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From Theory to Practice: Transfer Projects in Collaborative Research Centres link Research with Applications

So far, transfer projects in Collaborative Research Centres (CRCs) have addressed a relatively small number of participants – who are however extremely satisfied with the funding on offer and the results produced. These are the conclusions of the evaluation study „Transfer Projects in Collaborative Research Centres“ carried out by Joanneum Research (authors: Martin Berger, Susanne Meyer, Michael Dinges and Helmut Gassler). The findings of this study are summarised in this infobrief.

1 Starting point, Data, Methodology

The DFG commissioned Joanneum Research to carry out a study entitled “Transferprojekte in Sonderforschungsbereichen” (DFG 2012a) to analyse the development of this funding instrument between its inception in 1996 and July 2011. The research institute was requested to evaluate the

current status of the programme, the level of acceptance, and the type of results being generated.

During the 15 years or so for which the programme has been up and running, applications were submitted for 380 transfer projects from all scientific disciplines, of which 323 were approved. Projects are based on the scientific principles defined for the Collaborative Research Centres.

Transfer Projects in Collaborative Research Centres

Often, basic research produces results that also prove useful in applied areas of science. To facilitate the efficient transfer of these findings into practical applications, in 1996 the DFG introduced funding for transfer projects within the framework of Collaborative Research Centres. These projects allow researchers to work with partners from industry or the public domain to test their results in practical applications and transform them in the direction of real-life products or solutions. In this way the DFG promotes a partnership of equality, with knowledge and experience flowing in both directions. As well as enabling direct results (such as actual products or process optimisations), another important element of the funding programme is to give young researchers the opportunity to acquire practical experience, which can broaden their career prospects.

In order to answer the key questions of the study, the authors examined the applications and funding data for all approved projects. By analysing the reviews for 51 non-approved projects (out of a total of 57), they were also able to systematise the reasons for rejection.

Using an online survey, Berger et al. surveyed all 231 previous and current project leaders on their experiences with this funding instrument. 145 persons responded, which represented a response rate of 63 percent. Additionally, 237 application partners were electronically surveyed (with a return rate of 43 percent). The authors also surveyed the spokespersons for 235 completed CRCs to evaluate the viewpoints of those CRCs which did not apply for transfer project funding while they were up and running. Responses were received from 48 percent of those contacted. Given that the study covered a period of 15 years, the response rates were very high.

In addition to the online surveys, the authors also carried out face-to-face interviews. 21 transfer project participants (both researchers and application partners) were interviewed individually. Two group interviews were also held, each with three reviewers, to acquire information about procedures and review criteria. Finally, the authors carried out four interviews with administrative staff (for example in university transfer offices) about the practical implementation of transfer projects.

The combination of qualitative and descriptive quantitative methods yielded plenty of detailed information about the programme, its usefulness and the results produced.

2 Results

Although the funding instrument is open equally to all disciplines and all subjects, it appears to be more accessible and easier to use for some disciplines than others. Berger et al. examined the question of why researchers and users apply for collaborative projects and

investigated what form the collaboration between project members from different working environments actually takes.

2.1 Structural features of transfer projects

There is a broad spectrum of very different transfer projects, but the dominant type is the engineering sciences project which takes place at a technical university.

The majority of transfer projects (83 percent, N=268) relate to engineering subjects, and this tendency increased over the period under consideration. Within the engineering sciences, the dominant research areas are mechanical engineering and production technology with 143 individual projects, followed at some distance by electrical engineering, informatics and systems engineering (50 projects). The natural sciences and the humanities and social sciences each represent a small share of just 4 percent of the programme. Outside of the engineering sciences, most projects (18) are in the medical field, and at around 9 percent reflect a somewhat higher participation by the life sciences in research transfer. This distribution of transfer projects among the scientific disciplines as categorised by the DFG is in stark contrast to the overall distribution of Collaborative Research Centres (CRCs) by discipline. In 2011, for example, engineering collaborations made up just 20.2 percent of all CRCs (DFG 2012b).

In view of this distribution of funded transfer projects it is not surprising that the technical universities predominate among transfer project applications. The top recipients in terms of number of funded transfer projects are the Technical University of Aachen (with 42 transfer projects over the 15 years of the programme), the University of Stuttgart (with 25 funded transfer projects) and the technical universities of Munich and Berlin (with 24 funded projects each).

