Project Management Systems as Means of Development Students Time Management Skills

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Abstract. The article is devoted to the problem of development students' time management skills working on master's thesis by means of project management systems. It is established that the process of work on a master's thesis is inherent in the project style of activity, which allows the use of project approaches to the organization and management of master's research. Substantiated the use of project management systems as an effective tool in the planning process of the research stages of the master's project and monitoring their implementation. The effectiveness of the use of project management systems in the planning of work considering the deadlines of the main stages of the study and rational organization of the time allocated for conducting research is described. The experience of using project management systems in organizing work on master's thesis is described. The effectiveness of using MS Project to develop time management skills in the implementation of master's thesis, namely to develop planning skills, self-motivation, coping skills, organization, filing and independence, has been experimentally proven.

Keywords: Time Management Skills, Planning, Project Management Systems, Higher Education, Microsoft Project.

1   Introduction

The issues of comprehensive automation of educational processes are becoming increasingly important today. Nowadays, information technologies are developing steadily and modern students are studying in conditions of uninterrupted flow of information circulating in the world. One of the main tasks facing them is the ability to navigate in a huge stream of information, work on knowledge assimilation and practical skills from a large number of academic disciplines, and at the same time mastering the skills of self-organization, self-education, the correct setting of goals, preliminary planning of work, rational distribution of time, prioritization, self-discipline, etc. The result is an increase in both the effectiveness of the organization of the educational process and its quality, and most importantly - effective organization of students' future professional activities and professional self-realization in accordance with the challenges of our time.

In this connection, there are contradictions between:

— the growing importance of the time factor in modern society and the student's insufficient readiness to build his life considering the time factor;
— between a wide range of possibilities for a student's self-determination at the university and the lack of real goal-setting and self-organization skills for the majority of students.

The need for this research caused by the problem of insufficiently effective time planning by master students, working on master's thesis. Therefore, they do not always follow to the requirements for the content and design of the project, the rules for the organization of its implementation and defense, as well as the formalization of the basic stages of scientific research. Consequently, there was a need to find out such an approach to organizing work on diploma project, which would allow planning of work considering the deadlines of the main stages of the study; rational organization of the time allocated for conducting research and development of all diploma's parts; creation of internal motivations in the participants of the educational process, which helps to ensure the synergy effect and the appropriate quality of educational results.

The purpose of the article is to substantiate the use and experimentally prove the effectiveness of project management systems as a tool for developing time management skills in the planning process of research stages of a master's thesis and monitoring their implementation on the example of using MS Project.

2   Literature Review

There is a growing body of literature that recognizes the importance of professional's time management skills. The problem of how to manage time has been an object of research since the 1950s and several authors proposed methods on how to handle time issues on the job (e.g. Drucker, Lakein, Mackenzie, McCay). They suggested simple tools such as writing work plans down on paper (so-called "to-do lists") in order to increase job performance [1].

Time management has been described using many different terms. For example, Lakein included spontaneity, balance, flexibility, and time control; Simpson considered it as a habit developed only through determination and practice; Soucie – as a prioritization and implementation of these priorities; Jordan et al. – as a setting priorities and scheduling tasks. Time management was also considered as the process by which an individual more effectively accomplishes tasks and by Schuler; a process by which an individual obtains control over the time and the content of what he/she does by Oncken & Wass; and as what can be achieved with time by Mackenzie [2].

While a variety of definitions of the term 'time management' have been suggested, this paper will use the definition suggested by Claessens et al. who saw it as 'behaviours that aim at achieving an effective use of time while performing certain goal-directed activities'. According to them, this definition emphasizes that the use of time is not an aim in itself and cannot be pursued in isolation. The focus is on some goal-directed

activity, such as performing a work task or an academic duty, which is carried out in a way that implies an effective use of time [1].

Modern society places high demands on the level of specialist competence. The inherent quality of a professional in a dynamic economy should be the ability to efficiently spend their time, to organize their work effectively. For a manager, for example, a project manager, the ability of a subordinate to meet the execution of work on critical deadlines, is often more important than the quality of the work itself [3]. But in the absolute majority of universities, students do not learn the basics of time management, i.e. they do not get much-needed in the modern world methods and skills of self-organization [4].

Failure to spend time on the limit, prioritizing leads to a deterioration in the overall success of students, while in high school, when many people start to work and create family, the time they spend on learning is constantly decreasing [5].

