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CHANGING TEACHERS' PRACTICES AND PERCEPTIONS IN DEVELOPING CRITICAL THINKING AND CREATIVITY.

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Abstract. The article presents considerations on the development of critical thinking and creativity in the practical activities of teachers in the modern transformation of education through the use of digital technologies in education, methods of monitoring changes in teachers' perceptions, and substantiates scientific views based on industry sources.

Keywords: Digital technologies, practical activities, critical thinking, creativity, intellectual qualities.

It is important to describe how the research has changed teachers' perceptions and practices in the classroom, using digital tools to learn, and developing critical thinking and creativity. As is known, we describe the general appearance of the lessons and then focus on changes in practice.

Since the teachers themselves developed the lessons, we have identified three main options for designing lessons to draw conclusions about their use of task elements aimed at developing critical thinking and creativity:

1) the lesson contains only elements of activities that form critical thinking and creativity. In this case, the lesson continues in the usual way for the teacher and students, but, according to the teachers, an "interactive element" is used, which is associated with forms of work aimed at developing critical thinking and creativity using digital tools. For example, this could be group work lasting 5-7 minutes, a short survey via a digital service at the beginning or end of the lesson. Then the students returned to passive listening. In the interviews, the teachers said that they nevertheless tried to maintain critical thinking and creativity as

one of the lesson outcomes when developing the lesson, although "it was difficult".

2) Designing a complex lesson aimed at developing critical thinking and creativity. In this case, all elements of the lesson are connected by a single plot and are aimed at developing critical thinking and creativity. One of the options for such a lesson could be a mini-research or mini-project. Students worked in groups, each team performed a specific task, and the results were actively discussed by the whole class. The materials that the teams worked on were often taken from various sources (visual, audio, texts, newspaper clippings, etc.), which the teams had to study, analyze, select and develop a solution to the problem. This approach is similar to the examples of lessons discussed in teaching and developed during the research Vincent-Lancrin, 2019; Pinskaya, Mikhailova, 2019]. This study formulated the principles of evaluating and developing a lesson that develops critical thinking and creativity skills. The lesson begins with the introduction of a myth, after which the teams solve a problem or create a product, then present their results to the whole class, discuss and compare the solutions[1]. In particular, we give an example of a biology lesson (biology teacher, students), in which students strengthened their knowledge of evolutionary mechanisms by developing a timeline. The students were divided into three teams, each of which analyzed different periods of evolutionary development. In each period, the students were tasked with placing biological species on a common timeline for the whole class. The groups completed this task using a digital tool, which allowed them to create a timeline by adding text, images and dates. The teacher provided technical support (data was uploaded via Google Sheets). The students also had to invent a new biological species that could have existed during the given time period. The lesson was accompanied by a lively group discussion and presentation. The teacher noted that the task itself could be done without digital tools, using a single paper timetable.

3) Developing a comprehensive course. The third option for developing eight lessons involves developing a comprehensive course or mini-module that focuses on developing critical thinking and creativity within the subject and uses digital tools. Thus, the teacher asked students in groups to develop their own blog project presenting the Chinese language over 8 lessons (Chinese language, lyceum). Each lesson focused on specific cultural aspects, language units, and

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features of texts in the mass media (the target audience of the blog, a content plan that included topics such as living, recreation, moving, and so on). Each lesson was structured based on the logic of active learning using digital tools. In each lesson, students had group worksheets that structured their activities and open-ended tasks for working with the vocabulary necessary to describe the blog topics (Figure 1). The technological map of the students' lesson is presented in the appendix[2].

"What will the blogs be like?" / "Where will we go?" / "What will we see?" / "Final wrap-up"
"What will your blog be about?" / "What will we eat?" / "Let's explore Beijing"

Figure 1. Topics of the Chinese language course.

Practice change. Based on observations in the lessons, a scheme of changes in teachers' practice was developed (Figure 2). The description of this process allows for a more informed interpretation of the perceptions.

