

Integrated Art and ESP Project in Ukraine

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Abstract—The article describes an integrated art and English project for specific purposes on the topic “Academic Conferences” used for teaching future Ukrainian engineers in the winter of 2022. The project finished right before the war in Ukraine began. The sample size included 90 third-course future chemical engineers who study English for specific purposes. This study investigated the benefits of the project for future engineers, the role of the art practices used, as well as students’ perceptions of the project. Online questionnaires, observations and interviews were used. The results showed that the project improved students’ confidence in different conference-related skills and had a positive influence on the professional language skills development of future engineers. Art practices used in the project made learning memorable, contextualised and authentic. Art-related activities promoted professional communication and fostered the use of 21st-century skills such as cooperative, creative, critical and digital skills. The main hypothesis was supported and the project was effective due to the combination of project-based learning, art enhancement and integration, and specially chosen job-related art and ESP connections. The findings indicate an overwhelmingly positive response from the learners about this project and their interest in future art and ESP integrated projects. However, the study also revealed that students need additional support for developing cooperative, time management and writing skills as well as for working with authentic materials.

Keywords—English for specific purposes (ESP), art-integrated learning, project-based learning, academic conferences

1 Introduction

A project-based approach was chosen for art and English for Specific Purposes (ESP) integrated learning of Ukrainian engineers. This approach, according to [1], is focused on students and inspires them to delve deeper into concepts and create an end product. According to Cao and her coauthors [2], project-based learning also improves the learning concentration of students. In addition, it promotes a competency-based approach [3] and technology usage in the classrooms.

The hypothesis is that art-related activities in combination with project-based learning can lead to more educational benefits in relation to language and 21st-century skills acquisition. ESP is traditionally considered a non-artistic subject. To change this

traditional perception and provide ESP classrooms in Ukraine with the benefits of art practices, this art and ESP integrated project was introduced in the ESP classroom for future chemical engineers in Ukraine.

At the same time, the idea to combine ESP and art practices is not a new one. Some recent examples include a digital storytelling project which combined writing the script, creating the video, and voice-over recordings [4], a video creation project which involved props, music and humour [5], online role-playing [6], a project where students observed and videotaped real tour-related projects [7], developed a creative textbook design [8], drew a poster, wrote a poem, created a brand and made videos [9]. All these projects enhanced the digital skills of the students. They were created for ESP learners and the authors cited a great number of benefits they noticed during the projects.

Despite the recent boom in publications related to students' active participation in the classroom and the impact that the innovation involves in the learning environment [10], the topic of art-integrated learning for Ukrainian engineers is still not well-tested. At the same time, the necessity of the research is confirmed by the high interest of ESP teachers at the National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic institute" (Igor Sikorsky KPI) in teaching approaches, methods and techniques [11].

The purpose of this article is to develop, describe and test the art and ESP integrated project on the topic of academic conferences.

The main research questions (RG) include

RG 1. What are the benefits of the art integrated project for future engineers?

RG 2. What is the role of the art practices involved and what makes them effective?

RG 3. How do future engineers perceive art integrated learning?

2 Methods

This study was a mixed-methods qualitative and quantitative research conducted in the spring semester of 2022. The first RQ was about the benefits of the art integrated project for future engineers. To answer RQ1, online questionnaires in Google Forms were used by the authors to monitor the pre- and post-project competencies related to the topic of academic conferences. A method of classroom observations was also used to analyse the efficiency of the art integrated project.

To answer RQ2 the authors used literature analysis on curriculum development, developed special tasks with art elements and applied special classroom strategies. Students' answers in the Google form, comments on art submitted on wakelet.com, as well as their homework and classroom work were analysed. Classroom observations and interviews were held to determine the influence of the art integrated project on the development of language skills.

To answer RG 3 students completed a Google form to give feedback on the project. Their ideas about the weaknesses and strengths of the project were analysed. Interviews were used to clarify some answers.

