SITUATIONAL STUDENT RESEARCH PROJECTS MANAGEMENT

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Purpose: To propose a framework for choosing a project management approach for student research projects, taking into account the individual objectives of the advisor and the student, their personalities, the project type, and its environment. The proposed approach should increase the success rate of student research projects.

Design/methodology/approach: Student research projects are characterized, and the relevant literature is reviewed. The theory concerning recent project management developments that could be potentially useful for student research projects is presented. A case study is analyzed. On the basis of the case study and the literature findings, a conceptual framework for the selection of a student research project management approach is proposed.

Findings: It was found that student research projects, although apparently nonproblematic, need a conscious, individualized, situation-based selection of project management approach in order to assure a high success rate, according to the individual success understanding of project stakeholders.

Research limitations/implications: The proposed framework is a conceptual one. It was developed on the basis of theory and under consideration of student research projects in one area and homogenous culture. Further research is needed to add new aspects to the approach, expand it to other research areas and cultures, and validate its usefulness in practice.

Practical implications: Higher education institutions should promote project management knowledge among teachers and students, and conscious decision-making on the way student research projects will be performed. They should elaborate tailor-made frameworks for student research project management.

Social implications: Student research projects, if managed improperly, may cause students and advisors dissatisfaction and stress. The approach we propose may, in the long term, increase the quality of life of students and advisors.

Originality/value: The framework supporting the conscious selection of the way student research projects are managed, comprising recent developments in project management and taking into account the specific features and environment of each individual project, is an original contribution of the paper. It is addressed both to student project advisors and students themselves, as well as the managers of higher educational institutions.

Keywords: student research project, research project success, research project management.

Category of the paper: research paper.

1. Introduction

Student research projects, undertaken above all in the form of bachelor, master, and Ph.D. theses, possess all the features of projects. They have a specific goal, are unique, consume resources (as a minimum, the work hours of the student and the advisor, but other resources may also be necessary, depending on the area of the research) that are limited, and are time-related. They are also of high importance for at least one of their stakeholders: the student, but fairly often for the advisor as well. For the student, the student research project is the final step of an education phase and may decide about their future career. For the advisor, such projects may constitute an important contribution to their scientific achievement. Student projects may also bring tangible results to the organizations they are performed in. And still, the management of such projects has not received much attention in the scientific literature. We can mainly find tutorials on personal time management and communication with the advisor (e.g., Lee, 2019), with little reference to project management, especially to the recent developments in this area - like Agile management, stakeholder management, metrics-based management, multicriterial success understanding, situational project management, etc. One may have the impression that these projects are seen as being less important than projects implemented by an organization with legal personalities, as being uniquely "private," small, non-problematic projects with little impact on society. They are implemented in massive quantities over the whole world without much attention from mass media (apart from plagiarism cases), and thus seem to be smoothly manageable so that the research on them is not necessary.

And yet, without researching the issue systematically, we are unable to verify the truth about their alleged problemlessness, we cannot evaluate their success degree, and we cannot identify any success factors in order to improve the implementation of this project type. Of course, we face the problem of defining the success of a student research project. According to the current view on project success (Davis, 2014), we have to take various criteria into account set by the main stakeholders, not just the criteria based on time, scope, and quality. Being on time (i.e., in our case, graduating in time) may not be the only success criterion of the main stakeholder, the student. Also, the advisor may have other success criteria. For the student, additional success criteria may be a low level of stress during the preparation of the thesis, a high degree of usefulness of the thesis in the future job, a high degree of general satisfaction, a medium degree of difficulty in the work, etc. For the advisor, success criteria may comprise the "distance" between the thesis and a possible ready paper to be published in a reputable scientific journal, a low amount of time they have to spend with the student and on the thesis correction, etc. In a student research project, there may also be other key project stakeholders, e.g., the organization that is the object of the research, which will have their own goals and, thus, their own success criteria.

