

ACADEMIC ENTREPRENEURSHIP IN IRANIAN FACULTIES OF SPORT SCIENCES: A QUALITATIVE MODEL

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ABSTRACT

Iranian sports science faculties (ISSF) need to incorporate various activities that have not previously existed in their traditional functions to become innovative and entrepreneurial. For this reason, an effective model must be designed and developed to facilitate entrepreneurial research, independence of the faculties, development of their relationships, and application of sport sciences. Therefore, because of the importance of this issue, the purpose of this study was to present a model of academic entrepreneurship assessment in Iranian faculties of sports science. Using snowball sampling and based on the theoretical adequacy of the research, 11 people were interviewed. Regarding, the grounded theory was used to analyze the categories and indicators affecting the academic entrepreneurship assessment process. Also, Charmaz Grounded Theory approach was used to analyze data. These findings include four categories of requirements, enablers, activities, and consequences, for which 19 sub-categories were identified. The results can be used to evaluate, rank, and compare the entrepreneurial activities of academic actors, managers, and majors in sports science, as well as allocated grants and credits to units associated with academic entrepreneurship and commercialization.

Keywords: Entrepreneurship, Commercialization, Faculty, Sport Sciences.

INTRODUCTION

Universities perform essential roles in creating and transmitting new knowledge within contemporary societies (Calvo et al., 2019). Academic entrepreneurship has started to be considered a third mission in which university institutions engage, in addition to the traditional mandates of teaching and research. To encourage entrepreneurship among academics and students, universities are now developing entrepreneurship policies and implementing these initiatives to embed entrepreneurial thinking and practices within teaching, research and administration (Etzkowitz, 2004). Effective participation in entrepreneurship development as the mission of the university in the realization of a knowledge-based society is important from two aspects: first, the internal aspect and evolving functions, components, structure, relationships, and processes of the university in order to provide the educational environment and Entrepreneurial development, and the second; external aspect, are the outcomes and achievements that the university brings to the development of entrepreneurship at the community level, and are mutually reinforcing or influencing peripheral forces and systems in the field of economics and knowledge-based development, innovation and entrepreneurship (Audretsch, 2014; Muscio & Ramaciotti, 2019). Therefore, it is expected that the faculties of sports science will participate in Entrepreneurship development to pursue its mission of realizing a knowledge-

based society and achieving a sustainable competitive advantage, and by doing so to provide the essentials of internal transformation and achieve remarkable results and achievements Table 1.

Table 1 TRADITIONAL UNIVERSITIES VERSUS ENTREPRENEURIAL UNIVERSITIES		
	Traditional universities	Entrepreneurial universities
Structure	Department, Laboratory, Research center	Department, Laboratory, Research center TTO, Incubator, Spinoff
Goal	<ul style="list-style-type: none"> • Knowledge creation 	<ul style="list-style-type: none"> • Knowledge creation • Knowledge utilization
Action	<ul style="list-style-type: none"> • Academic routines 	<ul style="list-style-type: none"> • Academic routines Research commercialization
	(Teaching, Research publication and Public service)	
Adapted from the research literature		

Different approaches have already been proposed for the role of universities in the process of entrepreneurship development. One of these well-known approaches that have been emphasized and used in most researches (Monds Alizadeh et al., 2015; Azimi Delarestaghi et al., 2016; Goudarzi et al., 2016), is training sport entrepreneurship to the target groups, whether students or other members of society and to equip them with entrepreneurial knowledge, insight, and skills. Indeed, this approach reflects the university's contribution to entrepreneurship development by preparing individuals for entrepreneurship and assumes that graduates who have studied entrepreneurship are superior to other individuals in the field of Entrepreneurship and will work more successfully (Muscio & Ramaciotti, 2019). Another approach is the direct role of the university in entrepreneurship development, through the commercialization of knowledge and technology by facilitating the launch of new venture businesses. In light of this approach, the university acts as the treasury or the platform for entrepreneurship (Rasmussen & Sørheim, 2006). On the basis of the first approach, the entrepreneurial achievement is achieved through the entrepreneurship of graduates, while the second, the university is constantly witnessing its entrepreneurial achievements.

In line with this view, Doing the research and producing knowledge in various sciences, including sports sciences, is not the sole cause of wealth creation; rather the integration of knowledge and the effective use of science and technology is caused to create wealth and economic growth (Bengtsson, 2017). In fact, as long as research results are not converted into real products and are not used in the sports industry, there will be virtually no benefit to sports research for academia or society (Pane et al., 2015). Meantime, sports science faculties can improve the transfer of knowledge to the business sector and generate wealth for the country; nurture many entrepreneurs (Goudarzi et al., 2016) or enable sports entrepreneurial businesses to produce their innovative products before competitors in the current market. In fact, universities, industry, and government, each with their goals, policies, and functions can enhance the value of sport through scientific research in the chain of science, technology, product development, and commercialization (Pane et al., 2015).