The Ukrainian sample included ninety third-year students who study ESP at Igor Sikorsky KPI. The age diversity included fifty-two 19-year-old students (57.8%), thirty-five 20-year-old students (38.8%), two 21-year-old students (2.2%) and one

23-year-old student (1.1%). All students were future engineers studying at the faculty of chemical technology of Igor Sikorsky KPI.

3 Project description

The topic of the art integrated project was “Academic Conferences.” Students’ participation at real conferences is listed as a common professional situation in the ESP National Curriculum for Universities [12]. The professional situation “Academic Conferences” embraces a wide range of important skills such as event preparation, completing application forms, delivering speeches, participation in a discussion, agenda preparation, taking notes, preparing reports and communicating with the participants [12]. In addition, one of the recommendations resulting from the British Council project “English for Universities” is “specific language support in specific areas of academic work such as preparing conference posters and presentations” [13]. Thus this topic is essential as future engineers need to participate in science communication at conference levels.

The implementation stage of the project involved carrying out learning tasks in order to achieve language and art objectives. Art objectives of the project in a broader sense included the development of creativity, critical thinking, aesthetic sensitivity, cultural awareness, art skills, and lifelong interest in the arts.

This project allowed learners to use different levels of Bloom’s taxonomy such as understanding, applying, analysing, evaluating, and creating. Learners experienced different stages such as observing visual art, thinking about art, evaluating art, imagining their own art object, exploring, recreating, experimenting, deducing, expressing and creating their own art. These stages require actual involvement of cognitive, psychomotor and affective domains which fulfil the pedagogical need for competency-based learning [3].

The project was held remotely during the pandemic wave in 2022 and finished right before the war began in Ukraine. Different stages of the project developed various students’ skills. Eight art-integrated stages of the project as well as the predominant skills each stage emphasised can be seen in Tables 1–2.

The first stage of the project was designed to increase comprehension of the topic of the project by establishing or activating students’ prior knowledge about academic conferences. The teacher used different strategies such as group reflective discussions, presentation instructional strategies, inquiry, presentations, brainstorming, questioning techniques and quizzes. Students exchanged their thoughts, opinions, and feelings during this stage (Table 1). A “Conference Reflection Worksheet” was used to evaluate a real conference visited by students. It included categories of conference assessment such as presentation content, speaking skills, organisation, interaction with the audience, and subcategories. Students ranked each subcategory from 1 to 5 where 5 – fully meets the requirement, 4 – mostly meets, 3 – partially meets, 2 – doesn’t meet, and 1 – requirement is not present. In addition, students gave creative feedback for the conference they visited (Figure 1).



Fig. 1. Student submission example 1

For the second stage, the teacher used such strategies as a structured overview, advanced organisers, concept mapping, comparing, and cooperative learning. This stage included an analysis of conference information sheets by students. According to the career standards of high education in Ukraine, students should be able to search, process and analyse information related to their future vocational occupation as well as be creative within their field of study [14]. Thus this stage included analysis of conference texts and visual representation of them in a structured way (Figure 2).

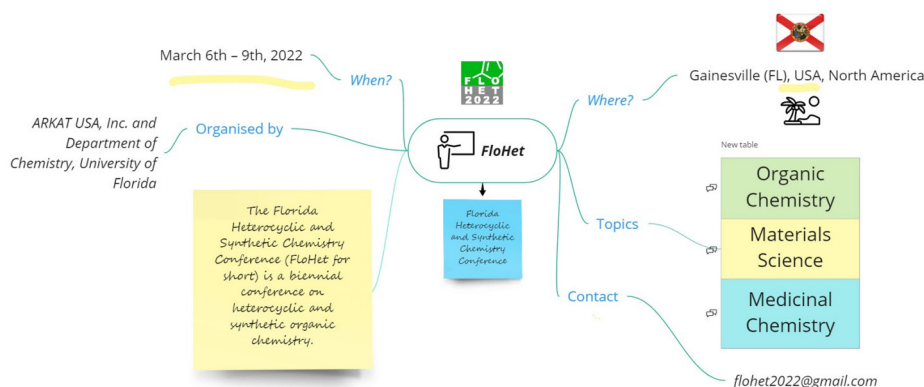


Fig. 2. Student submission example 2

As can be seen from Table 1, the third stage used art enhancement. It embraced problem-solving, discussion, and cooperative learning.