R. Cannon assumes, that we are not simply passive observers of the institutional contexts we are in but active participants with the capacity to manage ourselves as well as to influence (if not change) the events around us in our universities [6].

According to Reunova, the relevance of time management is related to the demands of modern times for a special project style of activity. The author claims that the self-organization of educational activities will be effective if in the educational process of the university:

1. The development of a time management knowledge system that is adequate to the competencies defined by the educational and professional program is ensured.
2. 'Time management' is used as a pedagogical technology that allows to structure student's life time in accordance with personal and academic goals and values [7].

The author also defines the concept of 'time management of a university student' as systematic, consistent and purposeful use of a set of mastered techniques of organizing personal and educational activities in daily practice in order to increase the effectiveness of self-organization [8].

Data from several studies in the field of academic time management suggest that time management training might be beneficial for undergraduate students' well-being and academic achievements [9, 10, 11]. Shazia Nasrullah, Muhammad Saqib Khan et al. determined the relationship between the time management skills and academic achievement of the students. Some of the students do not have good time management skills that has negatively affect their life and their academics. Authors found out that time management is highly related to the academic performance of the university students. Moreover, there is an association between time management abilities and educational outcomes. Students who were able to manage their time efficiently had good academic records [12].

The main tasks of the time management are: 1) to increase the student's own working ability; 2) constant control over the quality of the performed; 3) analysis of daily routines and its optimization; 4) improvement of the skills of using the budget of own time; 5) the ability to abandon inefficient and irrational activities; 6) rational planning of time and realization of all tasks at certain time intervals; 7) the correct organization of time for learning and recreation [13, 14].

According to PMBoK, a project is a temporary action intended to create products, services, or results [15]. There are common features that reflect the essence of projects: purpose, uniqueness, limited time, resource constraints, given parameters of the result [16, 17].

Today, effective project management is impossible without the use of modern software, as increasing the size of projects, the frequency of their execution, the volume of information. Project management software is a process that includes evaluation, sequence of actions, resource allocation and timing [18].

Some authors have considered project approaches and the use of project management systems in such processes as management of research project [19], the organization of the educational process [20], the development of the structure of the curriculum [21]. So far, very little attention has been paid to the role of using project management systems in development time management skills at university students.

3   Project Approach to Work on Master's Thesis

Modeling the content and organization of students' work on diploma project is needed first and foremost to develop the ability to manage time in order to rationalize the time spent on research.

If we consider the project as a set of measures and actions aimed at achieving a unique result under the current limitations of time, money and executors, then the work on master's diploma can be considered as a convenient object for the application of methodology and project management technologies, namely:

1. The process of master's study is aimed at achieving a unique result - scientific novelty and practical achievement.
2. This process takes place in conditions of defined time and resources constraints.

The peculiarity of the project lies in the fact that its management requires the ability to clearly plan action, constant control on the part of the head. A project can be considered successful when its purpose (result) is achieved with minimal expenses and at the set time. All of this is entirely relevant to the organization of work on diploma project. So, for planning it is expedient to use the same tools and technologies, as well as for any other projects.

Today there are a large number of automated project management systems that can be used to solve the problem [22]. Typically, automated project management systems include tools and features for designing the project structure and determining the critical path, resource and expenses planning, project monitoring, graphical presentation for the project structure and project reporting, group work ets.

The software market has a huge selection of project management software. The most popular programs of the entire set were selected. After analyzing more than 20 software, we have compiled a list of 9 the most functional platforms [23]. The following programs were considered: Jira, Smartsheet, MS Project, GanttPro, BaseCamp, Wrike, Redbooth, Odoo, ActiveCollab.

Analysis and comparison of programs were carried out according to the parameters: the ability to work online; share access; Gantt chart; operating systems supported by the program; the ability to share files; presentation of information in the form of diagrams (data visualization); creating reports for any period of time; simplicity and intuitiveness of user interface; the percentage of completion of tasks; cost accounting; availability of cloud storage.

To evaluate the programs, a scale was developed (Table 1), in which each parameter was assigned a certain number of points, and the total score of the program was the sum of points obtained by the program for each parameter [23]. The experts were lecturers of the Department of Computer Technologies in Management and Education and Computer Science of Berdyansk State Pedagogical University with experience in teaching in the field of information and communication technologies more than 10 years (15 lecturers).

The results of the evaluation and the rating of programs for the total number of points are presented in Table 2.