The authors of this paper represent two student research project main stakeholders: the student, who completed her research a few months ago, and the advisor. The advisor has over 30 years of experience in advising students on their research projects. This experience shows that there may be various ways of understanding the success of a student research project on both sides, apart from the quality (measured by the final mark) and timeliness, which are the most evident criteria. As a result, the student research projects are often not seen as successful as they could have been seen if they were treated more as "serious" projects and were managed more professionally. The students or the advisors often are not completely satisfied with the outcome and the course of the project (too much stress, too many conflicts, too many unspoken resentments, too little usefulness of the outcome for the future on both sides, etc.).

In fact, approaches to the management of "real" projects, especially research projects in general, should be systematically applied here, as student research projects are research projects which can often be classified, from the point of view of their stakeholders, as projects of high importance and complexity and involving various interests. And for research projects, the use of recent project management approaches is recommended (Pirro 2019), so they should also be considered for student research projects.

Additionally, student research projects have their own specific features. Some of them (like small size and impact) facilitate their management, but others may make it more difficult. We formulate the hypothesis that the following reasons (in addition to failure factors which we encounter in "normal" projects, led in organisations) may be responsible for the situation that the recent findings in project management are not applied to student research projects and these projects are not as successful as they could be:

- The problem of accidental project manager (Darrell, Baccarini, 2020). In the public sector, also in higher education institutions, the nominations to project managers are often based not on project management competencies but on the position held in the institution or on the fact that a person has been granted a budget for the given project. This problem is paramount in the area of student research projects. Advisors are nominated merely on the basis of their academic position. As a result, one of the two main project stakeholders, the person who is considered to play the role of project manager, usually has no or little expertise in projects and their management. And it is common knowledge that project management is crucial for project success (Munns, Bjeirmi, 1996). Although the student may also be a kind of "accidental project team member" who does not know much about projects, it happens more and more often that the student knows more about project management than their advisor because of their student jobs.

- The fact that the advisor and the student usually do not know each other. In organizations people have a chance to have worked together for some time or to get someone's opinion on the project manager or on the members of the project team. In the world of higher educational institutions, the couple "advisor-student" usually meet just before they start implementing the project. Thus, the project course may be burdened by the lack of proper communication and trust, strengthened by the position and power difference.

The appropriate project management methodology should be the first and most important choice to make in every project, also in student projects. Thus, the objective of this paper is to propose a set of recommendations that should help the advisors and students to implement their common projects in such a way that project success, according to their own personal definitions, is as probable as possible. The recommendations will be based on the existing literature on student research projects and recent developments in project management, summarised in section 2, on a case study described in section 3, and on the experience of the authors. The recent developments in project management to which we will refer here are above all: metrics-based project management, Agile and hybrid project management, stakeholders management, and situational project management.

The latter notion, the situational project management, is especially important for the approach proposed here. In (Lehamnn, 2016) it is claimed that there is no universal project management methodology, good for all the projects in an organization, and that project management approach should be adapted to each project individually. Lehamnn gives in that generally, the contrary is believed: organizations all over the world proudly announce the implementation of uniform methodologies for all their projects. However, he gives examples of projects for which this approach has led to project failures: one and the same methodology proved itself to be perfect for one project and improper for another one. This has happened even for apparently similar projects, from the same industry and of comparable size, implemented in the same culture and even led by the same project manager. We consider thus justified to propose an approach specifically designed for student research projects, which will be flexible and will be further adaptable to each specific situation in which the couple "advisor-student" may find themselves in.

2. Materials and methods

2.1. Metrics-based project management

According to Kerzner, a project cannot be managed effectively without metrics and accompanying measurements that can provide complete or near-complete information about a project's chances of success (Kerzner, 2013). To explain the essence of project metrics in

a transparent way, the literature proposes the simplest definition of a project metric: A metric is a measure of the phenomenon that is being measured. Kerzner formulates the following statements, which further clarify the essence of metrics:

- If a phenomenon in a project cannot be measured, it cannot be managed.
- The phenomenon that gets measured gets done.
- We can never really understand anything fully unless it can be measured (Kerzner, 2013).

Metrics inform project stakeholders about the status of the project. Stakeholders need to be confident that the right metrics are being used and that the measurement provides a clear and true representation of the state of the project. Metrics can determine whether it is feasible to undertake or continue a particular project and whether certain actions need to be taken.

