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Radosław Ryńca, Dorota Kuchta

Politechnika Wroclawska

IDENTIFICATION OF FACTORS INFLUENCING THE EVALUATION OF THE RESEARCH PROJECTS IN HIGHER EDUCATION INSTITUTIONS BY PROJECT EXECUTORS AND UNIVERSITY MANAGEMENT

Summary: In our opinion, a higher education institution should be evaluated by different entities, such as its students, employees and management. A vital part of such an assessment is the evaluation of the research projects carried out in an institution. This paper presents the results of studies aimed at identifying the factors (evaluation criteria) which are particularly important for both project executors and university management. The paper presents the claim that research projects may be evaluated according to different criteria, depending on what evaluating entities regard as important.

Keywords: project evaluation, higher education.

1. Introduction

In our opinion, a higher education institution should be evaluated by different entities, such as its students, employees and management. A vital part of such an assessment is the evaluation of the research projects carried out in an institution. Since research projects may be evaluated according to different criteria, depending on what evaluating entities regard as important, it seems essential to identify the factors influencing this evaluation. This paper presents the results of the studies (based on the literature and questionnaire) aimed at identifying the factors (evaluation criteria), which are particularly important for both project executors and university management.

2. Evaluation of research projects – a survey of literature

In our opinion, it is essential to identify the factors that influence the evaluation of the research work conducted in higher education institutions. This particularly applies to the research projects funded from outside sources. The criteria used by project executors and university management to evaluate projects can be of major

managerial importance since they can help to focus university management's attention on the aspects key for project execution, which may contribute to the satisfaction of both research work executors and their clients.

In the literature on the subject, the evaluation of research projects, which would be balanced, i.e., made by different evaluating entities, is not often articulated. Some research into this problem was done by Jordan et al. [2005] and Birnbaum [1977]. There are several criteria for evaluating research projects, developed by various entities, such as the National Science Centre or the European Union, but they have not been harmonized. In the literature one can find papers by Niedergassel, Leker [2011]; Numprasertchai, Igel [2005]; and the team: Barnes, Pashby, Gibbons [2002; 2006], who indicate factors conducive to successful collaboration between the university and its business partners (see also Ryńca, Kuchta [2011]). To our knowledge, no studies on research project evaluation criteria important from the university management's point of view have been published. Therefore, it seems essential to identify research project evaluation factors taken into account by university's different entities, particularly by project executors and university management. The results of the studies aimed at indicating which of the evaluation factors/criteria are particularly important for project executors and the persons managing a university are presented in the following part of the article.

3. The research project evaluation factors taken into account by project executors

Table 1 lists the factors, found in the literature on the subject, taken into account by project executors in their evaluation of research projects.

The factors in Table 1 were grouped under three categories concerning respectively the project team, the benefits from the project for its executors and the conditions in which the project is carried out in a higher education institution. Interpersonal factors, such as the degree of collaboration and mutual trust between the project team members and the level of communication between them, may turn out to be the critical factors in the evaluation of the project team. The mutual assistance and support in carrying out the project tasks can be another major consideration. Also the size of the project team and the level of supervision and control by the superior can be important considerations for the project executors.

As regards the evaluation of the benefits from the project, the possibilities offered by the project, especially the possibility of obtaining funding for their publications in domestic and foreign journals, the prospect of additional remuneration, the possibility of having one's researched funded and access to research equipment are important considerations for the project executors. Because of the peculiar character of some of the projects (especially the interuniversity projects) carried out in higher education institutions, the opportunity for establishing collaboration with other research units and enterprises interested in the commercialization of the research results can be a major factor.

Table 1. Criteria according to which projects carried out in university are evaluated by university employees