Almost all application partners (93.5 percent) are German companies. There is a relatively high proportion of medium-sized and

large organisations. 42.5 percent of these companies employ more than 500 people and a good 20 percent employ less than 50 people. Only a small proportion (7 percent) of application partners are not companies, instead representing the public domain.

In addition to the dominant project type – an engineering transfer project at a technical university collaborating with a major company – there is also a wide range of other project types. This can be seen in the fact that at least one transfer project has been carried out in every research area.

2.2 Reasons for and against applying for a transfer project

What motivates researchers to apply for a transfer project? The most frequently cited motivation, rated as important or very important by 97 percent of researchers (Fig. 1), is the opportunity to test, utilise and further develop research findings in a practical application. The second most important reason, cited by 90 percent of respondents, is the financial support which allows researchers to fund their own research or staff positions with their institutions. A similar view was expressed in another DFG-commissioned survey of researchers (Böhmer et al. 2011). The statement “I apply for third-party funding to fund staff positions” was the most frequently cited motivation for seeking third-party funding. For academic partners, the acquisition of knowledge was also a key motivation for participation in transfer activities. 88 percent of respondents cited the opportunity to collaborate with application-oriented researchers as an incentive, while close to 80 percent hoped that application-oriented work would give fresh impetus to their own basic research. This motivation is least evident in the humanities and social sciences. In this area, the practical testing of theoretical insights, knowledge transfer as an academic performance indicator and the training aspect play a more important role (Fig. 1).

Less than half of those surveyed reported a direct market orientation; the commercialisation of results in the form of patents or spin-off companies, or the prospect of further research contracts, was a motivation for approximately 40 percent of respondents.

However, the expansion of personal or institutional networks was rated as important (being cited by over 70 percent of respondents). Even more important was the opportunity for doctoral researchers and other institute staff to acquire practical experience and thus improve their career prospects. The fact that this was given as a primary motive by over 76 percent of respondents underlines the importance of the programme for knowledge transfer through individuals.

A comparison of these motivations with the reasons given by application partners (AP) for their participation in transfer projects reveals a slight difference in priorities. For application partners, the acquisition of knowledge comes first. The responses “Sharing knowledge with researchers”, “Generation of fresh impetus for R&D” and “Access to basic research” were each named by over 80 percent of respondents.

While the expansion of personal or institutional networks was perceived as relatively important, less significance was attached to “Opportunity for recruitment (students, doctoral researchers etc.)”, with just 2 percent rating the importance of this factor as “very high” and 37 percent as “high”. The opportunity for application partners to outsource research to universities also appeared to be relatively unimportant. This would reduce the risks associated with R&D and, according to respondents, save time, but cost savings were not necessarily expected. Evidently, then, the opportunity to outsource research and development plays only a minor role.

Instead, the primary motivation is the close partnership with university-based researchers engaged in basic research.