Metrics must be well-defined, and guidelines for their use must be fully accepted by those who will use them. A project management program through metrics should be designed and implemented so that the project team begins to consider metrics as the basis for activities that support project management excellence and overall organizational improvements. Data provided by a system of metrics can only become the basis for informed analysis if there is consensus on what is happening and what should be happening in projects (Kerzner, 2013).

Defining a metric requires answering several key questions concerning the measurement:

- What should be measured?
- When should it be measured?
- How should it be measured?
- Who will do the measuring?

and concerning information gathering and reporting:

- Who will collect the information?
- When will the information be collected?
- When and how will the information be reported? (Kerzner, 2013).

Metrics can change during each phase of the project lifecycle and from project to project. Metrics should be closely linked to project success factors and project success criteria for each particular project.

In the literature, the concepts of success factors and success criteria are interrelated, and many authors (Wateridge, 1998; Cooke-Davies, 2002; Koutsikouri et al., 2008; Jugdev et al., 2005; Rohman et al., 2015) suggest defining the concepts of project success criteria and project success factors as follows:

- Success criteria are dimensions for assessing whether a project has succeeded or failed.
- Success factors are variables (conditions) that increase the probability of project success.

The role of project metrics is to measure, during project implementation, to which extent the conditions enforcing project success (success factors) are fulfilled, and if the predicted values of project success criteria are satisfying. If the metrics values are unsatisfactory or exhibit a worrying tendency in time, relevant measures and steps have to be undertaken.

It has to be underlined that metrics do not have to describe undoubtedly and easily measurable aspects, like time and money-related issues. Equally important are metrics representing human mood, satisfaction, and similar soft project aspects. Such metrics are nowadays relatively easy to implement thanks to modern technologies (e.g., we can ask project stakeholders to systematically klick on smileys on their smartphones) and indispensable in the modern approach to project success evaluation, which involves both hard and soft criteria.

2.2.   Agile and hybrid project management

The Agile approach is an alternative to the traditional (waterfall) approach to project management. In the latter, the phases of initiation, planning, execution, and closure follow one another, and, in the ideal case, they should not overlap. In the Agile approach, these phases overlap and keep on returning. Agile development practices (known usually as just the Agile approach) is a term for a range of approaches and practices related to project management, based on the Agile Software Development Manifesto and the twelve principles that underlie it. Agile defines the values and principles that guide project teams without defining processes (Highsmith et al., 2001).

The most relevant characteristics of the Agile framework are based on the systemic approach of context, simplicity, ease of learning, and methodical components such as iterative, incremental, collaborative work, and adaptability to environments. Key ideas of Agile are as follows:

- people and interaction are more important than processes and tools,
- a working product is more important than comprehensive documentation,
- cooperation with the customer is more important than agreeing on the terms of the contract,
- being ready for change is more important than following the original plan.

Agile project management attempts to make project execution flexible and open to changes in the environment and the project scope. Agile requirements tend to be primarily functional and reasonably informal (Boehmand, Turner, 2005). There are several principles of Agile, out of which we present the ones that are most important for the following part of the paper:

- The highest priority is to satisfy the customer through early and continuous delivery of a valuable product.
- Changing requirements are welcome, even late in development. Agile processes harness change for the customer's competitive advantage.

- We should deliver subsequent versions of the product frequently, in intervals from a couple of weeks to a couple of months, with a preference for shorter intervals.
- The most efficient and effective method of conveying information to and within the project team is face-to-face conversation.
- At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly (Highsmith et al., 2001).

The great advantage of using Agile methodologies is not only fast delivery of the final product but also continuous adaption on the basis of feedback. Agile supports collaboration and continuous planning, as well as continuous learning. When using Agile, the focus is on planning, implementation, and final delivery of the product.