Project executors
<p>PROJECT TEAM:</p> <ul style="list-style-type: none"> – the degree of collaboration and trust between the project team members – the size of the team carrying out the project – the competence of the persons carrying out the project – the level of difficulty of the assigned tasks – the level of mutual assistance and support – the level of communication between the project team members – a high level of supervision and control in the project team <p>BENEFITS FROM PROJECT:</p> <ul style="list-style-type: none"> – the usefulness of the project results for individuals' own research – the possibility of attending foreign conferences funded from project sources – the possibility of receiving funding for publications in domestic and foreign journals – the possibility of gaining experience in conducting research – collaboration with other research units – the possibility of receiving additional remuneration for project work – the possibility of funding one's research, access to research equipment – the possibility of commercializing research results – the possibility of gaining the respect and recognition of other collaborators – the possibility of conducting independent research – considerable work autonomy – the relevance of the research to one's own scientific interests <p>PROJECT IMPLEMENTATION CONDITIONS:</p> <ul style="list-style-type: none"> – access to the equipment needed to carry out the project tasks – top management support for the project activities – the provision of space necessary for carrying out the project – the degree of bureaucracy involved in applying for the project – the degree of bureaucracy involved in carrying out the project – the degree of bureaucracy involved in producing a report from project implementation – the size of funds available under the project – the amount of time for carrying out the assigned tasks – the deadlines for carrying out the particular tasks

Source: authors' own study based on the literature on the subject.

The conditions in which the project is carried out can be another major consideration taken into account by the executors in their evaluation of the project. Access to research equipment and adequate space may be considered essential. In the case of projects funded from outside sources the degree of bureaucracy involved can be a major factor.

4. Research project evaluation factors taken into account by university management

Table 2 lists the factors, found in the literature on the subject, taken into account by the university management in their evaluation of research projects.

Table 2. Criteria according to which projects carried out at a university are evaluated by university management

<p>SCIENTIFIC IMPORTANCE OF THE PROJECT SUBJECT TO A UNIVERSITY:</p> <ul style="list-style-type: none"> – an evaluation of the project from the perspective of the scientific importance of project results – the importance of the project for the development of the fields of science given priority in the higher education institution policy <p>PRACTICAL IMPORTANCE OF THE PROJECT SUBJECT TO A UNIVERSITY:</p> <ul style="list-style-type: none"> – an evaluation of the project from the perspective of the practical importance of project results – the commercial potential of the project (the benefits accruing from the sale of project results) – the project results in patent application for an invention – the project results in application for a design or an utility model <p>BENEFITS FROM THE PROJECT FOR A UNIVERSITY:</p> <ul style="list-style-type: none"> – the quality of the project research (and university) promotion, especially in the business community – owing to the project, the number of highly qualified research personnel employed by a university will increase – the importance of the research work or tasks for the development of university's international collaboration in science and technology – the perceived degree to which the project will contribute to the positive image of a university – the research unit's perceived benefits accruing from the project (new equipment, collaboration with foreign partners, commercialization of research results, a higher position in rankings, affiliation to prestigious journals, etc.) – the project leads to the creation or expansion of a permanent R&D cell within the university structure <p>EVALUATION OF PROJECT EXECUTORS BY MANAGEMENT:</p> <ul style="list-style-type: none"> – an evaluation of the project manager and his or her co-workers from the point of view of the qualifications needed to entrust them with carrying out the project – the involvement in the preparation of the project – the cooperation between the project team and the university management in the course of the project – the systematic progression of work in the course of the project – the rate at which project team members are replaced in the course of the project

Source: authors' own study based on the literature on the subject.

As shown in Table 2, the authors propose to divide into four main categories the factors taken into account by the university management in their evaluation of research projects. The first category concerns the scientific importance of the project

subject to a university. It seems that the evaluation of the project from the perspective of the scientific importance of its results and the development of the fields of science given priority in a university policy can be of special importance for university management. Also the practical effects of the project can be important, especially the benefits stemming from the commercial potential of the project, which may accrue from the sale of project results or a patent application. Currently several universities have taken steps towards the practical use of their research results by establishing cooperation with interested parties from the world of business and by entering into technological partnership with industry.

The authors believe that, apart from the benefits resulting from building up a positive image of a university, the promotion of conducted research (and a university), particularly in the business community, may lead to an increase in the number of highly qualified research staff employed by a university and to the establishment of international cooperation in science and technology by a university. Currently some projects are run on the partnership basis and involve several academic centres. This may contribute to the formation of partnership with other universities, the exchange of research personnel, the collaboration in information interchange and in research. It seems that in the age of globalization this collaboration can bring several benefits to the university in which the project is carried out. Substantial benefits can also result from the creation or expansion of a permanent R&D cell in the university structure, the purchase of new equipment or the presentation of research results in prestigious foreign journals.

