



Preparation of Video Case Studies by Secondary School Students at the Center for Medical Pre-University Education: Preliminary Results

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Abstract: *Objective:* to test the case study method of teaching a group of students (grades 7–10) at Medical Pre-University, based on the analysis of a life history of S.R. Mirotvortsev – full member of the USSR Academy of Medical Sciences. *Materials and methods.* To implement educational video programs in the learning process, the Center for Medical Pre-University Education (*Medical Pre-University*) has developed the project *Virtual Tourist Itinerary around the Locales of Life and Work of Academician S.R. Mirotvortsev*. Each project participant, preparing video case studies, was expected to undergo several stages: 1. Collecting information on the topic, preparing the presentation and matching text, conducting an introductory mini lecture; 2. Discussion of the mini presentation, conducting a tour of the S.R. Mirotvortsev Clinical Hospital grounds. 3. Completing the video case study, analysis and discussion by the project managers and advisors, individual revision, viewing of the prepared video case study by the entire group of developers with participation of the teachers. This project is the first experience, involving educational videos, in organizing research activities of students aimed at preparing them for medical profession. The project was awarded the First-Degree Diploma of the IX Russian National Science Week with International Participation, dedicated to the 75th anniversary of the victory in the Great Patriotic War, which took place on September 22–25, 2020. *Results.* In the course of developing video case studies, Medical Pre-University students conducted extracurricular activities resulting in mastering their knowledge of the twentieth century history and of medical education and science development in Saratov on the example of impeccable service by S.R. Mirotvortsev as a physician, professor, department chair and university chancellor. *Conclusion.* The use of case study method benefited to active extracurricular involvement of pre-university students in developing their knowledge in the history of Russia and Saratov Medical University, which has improved the educational process efficacy in many ways, such as improving professional and ethical education of the students, augmenting their interest to studying, and effective implementation of interactive technologies in the educational process.

Keywords: case study, professional education, history of the university.

Introduction

The use of video and audio devices, overhead projectors, television, and computer programs from the end of the twentieth century has a significant impact on the formation of associative thinking in students, in general, on the quality of education and further development of an educational institution. Introduction of modern electronic technologies is currently acquiring a new meaning in the process of education and upbringing, allowing to conduct educational activities in a distance format. It makes a significant audiovisual contribution to the process of perceiving educational material, since it embraces several senses at once, such as vision and hearing [1, 2]. Such interesting educational technology as making educational video case studies is increasingly widely used now. This is a prevalent way of providing novel information in the educational process. In this case, the most effective is the introduction of educational video case studies, developed independently by school students. Multimedia resources can significantly increase the share of information offered in a visual form, opening up new opportunities for the teacher to present educational material [3, 4]. The development of video case studies is, of course, an effective product of design and research activities, both educational and extracurricular. This improves motivation, the level of learning, a sense of success, identity, and makes it possible to visually better represent the academic course and provide professionally oriented learning [5].

At the Center for Pre-University Education *Medical Pre-University* at Saratov State Medical University (hereinafter, *Medical Pre-University*), important attention is paid to the issue of professional self-determination, self-knowledge and self-realization of students. Introduction of educational video programs into the learning process is becoming an integral part of educational routine aimed at forming the moral and ethical principles of a doctor. In this regard, the project '*A virtual tourist route to locales tied with the life history and career of academician of the USSR Academy of Medical Sciences S.R. Mirotvortsev*' was developed, and it resulted in independent preparation of video case studies by the students.

Humanitarian culture, as an integral part of a doctor's work, is based on the heritage of outstanding representatives of Russian medicine of the twentieth century. Studying the history of their lives and

work helps developing and improving the level of contemporary medical education [6, 7], as well as instilling necessary moral qualities to future medical employees, in order to continue traditions and maintain continuity in the training of a future doctor.

Interest to the personality and activities of the outstanding clinician, surgeon, public and cultural figure, academician of the USSR Academy of Medical Sciences of the first convocation S.R. Mirotvortsev is not accidental, since, first of all, it is associated with Saratov. Also, his life is an example of exceptional professional and moral service to his country and medical science, which must not be forgotten. The entire life of S.R. Mirotvortsev, a participant of five Russian wars of the twentieth century, will always be an example of courage, high patriotism, and true service to the duty of a doctor [8–10].

Working with cultural and historical objects in the course of research activity is of paramount importance for professional self-determination of students [11]. School students have access to a large amount of information, including material available on the Internet, hence students should be taught to check the validity of such evidence. Teens need to be creative and discerning to keep their relations open and safe. The opportunity to communicate with teachers and researchers of the medical university provides numerous modes of participation in design and research activities, development of critical thinking, and motivation for choosing the profession of a doctor.