The top three for the selected parameters included MS Project, Wrike and Odoo.

One of the most commonly used project management systems is Microsoft Project, which has a friendly interface, a set of tools, and is characterized by ease of use, making it convenient for the development of simple projects.

Table 1. Evaluation scale of project management systems

Parameter	Min point	Max point	Operating System
Online	0	1	Android – 1
Share access	0	2	IOS – 1
Gantt chart	0	1	Windows – 1
OS support	0	6	MacOS – 1
Share files	0	2	WinPhone – 1
Data visualization	0	1	WEB - 1
Creating reports	0	2	
Intuitive interface	0	1	
Cost accounting	0	2	
% of completion of tasks	0	1	
Cloud storage	0	2	

Microsoft Project has been designed to assist in monitoring the progress of projects, automatically requesting and registering reports on the status of team members and alert the project manager if they are late or not completed. It has become a dominant program for managing PC-based projects [22].

Table 2. Characteristics of program by points

Parameter	Jira	Smartsheet	MS Project	GanttPro	BaseCamp	Wrike	Redbooth	Odoo	ActiveCollab
Online	1	1	1	1	0	1	1	1	1
Share access	2	2	2	2	2	2	2	2	2
Gantt chart	1	1	1	1	0	1	1	1	0
OS support	4	3	3	3	5	3	3	3	3
Share files	2	2	2	2	2	2	2	2	2
Data visualization	1	1	1	1	0	1	1	1	0
Creating reports	2	2	2	0	2	2	2	2	2
Intuitive interface	0	0	1	1	1	1	1	1	0
Cost accounting	0	2	2	0	0	1	0	2	2
% of completion of tasks	1	0	1	0	0	1	0	0	0
Cloud storage	2	2	2	2	2	2	2	2	2
Number of points	16	16	18	13	14	17	15	17	14
Rating	3	3	1	6	5	2	4	2	5

Consequently, to making an analogy between projects and the process of work on master's thesis, it is possible to conclude that these activities have many common characteristics. Analysis of project management systems allowed to highlight among the best MS Project parameters and functionality. The use of project approaches to managing the process of master's study in combination with modern computer technologies will make it more substantive both the process of planning the research stages and the process of monitoring their implementation.

4 Realization of the Master's Thesis Project in MS Project

If we consider the process of master's thesis implementation as a project, we can combine the main project management components with the tools that are used for this, using the project management model presented in Fig. 1.
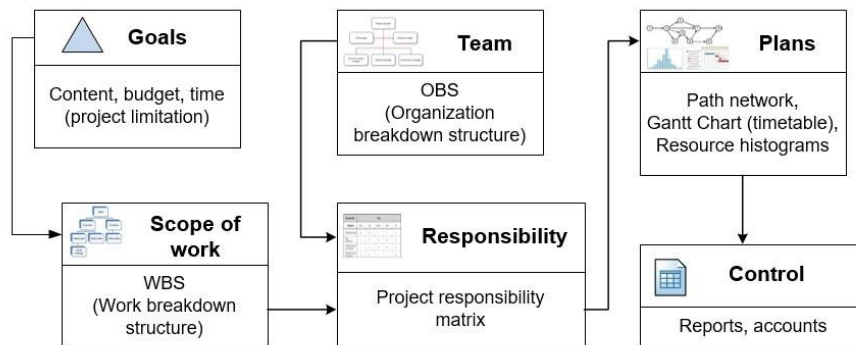
Fig. 1. Project management model

The effectiveness of the project depends on the decisions at each stage of its implementation, and the wrong initial understanding of the goals results in a chain of errors in the formulation of tasks and in determining the amount of work on the project, which in turn leads to loss of time and money. Setting goals for a project implies adherence to such rules: the result of the project should be clearly defined (scope of work); the project must be carried out in a certain external environment (participants and stakeholders); the terms of the project should be set (deadlines); the budget of the project should not exceed the given amount (expenses); the product must meet specified standards (quality); it is necessary to deal with reliable, flexible and stable suppliers and contractors (resources).

Thereby, project management is an activity aimed at implementing the project with the maximum possible efficiency with given time constraints, resources, as well as the quality of the final results of the project.

Most projects have a certain end date, resources, and scope of work. These three components are often called as 'project triangle', because when you make changes to one of these elements, both are changing. And although for the project all three elements are equally important, as a rule only one of them, depending on the priorities, has the greatest impact on others.