In Iran, the sports industry is evolving and this movement can provide a good basis for entrepreneurial activities in sport (Nasirzadeh et al., 2018). Sport affects other industries, including education and tourism, with a full focus on innovation and social entrepreneurship

(Oloyede & Tosin, 2017). Therefore, Knowledge and innovation in sport sciences are of great importance for the development of sport as it will improve the performance of athletes, promote community health and economic growth in the country (Kos et al., 2018). At present, there is a great potential and interest to advance research in the field of sports science and technology and emphasizes the need for focused research and appropriate development for emerging innovations (Nasirzadeh et al., 2018; Ratten, 2010). Increasing awareness of sports science and its benefits enhances the educational system in universities and add to the research and development of new knowledge in sports science and technology. Although sport is considered one of the top industries and at par with other industries, sports researchers at universities are striving to promote sport as a "social and effective institution in different sectors of society" and to promote cooperation between the university and sports industry. (Zaharia, 2017; Azimi Delarestaghi et al., 2016). This means that in order to be innovative and entrepreneurial, universities need to incorporate various activities that were not already in the scope of activities (Peris-Ortiz et al., 2017).

Generally, sport entrepreneurship empowers academic actors to identify opportunities and benefit from creativity, but to date, such programs have not been implemented in Iranian sports sciences faculties. (Azimi Delarestaghi et al., 2016), And the structure of universities and the sport system is such that their interaction is not realistic and appropriate and the context of collaboration is not conducive to applying the knowledge produced in sports science faculties. (Dastoom et al., 2013). To this end, academic activists need to pay close attention to business goals, along with scientific goals, and establish a balanced alignment between the two. Hence, the policy of promoting applied research and recognizing and developing the awareness of the challenges ahead is an important step in disseminating, implementing and making sports science research more relevant (Halperin et al., 2018). Furthermore, to commercialize sport researches, the relationship between industry, sports organizations and sports science faculties should be spread and academic research should be done based on the needs of these organizations. Also some conditions should be provided in sports science faculties in order to add research commercialization to their culture (Keshavarz et al., 2018).

In recent years, there has been a great effort towards drifting researchers to perform research in this regard, but there isn't much research on academic entrepreneurship in sport. With regard to the mentioned descriptions and considering the issue that the problem investigated in this research is not simultaneously studied in any other and the necessity of its investigation in a new field such as sport, as new aspects of research, it has been like a motive towards selecting this subject for research. Therefore, considering many benefits that sport sciences faculties can have by creating an entrepreneurial technology and the effects of its commercialization on the country's economic and social processes, the research problem is that how academic entrepreneurship in Iranian sports science faculties can be evaluated?

METHODOLOGY

Since in the present study, due to shortage of theoretical foundations, there was no possibility of sufficient knowledge about the important indicators related to the problem and their relationship with each other, qualitative research method was used. For this reason, the present study is exploratory in terms of orientation and applied in terms of purpose. The researcher followed a study protocol related to a grounded theory methodology, which contained the instrument, as well as the procedures, for obtaining answers to the research question. Reviewing the literature of Grounded Theory, we face three major approaches including

systematic approach (Strauss and Corbin), classic approach (Glaser), and constructivist approach (Charmaz) in the process of information analysis, that they have differences with each other in terms of the role of the researcher and the method of coding the concepts and analyzing the information (Creswell & Creswell, 2017). The main process in the Grounded Theory technique is the process of coding and classifying raw data, extracting the concepts and the main categories and the relationships between them.

In this research, the constructivist approach (Charmaz, 2000) was used. Initial data sources for this study were sport sciences professors/ entrepreneurs, and experts in entrepreneurship. Data were collected through semi-structured interviews. Potential participants were contacted by telephone and electronic mail to seek their consent to take part in the study. The researcher explained to the participants how the information would be collected, processed, and utilized. A written consent form was obtained from each participant before data were collected. To sustain the maximum variation of the sample, individual participants were selected through snowball sampling techniques. In this method, an initial group is selected for interview, and then the subsequent groups for interview are introduced by the same group; sampling continues until the data is saturated. Saturation in Grounded Theory means completion of code levels and it means that no new conceptual information is obtained which requires a new code or extension of the existing codes. The researcher, through continuous examination of the data, ultimately feels saturated and closes the sample (Strauss and Corbin, 1998).

In this study, 11 people were selected through the snowball method. In fact, from the 9th interview onward, a repetition in the received information was observed. But in order to be sure, it was continued until the 11th interview. Data collection lasted six months. Each interview lasted from 35 minutes to 70 minutes depending on the willingness of the interviewee to the subject. Interviews, with permission from the interviewees, were fully recorded and also nothing was done during the interview.

