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*From Scientist to Broker, and How Brokers Use Their Social Capital to Develop Talents at Universities**

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Abstract

The social capital of an organization is one of the key success factors of enterprises that build their competitive position in the market. This resource, obtained from social structures, can also be used to achieve goals set for public sector organizations, such as universities. Universities operate in conditions of high uncertainty, changing roles, and expectations of stakeholders, which requires adaptability and flexibility of

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operation. In addition to improving the quality of research and teaching, one of the important evaluation criteria is also the ability to transfer knowledge to the economy and commercialization of research. One of the activities undertaken by universities to support employees in ongoing changes is the implementation of academic scouting, introducing departmental innovation brokers who play the role of coaches/mentors, supporting research and teaching staff by commercializing their research results. The aim of the article is to show how the social capital of departmental innovation brokers supports the development of competences of scientific and research scholars. Based on the conducted qualitative research, it was presented how brokers use their social capital to achieve multidimensional goals in relation to other people, as well as organizational goals resulting from the entrusted function. Factors hindering the cooperation of departmental innovation brokers with academics, which are manifested in various areas of social capital – structural, cognitive, and relational – were analyzed.

Introduction

Globalization, technological progress, and the development of the knowledge-based economy lead to the growing importance and development of higher education (Leja, 2003). Universities operate with high uncertainty, changing roles and expectations of stakeholders, which requires adaptability and flexibility. The ongoing changes are particularly visible in the context of developing cooperation between universities and the socio-economic environment aimed at creating innovation.

Universities may engage in cooperation with the environment by disseminating knowledge, promoting mobility, undertaking joint research, commercializing knowledge, and conducting business activity of the university (Kardas, 2018; Złoty, 2018). According to the research, in recent years, many universities have transformed their operating models by positioning research and knowledge transfer in the first place (Miller, McAdam, & McAdam, 2018). A significant problem in establishing cooperation between universities and the business environment are the difficulties in reconciling knowledge transfer activities with the traditionally accepted nature of work and organizational culture of universities, in which the performance of academic tutors is measured by their ability to publish and by the quality of teaching (Perkmann, King, & Pavelin, 2011). Requirements for academic bodies in the field of evaluation impose additional tasks on university employees in terms of establishing cooperation with external entities (including enterprises, universities, local governments), and influencing the socio-economic environment, performing commissioned work, consulting, and generating income, e.g. by the commercialization of research (Cunningham, Mentor, & O'Kane, 2018).

Constant attempts to support the development of cooperation between universities and businesses aimed at increasing the innovative potential of the economy are observed in Poland. Trzmielak (2013) points out, however, that the key factors hindering the implementation of the knowledge transfer process include difficulties in defining competencies and assessing the staff involved in the commercialization process. Universities take measures to support employees in ongoing changes, encouraging them to change their behaviour through the use of financial rewards,

offering training, or enabling domestic and international internships. Research in this area indicates the key role of the so-called innovation brokers, whose task is to support the process of knowledge transfer and commercialization (Kauffeld-Monz & Fritsch, 2013). For this reason, the actions undertaken by universities include, e.g. the implementation of academic scouting, introducing departmental innovation brokers who act as coaches/mentors supporting research, and teaching staff by helping them in commercializing their research results.

The aim of this article is to determine how the social capital of departmental innovation brokers supports the development of competencies of research and teaching staff in establishing cooperation with the social environment. Based on the conducted qualitative research, the authors analyse the significance of social capital in the implementation of the role of the departmental innovation broker as a change agent, who, as a research and teaching worker, as well as an individual involved in the process of transfer and commercialization of knowledge, using the social capital held, contributes to cultural change and promotion of culture entrepreneurship at universities.