In the developed project, by the elements of the project triangle is meant:

The scope of work - is an elaborate explanatory note to the master's project and a practical result of the research (the diploma contains a technological part).

Resources - printed literary sources (books, articles, textbooks, etc.); technical equipment (computer, Internet connection); software tools (Word processor, MS Project, MS Excel or other statistics program, MS PowerPoint or other presentation program, specific software tools for the development of the technological part), office supplies, budget for the purchase of everything student need.

Time - a limited period of 1,5 years (time of study on the master's degree program and working on master's thesis).

After setting goals and clarifying the main requirements for the project and its results, the planning phase begins. To decompose the project into accessible for review

(at the planning stage) and managed (at the implementation stage) parts, the Work Breakdown Structure (WBS) of the project is used. Depending on the scale of the project, the number of decomposition levels may vary, up to the selection of works ready for inclusion in the network model. Fragments of project task list with levels of WBS and necessary resources for each task, designed in MS Project, is shown in Fig. 2 and Fig. 3.

	Реж зад:	СДР	Название задачи	Длитель	Начало	Окончание	Названия ресурсов
1		1	⊿ Introduction to the topic and work plan	4 дней	Пн 04.09.17	Чт 07.09.17	
2		1.1	Discussion of the topic with the thesis advisor	1 день	Пн 04.09.17	Пн 04.09.17	
3		1.2	Drawing up a diploma's plan with the thesis advisor	1 день	Вт 05.09.17	Вт 05.09.17	Stationery [1]
4		1.3	Working out a plan in MS Project	2 дней	Ср 06.09.17	Чт 07.09.17	Software tools (Word processor, MS Project)[1
5		2	⊿ Analysis of scientific sources and literature	50 дней	Пт 08.09.17	Чт 16.11.17	
6		2.1	Search for necessary information	20 дней	Пт 08.09.17	Чт 05.10.17	Paper resources (books, articles, textbooks)[1]
7		2.2	Processing sources	30 дней	Пт 06.10.17	Чт 16.11.17	Software tools (Word processor, MS Project)[1
8		2.3	Meeting and report to thesis advisor	0 дней	Чт 16.11.17	Чт 16.11.17	Printer[0];Stationery [0]
9		3	⊿ Experimental research	60 дней	Пт 17.11.17	Чт 08.02.18	
10		3.1	Experiment planning	5 дней	Пт 17.11.17	Чт 23.11.17	Paper resources (books, articles, textbooks)[1]
11		3.2	Conducting an experiment	45 дней	Пт 24.11.17	Чт 25.01.18	Paper resources (books, articles, textbooks)[1]
12		3.3	Analysis of the results of the experiment	10 дней	Пт 26.01.18	Чт 08.02.18	Software tools (MS Excel or other statistics pro
13		3.4	Meeting and report to thesis advisor	0 дней	Чт 08.02.18	Чт 08.02.18	Printer[0];Stationery [0]
14		4	⊿ Development of design and technological part	55 дней	Пт 09.02.18	Чт 26.04.18	
15		4.1	Development of technical specifications to software (hardware) product	15 дней	Пт 09.02.18	Чт 01.03.18	Software tools (Word processor, MS Project)[1]
16		4.2	Substantiation and choice of methods for solving the task	10 дней	Пт 02.03.18	Чт 15.03.18	Paper resources (books, articles, textbooks)[1]
17		4.3	Development of software (hardware) product	30 дней	Пт 16.03.18	Чт 26.04.18	Software tools (specific software tools for the development of the technological part)[1]
18		4.4	Meeting and report to thesis advisor	0 дней	Чт 26.04.18	Чт 26.04.18	Printer[0];Stationery [0]
19		5	Discussion at the department of theoretical and design-technological parts diploma project	2 дней	Пт 27.04.18	Пн 30.04.18	Software tools (MS PowerPoint or other presentation program)[1]

Fig. 2. Fragment 1 of project task list in MS Project

The formation of the working structure of the project logically leads to the question "Who will carry out these tasks?", The answer to which is to create an organizational structure of the project - Organization Breakdown Structure (OBS). It defines the relationship between project participants, their responsibilities and authority in the project implementation process.

The project team includes an advisor and a master student or an advisor and a group of students working on joint master's thesis. It is possible to use this approach for team work of master students who has common topic.