The goal of our project was to test the case study method of teaching a group of students (grades 7–10) at *Medical Pre-University*, based on the analysis of a life history and activities of S.R. Mirotvortsev – full member of the USSR Academy of Medical Sciences.

Materials and Methods

For project implementation, an extensive historical material was used, the basis of which was not only information and documents from published books and articles [12–16], but also materials from the personal family archive of one of the authors (Professor N.B. Zakharova). Dr. Zakharova is a representative of the renowned dynasty of Saratov doctors, the Sokolov-Zakharovs, close friends of S.R. Mirotvortsev. After studying and analyzing

this information, a project preparation plan was compiled. For consistent and accurate presentation of events during the peacetime and war-time, the milestones in the life and career of S.R. Mirotvortsev were divided into seven periods, associated with the most significant historical events of the twentieth century. Their geography commenced with the village of Ust-Medvedevskaya, located in the Volgograd Oblast. It is associated with Kharkov, St. Petersburg, Port Arthur in the Far East (now the Lüshunkou District of the city of Dalian, Liaoning province, People's Republic of China) and Saratov [17, 18].

The project authors and leaders are Vice-Chancellor on Academic Affairs of V.I. Razumovsky State Medical University of Saratov Dr. I.O. Bugaeva; Doctor of Medicine, Professor of the Department of Clinical Laboratory Diagnostics N.B. Zakharova; and Deputy Director of Medical Pre-University M.V. Chizhova. Project advisors were the teachers of Medical Pre-University: teacher of history and social studies of the first qualification category T.E. Luchnikova and the teacher of geography of the first qualification category L.A. Nurgaliev.

A group of Medical Pre-University students was selected for participation in the project on a voluntary basis by the project advisors. Each project participant was informed about the goals and specifics of prospective work on the project. The major topics marking the milestones of life and activities of S.R. Mirotvortsev were:

1. The opening of Nikolai State University in Saratov – the tenth higher education institution in Russia;
2. The beginning of the life journey;
3. The Red Cross surgeon during the Russo-Japanese war of 1904–1905. Book by A.N. Stepanov *Port Arthur*;
4. Years of study at the military medical academy;
5. Appointment to Saratov. World War I. Appointment as the Chancellor of Saratov State University;
6. Completion of the clinical campus construction at Saratov State University (currently known as S.R. Mirotvortsev Clinical Hospital);

7. S.R. Mirotvortsev during the Great Patriotic War;
8. Director of the Research Institute of Reconstructive Surgery and Traumatology with a prosthetic workshop;
9. Itinerary presentation of the tour dedicated to the participant of five wars, academician of the USSR Academy of Medical Sciences Sergei Romanovich Mirotvortsev.

For each project participant, the preparation of video case studies consisted of the following stages:

1. Preparation for the event: collecting information on the topic, making a presentation with relevant text, conducting an introductory mini lecture;
2. Group discussion of the mini presentation, preparing and conducting tour on the grounds of S.R. Mirotvortsev Clinical Hospital;
3. Preparation of the video case study, analysis and discussion by project leaders and advisors, individual revisions, group viewing of prepared video case studies by with participation of the teachers.

Results

The project took a total of 32 weeks to implement: from November, 2019, through June, 2020, its schedule is presented in the Table.

Because of prepared video case studies and excursion on the grounds of S.R. Mirotvortsev Clinical Hospital, it was possible to visually acquaint students of the Medical Pre-University with the history of Saratov Medical University. They had an opportunity to trace the results of introducing up-to-date educational technologies in the expansion of medical education fields; of creating schools and departments; and of the chancellor's role in organizing training of future physicians and university development. The virtual tour clearly shows considerable contribution of the outstanding doctor to the development of healthcare, as well as historical and cultural significance of the clinical campus buildings. At present, these buildings are considered historical and cultural monuments of the federal status.

