

EXPERIENCES OF PROJECT-BASED TEACHING APPLIED IN THE FIELD OF PSYCHOLOGY

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Abstract

The history of project work in higher education is quite a novelty starting at the end of the sixties, with a controversial discussion and several practical developments in the early seventies. Undoubtedly, the brief history of the project study and especially of the project-organised curricula is characterized by some outstanding and successful solutions, but even more by many failures and disadvantages with respect to the ambitious intentions and due to various reasons. To some extent the discussions about the project study are still controversial – particularly in the engineering education, and in border line field of it – and therefore it is worthwhile to investigate in detail the various models and experiences in order to support wider implementation in the future.

Now, at the Technical University of Budapest, at the Psychological and Ergonomical Department, we have more than 20 years of experience in the teaching of psychology to students of engineering. In the last few years we began the project-based teaching in the correspondence courses, organised for students of engineering to train them to be technical teachers of technology. We give a brief information about project organisation and the topics, and we report on our first experiences.

One of the most original results of applying the project, that in this form a real connection can be realised between practice and theory. The other consequences, that the student engineer – teacher is constrained to be engaged in a very active way in the pedagogical and psychological studies. In the project courses within the technical teacher education in the psychological subject, the self actualization and the professional qualities of a teacher are developed.

Keywords: project-based teaching, project-organized education, structure of project, engineer-teacher, psychology.

1. Project-Based Teaching in the Field of Psychology, Introduction

In our engineer - teacher education more and more projects are used for acquiring practical knowledge in the field of psychology. Moreover, these subjects are supported by computers as well at this university level. Project-based teaching is essentially connected with the problem-oriented approach. Psychology subjects have three parts: general psychology, educational, (developmental), and pedagogical psychology. In the first part of the training course (1st semester) the basic elements of psychological knowledge are provided. The second part and the third part (see it as semesters) are concerned with knowledge adaptation in practice and

the recognition of phenomena, e.g. educational problems, learning difficulties, attitude problems, etc. So these two semesters, as part of psychology, contain mainly practice and it is during this time when projects are used. First of all it is necessary to clarify some aspects of the problem-oriented approach and of projects .

2. Theoretical Background: The Educational System

Our educational system is developed to ensure a dialectic relationship between academic theory, professional practice and solutions, and to ensure proper adaptation of theory and practice for the purpose of solving real problems.

Some further features of this educational system are as follows:

1. This educational system has proved to be highly adaptable internally. The system is innovative and has been able to cope with current problems in the professions (teachers, etc.) and in society.
2. The system has also shown a great external adaptability. Students have gained extensive knowledge about the development of some methodological tools, and thus are well prepared to solve the unknown problems of the future and to extend their practice and employment into fields, other than those in which they have specialized at the university.
3. Students become experienced in interdisciplinary team work. It involves new tasks and challenges in the field of social partnerships, too.
4. They can possess the latest scientific and methodological knowledge free of charge.
5. Students are provided enough practice during the basic education process.

3. Problem-Based Education

Problem-based education is working with relevant and actual problems from real life: teaching, learning coupled with students', educational or engineers' professional activities in an environment where real problems and tasks are sought to be solved. In this education problems are analysed in depth and students use the disciplines and theories which are considered to be necessary to solve the problems, i.e. the problem defines the subject and not the other way around. Of course the process is limited by time as project work has to be finished before the end of a semester. The problems chosen by the students then must be identified with a view to this framework of time. According to our experiments this process normally includes some independent steps: problem analysis, problem solving and the report.

Problem analysis: Here the problem is presented, described, and assessed in a broad context. The relevance of the problem is evaluated. Strategies for solution are worked out. The problem is now to be finally formulated. Project work at this stage is mainly based on discussions and studies of relevant literature.

Problem solving: Here the criteria of evaluation are laid down using relevant scientific theories; and possible ways of solving the problem are evaluated. The problem may be investigated separately and in details, using relevant scientific methods. The solutions are evaluated, compared to the consequences and to the problem posed. Project work at this stage is characterized by professional absorption during lectured experiments, field work etc. It may include a partial project involving more than one student's work.

Report: Here the group, the students, the project workers have to review the project, draw conclusions, and finish the project documentation. At this final stage the project work is, of course, mainly shaped by the approaching deadline and the ensuing examination. The course is built on case studies and project work, allowing groups of 4-6 students. There are favourable opportunities to choose problems and work with them/solve them. A teacher is appointed to each group as a supervisor.