The last category of factors which university management may consider to be important in their evaluation of research projects concerns the evaluation of project executors. An evaluation of the project manager and his or her co-workers with regard to the essential qualifications, their involvement in the preparation of the project or the cooperation of the project team with university management in the course of the project can be critical for the potential project results. An important factor can be project staff rotation, which may cause difficulties in carrying out the project and result in delays in the performance of scheduled tasks.

5. Empirical study of the identification of research project evaluation factors

5.1. Identification of research project evaluation factors most important for project executors

Survey methodology: The survey had the form of a questionnaire consisting of 62 closed questions. Its aim was to identify the factors important for project executors. The respondents rated, on the scale from 0 to 5 (where 0 means negligible and 5 – very important), particular factors. In the questionnaire the factors were grouped under the categories shown in Table 1. The survey covered 25 persons (project executors) who were the employees of a technical university in Poland.

Survey results: Figure 1 shows the averaged ratings of the factors relating to the project team, considered to be the most important by the project executors.

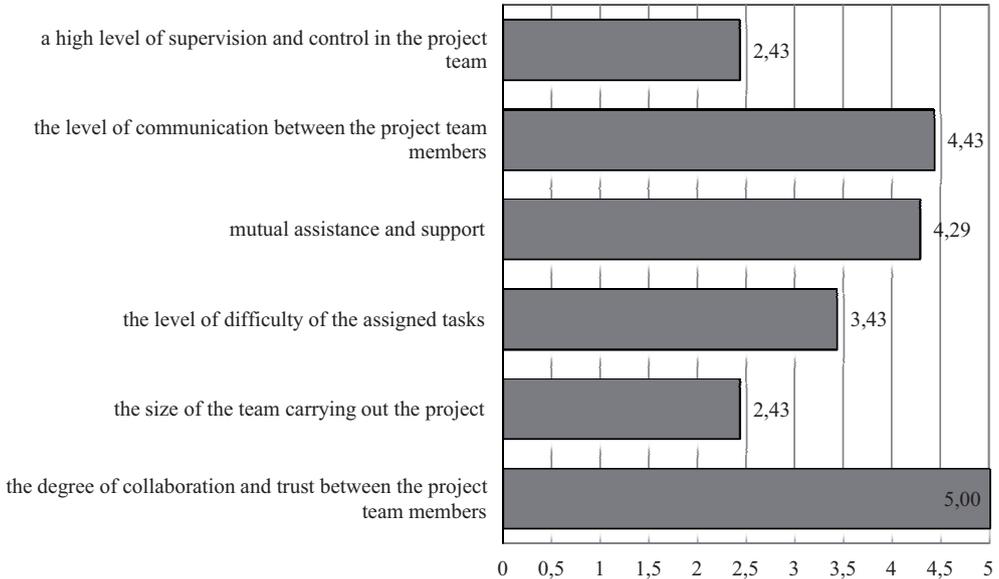


Fig. 1. Rating of factors relating to the project team by the project executors

Source: authors' own study based on the survey results.

As shown in Figure 1, the degree of collaboration between the project team members is ranked highest by the project executors in their evaluation of the project team. Also the mutual assistance and support are highly ranked. The authors believe that project research cannot be conducted properly when there is no close collaboration between team members. A proper level of trust and mutual assistance may significantly contribute to the effectiveness of conducted research and to sharing research results with other team members. The survey shows that a high level of supervision and control is not of major importance to the project executors. This may be due to the fact that research work is to a large extent autonomous and independent, which means that supervision by direct superiors is not exercised constantly.

Also the size of the project team is considered to be of little importance. Since most of project executors are responsible for carrying out the tasks allocated to them, the number of persons in the project team seems to be of no major importance to the respondents. The averaged ratings of the most important factors relating to the benefits from the project for its executors are shown in Figure 2.

As Figure 2 shows, the possibility of gaining experience in conducting research belongs to the major factors connected with the benefits accruing from a project for

its executors. This aspect seems to be particularly important for young researchers who have just started developing their research skills.