On September 22–25, 2020, the prepared video case studies were presented at the IX Russian National Science Week with international participation,

Table.
Activities During the Development of Educational Materials and Video Case Studies

Duration	Activities
Weeks 1-2	Informing students about the scope and purpose of the project. Familiarization with the material.
Weeks 3-7	Analysis of conducted information search, preparation of the presentation dedicated to the life and career of S.R. Mirotvortsev. Splitting students among the teams to work on the materials about life and activities of S.R. Mirotvortsev.
Weeks 8-12	Presentations on the topics: <i>'The opening of Nikolai State University in Saratov – the tenth higher education institution in Russia'</i> , <i>'The beginning of the life journey'</i> , <i>'The Red Cross surgeon during the Russo-Japanese war of 1904-1905'</i> , <i>'Book by A.N. Stepanov Port Arthur'</i> , <i>'Years of study at the military medical academy'</i> , <i>'Appointment to Saratov'</i> , <i>'World War I'</i> . <i>'Appointment as the Chancellor of Saratov State University'</i> . Analysis and discussion at the workshop, editing by the project leader.
Weeks 13-17	Presentations on the topics: <i>'Completion of the clinical campus construction at Saratov State University (currently known as S.R. Mirotvortsev Clinical Hospital)'</i> , <i>'S.R. Mirotvortsev during the Great Patriotic War'</i> , <i>'Director of the Research Institute of Reconstructive Surgery and Traumatology with a prosthetic workshop'</i> . Analysis and discussion at the workshop, editing by the project leader. Discussing the plan and time of the tour to the locales tied with the life and work of S.R. Mirotvortsev.
Weeks 18-21	Preparing and conducting the tour on the grounds of the S.R. Mirotvortsev Clinical Hospital (Figure 1).
Weeks 22-25	Presentation on the topic: <i>'The itinerary of the tour dedicated to the participant of five wars, academician of the USSR Academy of Medical Sciences Sergei Romanovich Mirotvortsev'</i> , its discussion in at the workshop, editing by the project leader.
Weeks 26-29	In connection with the transition of the Medical Pre-University to the distance education mode, discussions and amendments to the texts of the presentations in each team of students by the project leaders are carried out remotely. Preparation of video case studies, analysis and discussion by project leaders and advisors, compilation of the action plan on finalizing video case studies in a single format.
Weeks 30-32	Individual revision of each video case study by students and project leaders.

dedicated to the 75th anniversary of the victory in the Great Patriotic War, at the *Lyceum Student* section, and were awarded the First-Degree Diploma. The award raised the self-esteem of project participants, and assured them of their work significance. It was also important that, already at the stage of project completion, the entire group of school students – the authors of video case studies, demonstrated high satisfaction with the results of their own work.

Discussion

An interview with a group of school students who prepared and presented a project at the IX Russian National Science Week showed that each of them prepared a video case study with great enthusiasm, participated in a tour around the grounds of the S.R. Mirotvortsev Clinical Hospital, but at the same time improved performance in the major academic disciplines. In the course of their work, the school students shared their knowledge of Saratov State Medical University, its role in the development of Saratov healthcare system at each of university

clinics on the campus of S.R. Mirotvortsev Clinical Hospital with friends and teammates. The prepared video case studies, along with proposed project work, allowed school students learning how to interact in a group of peers and actively exchange knowledge. It became a fascinating activity, allowing them to confirm their knowledge and skills in using various gadgets and electronic devices. The most interesting stages in the implementation of the case study method for school students were the opportunity for each team member, under the guidance of teachers, to turn the prepared scenario and presentation into a video case study, and to participate in a tour around the grounds of S.R. Mirotvortsev Clinical Hospital.

For an initiative group of teachers of the Medical Pre-University, a scientific advisor and a project leader, the presented project was the first experience in organizing vocational guidance routine for school students via using interactive technologies, which showed the possibility of a significant increase in pedagogical potential [19]. As a tool for



Figure 1. Teachers and students of Medical Pre-University near the Church of St. Luke on the grounds of S.R. Mirotvortsev Clinical Hospital, March 2020

active learning in a team environment, case study methods are advantageous for students, correspond to their ideas about the surrounding digital space, and arouse their genuine interest in the study object, which undoubtedly improves the quality of mastering the material [20].

Conclusion

The experience gained in the application of the case study method showed that the project approach to developing video case studies by school students allows them applying the acquired knowledge when working on a computer, making independent decisions with visualized confirmation of the result, and working as a team. This solves such educational tasks, as formation of mutual assistance, cooperation, ability to subordinate personal interests to the team priorities, etc. The use of video case studies has great prospects, and in the future, it can become one of the methods of improving the quality of teaching and hence of educational material assimilation by the students, first of all, of specialized educational subjects, such as biology and chemistry. The creation of a video library by the students themselves within the framework of extracurricular vocational guidance classes, as well as other fields of employing the case study method, is fully consistent with the requirements of time as part of modernizing learning processes, including digitalization and implementation of the national RF project *Education*.

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