№	Реж задач	СДР	Название задачи	Длитель	Начало	Окончание	Названия ресурсов
20		6	⊿ Development of the methodical part	30 дней	Вт 01.05.18	Пн 11.06.18	
21		6.1	Methodical recommendations for the administrator of the software (hardware) product	10 дней	Вт 01.05.18	Пн 14.05.18	Software tools (specific software tools for the development of the technological part)[1] Software tools (Word processor, MS
22		6.2	methodical recommendations for the user of the software (hardware) product	10 дней	Вт 15.05.18	Пн 28.05.18	Software tools (specific software tools for the development of the technological part)[1]
23		6.3	additional methodological recommendations as necessary (installation, distribution, update, management of the software (hardware) product)	10 дней	Вт 29.05.18	Пн 11.06.18	Software tools (specific software tools for the development of the technological part)[1] Software tools (Word processor, MS Project)[1] Technical equipment (computer, Internet
24		6.4	Meeting and report to thesis advisor	0 дней	Пн 11.06.18	Пн 11.06.18	Printer[0];Stationery [0]
25		7	⊿ Writing and formalization an explanatory note to diploma project	107 дней	Вт 12.06.18	Ср 07.11.18	
26		7.1	Writing an Introduction	15 дней	Вт 12.06.18	Пн 02.07.18	Software tools (Word processor, MS Project)[1
27		7.2	Writing the first chapter - literature review and description of the experiment	25 дней	Вт 03.07.18	Пн 06.08.18	Software tools (Word processor, MS Project)[1]
28		7.3	Writing the second chapter - design and technological part	35 дней	Вт 07.08.18	Пн 24.09.18	Software tools (Word processor, MS Project)[1]
29		7.4	Writing the third chapter - methodical part	25 дней	Вт 25.09.18	Пн 29.10.18	Software tools (Word processor, MS Project)[1]
30		7.5	Writing a conclusion	7 дней	Вт 30.10.18	Ср 07.11.18	Software tools (Word processor, MS Project)[1
31		7.6	Meeting and report to thesis advisor	0 дней	Ср 07.11.18	Ср 07.11.18	Printer[0];Stationery [0]
32		8	Preliminary presentation of diploma project	1 день	Чт 08.11.18	Чт 08.11.18	Printer[1]; Software tools (MS PowerPoint or other
33		9	Preparing report and presentation for	15 дней	Пт 09.11.18	Чт 29.11.18	Printer[1];

Fig. 3. Fragment 2 of project task list in MS Project

Description of professions, if required by the scale of the project, details the organizational project structure. It should include the name of the profession, its brief characterization, regulation of responsibility and authority. This description may be supplemented by design procedures or work instructions, and comprise information about who is accountable to the person, what it is responsible and what authority it has.

After this, the next block of planning is much easier to implement - planning the timing of project work and developing a Gantt chart as a tool for scheduling (Fig. 4). The Gantt chart can be manually constructed, but when you submit project data to the Microsoft Project program, it is built automatically. For each work schedule defined resources that are combined in resource histograms.
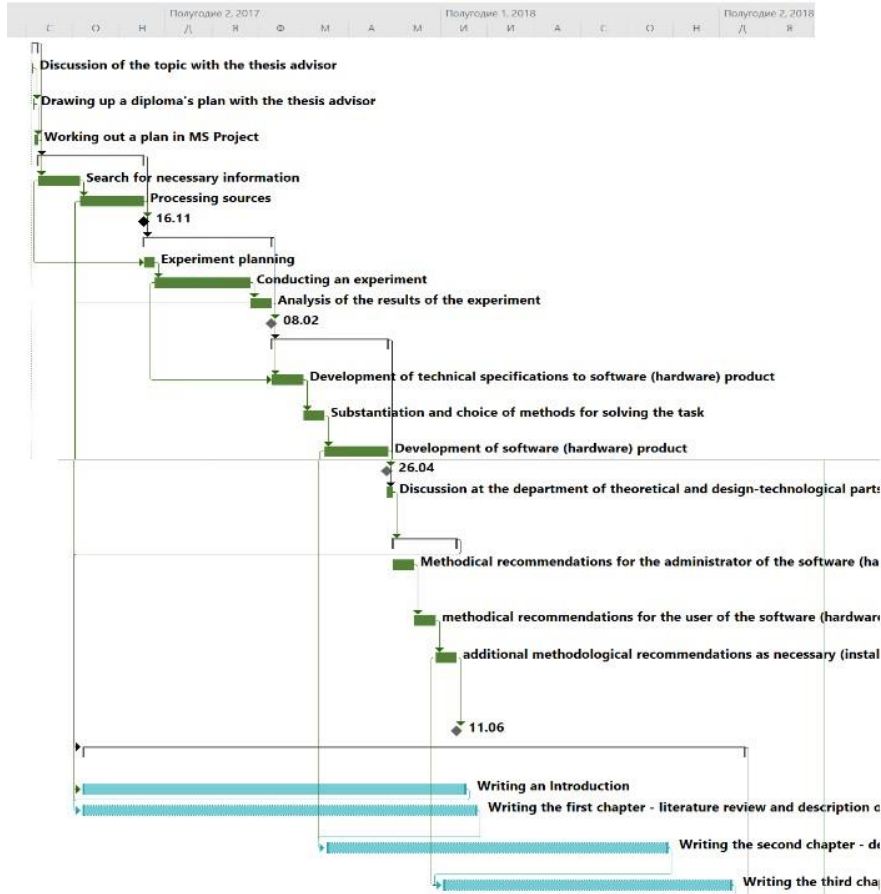
Fig. 4. The Gantt chart of diploma project in MS Project