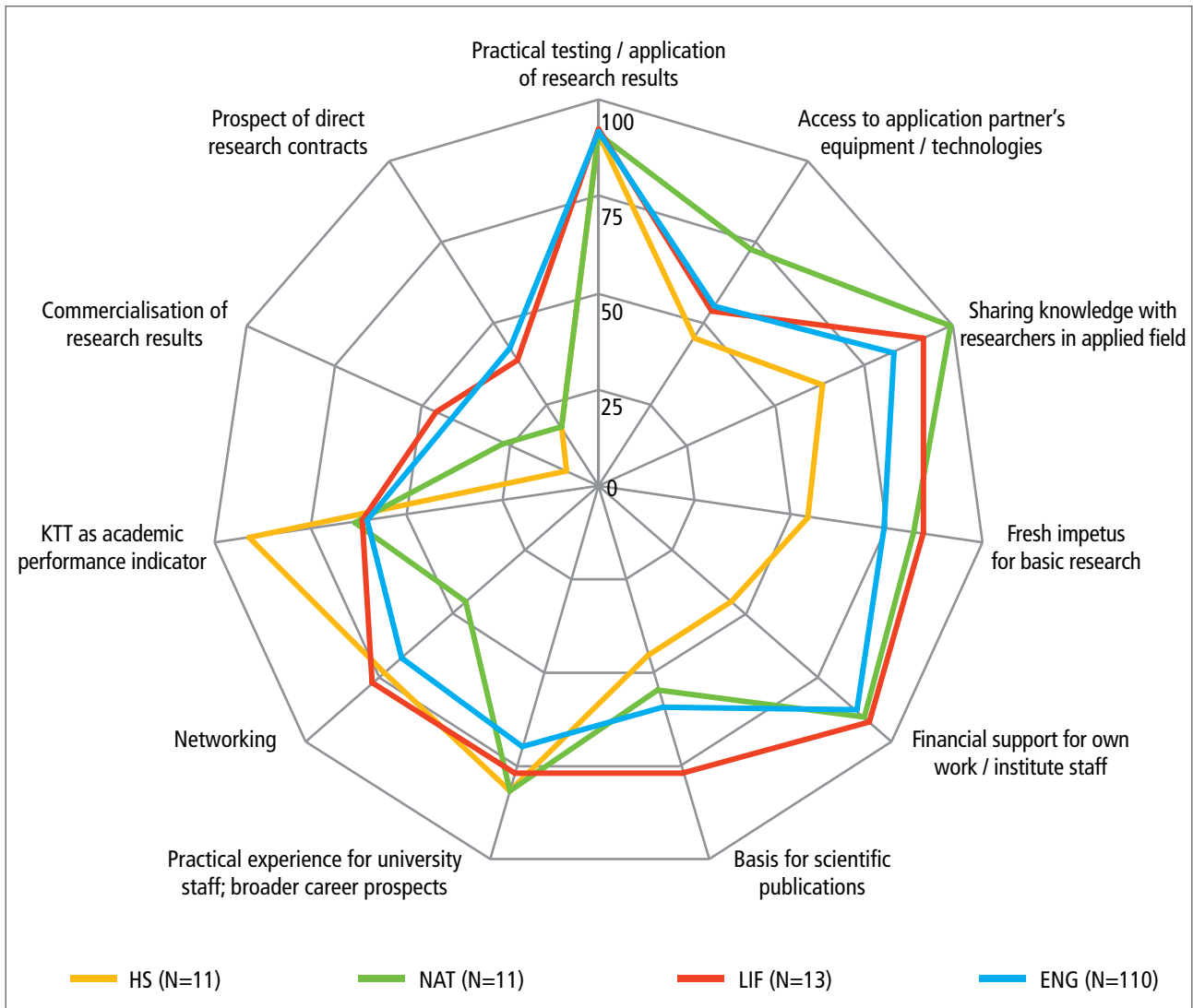


Figure 1: Selected motivations for application, by discipline

HS: humanities and social sciences, NAT: natural sciences, LIF: life sciences, ENG: engineering sciences, KTT: knowledge and technology transfer; figures are percentages of all respondents who rated the motivation as important or decisive.

Source: Survey of academic applicants for transfer projects. Statistics and diagram: JOANNEUM RESEARCH.

2.3 Attractiveness of the funding programme and participant satisfaction

Only a good 20 percent of all Collaborative Research Centres applied for at least one transfer project while they were up and running. The question therefore arises of why the majority do not take advantage of this funding option. What possible specific factors or obstacles might be responsible?

The spokespersons for CRCs that have not previously been involved in any transfer projects were divided by the authors into four categories according to their stated reasons.

The main reason for non-involvement was the effort involved in identifying a collaboration partner, applying for a project and seeing the project through to its conclusion. Secondly, researchers primarily focused on basic research had little interest in applying because they did not believe that a transfer project would contribute any added value to their own research. Thirdly, some respondents anticipated “practical obstacles”, such as a lack of suitable collaboration partners. Fourthly, many were simply unaware of the existence of this funding opportunity.