Broker as a bounder and change agent

The role of an innovation broker is to mediate and connect representatives of various environments by seeking and identifying knowledge, transferring information within and between organizations, and translation thereof so that this knowledge is understandable and transferable within one organization or between different organizations (Fleming & Waguespack, 2007; Morrison, 2008). The task of brokers is to build understanding between units the communication of which is difficult due to the presence of barriers related to the differences in their position, the function they perform (Buick, O'Flynn, & Malbon, 2019), and in the case of innovation brokers also through a specialized language, level of knowledge, understanding of the essential scientific research, as well as technology and the possibilities of application thereof (Klimkiewicz & Staszkiewicz, 2020). Operating in an environment in which individual actors express contradictory expectations, the broker should be empathetic, have the ability to empathize with the partner's situation, and understand different points of view, thanks to which it can support breaking down barriers and effectively implement changes. In the event of conflicting expectations, brokers are faced with the choice of an operating strategy. According to the theory of structural gaps (Burt, 2002, 2004), a broker acting as intermediary connecting unrelated actors may strive to achieve their goals and obtain further promotions. On the other hand, the broker, by engaging in the process of providing information inside and outside the organization, may assume the role of supporting the process of change focused on the results of the entire organization (Fleming & Waguespack, 2007). The differences in these approaches are confirmed by research on the behaviour of brokers of the

regional innovation system conducted by Kauffeld-Monz and Fritsch (2013), which allows to distinguish two strategies used by brokers: (1) seeking private benefits by accumulating knowledge from others and (2) being oriented towards generating social benefits by transferring knowledge to others. This shows how different ways of taking the role of an intermediary lead to different effects at the level of shaping the desired behaviour among actors participating in the knowledge transfer process.

From an organizational perspective, it is desirable to clearly define the broker functions that are consistent with the objectives and desired organizational outcomes. The analysis of the role and tasks of innovation brokers allows for the identification of key areas of responsibilities performed within this function, such as building a network of contacts and maintaining long-term relationships, transferring information, understanding dependencies and inter-organizational structures, planning and coordinating activities, acquiring resources, assessing risk and proposing solutions to complex problems (Cross & Parker, 2004; Gwarda-Gruszczyńska & Czapla, 2011; Williams, 2013; Buick, 2014). The desired effect of the activities of the innovation broker at universities is the development of cooperation between the university and business by supporting the process of knowledge transfer and research commercialization. The key areas of this cooperation include: obtaining licenses, creating special purpose vehicles (spin-offs), carrying out commissioned work, consulting services, joint research with enterprises, organization of events, or cooperation in conducting study programs, e.g. postgraduate (Rossi & Rosli, 2014). The effects of the work of an innovation broker can be measurably related to the achievement of goals in the above areas. Difficulties in establishing cooperation between business and science representatives largely result from the adopted attitudes and behaviours. Research reveals that academics show interest in cooperation with business when, in their opinion, it positively affects their publishing activity (Perkmann, King, & Pavelin, 2011; Alexander, Martin, Manolchev, & Miller, 2020). Research conducted in the 1970s and 1980s showed that activities such as consulting or commissioned work were perceived by academics as unattractive (Gibbons & Johnston, 1974; Boyer & Lewis, 1984). Scientists dealing with the development of basic sciences perceived such assignments as inconsistent with their cutting-edge research and rejected them on the basis of their perceived low value in pursuing an academic career (Gibbons, 2000). Further research focused on the analysis of the impact of the level of involvement in commercialization processes on the publication effects, both at the organizational and individual level, present a positive relationship. Scientists who publish in international peer-reviewed journals also achieve high results in the area of patent acquisition and the development of academic entrepreneurship (Breschi, Lissoni, & Montobbio, 2007; Lowe, & Gonzalez-Brambila, 2007; Perkmann, King, & Pavelin, 2011). The task of an innovation broker is, therefore, not only to familiarize employees with the possibilities of knowledge transfer and commercialization of research but also to often overcome reluctance resulting from prejudices and unwillingness to cooperate with the business environment. In this sense, universities that introduce

a concept of academic scouting (Wiśniewska, Głodek, & Trzmielak, 2015) bring an innovation broker at specific departments, who acts as an agent of organizational and cultural change, and its purpose is to overcome the barriers and concerns of academics. On the one hand, departmental innovation brokers are academics working at departments, knowing the scientific discipline and engaging in research. On the other hand, they share knowledge about technology transfer and help colleagues at their departments in advancing the implementation readiness level for research commercialization. This helps also to change the traditional way of thinking about a scientific career: from a narrowly understood scientific activity aimed at obtaining information towards scientific activity, the task of which is to transfer knowledge to the environment, and the effects of which have an impact on the socio-economic environment. In this context, the role of the departmental innovation brokers is to promote the culture of entrepreneurship and to support and develop the competencies of colleagues through the use of social capital.