Table 1. Stages 1–4 of the project with the skills and art practices involved

Stages of the Project	Principal Skills	Art Practices
<p>1. a) Doing a specially prepared by the authors Kahoot quiz on general knowledge about academic conferences. Brainstorming on conferences visited earlier, how to assess and choose a conference to visit, and how to connect with people there. b) Choosing and attending a real online academic conference and personally reflecting on the experience using a “Conference Reflection Worksheet.” Sharing experience in the classroom. Giving final creative feedback to the real conference visited.</p>	<p>Overall linguistic skills, Media literacy skills, observation skills, reflection and creative skills</p>	<p>Different art forms such as stickers, images, drawings, and creative texts written or recorded were used to give creative feedback about the conference visited</p>
<p>2. Searching for a conference that corresponded to students’ professional interests. Collecting the content information about the conference. Structuring the information found and highlighting the main aspects of the conference using the power of visual display. Presenting the visual to a group. Answering questions from peers.</p>	<p>Analysis skills, linguistic skills, collaboration skills, digital skills</p>	<p>Creating an infographic, a board on miro.com or a creative map on jamboard.com, choosing the form, combining visual materials.</p>
<p>3. In pairs searching for art objects related to conferences (for example, creative banners, posters, logos, creative titles or other art objects). Exchanging the objects found in wakelet.com. Presenting and describing the objects, answering questions from peers.</p>	<p>Observation skills, web searching skills, critical thinking skills, and overall linguistic skills</p>	<p>Visual or literary art was used as inspiration for discussion</p>
<p>4. Discussing conference preparation (the stages it involves, key elements of event management, conference information dissemination and assuring its high level and quality). Developing the idea of students’ own conference, thinking of the main topics of the event in mini-groups. Creating an attractive conference title, banner and logo in pairs. Adding created objects to wakelet.com and presenting them. Interacting on wakelet.com by writing questions/comments about art objects created and voting for the best art object (title, banner, logo) using the art rubrics adapted from http://rubistar.4teachers.org/.</p>	<p>Analysis skills, writing skills, creativity skills, and cooperation skills</p>	<p>Creating conference art objects such as creative titles, logos, and banners was integrated into the project.</p>

As can be seen from Table 1, the fourth stage was designed to help students understand the process of conference preparation and act as real organisers of their own academic conferences. It involved such strategies as brainstorming, collaborative writing, multimedia production, peer editing and assessment, and presentation of the infographic.

Table 2 shows the subsequent four stages of the project. The fifth stage was technology-driven as each mini-group created its own conference website and included the art objects submitted during the earlier stages of the project. For this stage, team leaders had to delegate tasks and make sure all conference aspects were included on the website. The main strategies for this stage were discussion, cooperative learning, and problem-solving.

The sixth stage (Table 2) involved such strategies as cooperative learning and multimedia production. At this stage, students could choose any form of art to create an eye-catching invitation for their conference.

Table 2. Stages 5–8 of the project with the skills and art practices involved

Stages of the Project	Principal Skills	Art Practices
5. In mini-groups creating a website for the conference using Google sites. Students were required to create a website which included art objects created earlier in the project (logo, creative titles, motto, and banner), a conference information sheet, visitor application form, guidelines for abstracts or video submissions and other important aspects typically found on conference websites. Presenting a website in mini-groups.	Information literacy, cooperation skills, digital literacy, and overall linguistic skills	Creating a website for the conference was integrated.
6. In mini-groups creating an invitation to the conference. Exchanging creative invitations with students from the other groups.	Self-expression, overall linguistic skills, creativity skills	Making creative invitations using any form of art (creative writing, video making, podcasts etc.).
7. Choosing the role for students' own conference (host, head of the organising committee, session chair, social media post writer) and for a peer conference students choose to visit (keynote speaker, active listener, critic). Holding the conference and visiting a peer conference.	Self-expression, public speaking skills, imagination, writing skills, overall linguistic skills, collaboration	Drama and role-playing were integrated.
8. Giving creative feedback for the peer conference visited. Reflecting on both conferences using a "Conference Reflection Worksheet." Reflecting on the project experience.	Overall linguistic skills, observation skills, reflection skills	Any form of art (stickers, cards, drawings, podcasts) was used to give creative feedback on the conference visited