At this planning is completed, since it is determined how all project goals will be achieved.

5 Research Outcomes: Organization of Pedagogical Experiment, Indicators of Time Management Skills, Statistical Analysis

In the course of the research, it was hypothesized that the use of MS Project as a master's thesis project management tool would increase the level of development of future specialists' time management skills.

The study lasted for two years (2017-2018). Students on the master's degree program of the Faculty of physical, mathematical, computer and technological education of the Berdyansk State Pedagogical University took part in it. The number of participants in the control group was 32, experimental - 32. In total, 64 students. The control group

students during the three academic semesters worked on master's thesis in a traditional way, without the use of project tools, and students of the experimental group used the MS Project to plan and organize the process of mastering research.

The pedagogical experiment was characterized by the justification of the choice of the experimental basis, control and experimental groups, qualitative and quantitative analysis of the results.

In order to evaluate the results and determine the level of formation of students' time management skills, a questionnaire was developed for their thesis advisers - professors and associate professors of the Faculty of physical, mathematical, computer and technological education. As a result of performance of master's thesis by their wards, advisers were offered to assess the level of students' time management skills on a scale from 1 to 10 according to the indicators: planning skills, self-motivation, coping skills, organization and filing skills, student independence. Indicators for the experiment were chosen based on modern approaches to topical time management skills, described in [24, 25].

All students from control and experimental groups were evaluated for each indicator. The maximum number of points that the student could get for one indicator was 10. For the quantitative assessment of the level of formation of students' time management skills indicators a numerical scale with the following values was used: the 0-3 points scored matched to the low level, 4 to 8 points - the average level, and 9 to 10 points - to a high level of skill development.

After receiving the results of the survey, statistical analysis of the received data was carried out. Initially, the frequency tables were built, breaking the sample at 3 intervals. When constructing frequency tables as the lower limit of the first interval, the minimum sample size is taken. When calculating the frequencies in the case of a match of the sample element with the upper limit, the corresponding element was taken into account in this interval. Table 3 shows an example of a frequency table for the 'Panning' indicator of the experimental group.

Table 3. Frequency table for the indicator 'Planning' of experimental group

№	Ranges	Middle of interval (z_i)	The number of sample elements in the i-range (n_i)	Relative frequency (n_i/n)	Accumulated relative frequencies ($\Sigma n_i/n$)
1	0 – 3	1,5	8	0,25	0,25
2	4 – 8	6	16	0,50	0,75
3	9 – 10	9,5	8	0,25	1,00

Results of univariate analysis of variance (ANOVA) experiment for the indicator 'Planning' are shown in the Table 4.

Table 4. ANOVA results for the indicator 'Planning'

Source of variation	SS	df	MS	F experimental	P-value	F critical (0,05)
Between groups	0,38253	1	0,38253	31,8942	0,002182	4,17
Inside groups	0,11705	32	0,00532			
Total	0,49959	33				

The experimental value of Fisher's test is greater than its critical value (31,8942 > 4,17), and P-value 0,002182 < 0,05, therefore, we can reject the null hypothesis: difference between the control and experimental groups are statistically significant for the indicator 'Planning'. ANOVA results for all other indicators of time management skills showed that the difference between the control and experimental groups is statistically significant for all indicators.