However, the Agile approach is not a solution for all projects. It is true that, in many cases, it is considered to be better and more efficient than the traditional waterfall approach. On the other hand, as it is described in Belling (2020), a pure Agile approach would not have chance to be helpful in certain types of organizations and projects. For example, in bureaucratic organizations, where the decision-making process is long and complex, Agile project management would be difficult or even impossible to implement. Also, in the case of projects where high investments have to be made in the initial phase – whether financial or mental investment is meant here – an Agile approach will not be adequate. In order to make the right investments, the whole project has to undergo a holistic and fairly detailed planning process. In order to use both the advantages of the Agile approach and the waterfall approach and to eliminate their weaknesses, hybrid approaches are proposed, with various degrees of agility and rigidity (Reiff, Schlegel, 2022). There exists a variety of hybrid methodologies; thus a careful selection process is recommended, according to the indications proposed in the literature (Reiff, Schlegel, 2022).

2.3. Project typologies

As we read in (Lehamn, 2016), the choice of project management approach should be carefully adapted to the project and organization type, thus to the specific situation in which it should be used (situational project management). This is a very important problem: various project types require various approaches to their management – one and the same approach may prove to be perfect for one project and lead to a failure in the case of another project (see (Lehamn, 2016) for examples). For this reason, it is important to be aware of the type of project we are going to manage. Project typologies may be helpful here. There exist different project typologies, one of the recent ones was proposed in (Lehamn, 2016). The author distinguishes, among others, the category couples listed below. The divisions are not crisp: a project may belong at the same time to both categories from each couple, but to different degrees.

- "1st" and "nth" projects: projects which are very different from all the projects implemented in a given organization or by a given group/person so far, and those that show a lot of similarities to previous projects;
- "blurry" and "focused" projects: projects with fuzzy or blurry requirements or final product specification and those with a detailed, apparently definitive specification;
- "greenfield" and "brownfield" projects: a greenfield project is built on virgin ground, literally or metaphorically, with little history related to the project area and product and with few stakeholders, while a brownfield project is implemented in an environment with some history and many stakeholders, and various interests that might be an obstacle to smooth project implementation.

Obviously, there exist numerous other project typologies. One of the best-known was proposed in (Turner, Cochrane, 1993). It distinguishes between projects with ill-defined goals and methods, ill-defined goals and well-defined methods, well-defined goals and ill-defined methods, and well-defined goals and methods. If we combine both typologies, we can arrive at categories like 1st (nth) project with respect to the goals, like 1st (nth) project with respect to the methods, etc. Each category may require another approach to project management.

2.4. Student research projects

Student research projects take on the form of the preparation of bachelor, master, or Ph.D. theses. The primary aim of a student research project is to develop the individual student's ability to conduct independent research (Sharp et al., 2002).

Supervision of student projects can often require a significant mental effort from the supervisor to be effective for the students. While supervising one or two students, it is relatively easy to remember the context of each student's work from one meeting to the next. However, with a large number of students, the mental complexity of the supervision becomes significant (Brodtkorb, 2019).

Tengberg (Tengberg, 2015) reports on Agile development methods applied to the supervision of Ph.D. theses and focuses on using short planning phases of around two or three weeks, called – as in the Scrum approach (The 2020 Scrum GuideTM, 2020) - sprints. His argument is that using agile methods in supervision will decrease the Ph.D. completion time. Another researcher reviews usage cases of the Agile approach at university level for interactive learning (Dewi, Muniandry, 2014).

The requirements for the successful completion of student research projects are, in some respects, difficult to establish. In particular, the amount of originality needed and the extent to which generalization of the results is possible may be unclear. At the very least, the conclusions which are reached must be validated. Certainly, the contribution to the knowledge of a student thesis should be of some significance, particularly in view of the fact that it is likely to serve as a reference work (Sharp et al., 2002), but it still has to be taken into account that this usually is the first research work for the student.

The academic space where student projects are implemented implies certain difficulties determined by the lack of expertise of students and advisors in project management, coupled with the magnitude of the responsibility. Difficulties are evidenced concerning the selection of the methodology and the designation of roles, the acquisition and administration of resources, and the management of time in compliance with the acquired commitments (Abuchar, Simansa, 2021).

3. Case study

The case study relates to the master's thesis prepared and successfully defended by one of the authors of the present paper. The thesis topic was 'Metrics for measuring research and R&D projects'. The aim of the master's thesis was to propose a way of measuring the progress of research and R&D projects. The objective was achieved through an extensive literature review, the development of a specific case study, and questionnaires and interviews with the manager of a partially failed research project.