For the seventh stage (Table 2) special role cards with basic role descriptors were used. This stage dealt with the final result of the project, which involved the students holding their own conference and visiting a peer conference of another group. For both events, students acted according to the role they had chosen. The final product of the project was conducted like a real scientific conference where students in both groups met online and performed their roles. This stage offered all advantages of role-playing in educational settings. In the seventh stage, the teacher also applied cooperative learning and inquiry strategies.

As can be seen from Table 2, the final stage of the project involved creative feedback, preparation and reflecting on the art-integrated learning. This stage was essential for the research. From this, students' perceptions of the project were gathered and further analysed. The main strategies used at the final stage were group reflective discussion, brainstorming sessions, presentation instructional strategies, field observation, and inquiry.

4 Results and discussion

Eighty-nine out of ninety students who took part in the project submitted a self-assessment of prior competencies for the real-life professional situation "Conferences." They could rate each competence from 1 (not confident) to 5 (very confident). The same self-assessment was offered after the project to track the influence of the project on the complex conference-related competencies.

The first competence was "I can understand and use the vocabulary of conference texts". The majority of students (88.8%) chose confidence levels from 2 to 4. Confidence level 2 was put by 16 students (18%), 3 by 35 (39.3%), and 4 by 28 students (31.5%). This data lines up with the results of the Kahoot quiz specially developed for the project. Answers for the quiz confirmed a lack of students' understanding of conference-related terms such as plenary session, poster session, keynote speakers, workshop, conference proceedings, call for papers, camera-ready, author guidelines, peer review, predatory conference, and agenda.

Throughout the stages of the project, students practised conference-related vocabulary and the final results of this competence were very different from the prior. Thus, only 3 students indicated they were not confident and chose 1 while the rest chose 3 (10 students – 3.4%), 4 (36 students – 40.4%), and 5 (40 students – 44.9%) for competence "I can understand and use the vocabulary of conference texts" after the project. This data corresponds with the teacher's observations.

Before the project, the majority of students also confirmed the need to improve their competence in scanning conference programs and other conference texts for specific relevant information. Students mostly put 3 – 26 students (29.2%) and 4 – 36 students (40.4%). Only eleven out of 89 respondents (12.4%) were very confident in this area. Similar responses were about skimming conference texts for gist. Students mostly put 3 – 33 students (37.1%) and 4 – 28 students (31.5%). Meanwhile 14 out of 89 respondents (15.7%) were very confident in this. This proved the need to practise skimming and scanning conference texts which were involved, for example, in stages 1b, and 2 of the project. The post-project self-assessment showed an improvement in both competencies. Regarding scanning for relevant information, students mostly put 4 (45 students – 50.6%) and 5 (30 students – 33.7%). There was a rank of 3 chosen by 14 students (15.7%). Similar improved results were submitted after the project about skimming: rank 3 (10 students – 11.2%), 4 (38 students – 42.7%), and 5 (38 students – 42.7%). Only 1 student selected 1 (1.1%) and 2 students chose 2 (2.2%) for the competence to skim conference texts (read to get a general overview).

Before the project, students showed less confidence in writing conference texts (replying to an invitation, filling in the application form, writing conference requirements, composing an agenda, creating ads if necessary etc.). Thus, 28 students (31.5%)

chose 2, an equal number of students ticked 3 (31.5%) and 18 students marked 4 (20.2%). Only 5 students were very confident in writing conference texts – 5.6%. This information helped to design the project and include writing tasks mostly present in stages 5–6 (Table 2). When asked about the same competence after the project, students showed a moderate rise. Ten students put 2 (11.2%), 20 students – 3 (22.5%), 30 students – 4 (33.7%), 29 students – 5 (32.6%). Thus, even after the project, 33.7% of the students still felt a lack of confidence in their writing skills (levels 2 and 3) such as replying to a conference invitation, writing conference requirements, composing agendas, and creating conference ads. This could be a result of the fact that writing conference texts is a complex and time-consuming competence which requires additional support for students.