Development of social capital through coaching and mentoring programs

The concept of social capital has initially developed in relation to the society (macroeconomic approach) and subsequently progressed on the microeconomic level, where it is the basis for describing and characterizing the set of relations in the organization (Inkpen & Tsang, 2005). In the context of the social capital of an organization, one can distinguish intra-organizational social capital, presenting relations between employees, between employees and managers/owners, and external social capital, reflecting the relations between organizations. It can also be indicated that internal and external ties are not mutually exclusive, and the behaviour of a community such as an enterprise is shaped both by their external ties with other companies and institutions, as well as by internal ties within their own community (Burt, 2002; Skrzypek, 2014). Such an approach can be found in the definition proposed by Nahapiet and Ghoshal (1998), who assume that the social capital of an organization is a component of its intellectual capital. They define it as the sum of real or potential resources, originating and embedded within the network of relations and available through the network of relations owned by an individual or social unit. Social capital, therefore, includes both networks and the assets that can be activated by this network. The authors describe three dimensions of the manifestation of social capital in an organization: (1) structural dimension – refers to the properties of the social system and the network of ties as a whole, and describes the impersonal configuration of connections between people or units. The most important characteristics of this form of human capital include: the presence/absence of network connections between entities, network configuration or morphology, illustrated by: the density of connections, their connections, their hierarchy, and organizational suitability; (2) relational dimension – describes the type of personal relationships that have devel-

oped as a result of certain contact history. It includes the relationships, connections between people, such as respect, friendship, which influence their behaviour. The key aspects of this dimension include: trust, credibility, norms and sanctions, obligations and expectations, identities and identifications; (3) cognitive dimension – refers to the aspects characterizing a shared reality, interpretations, and systems of meanings between subjects. Three components of the cognitive part of social capital are significant for this dimension, i.e.: the shared language, codes, and stories. It is worth noting that although such a three-dimensional approach to the social capital of an organization facilitates focusing research and management attention on specific aspects, these dimensions should not be treated separately, because only together they form the inseparable essence of human capital (Czakon, 2014).

Relating the concepts of social capital to universities, it can be found that the effectiveness of their functioning consists of the intellectual dimension, represented by the knowledge available, and the social dimension, the source of which are the bonds that create social capital. It can be assumed that the social competencies of employees within an organization, understood as knowledge embedded in social relations play a significant role in the process of building social capital. The determinants of social resources owned by the participants of the organization are behaviours and attitudes based on cooperation, open communication, trust, and social sensitivity. In the context of the work of a departmental innovation broker, their social competencies seem to be, on the one hand, a plane that helps them build the social capital of universities – they help build a network of connections, share knowledge and information, and on the other hand, they become a valuable resource shared with scientists. Such learning can take place both by modelling behaviour and supporting the development of scientists' competencies through the use of activities characteristic of coaching and mentoring.

Following the number of publications on coaching and mentoring, there is a growing interest in the practice of their application (Czarkowska, 2012; Dembkowski, Eldridge, & Hunter, 2006; Hargrove, 2006; Sidor-Rządkowska, 2014; Smółka, 2009; Starr, 2011). Some key similarities can be seen in the case of these methods (Czekierda, 2015; Juchnowicz, 2014):

– these include methods of close interaction, where the development of competencies takes place in the context of the relationship between the coach/mentor and people subjected to coaching/mentoring processes – mentees (coachee/mentee),

– in making a change (improving competences/developing talents), a learning process is used, aimed at achieving specific goals,

– the effectiveness and safety of the relationship depend on the methodology, knowledge of the process, tools, know-how, as well as ethics of the coach or mentor.