To determine the quantitative characteristics of the improvement of indicators of students' time management skills the percentage increase of their mean values was calculated in the experimental group relative to the control group.

Table 5 shows the levels of formation of time management skills by the number of students in the control and experimental groups and the levels they received.

Table 5. Levels of formation of time management skills in control and experimental groups (increase in %)

Indicators of Time Management Skills	Short name	Levels of formation					
		high		middle		low	
		EG	CG	EG	CG	EG	CG
Planning skills	PL	39,1	19,7	78,1	53,8	-39,1	-83,1
Self-motivation	SM	53,8	29,4	73,1	58,8	-29,4	-68,4
Coping skills	CS	24,4	14,7	58,8	53,8	-73,1	-87,8
Organization and filing	OF	44,1	19,7	68,4	73,1	-44,1	-63,4
Independence	IN	39,1	24,4	78,1	62,5	-39,1	-68,4

Diagram of dynamics of relative indicators' growth of students' time management skills formation in experimental and control groups is shown in the Fig. 5.
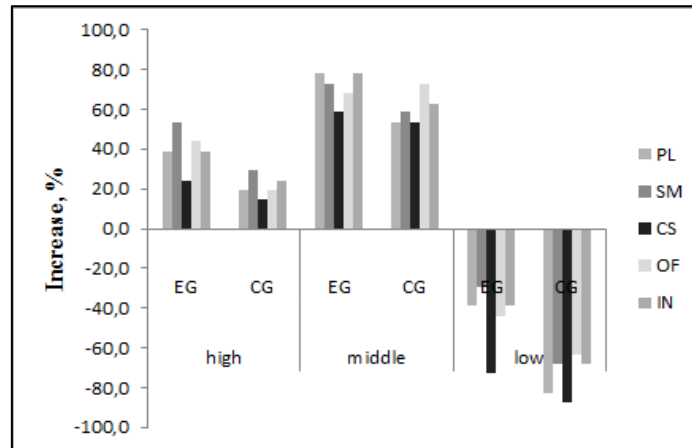
Fig. 5. Diagram of dynamics of relative indicators' growth of students' time management skills formation in experimental and control groups (%)

In this way, in the experimental group the increase in indicators of time management skills was detected compared to the control group. The most increase was found in such indicators as Planning skills, Self-motivation, Independence. This leads to the conclusion that the use of MS Project as a master's thesis project management tool would increase the level of development of students' time management skills.

6   Conclusions

Time management skills are extremely important in modern society and highly valued in both professional and everyday life. The organization of work on the master's thesis, as one of the first serious projects of the future specialists, requires a fairly clear planning, setting goals, a rational allocation of time to conduct and design the study.

Therefore, the task was to find such an approach to master's research, which would combine the methodology of organizing activities to achieve a unique result with limited time, resources and volumes, and at the same time would develop time management skills among students. Such an approach was found - we considered the master's thesis as a project, and the process of working on it as an object for applying the methodology and techniques of project management.

The process of working on a project is greatly simplified when using automated project management systems that are quite widely represented in the software market. We analyzed the common project management programs for set of the necessary parameters, and chose the Microsoft Project as the most suitable for the project's work on master's thesis.

The implementation of the master's thesis project included setting goals with defining the main constraints, developing the work breakdown structure of project, drawing up a list of resources, planning the deadlines for project work and developing the Gant chart as a scheduling tool.

To identify the level of development of students' time management skills, a pedagogical experiment was conducted among the undergraduates of the Faculty of physical, mathematical, computer and technological education of the Berdyansk State Pedagogical University. The students of the control group worked on master's thesis without using project tools, and the students of the experimental group used the project approach and the project management system MS Project to implement this approach. As a result, in the experimental group the increase in indicators of time management skills was detected compared to the control group. The most increase was found in such indicators as Planning skills, Self-motivation, Independence. This leads to the conclusion that the use of MS Project as a master's thesis project management tool would increase the level of development of future specialists' time management skills.