About a third of respondents lacked information about this funding instrument, and in this respect there were very noticeable differences

between disciplines. While only about 5 percent of engineering researchers were unfamiliar with the programme, the figure for the humanities and social sciences was over 50 percent (Fig. 2). The study clearly reveals the attractiveness of the programme for participants. The high estimation in which the programme is held by participants is shown by the fact that 98 percent of researchers involved in transfer projects believe that it is an important complement to basic research projects. 88 percent of researchers surveyed rated positively the general framework for transfer funding. Among application partners, a similarly high proportion (81 percent) agreed, with particular importance being attached to project time scale, usability of results and cost/benefit ratio.

2.4 Implementation and results of transfer projects

Transfer projects are prone to a certain amount of conflict, as researchers and application partners have to adapt their different working styles and approaches to each other. This often makes it a challenge to design and implement such a project. The question thus arises of what factors govern the search for project partners and what form the partnership then takes.

In 90 percent of cases it is the researchers who initiate the application for a transfer project. Many project partnerships are also based on existing contacts or collaborations. In the natural sciences and engineering sciences, in

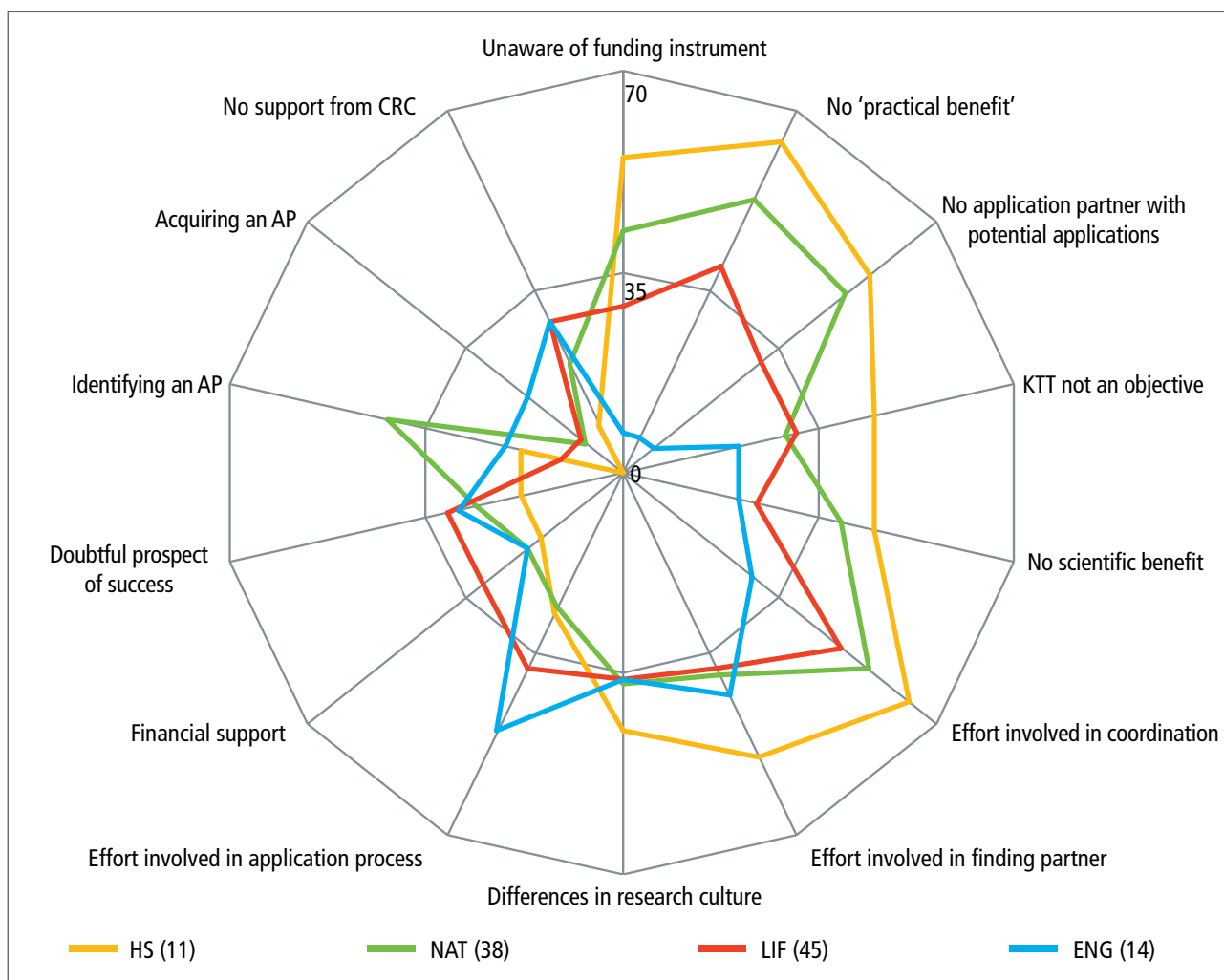


Figure 2: Reasons for non-participation, by discipline, among surveyed CRCs

HS: humanities and social sciences, NAT: natural sciences, LIF: life sciences, ENG: engineering sciences, KTT: knowledge and technology transfer; figures are percentages of all respondents who rated a reason as applicable or fully applicable.

Source: Survey of Collaborative Research Centres with no transfer projects. Statistics and diagram: JOANNEUM RESEARCH.

over two thirds of pairings between researchers and application partners, there was already personal contact before the commencement of the transfer project. In the humanities, so-

cial sciences and life sciences this figure was less than half. While 30 percent of researchers in the humanities and social sciences first sought contact with a view to collaborating on