The next two questions in the Google form were about the competence in conference organisation. Only 14 students were very confident in understanding this process (15.7%) and the majority put 3 – 33 (37.1%) and 4 – 26 students (29.2%). Only 4 students stated that they felt very confident in organising the conference (4.5%) whereas other students' responses ranged from 1 to 4. 22 students (24.7%) put 1, 22 students (24.7%) put 2, 25 students (28.1%) put 3, and 18 students (18%) put 4 when asked about the ability to organise a conference. These results were valuable for the development of stages 3–6 of the project as they were aimed at the improvement of students' organisational and leadership competencies. During a post-self-assessment, most students marked that they understood the process of conference organisation at the level of 3 (16 students – 18%), 4 (26 students – 29.2%) and 5 (47 students – 52.8%) out of 5. A few students were unsure about the competence to organise a conference even after the project and put only 1 (2 students – 2.3%), 2 (3 students – 3.4%), or 3 (3 students – 3.4%). Whereas the majority ticked 4 (47 students – 52.8%) and 5 (26 students – 29.2%) for the competence to organise a conference.

There was also a question about understanding real conferences in English. Most students ranked their competence here as 2 (26 students – 29.2%), 3 (33 students – 37.1%) or 4 (20 students – 22.5%). These results were taken into account and visiting real conferences was included in stages 1 and 7 of the project as a good practice for this competence. After the project students became more confident in this competence. Twenty students put 3 (22.5%), 45 students put 4 (50.6%), and 21 students put 5 (23.6%). However, one student (1.1%) chose only 1 and two students (2.3%) chose only 2. It turned out that the students underestimated their skills in understanding authentic materials. During the interviews, they mostly answered that they understood more than expected; in some cases, the context helped a lot as well as the visuals presenters used at the conferences. Due to the project activities, their confidence in this competence improved and students got used to working with not adapted materials.

The next question dealt with the competence of delivering a speech at the conference. The range of answers included 1 (10 students – 11.2%), 2 (29 students – 32.6%), 3 (29 students – 32.6%), 4 (16 students – 18%), 5 (5 students – 5.6%). The majority of students ranked their competence here as 2 and 3. The teacher's observations aligned with these results and confirmed the need to improve speaking skills on professional topics. For this purpose, students became speakers in stage 7 of the project. According to students' answers after the project their confidence rose and only a few left with a rank of 1 or 2. Most put either 3 (33 students – 37%) or 4 (40 students – 44.9%).

The rest ranked themselves as very confident and put 5 (11 students – 11.2%) for the ability to deliver a speech. Being students of the third course, respondents agreed on the necessity to further improve their professional speaking competencies by mostly indicating confidence levels of 3–4 out of 5.

Another difficulty was asking questions at the conference. Most students were not confident with this competence and put 2 (19 students – 21.3%), 3 (27 students – 30.3%), 4 (27 students – 30.3%). The minority ranked this competence choosing 1 (8–9%) or 5 (8 students – 9%). Asking questions is an important part of interacting with people at a conference. In stages 3, 4, and 7 of the project students improved in this competence. The final post-assessment showed different results for the question with the dominating answers of 3 (16 students – 43.8%), 4 (22 students – 24.7%), and 5 (23 students – 25.8%).