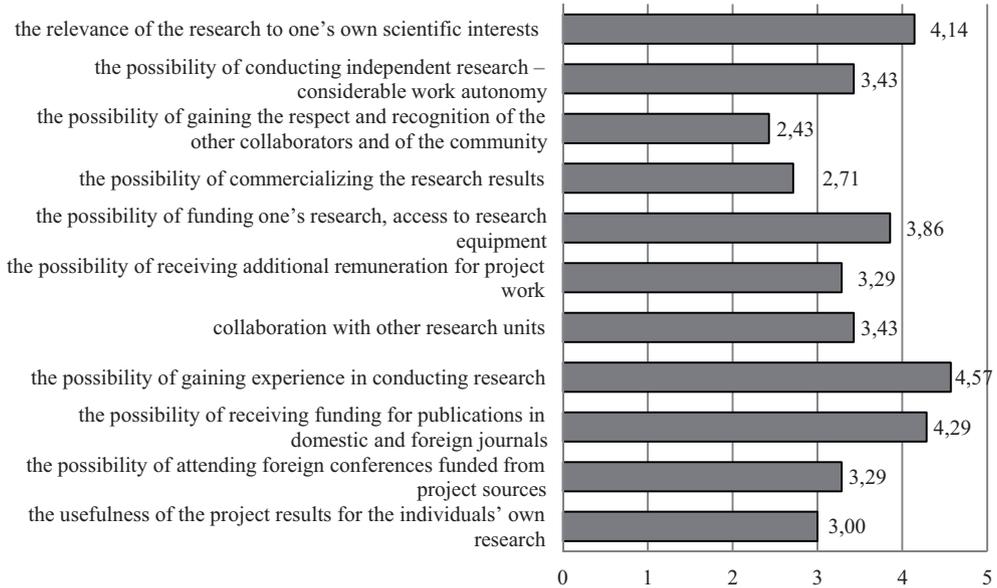


Fig. 2. Ratings of “benefits from the project” factors by the project executors

Source: authors' own study based on the survey results.

The participation in research projects opens up many opportunities for their executors since in this way they can obtain funding for publishing their papers in domestic and foreign journals. This factor (occupying the third position in this category) is of major importance for most of the respondents. The survey indicates that the possibility of carrying out research consistent with their interests is particularly valued by the respondents. It seems natural that the persons taking part in a research project want to be involved in activities to which their knowledge and skills predispose them and which are close to their scientific interests.

As the least important factor in the considered category, the respondents indicated the possibility of gaining respect and recognition of other collaborators and of the community. Also the possibility of commercializing research results is rated low. The reason seems to be the peculiar character of Polish science, in which the practical aspect of research seems to receive little emphasis. Similarly, the hermetism of many research units in Poland is indirectly responsible for the fact that there is little need for collaboration with other research units. Also the fact that the factor “the usefulness of the project results for the individuals' own research” scored a rather average rating is puzzling considering that “the relevance of the research to one's own scientific interests” received a high rating.

The possibility of receiving remuneration for project work is not very highly rated by the respondents. This is puzzling considering the fact that the salaries of researchers in Poland are low. Table 3 shows the averaged ratings of the factors relating to project implementation conditions, viewed as the most important by project executors.

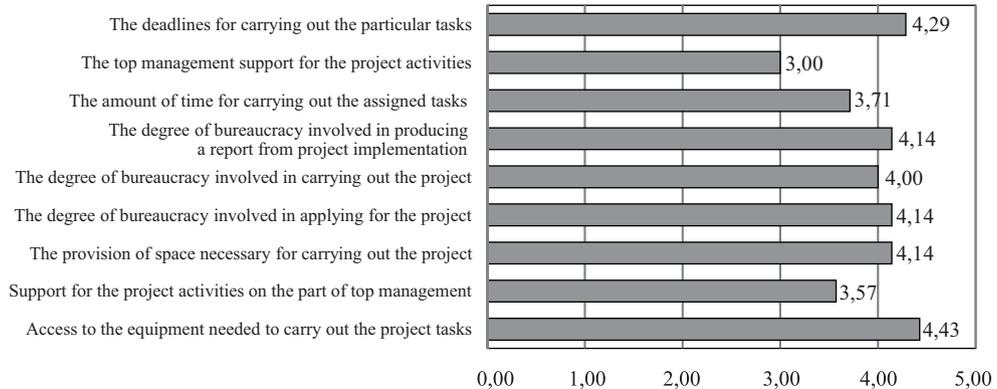


Fig. 3. Ratings of “project implementation conditions” factors by the project executors

Source: authors’ own study based on the survey results.