Despite these evident similarities between coaching and mentoring, in the case of coaching, the focus is on creating the coachee optimal conditions to achieve a specific goal on their own. There is no transfer of knowledge or offering a ready solution, and the coach does not act as an expert or substantive authority in relation

to the area covered by the improvement process. They must be an expert, but only in terms of the method of carrying out interactions, the effect of which is to help the charge achieve the development goal (Juchnowicz, 2014). In this context, some basic skills of the coach are identified in this respect (Starr, 2011): building understanding and relationships, listening skills, using intuition, the ability to ask questions, and providing helpful feedback. The use of these skills is supposed to help achieve goals, which in this context are most often defined as (Czekierda, 2015): strengthening strengths and effectiveness, maximizing potential, activating resources and skills that have been unused so far, or avoiding poor results. It is worth mentioning that it is certainly a good thing when a coach knows what the coachee does on a daily basis (Sidor-Rządkowska, 2012), but the mentor will be a person who, by definition, is usually more experienced than the mentee, has knowledge, skills, interesting contacts and achievements. They should also be an example to follow and may be a kind of role model, give advice and guidance. A mentor's task is to develop a person's potential, advise them and, in critical situations, be their advocate. The mentoring itself is based not only on inspiration, stimulation but also on leadership (Czekierda, 2015).

Research methods

The research described in the article was part of a project defining a model competence profile of personnel responsible for creating and implementing research and innovation policy in the academic environment. The aim of the research was to determine how departmental innovation brokers use their social capital, assuming the roles of a coach or mentor to promote behaviours related to the commercialization and transfer of knowledge among academics at a technical university. The research was conducted in natural conditions, during the actual processes of diagnosing the competences of employees of the university's transfer and technology centre.

In the research process, understanding the specifics of the broker's position was crucial, including the specific areas of responsibility, knowledge, abilities, skills, and other features required for the effective implementation of tasks. The first phase of the research covered a critical analysis of the available empirical data regarding the work of an innovation broker, the roles played by them, and the desired competencies. The analysis included scientific publications, documents regulating the formal and organizational side of the functioning of commercialization and knowledge transfer units at universities in Poland, taking into account three key levels: national (analysis of laws and regulations), university (analysis of the university statute, university senate resolutions, work regulations) and the organizational unit of the transfer and technology centre (strategy, mission, and vision, organizational structure, job descriptions, archival job advertisements). In the next stage, two focus group interviews were conducted with a total of 18 people. The first group of respondents consisted of the departmental innovation brokers, while the members of the second group were

persons holding managerial positions at CTT – Centre for Technology Transfer at the university. In the next stage, individual in-depth interviews were conducted with departmental innovation brokers (4). The activities finalizing this stage consisted in the confrontation of information collected at all stages of the research process. Comparative analyses were carried out for data collected on the basis of documents and data collected in focus interviews and individual interviews. The results from the entire project were covered in internal report and presented to the university authorities (Klimkiewicz, Kowalik, Staszkiewicz, Konopka-Cupiał, & Beck-Krala, 2019; Klimkiewicz, Szmal, Staszkiewicz, Kowalik, & Kowal, 2021).

Results

The research allowed describing the function of an innovation broker from the point of view of various expectations that are associated with this role. Three main roles emerge on the basis of the analysis, responding to the expectations of brokers in the area of how to support research teams and achieve organizational goals: the role of the provider, mentor, and coach (Figure 1).