The research objective attainment started with the answers to the following research questions:

- What factors influenced the partial failure of the selected research and development project?
- Could problems with the project have been identified before they occurred, and how?
- What metrics could have helped to identify problems that occurred in the project before their occurrence?

Conducting a qualitative study aimed to point out the specifics of the selected R&D project, identify the problems and difficulties encountered in its implementation, and to identify the factors of its partial failure. The final result of the thesis was an initial concept for measuring research and R&D projects, its verifications using the selected project, and the final version of the concept. The result of the qualitative research carried out in the thesis was an attempt to define metrics measuring the chances of success of a research project during its implementation and indicating potential problems.

The work on the thesis started apparently according to the waterfall model, as there was a precisely defined sequence for completing the thesis parts. The schedule of the work was clearly defined, with the theoretical parts having the highest priority. Dependencies between the project work elements were clearly defined. It was not entirely known, however, what results were to be expected; the expected outcomes remained only roughly described. There was no certainty as to what conclusions would be reached because they depended on the results of the questionnaires and interviews.

A strict schedule was worked out for the development of the case study, the creation of the interview and questionnaire forms, the conduct of the interviews, and the development of the audio materials, but it turned out that in reality, it was not possible to adhere to such a rigid timeframe. The schedule changed a lot, and these changes and their consequences could only be analyzed once the project had been completed.

Collaboration with the advisor was performed via the Zoom platform and email. The most important issues were discussed during numerous consultations on the Zoom platform. These consultations took place at a frequency of one to two weeks, depending on the stage of the work in progress and its difficulty. The frequency of the online meetings also depended on the work actually carried out, as their topics covered the parts of the work where problems and difficulties arose. The duration of the meetings was not set beforehand; it depended on the course of the conversation; the meetings ended at the moment when the thesis author's vision seemed to be clarified, and the next steps were explained.

It is worth noting, however, that the author's vision for her master's project work began to change strongly the moment the actual research on the case study (questionnaires, interviews) began. The vision of the final product gradually established itself during the Zoom meetings.

At this point, the number of Zoom meetings relatively increased, and due to the uncertainty about the results, the traditional approach changed to an iterative approach to managing the project and creating the final product on an ongoing basis. Frequent meetings with the supervisor on the Zoom platform and emails incorporated elements of sprints, which are central to the Scrum approach (The 2020 Scrum GuideTM, 2020).

The Agile approach, to which the initial waterfall approach evolved, allowed the thesis author to deliver subsequent elements of the thesis faster and more frequently, to consult and clarify uncertain and unclear elements in the research work more frequently, and to adjust the next steps of research and development of the final product. The aforementioned advantages of this approach have resulted in greater flexibility to adapt to change and a constantly evolving final product. An iterative approach to the delivery of successive parts of the research, which focuses on ongoing editions that take into account the supervisor's feedback and the thesis author's reflections, was observed to be very effective.

In summary, the effectiveness of applying Agile project management to the student project is worth highlighting. The possibility of correcting actions during each iteration increased the speed of response to change and adaptability to the specific environment in which the research was conducted. On the other hand, it was advantageous to begin the project according to the waterfall approach because a considerable amount of preparations had to be met: preparation of the case to be analyzed, of the persons to be interviewed and questioned, of the questionnaire and interview schemes. These elements had to be ready at the beginning, and it would have been impossible to modify them after each iteration.

Referring to the project typology described in section 2.3, we have to state that the project, with respect to the goal, was rather a "1st" project also for the advisor, which strongly contributed to the fact that at the beginning the end result was not clear and the vision was

frequently changing. It was thus also a "blurry" project with respect to the goal. The goal was ill-defined, but the methods (interviews, questionnaires) were well-defined, which is why the waterfall approach to the planning of methods was possible in the initial stage. It was also a "greenfield" project, thanks to which there were practically no stakeholders interested in disturbing its course.

Referring to section 2.2, where the problem of the agility and rigidity degree in hybrid approaches to project management is discussed, it is worth noticing that in the case of the student project discussed here, a high amount of mental and time investment was needed in the initial stage – the research methods had to be carefully planned. For this reason, a pure Agile approach would not have been possible, and a hybrid approach was necessary.