As shown in Figure 3, access to the equipment needed to carry out project tasks is ranked the highest among the factors relating to project implementation conditions. It seems obvious that proper equipment, proper space and support from top management are needed in order to effectively carry out project tasks. Also access to information influencing the successful completion of the project is important for the respondents. The degree of bureaucracy involved in applying for the project, carrying it out and producing a report from its implementation is a major consideration in the evaluation of research projects carried out in higher education institutions, especially when the project is co-funded from external sources. Bureaucracy in these respects entails a huge amount of time-consuming work. As the least important factors the respondents ranked the amount of time for carrying out the assigned tasks and the support from the top management.

5.2. Identification of research project evaluation factors most important for university management

Survey methodology: The questionnaire included 17 closed questions. The aim of the survey was to identify the research project evaluation factors most important for the university management. The respondents rated, on a scale from 0 to 5 (where 0 means negligible and 5 – very important), the particular factors. In the questionnaire the factors were grouped under several categories, such as the scientific importance

of the project, the practical importance of the project, the benefits from the project and a category concerning the project executors. The survey covered a group of 16 rectors of the technical universities in Poland.

Survey results: Figure 4 shows the averaged ratings of factors relating to the scientific importance of the project to the university management.

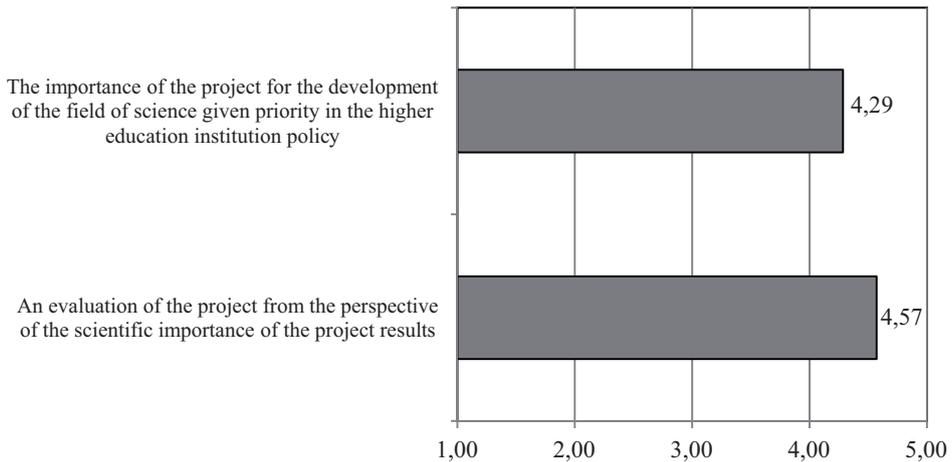


Fig. 4. Ratings of “scientific importance of the project” factors by the university management

Source: authors’ own study based on the survey results.

In the evaluation of the project by the university management, the aspect connected with the scientific result of the project (see Figure 4) may rank high. This is not surprising, considering that the university is the place in which the development of science is of fundamental importance.

In our opinion, the projects carried out in higher education institutions to a large extent should have a practical character. Thanks to the collaboration with external entities, e.g., enterprises (see Ryńca, Kuchta [2011]), the results of such projects could be used in practice.

As Figure 5 shows, in the evaluation of research projects carried out at universities by the university management the practical importance of the project results and the commercial potential of the project rank high. The sale of project results can be a source of additional income for the university and it may enhance its prestige in the business community. Thus, it can be concluded that the surveyed university management attach high importance to the cooperation with the world of business. In order for this cooperation to be effective, networking and ways of transferring knowledge and technologies (e.g., incubators, knowledge and technology transfer centers) need to be developed [Ryńca, Kuchta 2011]. The survey indicates that patent applications and design applications are not very highly rated.

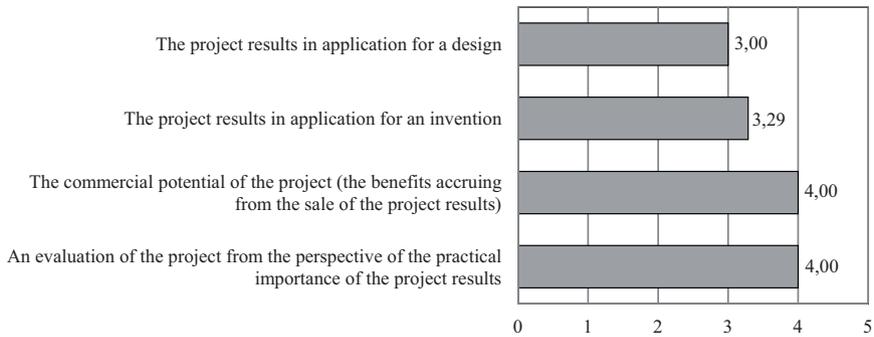


Fig. 5. Ratings of “practical importance of the project” factors by the university management

Source: authors’ own study based on the survey results.