An important skill of the 21st century is teamworking. Some students are less confident with this competence and put 1 (6 students – 6.7%), 2 (12 students – 13.5%), and 3 (29 students – 32.6%), whereas 30 students (33.7%) and 12 students (13.5%) put 4 and 5 respectively. Taking this into account the project had team tasks that developed team cooperation skills. After the project, students revealed more confidence in their ability to work efficiently in a team. Thirty-five respondents (39.3%) marked 3, 33 students put 4 (33.7%), and 17 (19.1%) – 5. The project uncovered a problem with teamwork among group members. The project results confirmed the improvement of cooperation competence with the confidence level of 3–4 as dominating answers. These findings are consistent with similar research in ESP [8]. The Art and ESP integrated project helped students to develop real work skills. Students learned to accept others' ideas, collaborated and created a special atmosphere in their mini-groups that lasted even after the project was finished.

However, the teacher spotted a necessity to improve cooperation skills. In some cases, some team members didn't participate actively enough to achieve team goals. Students were also asked about Internet searching skills when looking for a conference. Most students were not very confident in this competence. 5 students (5.6%) put 1, 16 students (18%) put 2, 22 students (24.7%) put 3, 31 (34.8%) students put 4, and 15 students (16.9%) – 5. After the project, the answers improved. Forty students (44.9%) indicated 4 and 40 students (44.9%) chose 5. The minority put 3 (4 students – 4.5%) and 2 (5 students – 5.6%) when asked about their competence to find a conference that interests them.

Digital skills are now an important part of modern engineering jobs. Thus, one of the questions in the Google form was about using digital tools (jamboard.com, miro.com, Google sites etc.). Only 10 students (11.2%) out of 89 were very confident in using digital tools, 34 students put 4 (38.2%) and other students feel less confident and put 3 (20 students – 22.5%), 2 (18 students – 20.2%), and 1 (7 students – 7.9%). To improve these skills in the project, the mentioned online tools were used to create a conference or supplement students' tasks or speeches. Post-self-assessment revealed a positive tendency in improving digital skills as 5 students (5.6%) put 1, 4 students (4.5%) put 2, 30 students (33.7%) put 3, 25 (28.1%) students put 4, and 25 students (28.1%) – 5.

Research question number 2 (RG2) was created to understand art practices' role. In this project learners went through different stages such as observing visual art, thinking about it, evaluating art, imagining their own art object, exploring,

recreating, experimenting, deducing, expressing and finally creating their own art. We agree with Indian researcher [3] that these stages require actual involvement of cognitive, psychomotor and affective domains which fulfil the pedagogical need of competency-based learning.

A special benefit of the art used in the project was an opportunity for flexible transition to specialised professional content. It is especially relevant when students start learning ESP. As mentioned by Marcu [15] ESP materials should not get too specialised for those students who begin to learn ESP. We agree with Marcu [15] that “the criteria in the selection of teaching materials for English for engineering should not be restrictive and they should function more like a scaffold where the English for engineering instructor can find inspiration and thus generate interesting and motivating materials that produce efficient learning.” Art projects can be a great source of interesting and motivating tasks that can be used for different topics such as introduction to a specialised field, career choice, university campus, communication at scientific conferences, professional teamwork, work-related presentations, job interviews, and mobility programs, online communication and others.

Art and ESP integrated projects allow teachers to utilise different scaffolding strategies such as referencing students’ previous knowledge or skills, utilising structured talking, accessing information any time to revise, and ensuring that students can demonstrate their knowledge in multiple ways. Moreover, the arts make learning content more accessible by ensuring differentiated instruction. Art helps teachers uncover the student’s different intelligences that are sometimes ignored in the traditional curriculum. The arts address different learning styles and techniques. The inclusion of arts in the curriculum assists in meeting the needs of all learners.

Our research findings go in line with the results of Taylor [16] who stated that “arts learning can be effective in teaching core concepts and skills and helping students acquire the 21st-century skills”. It is noteworthy that among the 220 reading standards reviewed, 50 utilised arts-based content as a tool for strengthening analysis and observation skills [17]. Similar results were confirmed by students’ feedback. Students proved that the project stimulated critical thinking, communications skills, creativity, problem-solving, media literacy, collaboration, innovation skills, and digital skills.

