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DEVELOPING FUNDAMENTAL SKILLS THAT COMPRISE FINE ART AND SCIENCE COMPETENCES – EXAMPLE OF A SET OF ACTIVITIES DURING REMOTE LEARNING IN THE FIFTH GRADE OF ELEMENTARY SCHOOL IN SLOVENIA

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Abstract. The article deals with the case of conducting remote learning where students enjoyed independent activities in fine arts and science. It focuses solely on planning, conducting the activities, and their evaluation. The introductory part briefly defines the concepts of remote learning, competences, and skills within science and art that are supposed to be developed in the fifth grade of elementary school. The case study, as presented below, included the introduction of distance learning activities in which the teacher would motivate students for developing their skills, necessary for the development of science and art competences. In the continuation of the activity, students joined in the activities for fostering the development of skills, fundamental for science and art competences. During the planned cycle of activities, students were faced with a project combining their art and science knowledge. The discussion part then sheds light on the issue by a brief commentary through the prism of theoretical starting points.

Key words: *remote learning, competences, science competences, fine art competences, skills.*

Theoretical background

Learning is a complex process where active involvement and building representations about the reality of the environment (among others, Vygotsky, 1980; Bruner, 2009) are the starting points for both learning and teaching. The challenges facing contemporary society with the demands for a new education of new generations, and working and contributing to the welfare of society, have gained new significance with the epidemic of the new coronavirus COVID-19. The measures and modes of operation of different segments of modern society that followed the declaration of an epidemic were determined by public services for each public sector. Public education in Slovenia is in the domain of the Ministry of Education, Science and Sport. Therefore, during the first and the second wave of the pandemic, the Ministry was tasked with implementing measures in the field of education. In the second half of April, educational institutions received recommendations for the assessment of knowledge in primary school (ZRSŠ, 2020-a and 2020-b) and a decision on measures for the smooth performance of educational work (MIZŠ, 2020).

The second wave brought some new recommendations as far as measures in practice remained similar, though adapted to the newly formed so-called »models« (Kustec et al., 2020). The school year of 2020/2021 has therefore offered new dimensions of combination of in-site and remote learning. Slovenia is one of the EU-countries with the longest period of distance learning during the mentioned school year.

Distance learning is therefore a form of continuing schooling when in-site learning is not possible due to certain curcumstances. In-site learning is organized by the teacher who teaches according to the framework set by the curricula of individual subjects and the legislation in the field of education (Zakon o organizaciji in financiranju vzgoje in izobraževanja, 1996). Distance learning is not just an extension of this definition with teaching through IT technologies and with the absence of in-site learning. A more precise definition is needed, but it is necessary to understand that remote education standards are still being developed, and thus its definition as well (Purkat, 2020).

According to the relevant literature, competences in general consist of a set of skills, knowledge, and attitudes that enable the success of an individual, or provide a basis for dealing with the diverse issues of modern society (DeSeCo, 2002; Key Competences, 2002). In elementary school education, these should be different for each subject area, but they also have some common starting points.

The activity, which was introduced in the fifth grade in distance learning, is focused on developing the set of skills which represent the basis for the development of fine art and science competences.

The scientific skills are a fundamental part of all science competences (Krnel, 2004a and 2004b). Basic cognitive procedures that are being developed in the first five grades of elementary school in Slovenia are sorting, arranging, attributing, scheduling in space and time, and using symbolic systems (Krnel, right there). Later, students develop skills of observation (systematic observation) and experimentation (especially in the direction of understanding impartial and objective experiment), handling information and asking questions skills. The similar array of procedural knowledge is also referred to by other authors (e. g. Smart, 2017; Van Uum, Verhoeff and Peeters, 2016): asking questions, observing, predicting, sorting, measuring, exchanging ideas, and interpreting the obtained data. At the end of the second three-year period, students in the Slovenian elementary school should be ready to research and thus develop procedures for forecasting, formulating hypotheses, presenting, and integrating data. Nevertheless, some research shows that students in the fifth grade of elementary school in Slovenia are better in content knowledge, they have a high attitude towards science but have inadequately developed skills (Purkat and Devetak, 2019).

Art competences are difficult to define, as very diverse definitions appear in the literature but even in this case, the basic definition of competences (a set of dimensions of skills, knowledge, and attitude) applies. Tacol (2003) states that artistic competences should be defined as a combination of artistic knowledge, (manual) skills, and experiential orientation (attitudes).

She furthermore concludes that in the subject area of fine arts, a set of competences include future-oriented: developing an independent search for information and handling it; active acquisition of knowledge, skills, strategies; learning through discovery and research; integrating acquired knowledge and applying knowledge in new life situations.

The concepts of visual competence and visual literacy with its dimensions – creation, presentation, analysis, and assessment – both emphasize the importance of experience in accordance with the principles of experiential learning (Purkat, 2020).

When reviewing the scientific and professional literature, it seems possible to create a set of art as well as of science competences that are compatible with the curriculum for fine arts and science subjects (Učni načrt. Program osnovna šola. Likovna umetnost, 2011 & Učni načrt. Program osnovna šola. Naravoslovje in tehnika, 2011).