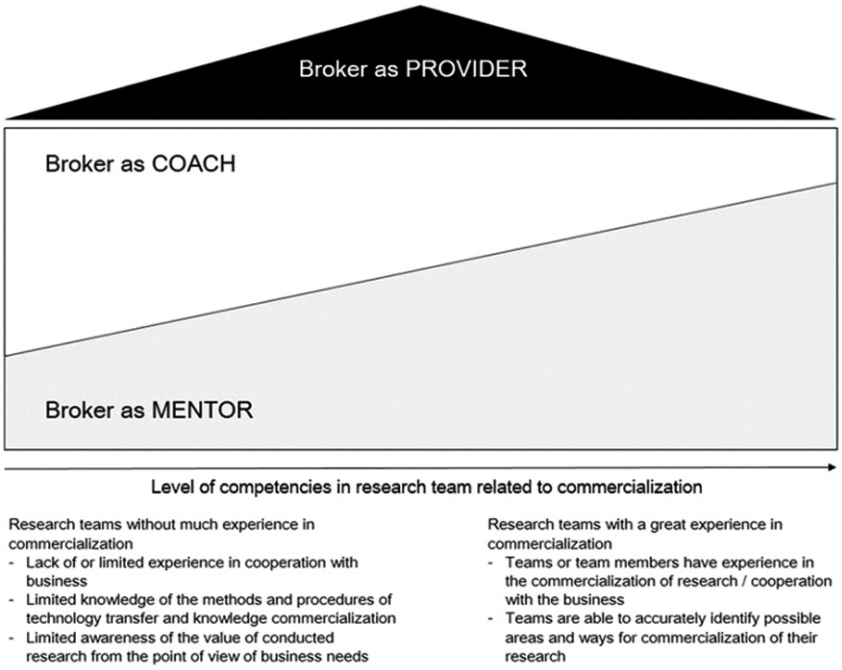

Figure 1. Different roles of an innovation broker: provider, mentor, and coach

Source: Authors' own study.

Broker as a provider – the perspective of the university authorities

An innovation broker must deliver results – the number of contracts concluded, patents obtained, the sum of revenues generated by cooperating companies are the desired effects of activities in the field of commercialization and knowledge transfer. The indicated effects of commercialization also include achievements important from the point of view of the evaluation of university units, hence the university authorities expect that the faculty authorities will actively support brokers and their activities. From the point of view of the management, the role of the departmental innovation broker is based on the social capital held by the broker. This capital is perceived through the prism of the ability to develop one's own network of contacts (formal and informal), establish and maintain permanent contact with creators (including making periodic visits to university units and individual employees/research teams; encouraging people to increase implementation readiness; helping teams/scientists in finding business partners and investors) and with entrepreneurs (e.g. maintaining electronic contacts). As a result of developing a network of contacts, the broker should also focus on the image and recognition of universities and units responsible for technology transfer. The effectiveness of the broker should be manifested, among others, by the ability to effectively convince the scholars of the benefits of research commercialization through the university, exert pressure, the ability to prepare and effectively present a technological offer in the language of benefits and in a manner understandable to a layperson, and conducting effective meetings with teams of scientists and entrepreneurs.

Proactivity and open-mindedness in the work of a broker should, in the opinion of the management, also be expressed in the pursuit of supplementing specialist knowledge, learning from mistakes, openness to new ideas and unconventional methods of operation, and accepting constructive criticism. Representatives of university authorities also perceive the importance of establishing relationships based on trust, e.g. by maintaining discretion, showing understanding for the creator's situation and their way of thinking (empathy), active listening, and reaching the intentions of the interlocutor.

Broker as a mentor and coach – the perspective of departmental innovation brokers

The focus interviews conducted in the course of the research and in-depth individual interviews with department brokers allow us to look at the role of the broker through the prism of the challenges faced by brokers on a daily basis. According to the respondents, the main task of a broker is to build a relationship with scientists based on trust and "teach a scientist how to think in business", which is expressed by sharing knowledge and transferring the broker's know-how, which is to raise awareness and encourage teams to make attempts of commercialization of knowledge and cooperation with the economy.

Focus interview participants pointed to the expectations of individual interest groups, such as university and faculty authorities, administration, technology transfer centres, research teams, and entrepreneurs (Table 1).