Each interview was analyzed immediately after completion. Along with analyzing the interviews, the researchers have also referred to scientific texts as secondary sources to integrate appropriate elements and prior theories into their theory. The process of simultaneous data collection and analysis by the Zigzag method continued until no new data or categories were found (theoretical saturation) Table 2.

The recorded files were transcribed after the interviews. Prior to the next interview, the initial coding and analysis of the interviews were done with the help of memo-writing. The researcher was responsible for data collection, transcription, translation, and analysis to ensure the quality, consistency, and accuracy of data processing and interpretation. The protection of the participants' anonymity was essential. As such, audio-tape recordings of interviews were transcribed and labeled using pseudonyms in the manuscripts. In addition, at the completion of the study, the audiotapes were destroyed. However, the transcripts were retained, using the established pseudonyms.

Table 2		
INTERVIEW QUESTIONS		
	Questions	Sub-question
Q1	What do you think the academic entrepreneurship evaluation model should look like?	Requirements, Incentives, Mechanisms, Barriers
Q2	What are the capabilities of the faculties of sports science?	Orientation, Skills, Competences
Q3	What do you know about the	Social, Economic,

	necessity of applying sport innovation and technology and the implications of applying sport science research?	Scientific
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Selected Interviewees for this study were from a variety of backgrounds (2 sport physiology, 2 sport management, 1 sport marketing, 1 sport entrepreneurship, 3 academic entrepreneurs, sport biomechanics, 1 entrepreneurship management) and were able to enrich the contexts for analysis. 11 Interviewees (8 males, 3 females) between the ages of 32 to 61 years were purposively recruited. Their years of experience were between 14 and 27 years.

In the constructivist analysis of this study, three overlapping processes of initial coding, focused coding, and theoretical coding was used. The process of data collection and analysis was performed simultaneously with multiple revisions (Charmaz, 2000).

Validity in qualitative research is related to the question of whether the used methods, approaches, and techniques are related to each other and measure what the researcher is searching for (Hooman, 2010). In the 1980s, Guba and Lincoln considered the concept of trustworthiness as a criterion to replace validity and reliability and they suggested that this concept consists of four elements of credibility, transferability, dependability and confirmability (Hooman, 2010, pp. 62-66). In the present study, in order to calculate the reliability of the test, 4 interviews were selected among the conducted interviews and two methods of re-coding by the researcher and the method of member checking was calculated and evaluated. In this method, the researcher re-encodes a number of interviews after 30 days and examines the reliability of the research according to the following formula (Andrew et al., 2011, 146-123).

$$\text{Reliability percentage} = \frac{2 \times \text{Number of Agreements}}{\text{Total number of}} \times 100$$

Table 3 INTERVIEWING ABOUT THE RELIABILITY OF RETEST					
	Interviewee	Number of codes	Agreements	disagreements	Reliability retest
1	P2	29	11	7	75%
2	P5	30	12	6	80%
3	P6	24	8	3	66%
4	P9	33	12	4	72%
Total		116	43	20	74%

As can be seen in the Table 3, the number of codes in two 30-day intervals is equal to 116; the total number of agreements between the codes in these two times is equal to 43, and the total number of disagreements between codes in these two times is 20. The reliability of the retest of the conducted interviews in this study, using the mentioned formula, is equal to 74%. Given that this reliability is more than 60% (Kvale, 1966: 237), the reliability of coding can be confirmed.

The member checking method was used to determine credibility, transferability and confirmability. The final coding and model was provided to three interviewees who applied their views and finally confirmed the overall model of the research. Also, in order to ensure the transferability, the findings of the research were made available to two members of the entrepreneurship faculty and the transferability of the model was confirmed. Analyzing the data according to the qualitative nature of the information obtained from the interview and extracting similar concepts in them, by qualitative data coding method and by considering the data review

process, formulation of coding guide, data organization, data classification, initial coding, focused coding, final report compilation, and qualitative data analysis were performed by constructivist method (Chun et al., 2019).

RESEARCH RESULTS

In the data analysis stage, the conducted interviews were analyzed. Analysis of the obtained data and identification of main and secondary categories and concepts, as well as the relationship between the categories and finally, identification of their hierarchy, are among the most fundamental methods of Grounded Theory that ultimately lead to the formation and extraction of theory from the conducted interviews. For this purpose, three stages of coding as below have been used in order to identify the mentioned categories and their relationship with each other and, finally, discovering a conceptual framework from the interviews (Charmaz, 2016).