Referring to the problem of project success understanding, here, the student was interested in preparing a high-quality thesis, which would allow her to apply successfully for a Ph.D. position. The prerequisites for the Ph.D. position comprised publications in practically any scientific journal; thus the aim of the student was to prepare a thesis that would give rise to rapid publications in student conference proceedings. The advisor was rather interested in more ambitious publications in reputable journals, but she accepted the objective of the student as a compromise.

Additionally, after the analysis of the selected student project, it is worth stating that the course of student research projects can be improved and the problems and risks encountered in their course eliminated by applying the following improvements:

- Focusing more on the principles of the Agile project management approach: reduce the sections of work sent to the advisor for checking, which will eliminate the problem of waiting for the responses: checking a smaller section takes less time. In addition, smaller sections of the work will help to detect errors early and to react to them quickly.
- Increasing the frequency of meetings so that questions and ambiguities are dealt with immediately.
- Balancing the number of students advised by the advisor and their teaching load so that the advisor is available more frequently.

4. Proposal of an approach to student research projects management

We propose here a situational approach to the choice of project management method for student research projects. Thus, we list the points to be considered by the couple "advisor-student", or, in case of communication difficulties, by each of the two stakeholders individually, in order to choose the final approach, tuned in a discussion, where a compromise should be reached before the project starts.

Table 1.
Indications for the choice of management method for student research projects

Aspect of the project	Selected issues to be addressed
Project type	• "1st"-"n^{th}" project for the advisor: if the project has a lot of unknown elements also for the advisor, a higher initial investment in the planning has to be made, but the initial plan has to be considered as potentially changeable (a hybrid approach); • "blurry" – "focused" projects and ill/well-defined goals projects: if the objective and the product are to a great extent blurry, a more Agile approach should be adopted, with a high frequency of meetings; • "greenfield"-"brownfield" project: if the student research has to be performed in an organization where the student research activities or the student presence may interfere with everyday operations or disturb anybody for any other reason, the advisor has to take care of adequate stakeholder management before the project starts.
Expertise in project management	• if the advisor is an experienced project manager and the student is not knowledgeable in this area, the advisor should introduce basic project management elements into the project, obliging the student to study them; • if the student has some experience in project implementation and the advisor does not, the student should make an attempt, respecting the existing power distance and the advisor's personality, to propose the application of project management elements they found useful (e.g., iterations, frequent meetings, etc.), and the advisor should be open to the proposals; • if none of the two is knowledgeable in project management, the advisor should study the basic elements of project management (basic scheduling principles, risk management, stakeholder management, etc.) in order to be able to better help the student to reach success in the project.
Project success criteria and measurement of their achievement	The advisor and the student should talk about their mutual project success criteria. In other words, the questions "what do you expect from the project? what is most important to you?" should be asked mutually, and the project management method should be selected, taking these answers into consideration. If the student is mainly interested in graduating on time and the advisor in an ambitious work, it may be even better to break the project in time and let the student search for another advisor. In the case of less conflicting success criteria, a compromise has to be searched for (like in the case from section 3, where the compromise was found as to the reputation of the journal in which the results were to be published). Once the success criteria have been set, project metrics to measure their achievement chances should be decided upon individually by the advisor and the student. Examples of metrics are: "frequency with which the student sends the intermediate results," "the quality of the intermediate results," "the delays with respect to milestones" (for the advisor), "the time-to-answer of the advisor to the questions of the student," "the clarity degree of the advisor's answers and corrections" (for the student), etc. Troubling values of the metrics would require some actions, like a conversation between the student and the advisor.
The object of the research	If the object of the research may pose some difficulties, special care has to be taken of this by the advisor before the project starts. For example, if the student has to conduct research in an organization, this organization or its individual members may become stakeholders with a negative influence on the project. For example, they may give the student low-quality answers in interviews and questionnaires, as the student has no power and no tangible importance to them but only takes their time. Additionally, if the organization in which the proper research is to be performed is highly bureaucratical, a waterfall approach should be preferred, with a lot of effort put into initial project planning and stakeholder analysis, including the resolution of all the formal and rigid procedures challenges.