4. Project-Organized Education

What is a project ?

- a. a project often refers to earlier parts of a fairly large and complex undertaking,
- b. the work is also associated with research irrespective of the state of progress,
- c. a project emphasises the ideas and the processes which, when accomplished with skill, eventually lead to satisfactory result;
- d. the processes often include elements of induction from observation and experience, at least some of which have to be generated during the project,
- e. a project is a type of learning activity. Sometimes it is a collection of methods; and very often it is the best way to gain experiences without risk and damage.

In higher education, research projects have been induced in later parts of teaching programs for a long time. The students are thus expected to have acquired sufficient knowledge and skills by the time they prepare their thesis to work on certain scientific problems to which the answer has not yet been found.

Projects, however, show up in earlier parts of tertiary education as well as in secondary school. Still, projects at these levels are quite different in style, aims and duration. In our country, though, we are only at the beginning of project-based education. One possible way to characterize different types of these learning activities may be to consider the degree of student influence on the choice of subject matter and of the students' responsibility to go ahead.

5. Type of Projects

5.1. Standard Project

On the one hand, there are well-planned, 'standard projects'. Activities for each student, which may be repeated by the next group of students, are often valuable

supplements to textbook reading. These 'case studies' may help students to comprehend (possibly at a higher cognitive level) the discipline in question because they illustrate concepts, facts and theories from the syllabus. Still, the teacher is pulling the strings, keeping the students on track towards the 'correct' answer.

5.2. Problem-Oriented Projects

On the other hand, this other type of projects includes learning activities characterized by some problem being formulated and studied by a group of students assisted by their supervising teacher. This type of projects puts emphasis on several aspects of the processes of scientific inquiry not normally experienced by younger students. The aim of such projects is clearly broader than that of case studies, pointing towards more general professional skills and attitudes not aimed at by the discipline-oriented part of the program. Moreover, this type of projects is very often already a real research activity, requiring certain professional attitudes and abilities. As opposed to this type, the requirements of standard projects rather concern disciplines, facts, and their practical adaptation and recognition.

5.3. Scientific Programs at Universities as Projects

Science-based curricula including this last type of problem-oriented projects have been developed and tested at many universities.

Within psychological and ergonomic curricula in engineering teacher education (dipl. engineer teacher training) at our institution, half of the time is thus project-organised during the second semester, whereas the other half of the time is devoted to a number of discipline-oriented courses. From the upper secondary school students know of the subjects – the disciplines – of science and mathematics, which they have been exposed to with one subject isolated from the other. They might have had some experience of the "case study" approach, but they do not, for several reasons, master problem-oriented, project-organised learning situations, which are different from most of their prior learning experience. Accordingly, students have to learn as well while studying psychology science and technology by doing projects.

5.4. Interdisciplinary and Multidisciplinary Study Project

This is the 'top' of the projects, a collection. Typically, it involves projects done by a group. This team consists of 2-8 students.

The aim of an interdisciplinary study project is to complete structural inventories of social and managerial, economic, and industrial problems, to carry out feasibility studies and to get some pilot studies implemented within that context.

In professional teacher education – such as dipl.engineer teacher training - such interdisciplinary study projects can be the following :

Possibilities for development of cognitive competence in electrotechnics (or other fields). This includes the following partial projects: psychological aspects of thinking, the technical subject's basic elements for transfer, calling students' attention to didactical problems of a certain subject, etc. Technical aspects as projects: developing the attitudes of a certain technical profession, classical electrodynamics systems within electrotechnics, etc.

6. Conclusions (I)

1. Project work may be characterized as 'learning by doing' or 'action learning'. The ability to carry out independent investigations on a scientific interdisciplinary basis as well as the ability to present independent conclusions are improved during project work.
2. The ability to finish a project in time is also developed. In fact, the process is very similar to the problem solving process in practice.
3. Project work also has a very important pedagogical point: each student must be able to explain the results of his/her study work to the colleagues in the group and to the teacher/supervisor as well. This demand may be the clue to professional awareness. In traditional education, students mainly master knowledge presented by the teacher. In project work, however, knowledge and awareness are established during discussions between the students in the group, and mainly without the presence of the teacher.
4. Project work is normally concurrent with a semester. Each semester in a curriculum is centered on a set of professional subjects, a "theme", and the choice of problems has to lie within the theme. The entire curriculum thus involves project work on at least 6 to 8 different themes.
5. Students can, within broad limits, choose their themes for a specific professional profile and choose their problems to acquire some special knowledge.