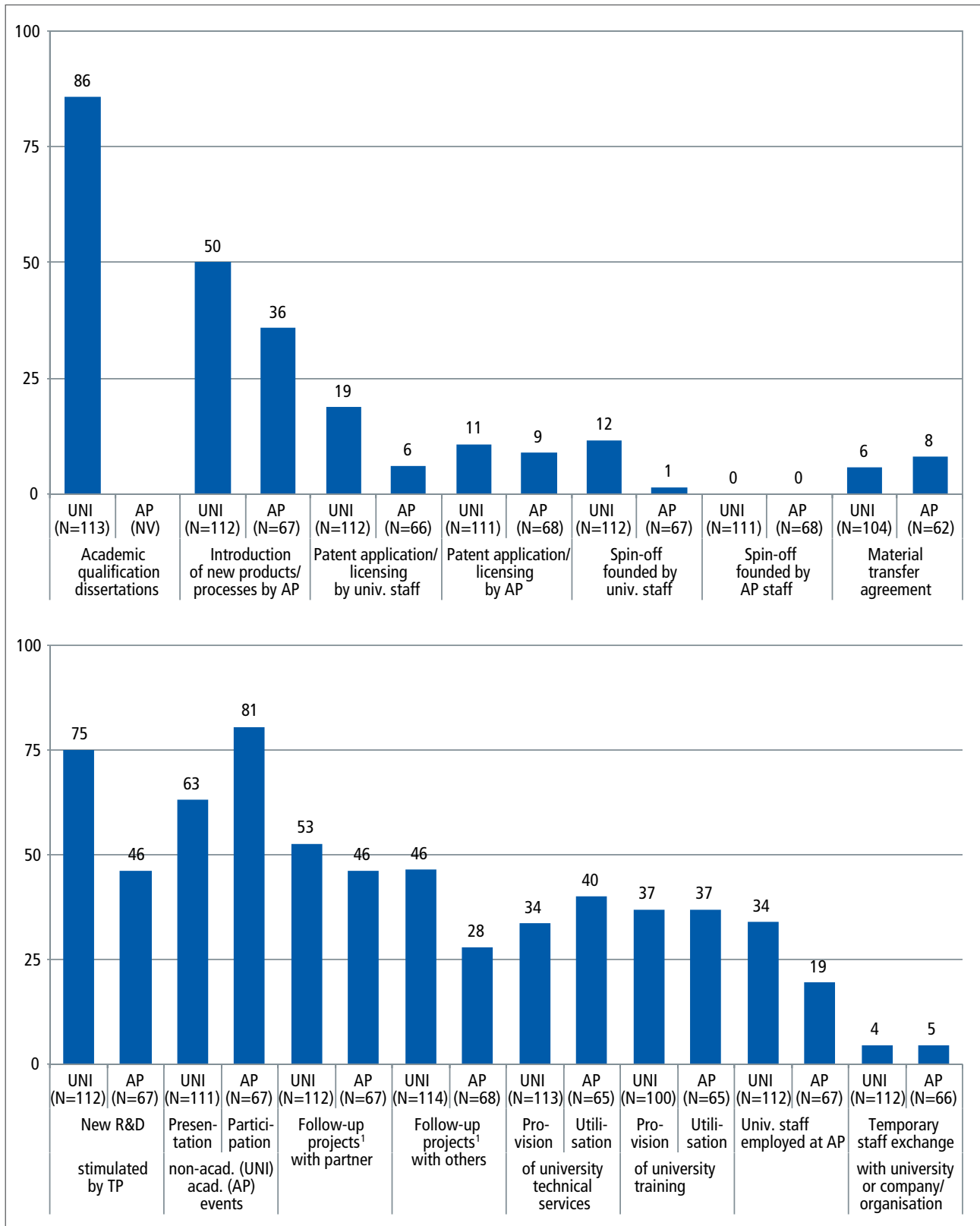


Figure 3: Results and follow-up activities of completed transfer projects

Figures are percentages of all respondents with a completed transfer project; ¹Contract research, research cooperation, consulting. Source: Survey of academic applicants and application partners of transfer projects. Statistics and diagram: JOANNEUM RESEARCH.

a transfer project, the figure for engineering researchers is only 10 percent. It is therefore unsurprising that, for the humanities and social sciences, finding an application partner at the start of a project is perceived as a major obstacle.

For most respondents, the actual project work consists of a combination of project meetings to discuss content in depth (cited by over 90 percent of researchers and application partners surveyed) and regular visits for the purposes of joint project work and independent work packages. Application partners frequently provide technical infrastructure (in over 50 percent of cases according to respondents), while in almost as many cases the university is the infrastructure provider. Less commonly, there are mixed working groups based at the same location (in 20 percent to 30 percent of cases) or university staff working temporarily at the application partner's organisation. More rarely (in 3 percent to 4 percent of projects), employees of the application partner work at the university. About three quarters of participants believe that entitlements and responsibilities are shared equally between the project partners, despite the fact that application partners tend to ascribe less importance to the project than researchers.

One primary concern of the study was to document the results of completed transfer projects in order to obtain a clearer picture of participants' expectations. 96 percent of researchers and 79 percent of application partners describe the completed projects as successful. In terms of project results, the picture is also a positive one. The high proportion of qualification dissertations written on the basis of transfer projects serves as an indicator of the close links with basic research (Fig. 3). Transfer projects also deliver in terms of real-life applications, as one in two projects (according to researchers) or one in three (in the estimation of application partners) results in a new product or process.