Table 1. Expectations of various interest groups regarding the role of the broker

Stakeholders	Expectations towards faculty brokers
University and faculty authorities	advice on the issue of funds allocated for commercialization, generating income for universities/departments, searching for orders, commitment, "peace of mind"
Technology transfer centres	timely reports, answering to emails, information from departments
Research teams	market perspective, legal, mental and substantive support, finding money, "peace of mind"
University administration	"peace of mind", knowledge
Entrepreneurs	presentation of the technological offer in a language understandable to a layman, providing ready solutions, data, ideas, new solutions, providing services, "washers" for the project

Source: Authors' own study based on their own research.

A broker, on the one hand, has knowledge about the possible benefits of commercialization, on the other hand, they originate from the university environment and understand fears that may discourage researchers from cooperating with the economic environment. Having an understanding of both perspectives, they become a kind of advocate for technology transfer at the university – their task is to gain the interest of their colleagues from the faculty, overcome their anxieties and gain trust. The key competences enabling brokers to build long-term relationships based on trust and the development of the competences of creators enabling them to cooperate with business include:

– communication competencies related to establishing long-term relationships: the ability to adapt to the interlocutor – to adapt to the scientist – not necessarily only in direct conversation, but also in the perspective of a long-term relationship; listening, accepting criticism (often in the direction of commercialization processes and procedures used at the university), presenting arguments regarding the benefits and difficulties related to the commercialization process, taking over the role of a mediator between the university and the scientist/teams of creators, showing empathy and understanding for the particular situation, with the simultaneous ability to set boundaries (e.g. not taking over responsibilities and tasks in which the creator should be involved),

– the ability to motivate – the ability to encourage action, understand frustration, patience, standing "by" a scientist in difficult moments, supporting failures,

– advisory skills – including the substantive knowledge (in the area of commercialization of knowledge, intellectual property law); the ability to critically evaluate ideas, express one's opinion, provide feedback in a constructive way, show interest and willingness to help,

– psychological competencies – stable ego (neither too low nor too high because such is manifested by aggressive/explosive or submissive communication); confidence, beliefs about their competencies, persistence, recognition of their role, confidence in the role of a broker,

– developing a network of contacts, proactivity – competencies expressed by building a network of contacts, establishing and maintaining relationships with scientists (not only when they are interested in their intellectual property), being present/visible at faculties – participation in meetings, councils, conferences, etc. – high personal culture, expressed by showing respect for the diversity of other people, their ways of thinking and acting, maintaining discretion.

Responding to the needs of individual groups of stakeholders, brokers take over the role of a coach or mentor, adapting to the expectations and substantive level of the teams they work with. Characteristically, the importance of the role of the coach in supporting teams with little experience in commercialization is emphasized more often. The activities of brokers are primarily aimed at overcoming the fears related to undertaking the process and building self-confidence in dealing with business. In this case, the role of the mentor is limited to sharing knowledge and helping to take the first steps in the process. In the case of teams that already have experience in commercialization, the broker plays the role of a mentor to a greater extent, sharing experience, and social capital, indicating the best methods of conduct (Figure 1). The role of the coach, in turn, is limited to helping to maintain the cohesion of the team.

In the course of the research, attention was focused on the barriers indicated by brokers, which make it difficult for them to build social capital (Table 2).

Table 2. Factors hindering cooperation between the broker and creators

Related to broker's attitude	Related to researcher's attitude
Structural social capital dimension	
– lack of formal authority held by the broker – scientists do not remain subordinate to him – different, often contradictory expectations of individual interest groups towards the broker's role (e.g. tension between maintaining the *status quo* and implementing changes)	– opinions that the university is not a good partner for commercialization – bad experiences with university administration, negative opinions overheard – fears of excessive procedures/formalities – expected problems with the university administration/legal department – the researcher's involvement in his/her own business activities
Cognitive social capital dimension	
– low level of substantive knowledge – lack of identification with the role of the broker, resulting in a low level of commitment	– prejudices resulting from the lack of awareness of the market value of the conducted research – scientists' reluctance to implement scientific results, – fears of evaluating ongoing research – insufficient competences/knowledge about the commercialization process

Related to broker's attitude	Related to researcher's attitude
Relational social capital dimension	
– deficits in the social competences – individual personality factors (self-confidence, emotional stability) – personal situation, e.g. family or health situation	– low level of social competences that may constitute a barrier to communication with colleagues or with a broker – individual personality factors that may constitute a barrier to communication with colleagues or with a broker, incl. little openness, overconfidence, distrust – personal situation that excludes additional involvement, e.g. family or health situation – difficulties in working in a team, e.g. difficulties in sharing intellectual property within a team whose members have ceased cooperation

Source: Authors' own study based on their own research.