7. Processes of the Projects

1. Formulation of a problem:
 - Suggest theme,
 - Make questions,
 - List,
 - Define,
 - Reduce and choose, decide,
 - Formulate problem and hypothesis.
2. Investigations:
 - Design and find equipment,

- Method, place, symptoms,
 - Selection and obtain data,
 - Reproduce and calculate.
3. Evaluation:
- Interpret and compare,
 - Conclude,
 - Document.

8. Remarks

The formulation of a problem as a question, which at least in principle can be answered by scientific methods, is very often experienced as a fairly difficult and long process. Many different kinds of sources may be used as a tool from idea to problem: newspaper, magazines, TV sets, incidental observations or knowledge, reviews, articles; proposals from a teacher or an older student, a lecture or simply from conversation with an 'expert' or even from rumors or sayings. In our practice, students do like to get the theme. The given theme is evaluated by the students as if it were a real problem, and they think it can be worked out with good result.

9. Project-Based Teaching in the Engineer. Teacher Courses in Psychology

Engineer teacher education includes a fairly generous amount of general and applied psychology besides technical and pedagogical subjects. One third of the knowledge required for teaching is based on psychology. Just to mention some themes: personality evaluation, entrance examination, capability, attitude and motivation in learning, conflict management, rating, etc. Our students are mostly part-time. They are already teachers in a technical or vocational school as engineers.

Projects within the psychological module complete its theoretical background. They are only used after the first semester is finished and they are run during the following two semesters. Projects have been implemented for two years. Now we have the first experiments.

After one semester of psychological studies, trainee teachers narrow their study path according to their special interests. The possible specializations in engineering teacher education now are the following: electrical engineering, mechanical engineering, transportation, traffic, light industry and as a special field, the State Railways.

10. Some Project Themes Connected with Specializations

- Psychological and physical factors of performance in a certain technical subject or educational form;

- Rating of learning;
- Learning as performance;
- Cognitive employment of different subjects in youth;
- Aptitude criteria on certain professional education at secondary level;
- Motivation and satisfaction in skills-based teaching;
- Possibilities in development of personal competence in different kinds of subjects.

Specializations include e.g. electrotechnics, industrial design, professional didactics, etc. (Remarks: these are mainly interdisciplinary projects).

11. Aims of the Psychological Projects

- Orientation on a certain practical task in the field of teaching of technical subjects;
- Teaching a problem analysis methodology for psychological problems at secondary level;
- Recognizing psychological and educational problems mostly within the framework of secondary school;
- Training in project management and teamwork (working in a team);
- Motivation for self-actualisation;
- Writing project documents; and
- Oral presentation skills.

12. Organisation (Steps)

- Technical students have the choice between 2-3 project themes related to their specialization or interest, or their special possibilities as employees somewhere, not only at a school. In the latter cases part-time adult students are involved, graduating in the framework of distance education (or in correspondence courses) from our institution. Full-time students are influenced by the teacher, the staff etc., in topic selection.

In our experiences, adult engineer students have many opportunities to bring their special interests in a topic. This fact results in very high motivation to work out a project. Many of the themes are coming from their teaching difficulties – mostly they are educational – and personal managerial aspects.

- Projects last for two semesters as it has been mentioned before. They take about 100–120 working hours at home and in practice.
- In general students work in project teams of about 6–8 students.
- Many of them – mostly part-time students – work alone, only by tutoring.
- All of them have consultations monthly in our department (3 days).

- Each group has two–three tutors:

The principal tutor, who is from the Psychological and Ergonomical Department and manages all of the themes and theme selection. The aspect tutor, who also works here or at other technical, pedagogical departments or institutions. It depends on the relative importance or the structural aspect of the design.

- Project work starts with an introductory lecture, where information is provided:
 - a. The structure of the project
 - b. Relationship between the real world and the project
 - c. Making a schedule
 - d. Practical advises: facilities available and
 - e. Where to find information (tutor, specialist, bibliography, library, internet etc.)

13. Structure of the Project

The phases to be distinguished are at least the following:

13.1. Orientation (10 hours)

After getting acquainted with the theme, additional information is gathered and recorded, the problem and the objective are formulated and the working strategy is defined. At the end of this period the student (group) writes a short working plan.

There is no oral presentation or assessment of the work plan in this phase.

(Remark: the work plan is seen as an instrument for the group or student in getting a quick start.) The schedule functions as an agenda for further meetings during the project.