Planned activities

The purpose of this paper is to present the set of activities that corresponds to the principles of the chosen interpretation of remote learning and help to develop competences according to the model of competences that should be developed in fifth-grade students, required in fine arts and science. In doing so, the tasks covered by the activity would develop individual dimensions of the mentioned competences.

The list of activities consists of (in time-order of application):

1. sorting;
2. arranging;
3. data collection;
4. working with data;
5. experiment planning.

Students were involved in the mentioned activities after approximately two months of distance-learning. That way they were already able to fully participate in the platform for e-meetings MS Teams and use its benefits as fully as possible. Activities were applied during online group meetings with students; individual work of students was backed up by chat service and file-sharing options of the MS Teams in-service apps.

Below all the five activities are presented and commented in the discussion.

Introductory task

Sorting

During group meeting via MS Teams platform students were informed that they had one minute to collect at least ten different items in the kitchen. They were suggested to collect items from drawers, on the counter, table, etc. Special attention was paid to the safety in searching for the items in the kitchen and it was emphasized that students do not use sharp objects and devices that are connected to electricity.

When students collected the objects, they were instructed to place them on a larger flat surface and arrange them sensibly into at least two groups. In their notes they had to write down according to which variable(s) they sorted the objects. A discussion of selected variables and practical examples of sorting followed.

Follow-up task

Students were then acknowledged with the task of making their home-made watercolour paints and creating their own artwork with them.

The task began with a short lesson about the history of natural dyes and pigments. Then the terms colour, dye and pigment were clarified. The introduction part concluded with a short explanation of what the chemical solution consisted of. What followed were instructions for the task.

The mentioned task included a set of side activities focused on sorting, an introduction to the skill of arranging, and data collection. These were discussed in the lessons that followed the week after the task had been published in the virtual classroom.

In the following section, every side activity is presented for clarification.

Arranging, data collection

When making their home-made watercolour paints, students had to first paint with the obtained colours test sheets of different paper sizes (the models would have been previously handed over in digital form to the students) in order to obtain colour samples.

They had to then arrange the data in the table as proposed in one of the Annexes, published in virtual classroom.

This was followed by creating according to the instructions in the PowerPoint presentation, located in the virtual classroom. Students then made an art product with home-made water colours and made (wrote down or videotaped) presentations of their products.

Following with the fine arts lesson, they were then instructed to arrange the colours according to brightness. What followed was a discussion of what this variable was and what variables could still be used to edit the existing sheet patterns.

Closing tasks

This was again followed by the natural science part. In the lesson, they were instructed via a multimedia presentation and their textbooks about two important/crucial processes in every live being – cellular respiration and photosynthesis. In the conclusion of the lesson, they were able to explain what chlorophyll is and where it can be found. Students were also fostered into thinking about differences between plants and other beings, and therefore between the mentioned two processes. At this point, most students understood that the green colour was (in most cases) obtained from chlorophyll from plants.

Data collection

After discussing the importance of data collection and proper presentation, students were invited to an independent activity. The task predicted collecting data about expiry dates from declarations on food products in their home environment. In dealing with the collection, editing and presentation of data, certain content from Slovenian language lessons and math (exactly this learning content in the textbook) was used to support the theory about data collection, editing, and presentation.

Working with data

Students were invited to view the spreadsheet they created from data about expiry dates and record the conclusion they could draw from the data. This was followed by a discussion on the importance of presenting data and their role in the work of a researcher. Several different types of data presentation were discussed within the scopes of language lessons and math.

Pupils were reminded of the topic of food preservation and food preparation hygiene, which they discussed before going to remote learning.

Experiment planning

The last activity was not carried out in full, as it was postponed due to a change in the activity plan. Students did an experimental activity within creating an artwork with home-made watercolours in the artistic task, but not in science topic as planned.

A few students, however, conducted the research on their own initiative. This only confirms that students are curious and like to check their hypotheses. One of the students thus checked which ingredient contributed the most dye. The conclusions from his research were presented in one of video lessons in the following weeks after the initial (introductory) task.

Discussion

The activities presented were focused on developing basic skills required both in science and arts, but were based in different topics, mainly from both subjects. Nevertheless, the same topics were discussed also in language lessons and math in Slovenian elementary school. It is important that teachers understand the importance of interdisciplinary teaching when planning such activities, especially those based on the development of basic skills.
Students were motivated when doing the tasks presented. What seems to be the most important benefit of such activities is that they are based on creativity and topics addressing important concepts that are difficult to grasp when discussed in a traditional learning environment. Here students had the chance to experience the concept of chemical solutions, data collection, editing, and presentation.

It is important to note that the activities were successful also because of the multimedia supported learning – photosynthesis and cellular respiration were explained with the help of computer animations.

Nevertheless, there is still room for improvements. The activities presented should be broken down into smaller chunks, supported by video lectures. Therefore, students would have clearer instructions given in textual and speech form. Every activity should also include a more formal discussion part. In the case of our application, they were only invited to the discussion, but it was moderated occasionally and not structured.

Conclusion

It can be concluded that remote learning offers certain challenges, but teachers can take advantage of a gradually better software, professional support, and new learning environments (home environments). This way students are able to experience learning in new ways, can more easily transfer learning content into everyday life and form knowledge that they will be able to use in future.

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