References

1. Brigitte J.C. Claessens, Wendelien van Eerde, Christel G. Rutte, et al.: A review of the time management literature. Personnel Review Vol. 36 (2), 255-276 (2007)
2. Hellsten, Laurie-Ann M.: What do we know about time management? A review of the literature and a psychometric critique of instruments assessing time management. Time management. InTech (2012)
3. Arhangelskiy, G.A.: Time management: from personal effectiveness to company development. Teoriya i praktika menedzhmenta SPb: Piter, 760 p. (2008)
4. Arhangelskiy, G.A., Lukashenko, M.A., Telegina, T.V., Behterov, S.V.: Time Management: full course. – M.: Alpina Pablisher, 312 p. (2012)
5. Kornyeyeva, O. M.: Time management as a means of increasing the student's progress in higher education. Problems and prospects of the formation of the national humanitarian and technical elite: zbirny`k naukovy`x pracz`. Xarkiv, NTU "XPI" 44 (48), 309-318 (2015)
6. Cannon, Robert: 'Time Management': a review of issues and strategies for academic staff, Overview -University of Wollongong Teaching & Learning Journal, 3(1), 1996, 37-44
7. Reunova, M.A.: Time Management as a pedagogical technology. Letters in the issue. Offline (TheEmissia.OfflineLetters): elektronnyiy nauchnyiy zhurnal. CPb. (2013)
8. Reunova, M.A. Student's time-management in condition of transformation the system of higher education. Science, technology and higher education. Westwood. Canada, 135-139 (2012)
9. Oettingen, Gabriele, et al.: Self-regulation of time management: Mental contrasting with implementation intentions. *European Journal of Social Psychology* 45.2, 218-229 (2015)
10. Häfner, Alexander, Armin Stock, and Verena Oberst. Decreasing students' stress through time management training: an intervention study. *European journal of psychology of education* 30.1, 81-94 (2015)
11. Divya Gupta, Saloni Chitkara: Effect of time management on academic performance of management students. Global Journal on Recent Advancement in Business Forecasting and Marketing Intelligence Vol 2 (2018)
12. Shazia Nasrullah, Muhammad Saqib Khan: The Impact of Time Management on the Students' Academic Achievements. Journal of Literature, Languages and Linguistics, Vol.11, 66 – 71 (2015)
13. Kuzovleva, N. V.: Fostering a culture of mental work of undergraduates and graduate students in higher education: dissertatsiya doktora pedagogicheskih nauk. Orel, 1011 p. (2016)

14. Ivanova, G.: Time management as a pedagogical technology for the formation of a culture of mental work of students. PedagogIka vischoYi ta serednoYi shkoli, Vl. 1, 282-292 (2017)
15. Project Management Institute, A Guide to the Project Management Body of Knowledge – Fifth Edition, Project Management Institute Inc. (2013)
16. Dennis Lock.: The Essentials of Project Management, 228 p. (2014)
17. Clifford, F., Gray, Erik W. Larson: Project Management: The Managerial Process. McGraw-Hill/Irwin (2006)
18. Ragavi, S., Dr.R.N.Uma: Review of project management softwares - MS Project and Primavera. International Research Journal of Engineering and Technology (IRJET), Vl.03, 1260 – 1263 (2016)
19. Yanjin, Li: Application of MS-Project in Scientific Research Project Management. Proceedings of the 8th International Conference on Innovation & Management, 1346 – 1349 (2011)
20. Bobrova, Yu.K., Malashevskaya, E.A.: Creating a learning project in MS Project. Aktualnyie problemyi aviatsii i kosmonavtiki, Vl.2 (6), 97-98 (2010)
21. Alyeksyeyeva, H.M., et al.: Curriculum Optimization by the Criteria of Maximizing Professional Value and the Connection Coefficient of Educational Elements, Using Software Tools: (ICTERI 2018: 14th International conference on ict in education, research, and industrial applications) [Electronic resource] (Kyiv, Ukraine, May 14-17, 2018). CEUR Workshop Proceedings, Vl 1, 365-378 (2018)
22. Muhammad Sajad, Muhammad Sadiq: Software Project Management: Tools assessment, Comparison and suggestions for future development. IJCSNS International Journal of Computer Science and Network Security, Vl.16 (1), 31 – 42 (2016)
23. Boldyireva A. A., et al.: Comparative analysis of modern information technologies in project management. StudArctic forum, Vl. 3 (7) (2017)
24. Alison Doyle: Time Management Skills List and Examples. https://www.thebalancecareers.com/time-management-skills-2063776, last accessed 2019/02/11
25. Essential time management skills. https://www.coachingpositiveperformance.com/17-essential-time-management-skills/, last accessed 2019/02/11