13.2. Preliminary Design (40 hours)

A list of requirements is prepared based on the gathered information list. The first or different alternative solutions are generated and evaluated on this basis. The most suitable solutions are studied during the next phase. At the end of this phase the group or the student compiles an interim report. This is the first presentation. Presentations are organised at least with two groups (no more than 20 students participating), during which each group presents the report in presence of the other group and the tutors of the groups. This interim report is not assessed in general, it is only commented upon.

13.3. Structural Design (50 hours)

In subgroups (2 or 3 students) or by students themselves different aspects of the general design are studied very thoroughly (detailed study). During this phase it is important to have regular meetings to adjust to the designs of others, or other subgroups. In this phase the subgroups may get extra support from tutors or consultants. The consultant is a person who is not necessarily connected with the university, but has the specific knowledge and experience of the problems studied by the student or the subgroups.

It happens many times that an older, more experienced colleague or a former teacher is able to give more information or aids than the university staff.

In our experience this is very characteristic of part-time students in distance education.

At the end of this period each student or subgroup writes their own (sub) report. The subreports are enclosed in the final report, and are individually marked.

13.4. Integration (15 hours)

This phase implies integration of the complementary designs of the student or group. The final solution and work process is presented in the final report.

The final report is orally presented in presence of another group, tutors, and consultants.

The final report is assessed and a group and individual mark are given. The group mark together with the individual mark given for the subreport are converted into individual work for each student.

Remarks: The difference between part-time and full-time student is very clear in this phase. It is mainly the full-time students who work in groups. Part-time students in our field – they are active engineers and teachers – work alone. They work and teach at a school at the same time. They are employees.

Full-time students have less experience. They are younger than the part-time student, they do not have practical experience.

Further main features of project structure are:

Orientation (problem and objective formulation): verbal

Preliminary design (list of requirements): interim report

Structural design (different aspects of the design): subreport

Integration (final solution and working process): final report/oral and written

Our project structure used now is based on the Delft Univ. project education system (P.de BRUYN, 1996). Projects are scheduled in the following way:

14. Schedule

Time schedule of the D2-project

week	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Orientation	X	X												
– gathering information														
– workingplan														
Preliminary Design		X	X	X	X									
– l.o.r.														
– alternative solutions														
– interim report														
Presentation						X								
Structural Design							X	X	X	X	X			
– detailed studies														
Integration												X	X	
– integration														
– tech. drawing														
– final report														
Presentation														X
time-schedule														

15. Conclusions after Two Years (2)

1. Both full-time and part-time students claim to get involved in selection of project theme. It concerns getting information too, see phase 1. Orientation.
2. Full-time students are rather dependent on each other. Therefore they do like to work within a group. Of course, there are very independent persons as well among them. They have less self-confidence in the realization of a non technical theme.
3. If somebody brings up a project theme adjusted to an educational aim, it is the best motivation to complete that project.
4. For technical teacher trainees, oral presentation is a fundamental element of being professional in teaching.
5. There are difficulties with problem formulation. There are big differences among students in their capacity of problem formulation. The younger they are, the less they are capable to "see" the problem in something. This indicates that lectures about the structure of projects, the steps, the design, the time schedule, all the formal parts and requirements constitute important information for students.

6. A project in technical higher education for engineer teachers is a useful tool to get practical knowledge; it is an aid in gaining self-confidence and it ensures self-fulfilment and, last but not least, in the project he can realise his ambition and interests.
7. At the same time they can realise their ideas without risk and damage.
8. Within a group it is possible and compulsory as well to study 'teamwork' and some social aspects beside it, including management, conflicts, persuasion, leadership, communication, etc.
9. Psychology project work is very popular with our engineer teacher students.

16. Practical Experiments

In the 1998/99 school-term the department of Ergonomy and Psychology improves the teaching of Psychology by introducing the project-based, experimental method in the engineer teacher. The essence of the change is that among the lessons setting down in the curriculum (all together 32 hours of consultation during the three semesters) students get project tasks independently during the second and third semesters.

This gives possibility for a deeper acquisition and an independent application of psychological knowledge, and it helps the students to enrich their experiences in psychological practice.

The usage of this method doesn't widen the curriculum quantitatively, but it makes in the psychological praxis more closely.

The new, experimental program requires essentially more extra work besides the lessons from students and teachers as well.

At the end students are asked to give us feedback regarding the efficiency of the project-type education. With this we would like to make their practice of pedagogical-psychological knowledge more successful.