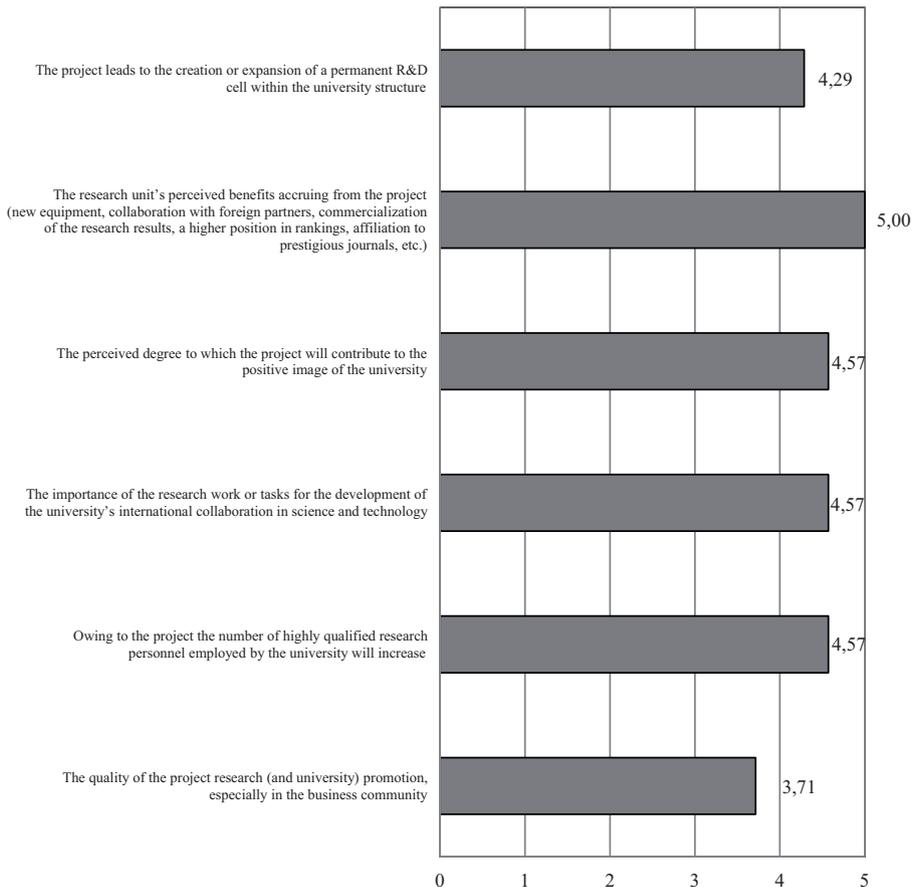


Fig. 6. Ratings of “benefits from the project for the university” factors by the university management

Source: authors’ own study based on the survey results.

The university management evaluates projects mainly from the perspective of their benefits for the university (see Figure 6). As the survey shows, the benefits accruing from the purchase of new equipment, the collaboration with foreign entities or the commercialization of the research results are particularly highly rated by the university management. Also the aspects connected with the university's image (prestige) and its collaboration in science and technology with international institutions seem to be important. The university management perceives as important also such projects which contribute to an increase in the employment of highly qualified research staff. It is puzzling, however, that the promotional effect of the project research, which obviously can greatly contribute to the establishment of collaboration with business entities, was not ranked highly by most of the respondents.

