based activities were effective in the learning environment. The action research was undertaken in September – October, 2018 in five Belarusian educational institutions in Baranovichi region (Palonka secondary school), Borisov (Secondary school 13), Brest (Secondary school 1), Minsk region (Priluki secondary school) and Mogilev (Mogilev State Kuleshov University). In total, five English teachers and 85 participant students of pre-intermediate, intermediate and advanced levels of English were involved in the research project. The educators' teaching experience was about 10 years. The age of the trainees varied from 10 to 18. When the approbation was done, the teachers analyzed the quality of the suggested activities using the criteria of goal achievement: communication, collaboration, critical thinking and creativity skills development.

Then the survey by means of Google Forms revealed the quality of the suggested technology based activities. The respondents were asked to rank them using the scale from 1 (least effective) to 5 (most effective).

The quantitative analysis of the results showed that the suggested instruments were effective to develop 21<sup>st</sup> century skills. In particular, they are very effective to develop creativity (100% of teachers gave them a "5"). Also, communicative skills can be well developed by means of these exercises (83.3% of the respondents ranked them "5" and 16.7% – "4"). However, the activities

appeared to be less effective to develop collaborative (83.3% – "5" and 16.7% – "3") and critical thinking (66.7% – "5" and 33.3% – "4") skills.

### 5.2 Teachers' Reflection

The survey helped us to find out that while doing exercises, the learners faced the barriers which were connected with insufficient IT competence and lack of access to the net. E. g.:

- the students didn't use Edmodo and Coogole except these English classes;
- children in the village often don't have access to the net at home.

Furthermore, the teachers suggested to change:

- (a) the task – in the written speech activity, intermediate level of English (4.3.2);
- (b) the web tool – in the written speech activity, advanced level of English (4.3.3);
- (c) the situation, the way of collaboration and the level of complexity of cognitive skills – in the oral speech activity, pre-intermediate level of English (4.2.1).

Unfortunately, the English teachers did not write their versions of exercises that they had found less effective. In the future, I suggest to consider the following variations.

As for task 4.3.2 is concerned, it was to write a fanfic of the fairy tale using Meeting Words. To simplify the task, students could continue the story which they read. As an alternative technology, I think Google Docs or One Note could appear more appropriate in different didactic conditions.

Edmodo was the technology that was advised to replace in activity 4.3.3. In this exercise, I recommend to try a more familiar platform with similar functions, such as Google Class. In any case, students and teachers need ICT literacy and experience to utilize such technology in the flipped foreign language classroom.

The least effective activity in the list is 4.2.1 – in oral speech, pre-intermediate level of English. My suggestions for improvements are the following:

- the situation in London can be replaced with another tourist attraction – not the London Eye, but a museum, park, zoo or monument;
- the video can be presented without sound, or a shorter video sequence can be chosen to introduce the situation;
- the way of collaboration may be modified by giving badges to kids for their answers in order to stimulate active participation in the discussion;
- the teacher is free to change the level of complexity of cognitive skills: instead of evaluation, the educator can ask learners to agree or disagree with pros and cons of visiting two sights and then vote for the sight to visit (the list of pros and cons for analysis should be prepared by the teacher in advance).

On the whole, reflecting on the results of research, it is seen that the suggested technology based activities are basically effective and therefore can be organized in different educational institutions to develop 21<sup>st</sup> century skills.

Another benefit of this study consists in teachers' participation in action research, which helped them to develop their own understandings of what they did in the classroom and why; what worked, what did not, and why; how to assess an activity and measure its effectiveness; and what possibilities and alternatives to their current practices were available and appropriate in their particular context [19].

## 6. CONCLUSION

The study proves that it is possible to develop 21<sup>st</sup> century skills in the foreign language classroom by means of the suggested technology based activities. The criteria which help teacher to design and assess such an activity include: communicative purpose, real life situation, interaction (communication skills); equal participation, turn taking, negotiation (collaboration skills); independent thinking, high order thinking skills development, reflective thinking (critical thinking skills) and originality of the content / content and form (creativity).

The study demonstrates that it is reasonable to combine oral and written speech activities with information technology: YouTube, Google Forms / Slides / Docs, Meeting Words, Coogle, Kahoot, Padlet, Video Notes and Vizia. The implementation of Edmodo in the educational process has not received positive feedback from practitioners yet.

However, more studies are needed to explore whether other activities and web applications may be equally efficient in teaching 4 C's skills.

Finally, there was no control group in the present study, so no comparison is given between the experimental and the control groups to see whether by using technology learners of English may become more competent in communication, collaboration, critical thinking and creativity. These are areas of future research.

## 7. ACKNOWLEDGMENTS

The author gratefully acknowledges the support provided by teachers of English who approbated the suggested technology based activities that are aimed at the development of 21<sup>st</sup> century skills:

- Alesya Shevtsova (Mogilev State Kuleshov University, Mogilev);
- Ekaterina Zubarik (Secondary school 1, Brest);
- Helen Yurenia (Palonka secondary school, Baranovich region);
- Iryna Bagovich (Priluki secondary school, Minsk region);
- Tatiana Yakovleva (Secondary school 13, Borisov).

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