3 Conclusion and Outlook

The most important findings of the study, from the DFG's point of view, are:

- Transfer projects fulfil participants' expectations. Feedback from respondents indicates a high level of acceptance of the funding conditions and high satisfaction with the funding on offer and the results produced.
- Transfer projects are closely linked with basic research, as shown by the high proportion of qualification dissertations that emerge from transfer activities. The acquisition and sharing of knowledge is a key incentive for both parties to participate in a transfer project.
- Transfer projects directly bridge the gap between research and application, giving rise to new products and processes in 30 percent to 50 percent of cases.
- Non-engineering disciplines have not, so far, made adequate use of this funding instrument. Transfer projects commonly relate to production technology and mechanical engineering, with mid-size and large companies as collaboration partners.

The study did not adequately answer the question of whether the instrument could have similar benefits for other potential user groups or would be inadequate. The intention is that the funding instrument should be attractive to researchers in all disciplines who want to carry out research with all kinds of application partners. In future analyses it would be appropriate to document additional information in structured form in applications and final reports and thus make it available for statistical analysis without increasing the workload for the applicant. This would also make it easier for DFG committees to compare different projects at a glance.

Knowledge transfer remains very important to the DFG, and not only within the

Collaborative Research Centre programme. The Knowledge Transfer Strategy is now entering its fourth year. This strategy combines various measures designed to promote collaboration between DFG-funded researchers and application partners in all disciplines. Since 2009, individual grants have been awarded to 67 transfer projects.

To accompany this study, the DFG will publish a statement in early 2013 summarising its conclusions arising from discussion in its decision-making bodies and providing a foundation for the future development of the programme.

4 References

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