17. The General Purpose and Specific Program of the Subject 'Psychology'

Students should familiarise themselves with the most important fields of psychology, the principles of the human psyche's functions, their differentiation according to ages, and the principles, methods used in educational processes.

The treatment of the theoretical knowledge is practice-directed. It includes realisation of projects, their documentation in studies, a public introduction and, at last, the defence of it in the scope of a complex sessional examination. This way students can get possibility for studying and analysing the chosen topic both generally and specifically and for presenting it in a high-standard way.

Specific Goals:

Students should extend their psychological knowledge by working out the optional projects. They should take part in consultations individually or collectively, which can help them to prepare for the defence of the projects. In case of excellently treated topics there is a discipline-based possibility of improving it as a diploma work.

18. The Course of the Curriculum's Treatment

During the first semester students acquire an elementary psychological knowledge, and by considering the possibilities of the empirical researches – choose a proper topic from the teachers' list, which should be specified with a teacher's help.

In the second semester students work on the chosen topic, either in consultations individually or in small groups, and with independent work at home, according to a given schedule. The parts of the project (basis of the topic, empirical examination, interpretation of the results, conclusions) reflect that students have the necessary psychological knowledge and an adequate usage in their pedagogical work.

The project-based educational method gives possibility for exchange of experience within small groups organised from students working on a similar topic. They can know each other's examination methods and analyse the results.

At the end of the curriculum of the second semester the students outline the parts of their work, and their further purposes.

19. Requirements:

Students have to relate the theoretical knowledge of the curriculum in oral examinations during the first semester, and in multiple choice tests during the second and the third semester.

At the end of the second semester the consultant teacher qualifies the symmetrical performance of the project task to their mates as well, both in writing and orally with visual aids, e.g. overhead projector, posters, ppt-presentation or video films. During the presentation students have to emphasise the questions and possibilities of practical utility.

As a closing of psychological studies students defend their project documentation in a complex sessional exam.

The grade of this exam contains in 1/3 part the result of the written test, and in 2/3 part the result of the presentation and its defence. In this case 'defence' means that teachers give questions according to the project, which demands acquisition of the given special literature from the students. *Those who work at the best project tasks, are suggested to improve the topic in a diploma work.*

The personal needs of the project-based educational method.

In the project-based psychology teaching 8-10 topics are required, which depend on the number of students. This means the continuous and interactive work of at least four teachers responsible for the topics. Beside the consultations fixed in the schedule there should be a possibility for students to be in touch with teachers by letters or electronic mail as well.

20. The Requirements of the Project's Written Form:

Length: 25–30 pages + enclosure, illustrations

Structural make-up:

1. The timeliness of the chosen topic.
2. The empirical foundation of the topic.
3. Selection of the empirical matter and its methods.
4. Presentation and analysis of the course and results of the research.
5. Presentation of the experience according to pedagogical practice.
6. Bibliography.
7. Enclosures.

1. Semester

The Contents of the Subject:

A short, historical outline of the theme, the task and the methods of psychology.

Presentation of different psychological schools and trends.

The characteristics and parts of psychic development.

The personality and its main theoretical approaches (psychoanalysis, interpersonal theories, behaviorism, humanistic).

Cognitive processes and their development.

Description and development of perception.

Description and development of learning and remembering.

The importance of attention in different phases of development.

Thinking and intellectual performance according to ages.

Motivation and emotion, volitional action.

Learning and the systems of motives.

The formation and development of emotions.

2. Semester

The Contents of the Subject:

The theme and methods of developmental psychology.

External and internal circumstances influencing the development of personality.

Inheritance, maturation and learning.

The principles of development.

Socialisation in the family.

Self-development, physical image, self-image, self-estimation and preventive mechanisms.

The psychology of ages before schooling-age.

Critical points in development: obstinacy, beginning school, growing-up.

Prepuberty and puberty: at the doorstep of adulthood.

Formation of identity, deviancies in puberty.

The importance of age groups and reference groups in the process of social adapting.

Forms of activity in childhood: play, learning, work.

Performance motivation, success, failure, external-internal control attitude.

3. Semester

The Contents of the Subject:

Socialisation, the process of social learning, imitation, identifying, empathy, choosing, choosing a model, status, role, role learning, etc.

The interaction of the individual and the group in the development of student communities. Groups, group dynamics.

Attitude, the effect of educational attitudes on the children's development. Communication at school.

Possibilities and methods of knowing the students at school.