Besides providing teachers with multiple ways to engage students across all content areas, an art and ESP integrated project encourages active learning. Project-based learning as an instructional method provides students with complex tasks that involve active students’ work. It drives students to encounter the central concept using inquiry, paying close attention to the essential question and the process surrounding its exploration. The active engagement is based on student grouping, creating original solutions and exploring questions from multiple perspectives. Art and ESP integrated projects stimulate complex learning experiences that call for active processing and personal reflection. As Crawford [18] mentioned using art is an empowering pedagogy as it helps students express personal connections to the content. It is culturally and linguistically responsive, maximising learning while developing student voice and opportunities for leadership for all students.

Art used in the project was not only enhanced but also integrated. This related well to the definition of an arts-integrated curriculum as ‘an elegant fit between the content and an art form’ when standards in both are taught and assessed [19]. The problem with

art and ESP curriculum development is the confusion between arts enhancement and integration. Integration does not mean the usage of art in the service of other content areas. It is important to define if art practices are related to enhancement or integration. “Enhancement is where the arts are simply supporting the content area but are not being assessed and integration is where both the art and the content area have objectives and both are being assessed” [20]. Most ESP teachers who use art elements in their classrooms implement art enhancement without using any art assessment. In this case, art is only used as an engaging element which is also good but it cannot be called a true integration. The challenge is to ensure that the arts are not used only as a tool to focus on other content, but are treated as a major content area that develops curricular identified skills, knowledge, and capacities. This requires teachers to have an understanding of the content and some experience with the pedagogy of the arts.

It is important that art objects created by students in the project were evaluated. It is an essential part of art integration, which differs from art enhancement. For this purpose, templates on art assessment from <http://rubistar.4teachers.org/> were adopted and used for peer assessment in the fourth stage of this project. For example, for the logo competition, the criteria were creativity, design, attention to the topic of the conference, time and effort, titles and text. Students could stick different reaction stickers for each criterion on wakelet.com near the art objects they wanted to vote for. Thus, elements of competition were also included.

Similar to other art-related projects in ESP [4, 6, 9] this project has proven to be successful in improving language acquisition. It is confirmed by students’ answers and the teacher’s observation. An important requirement for language skills development is an individual approach. Students could choose the professional topic for the conference, the role they played at the conference, the type of art object they created and the mini group participants. This ensured that the project and art practices involved supported an individual approach.

The connection of art created with the future job in mind is also essential to develop the English language skills of future engineers. The findings of the research confirm that the development of integrated art and ESP curriculum requires an ESP teacher to work more on finding art and ESP connections that will help students to increase their understanding of job-related concepts and improve language skills while creating or analysing a particular form of art. Thus, an art and ESP integrated curriculum is possible when teachers find good connections between ESP content and an art form and then achievements in both areas are assessed.

The eight stages of the project included enhanced or/and integrated art-related practices. They involved creating conference feedback, invitations, creative titles, logos, banners, and websites. Students were actively involved in art creation. For example, in the images, you can see some of the examples of the art objects created by the students for their conferences and used for assessment, description, and discussions.

These tasks stimulated future engineers to produce new and original job-related work. Most of the art used in the project was created by the students who participated in the project. It was meaningful for them and used for further job-related communication in different forms such as by commenting online or describing or discussing on Zoom. For example, students could comment on the art on wakelet.com, ask and answer questions about it, and vote for the best art according to different criteria.

To answer RG 3, 85 answers were analysed via Google forms. The form was called “Final Feedback about the Art-integrated Project on Scientific conferences.” The majority of students enjoyed the art-integrated project (74 students – 87%). The same number (74 students – 87%) agreed that the project improved their 21st-century skills (for example, cooperation, digital skills, creativity, and critical thinking). When asked about the most favourite stage of the project, students gave a wide range of answers. Some examples include “students’ cooperation,” “when we were involved in chemistry,” “creating the material and working in a team,” “cooperation, creative work with practically no limits,” “creating the website,” and “unusual tasks, we had to come up with something new, creative, learn new information,” “creative approach to tasks and freedom of topic choice,” “the questions and answers part of the conference,” “speakers’ presentations at the conference,” “creating agenda,” and “the conference we organised and held.” It is noteworthy that 10 students mentioned teamwork as their favourite part and 8 students marked the Q and A section which is also related to interaction and cooperation. At the same time, after the project, only 17 students (19.1%) were very confident about working in a team. From this, we can gather that successful teamwork is a very memorable experience for students and special tasks should be developed to teach students cooperation skills.