<table>
<tr><td colspan="3">Student-centered learning process</td></tr>
<tr><td colspan="3">Elements of active learning activities of students in the lesson</td></tr>
<tr><td colspan="2">"Strong" lessons in terms of active learning at the beginning. At the end of the study, more RV + more forms of work were added for active learning</td><td></td></tr>
<tr><td colspan="2">Lessons focused on development and included RV for active learning</td><td>Using digital tools</td></tr>
<tr><td>The lessons did not include ICT.</td><td>"Traditional" lessons with some digital tools to collect feedback</td><td>Digital tools were widely used, but fragmented in terms of active learning.</td></tr>
<tr><td colspan="3">Teacher-centered learning process</td></tr>
</table>

Figure 2. Changes in teachers' practices and perceptions during the study.

This figure shows how teachers' practices changed over the course of 8 lessons. The vertical axis represents the increase in lesson elements that include active learning activities (AL) of students. The horizontal axis represents the use of digital tools (DW). Thus, the described teachers' practices are divided into four "quadrants": lessons structured according to the logic of active learning without the use of digital tools, the use of digital tools for active learning tasks, the use of digital tools within the framework of a frontal lesson, and the absence of a frontal lesson and digital tools.

The transformation of teacher practice is related to the scale of perception of the learning process as teacher-centered (bottom-up) or student-centered (top-down). With the expansion of student activity, the change in practice (based on observations) was accompanied by an increase in student-centeredness (based on data from the introductory and final interviews).

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Within the framework of the change in perceptions, five trajectories of practice change were observed.

1. Moving from a "traditional" lesson to an active lesson without the use of digital tools (Case U4). During the action research, the teacher did not use digital tools because they did not fulfill the current learning tasks.

2. Maintaining the format of a frontal lesson with individual work of students, but using digital tools to collect feedback from the teacher himself. No change in perceptions was observed (Case U13). Collecting feedback is an important change in practice, but in this case it was implemented in order to automate the assessment of control work.

3. New use of digital tools: for performing learning tasks within the framework of active learning (cases U10, U14, U8, U15, U6). Before the field

study, the lessons included a large number of digital tools used by the teacher (video, presentations, audio). During the field study, digital tools began to be used by students, which, among other things, implied a change in the learning tasks.

4. Transition from “traditional” lessons without digital tools to active lessons using digital tools for tasks in this format (instead of frontal) (cases U9, U1, U2, U12, U7). A description of specific digital tools is given below.

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The lessons that the teachers conducted in their groups served as a testing ground for their teaching. Action research did not involve transferring newly acquired skills from a separate learning environment to their own practical activities. Therefore, we do not talk about transfer, but about what the teachers found valuable for their practice and plan to do in the future. In this, we link the teachers’ readiness to use new tools and ways of working with what they used in practice during the eight lessons. Their selection is based on their experience in the AR framework.

What digital tools were tested by the teachers and introduced into their practice? During the interviews, it became possible to distinguish several groups of tools.

1) Using digital tools to develop higher-order skills (e.g. critical thinking and creativity). These include, for example, services such as working with evidence (Tricider), creating collages of work results (Canva), using an interactive timeline (Timeline JS).

2) Using feedback. Teachers used services such as Nearpod, Plickers, and Mentimeter for quick feedback with students.

3) Accessing information, using digital tools: using the Internet to search for ideas, sites with virtual tours of famous museums, Google Earth to assess the terrain, online translators, hotel search services to create a tour, searching for images to depict on the timeline.

4) exchange of ideas between students during the lesson: Googledocs for chats, collaboration on documents and commenting on the work of others, Jamboard and Miro for visualizing students' ideas during group work.

Thus, the research conducted by teachers through their practices not only facilitated their acquaintance with new tools, but also allowed them to apply them. This is largely explained by the regular reflection of their own pedagogical actions. This habit helps teachers to be more careful in choosing pedagogical strategies and tools.

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