Psychology of non-average children (learning troubles, inadaptability, talent scouting). Career choice, career development.

The psychological characteristics of a teacher's role.

New trends in school system, alternative schools.

Project Task Themes:

1. The formation of identity in puberty.
2. Talent scouting and study of talent at school.
3. Social values and norms.
4. Inadaptability at school.
5. Performance motivation, level of pretensions.
6. Group dynamics processes.
7. Career, image.
8. The psychological examination of the educational environment.

21. The Application of the Project-Based Educational Method*1.–2. Semester**1. Consultation*

Introduction to the requirements, preparation for the half-term work.
 Requirements of the project's contents and form.
 Presentation of the themes, methodological preparation.
 Possibilities of application of different methods.
 Topic choice, individual forming of topics.
 Presentation of the bibliography connected with the topic.
 Small group organisation, specifying of methods.
 Preparation for the next lesson.

2. Consultation

Discussion of topic, individually or in small groups, consultations.
 Methodological preparation. Possibilities of method application.
 Methodological preparation.
 Possibilities of method application.
 Feedback from the bibliography connected with the topic.
 Choosing the topic's examinational method.
 Definition of the sample's size and choice.
 Indication of the empirical matter's entering place.
 Preparation for the next class, setting individual tasks.

3. Consultation

Discussion about bibliography and possible problems.
 Working out the chosen method in detail (making questionnaires, interview questions, scales, etc.)
 The ways of sample choice.
 Work individually or in small groups.

4. Consultation

Presentation of the theoretical matters' working out, individually.
 Working out the methods (students' presentations).
 Presentations of the topic choice reasons and the topic for working out methods within 10-15 minutes.
 Debate, exchange of working methods.

3. Semester

1. Consultation

Actual presentation of the project's working process. Stating the results, part results. Problems, questions according to the matters.

2. Consultation

Comparison and discussion of results and special literature approaches. Perfecting of further working processes.

3. Consultation

Individual presentation of the topics.
Debate, exchange of working methods, conclusions.

4. Consultation

Individual presentation of the topics (continuation)
Debate, exchange of working methods, conclusions.
Evaluation of project work, closing of the term, collecting the students feedback.

22. Description of the Project Topics in Detail

1. *The Formation of Identity in Puberty*

The examination of the adolescents' self-identity.
The adolescents' forms in their environment, among friends.
Formation of antisocial groups in puberty.

2. *Talent scouting and study of talent at school*

Possibilities of improving talented students at vocational secondary schools.
Problems of talented children failing to fulfil the norm in the learning process.
Connection between creativity and talent, possibilities for its measuring and improving.

3. *Formation Process of Social Values and Norms*

Examination of adolescents' values judgement.
Conceptions, plans about the adult way of life.
Formation of prejudice in age-groups.

4. *Inadaptability at School*

The examination of student–teacher, student–student, student–parents relationship.

The importance of subject interest and motivation in the learning process.

Student–teacher conflicts at school.

Educational situations and solving methods.

5. *Performance Motivation, Level of Demands*

The examination of learning style and learning motivation in vocational secondary schools. Empirical analysis of questions in the field of psychology of instruction connected with productivity.

Measuring motivation and level of demands in vocational secondary schools.

6. *Group Dynamics Processes*

Acquaintance with groups, examination of group dynamics processes at school.

The social psychology of school classes.

The personality-forming role of school classes.

7. *Career Choice, Career Orientation, Career Image*

Motives of adolescents' career choice, the effect of environment and school. Possibilities for the preparation of career choice at school, career knowledge and self-recognition, career-orientation processes.

Possibilities for career counselling, the participants of this process at school.

Examination of the career image formation. The adolescents' opinion about the connection between the value of work and the social esteem.

Adolescents' confronting with unemployment.

8. *Improvement of Educational Environment with Psychological Methods*

The topic includes all those external effects that belong to the context of learning:

- curriculum (books, supplementary matters, alternative educational aids).
- schools equipment (teaching technique, visual aids).
- physical environment (the arrangement of school).
- social environment (student–student, student–teacher, teacher–teacher relations, communication inside the school).

- the interaction of all these together.

The working-out begins with the presentation of a case study in detail, which means an actual presentation of one factor from above. The case study contains the critical evaluation of the psychological factors connected with the matter. This way students give suggestions for improvement, with the help of psychological aids. During the working process, we emphasise the creative topic-choice, the timeliness of the topic, the proper documentation of the present situation, and the excitability of the improving suggestions.

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