Students were also asked about the difficulties they had during the project. Here are some of the answers: “Searching for information,” “fast pace of work,” “much work,” “managing work of a team,” “assigning somebody [a peer] the role of a speaker,” “creating logos,” “structuring information,” “working with authentic texts,” “working with the team,” “equally delegating responsibilities,” “lack of time,” “choosing the role for the conference,” “lack of cooperation within the team”. Fifteen students (16.5%) mentioned teamwork as a difficulty.

The fifth stage of the project (Table 2) was challenging for students as it was both cooperative and creative. For some third-year students, it is still difficult to work in a team and show their leadership skills.

The teacher’s observation and interviews also revealed that teamwork still remained a difficult competence for some students. This can also be related to the fact that Ukrainian engineers are used to working independently, although they occasionally receive assignments to work as part of a team. Moreover, the recent pandemic limited the chance to practice these skills offline.

According to students’ answers, 50 students (58.8%) are very interested in having more art integrated projects in the future, 28 students (32.9%) would think about it and replied “maybe” and 7 students are not interested in art integrated projects (8.2%). When 90 students were asked about the kind of project students would like to have in the future, they gave a wide range of answers with different art forms involved. The most popular art forms chosen were music (50 answers – 55.6%), literature (46–51.1%), visual (41 answers – 45.6%), and creative experiments (36 – 40%). The last one can be explained by the fact that these future engineers major in chemistry which involves lab experiments. There were some original answers such as “I want to take part in international projects,” “round tables/debates/discussions,” and “cooperative presentations”.

5 Conclusions

This art and ESP project is an example of transforming a traditional non-artistic ESP classroom on the topic “Academic Conferences” into a new art integrated classroom on this topic. The main benefits of the art integrated project for future engineers are that it can be related to any specific professional area of academic interests, aligned with all levels of Bloom’s taxonomy and that it allows teachers to apply different strategies. The results proved that the majority of students improved special conference-related vocabulary competence; they also became more confident in skimming, scanning and writing conference texts. The project had a positive influence on the competence of most students to understand the process of a scientific conference organisation and the ability to organise it. The project has a positive influence on the students’ confidence in working with authentic conference-related materials.

Due to this art and ESP integrated project, the students’ confidence in delivering speeches and asking questions was partially improved with the dominating levels of 3 and 4 out of 5. Teamworking skills were also improved. However, an additional set of art integrated activities with an emphasis on improving teamwork is recommended to be developed for future engineers as only 17 students (19.1%) felt very confident with this competence. At the same time, teamwork turned out to be very important as students who succeeded in it mentioned working in a team as the most memorable experience of the project. The project also helped most of the students to improve their confidence in Internet searching and digital competencies.

The results also showed that due to the project the majority of students improved their complex conference-related competencies which involve 21st-century skills. The main role of the art practices used at each stage of the project was the provision of students’ active participation, opportunities for self-expression and creativity skills development, flexible transition to specialised professional content and better content retention. These benefits foster professional language skills. Art practices helped to achieve both art and language objectives. Using different levels of Bloom’s taxonomy and an individual approach to creating art was also important for achieving these goals.

Students generally gave positive feedback about the project and its influence on 21st-century skills. However, some of them mentioned difficulties they had in the project such as working in a team, time management, and working with authentic materials. When asked about art forms for future projects, future chemical engineers who had this project mostly expressed their interest in music, literature, visual art and creative experiments.

For the next stage of the research, students’ readiness to do art in the ESP classroom should be separately investigated based on the analyses of the tasks they completed for different stages of this project and their perceptions of art. Additional attention should be also paid to the art integrated curriculum development and its peculiarities in Ukraine, using art integrated learning to relieve the war stress of Ukrainian students.

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