Cont. table 1.

Degree of relation symmetry, degree of trust	Relations between the student and the advisor are of utmost importance, and the two project stakeholders, if they have not worked together before, should try to get to know each other and clarify the roles and expectations. Of course, the relationship will never be fully symmetrical because of the power distance between the student and the advisor. But the degree of this asymmetry can vary. For example, a student who has worked in an Agile team is used to collective decision-making and to the freedom to make their own proposals. This can be of advantage to the success of the student research project; thus the student may try to get out to which degree the advisor would be ready to enter into such a relationship. Mutual trust should be built in consecutive meetings, even if the traditional approach is used. Both sides (independently) should define metrics to control the quality of the relationship. Examples of metrics are level of stress during the meetings, degree of satisfaction with the answers (for the student), degree of compliance to the remarks, and openness in the formulation of the questions (for the advisor).

In the case of the project presented in section 3 (which was a 1st - for both the student and the advisor - project in respect to the goal, with a blurry objective but with well-defined methods), the methods tools (interviews and questionnaire forms) had to be made precise at the very beginning, which demanded an initial considerable mental and time effort. That is why it was chosen to perform detailed planning of the methods, but the result of the project remained undefined and was made specific in subsequent interactions. As it was a "greenfield" project, with no difficult object of research (the interviewee and responder were a colleague of the advisor), no stakeholder management was required on the part of the advisor. The student and the advisor agreed on the success criteria, finding a compromise. They thus decided that one of the objectives was to prepare a high-quality thesis, meriting a very good mark and able to be defended within the earliest deadline set by the university, and to create results worthy of being presented in a student paper at a student scientific conference. Thus the advisor was constantly measuring the quality of the intermediate results from the point of view of the timely termination and the publication chances in the selected journal type. The asymmetry of the relation was gradually, but of course only partially reduced in the numerous online meetings, where the student was developing self-confidence in the formulation of her own original proposals.

Conclusions

In this study, we propose to apply the situational approach to the management of student research projects. The situational approach means that the method of project management is selected for each specific case, taking into account the features of the project, its stakeholders, and the environment. In our approach, we emphasize the need to take into account recent developments in project management that can turn out to be advantageous to the student

research project. We should not be misled by the apparent simplicity of student research projects (a tiny team, usually composed of two persons, low importance for organizations and society, low consequences of failure for organizations and society, low interest of mass media, short duration, etc.). The mere fact that, usually, the project advisor is a so-called "accidental project manager", and the existence of a high power distance between the advisor and the student constitute important failure factors of student research projects. On top of that, we face the frequent problem of the two basic stakeholders not knowing each other before the project, as well as of the variety of project success criteria both sides may have, more or less consciously. All this is intensified by the normal challenges and risks of research projects (Klaus-Rosińska, 2019).

Our proposal consists in considering various aspects of each research project during a meeting with the advisor and the student, and choosing consciously the way they will perform the project together, making use, if appropriate, of recent developments in project management, like metrics-based project management, stakeholder management, various project typologies, Agile and hybrid approach, etc.

Certainly, our proposal has numerous limitations. First of all, it has to be tested in actual student research projects in various higher educational institutions in various countries (because cultural differences may be an issue too), and further developed (in our proposal certain aspects influencing the choice of the management method have certainly remained unnoticed). Secondly, there are human factors that may be an obstacle to the implementation of the approach, especially the personality of the advisor and of the student. Also, the domain of the research may influence the approach: the authors of this paper come from the field of management, which certainly has limited their vision. We are, however, certain that our, or a similar approach, may increase the quality of student research, and it will do so in a sustainable way: allowing us to consider also the student's and the advisor's stress and tiredness level, their satisfaction, and their wellbeing. In the modern approach to project management, these soft aspects should, among others, constitute project success criteria and be measured by relevant metrics. In the long term, our approach may thus contribute to the well-being of society and the quality of research.

Our approach should be taken into account by the management of higher education institutions and be the object of seminars and training, both for advisors and students. Organizational frameworks for choosing the management method for student research projects should be developed. This investment will certainly pay itself off in the form of increased research quality, as well as the satisfaction of both advisors and students.

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