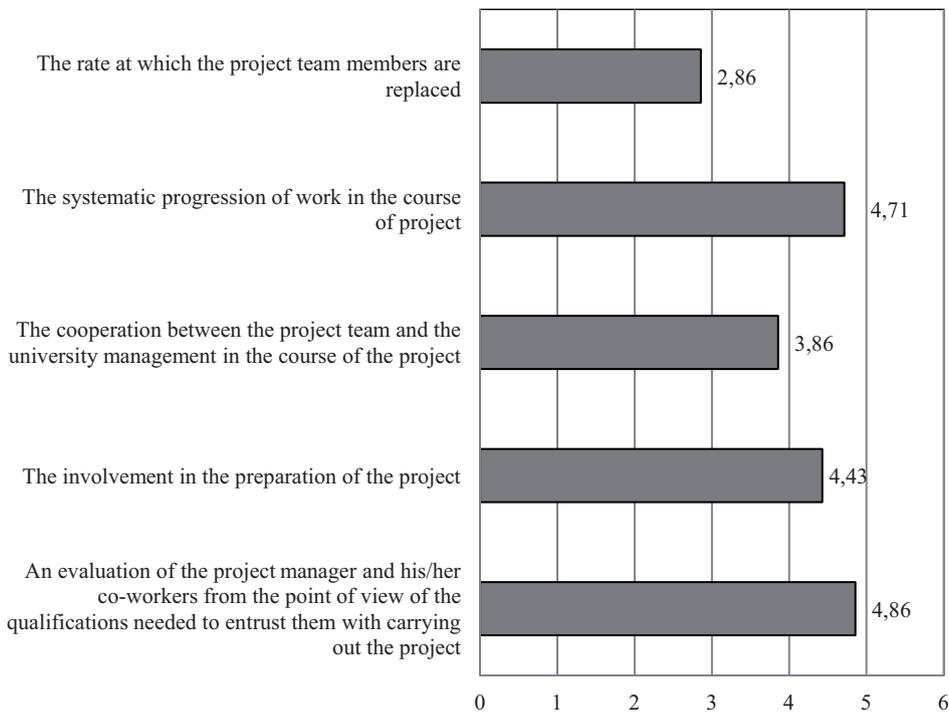


Fig. 7. Ratings of “evaluation of the project executors” factors by the university management.

Source: authors' own study based on the survey results.

In our opinion, the factors relating to project executors are an important element in the evaluation of the research projects carried out at the university by the university management since the quality of the project results largely depends on the project executors. As Figure 7 shows, what is ranked at the top is the evaluation of the project executors from the point of view of their qualifications needed to perform the rese-

arch project tasks. Also the systematic progression of work and the proper involvement of the team members in the preparation of the project are highly rated. Most of the respondents did not consider the rotation of project executors and the cooperation of the project team with the university management to be highly important.

6. Conclusion

The evaluation of the projects carried out in higher education institutions can play a major role in taking measures aimed at improvements in the areas connected with the conducted research work. Thus, it is vital to identify the factors influencing the evaluation of research projects by the different entities involved, especially project executors and university management. In our opinion, this should be highly useful for studying the needs of project beneficiaries and should aid taking project planning and implementation decisions. The identification of the factors can also help to improve the efficiency and effectiveness of the activities involved in carrying out projects and to indicate areas in which remedial measures should be taken.

In our opinion, in order to effectively manage higher education institutions, it is necessary to support researchers in their research work and create proper institutional and infrastructural conditions for project implementation, which would be conducive to the commercialization of the results of the projects carried out in higher education institutions and would enhance their positive image. The results of the survey aimed at identifying the factors especially important for project executors and the university management have been presented.

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IDENTYFIKACJA CZYNNIKÓW MAJĄCYCH WPLYW NA OCENĘ PROJEKTÓW BADAWCZYCH REALIZOWANYCH W SZKOLE WYŻSZEJ DOKONYWANĄ PRZEZ WYKONAWCÓW PROJEKTU ORAZ KIEROWNICTWO UCZELNI

Streszczenie: Ocena szkoły wyższej zdaniem autorów artykułu powinna być dokonywana przez różne podmioty, np. przez studentów, pracowników, czy kierownictwo uczelni. Niezmiernie ważne wydaje się także zidentyfikowanie czynników mających wpływ na ocenę realizowanych w uczelni projektów badawczych. W artykule przedstawiono wyniki badań, których celem była identyfikacja tych czynników (kryteriów oceny), które są szczególnie ważne zarówno dla wykonawców projektu, jak i kierownictwa uczelni. W artykule wskazano, iż przy ocenie projektów badawczych mogą być wykorzystywane różne kryteria, istotne z punktu widzenia podmiotów dokonujących oceny.

Słowa kluczowe: ocena projektów, szkolnictwo wyższe.