The respondents perceive difficulties in building social capital in the first place in the way the role of a broker is formalized within the university structures, and they also point to prejudices against the process of commercialization of research through the university. The indicated formal issues affect both the perception of the broker's authority by scientists, and may also weaken its driving force in solving the existing problems. In both cases, the broker's social capital is weakening in structural terms. The beliefs of scientists about the low-quality support offered by the university administration are one of the key barriers discouraging them from starting cooperation with businesses through the university. The broker's task is to present the process, explain the role of individual entities in the entire knowledge transfer and commercialization system. However, the broker's support does not consist in solving all difficulties, the broker takes over the role of a mentor – shares their own experience, and presents possible paths of conduct. In this way, they support the scientists in building their own social capital.

Barriers hindering the cooperation between the broker and scientists often result from the lack of knowledge of the market conditions, which makes it difficult for scientists to determine the value and importance of their own research in terms of market demand. Employees may underestimate their own research and miss the commercialization potential thereof, or misjudge (e.g. overestimate) this potential. An example may be the situation quoted by one of the respondents, which shows how the belief in the very high commercialization potential of the scientific team made commercialization impossible due to the overestimation of potential benefits and loss of trust in business representatives. Lack of trust resulting from the lack of awareness and understanding of market mechanisms leads to the reluctance to share the results of own research, which is also exacerbated by the fear of losing intellectual property rights. Commercialization of research results or obtaining a patent is associated with both financial gratification and recognition in the (scientific and economic) environment. In both cases, the scientific achievement is verified and assessed for the usefulness and innovation thereof. Academics who are concerned about the results

of such an assessment are less likely to cooperate with business, driven by fear of failure. Overcoming this barrier not only requires organizational skills as in the case of concerns related to formal procedures. The key here is working on beliefs and making some kind of cultural transition – moving from risk avoidance thinking to develop an entrepreneurial mindset in which failure is treated as a valuable experience on the way to achieving the goal. The role of the broker is, therefore, to work on beliefs in the direction of changing a conservative attitude into an entrepreneurial and open attitude, characteristic of proactive business culture.

Discussion

From the perspective of university authorities, the role of a broker is similar to the concept presented by Allen (1977) or Tushman (1977), which consists in mediating relations between teams of scientists and entrepreneurs and should contribute to obtaining results by identifying (recognizing the offer, establishing contacts with creators), translation (including the conduct of meetings with teams of scientists and entrepreneurs, presenting the technological offer) and transferring information within the university and between the university and enterprises. However, the perception of the role of the broker through the prism of technical tasks seems to be very limited. Research shows that interpersonal competencies, such as social and emotional intelligence, are key to building economy 4.0 (Sitko-Lutek, 2013; Sobotka, 2020), in which the role of technology transfer between universities and business plays a key role.

The focus interviews reveal the image of a broker who balances between the technocratic requirements set by university authorities in terms of reporting results and monitoring the situation at departments, commitment to teams of scientists who expect substantive advice and overcoming reluctance resulting from the unwillingness to change and take action to promote knowledge transfer. This reluctance is manifested in the need for "peace", which appears sporadically, but is noticeable at almost every level of cooperation. This feature of organizational culture is a special barrier for the broker's activities because, despite formal assurances about the support of the authorities, high status, and wide possibilities of taking actions by brokers in faculties, there is a widespread opinion that the broker "disturbs the peace of mind" of the administration, scientists or even deans, which reduces the role of a broker to an unwanted salesman. Such attitudes of the authorities may also lead to a loss of brokers' trust, and as a result, translate negatively into the social exchange they perceive and their attitude towards the organization (Wnuk, 2020). As a consequence, the excessive bureaucratization of the role and treating the broker solely as a "provider" as well as the low level of social capital in the structural dimension may constitute significant barriers to the effective implementation of the broker role. Research shows that a low level of social capital at the organizational level may

negatively affect the involvement of persons acting as brokers (Leana & Van Burren, 1999), which may block commercialization activities. As shown by the research conducted by Andrews (2010), the combined influence of social capital and appropriate organizational structures affects the effectiveness of an organization. This influence is particularly visible in the relational and cognitive dimensions, which means that brokers using their knowledge of intra-organizational connections and having a network of developed contacts may contribute to the effective implementation of commercialization goals at universities. It is important to emphasize the essential role of mentoring in building not only the subject's substantive knowledge but also in the development of social competencies. It is the mentor who, acting as a guide and an advisor of the mentee, introduces him to the network of social connections. By assuming the role of a coach or mentor, brokers are able to largely respond to the expectations of particular groups of stakeholders. The conducted research shows that brokers' satisfaction comes from building and sharing their social capital with research teams, supporting them on the way to commercialization of research results. This occurs both through the sharing of social capital in the relational dimension (Kobylińska, 2020), as well as through the transfer in the cognitive dimension of social capital – transferring knowledge, advising, but also through modelling behaviour, which is naturally related to the coaching and mentoring process. Building social capital in the relational dimension is particularly desirable in public sector organizations, where, as research confirms, the quality of the intra-organizational network of contacts between employees increases their job satisfaction and results (Marzec, 2020).

Fulfilling the role of a coach or mentor through direct contact of a scientist with a broker who has high social competencies gives them the opportunity to draw on the broker's social capital, which allows them to change their behaviour and social habits. Such a process is the result of participation in the natural social training that takes place in the space of the broker–scientist relationship, but it also takes place in the case of any interaction with other people that the creator meets on the way to commercializing the effects of their work. The aim of the activities undertaken is to help improve social skills and increase interpersonal effectiveness so that the learner is able to act in selected social situations or undertake specific interpersonal challenges in an effective, adequate, satisfying, and reputable manner (Smółka, 2009).

Conclusions

The article describes the roles of a coach and mentor that the departmental innovation broker takes in a relationship with a scientist. Regardless of the indicated differences between them, which result mainly from different goals, what they have in common and what seems to be of particular value on the way to building social capital is not only aiming at developing potential, talents, setting ambitious goals,

and achieving them, but also accompanying empathy, understanding, and respect for the subjectivity and individuality of each scientist. It also seems that the relationship between the broker and the scientist, devoid of these elements, will bear the hallmarks of short-term cooperation focused on the implementation of a specific task and, regardless of its immediate effects, will not significantly affect the building of the social capital of the organization and changes in the organizational culture. The role of university and faculty authorities is to create space for the development and sharing of social capital among brokers and scientists. It is particularly important to create structures conducive to establishing relationships and ensuring transparent and efficient paths of communication and information processing so that formal issues do not constitute an additional burden for actions taken by brokers. Administrative support is also crucial in building the broker's authority in the environment, however, excessive formalization of the role and treating the broker's function as a supplier may adversely affect the development of the social capital of individuals.

The limitation of the research is that the study was developed based on data gathered at one university. We have collected data from departmental brokers active in different scientific fields, what showed clearly that the potential for technology transfer and research commercialization is diverse among scientific fields. Therefore, we see the need for deeper studies in order to identify the challenges for departmental brokers in specific disciplines.

Finally, in the light of the research outcomes obtained, it can be said that a good, trust-based relationship between a broker – coach, mentor, and scientist is a platform on which the broker's work takes place, the final effect of which is the development of scientists' potential in the field of commercialization of knowledge. Owing to this relationship and other social bonds, a scientist gains access to various, often new, opportunities for professional and personal development.

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