Initial coding: This is the first stage of the coding process in Grounded Theory methodology (constructivist approach) in which there are two methods for extracting data from interviews: minor analysis and key points' analysis. In this study, firstly the content of all interviews was written and then their open coding was done using key points' coding method, such that the data collected in the interviews was written, conceptual labels were placed on most lines of text, the researcher created a list of important themes for the interviewee, and then through line-by-line and paragraph-by-paragraph analysis of the written materials, initial codes were created. After coding the key points, those codes resulted from analysis, which was mentioning "a common subject", are manifested in a title named "concept" (Chun et al., 2019).

Focused coding stage: This step is much more abstract, and coding was used for several lines or paragraphs in the manuscript. Therefore, the researcher chose the most frequently repeated codes to represent the interviewee's voice. This step helps to verify the adequacy of the basic concepts developed. In this section, the encodings and categories were combined and the content of each was put into a centralized code format. Of course, at this point, referring to the theoretical literature of the research helped too much to more precise groupings.

Theoretical coding: Charmaz (2000) explains that theoretical coding is the reordering of data that is broken down into separate codes through line-by-line coding. In fact, the most abstract level of coding is the theoretical coding that describes the relationships between the categories created. In this research, it has been tried that based on the researcher's understanding of the context of the studied phenomenon, namely academic entrepreneurship assessment in Iranian faculties of sports sciences, the framework of the paradigm model will be disassembled and the final theory will be shown in graphic form. Grouping of focused codes in each case and their comparison showed that all the obtained codes can be put in four main categories Table 4.

Table 4
THE EXAMPLE OF CODING PROCESS

Interview transcript	Initial coding		Focused coding	Theoretic al coding
	Categories	Categories		
<ul style="list-style-type: none"> Sport science faculties can be effective in promoting academic entrepreneurship, as well as providing the basis for international modeling and partnerships, albeit by providing educational, laboratory, and research costs to faculty members or students. 	<ul style="list-style-type: none"> Developing curricula based on social needs Partnership of industry and economics in textbook editing 	<ul style="list-style-type: none"> Entrepreneurship education Develop an entrepreneurial spirit Financing International 	Academic functions in the path of sport entrepreneurs hip	Enablers

Developed countries have brought universities into industry and industry into universities, so professors at some universities have been forced to commercialize their research ideas every year.	<ul style="list-style-type: none"> • Educational Entrepreneurship Expenditures <ul style="list-style-type: none"> • Key Entrepreneurial Skills • International Joint Research Projects • International faculty members • Cost of technical and laboratory services for academic entrepreneurship activities • Per capita research of academic activists • Rewarding academic entrepreneurship activities • The Impact of Participation on Entrepreneurial Activities (Idea Development, Innovation, Invention, Knowledge Transfer) in Performance Evaluation and Ranking 	<ul style="list-style-type: none"> • presence • The role of researcher and researcher in solving community problems • Educational evaluation system 	Entrepreneurial Resource Platform Optimal patterning	
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Requirements

Obviously, the role of sports science faculties in the process of developing the sports industry and providing social welfare has requirements. These requirements refer to elements such as entrepreneurial orientation, entrepreneurial capital, entrepreneurial passion, and entrepreneurial participation that are essential in the configuration of sport science faculties for the emergence of academic entrepreneurship activities. Requirements are considered as infrastructure and hardware resources in the faculties of sports sciences, the proper evaluation of which will lead to the formation of the institutional culture of the faculties and the creation of the necessary structures for sustainable academic entrepreneurship.

Enablers

In this study, empowerment as a complement to the requirements category refers to those elements that accelerate the process of academic entrepreneurship and increase the individual and organizational empowerment of sport science faculties. There is now a need to change the way faculties operate and empower their resources by clarifying the impact of change in each of these contexts at national, regional, and international levels (Dastoom et al., 2013). A closer look

at the issue of empowering sport science faculties reveals that in order to move from an educational-driven and research-driven approach to entrepreneurial and value-creating, entrepreneurial and value-creation culture must be institutionalized in the faculties and empowered, creative, innovative, productive, risky and independent human resources be nurtured.

Based on the findings of the present study, formulating and developing curricula based on community needs is the first priority in empowering sport science faculties. Curriculum mismatch with the real needs of society is a problem that adds to the current problems of the Iranian sports industry (Keshavarz et al., 2018). Academic activists will not produce useful research output if they are unaware of the needs and desires of the community, and the academic entrepreneurship cycle will stop moving. Therefore, the first step in empowering faculties is to market sport sciences research. This can be done through a variety of strategies such as marketing research, doing organizational projects, and proposing projects outside the university. Based on what was found in this study, increasing inter-sectoral communication and closing the gap between industry and university is the most important and useful strategy for curriculum development and application training. According to the participants in this study, cross-sectoral communication refers to the communication between stakeholders in sport, academia, and society, that can work together to advance the goals of sport sciences.

Academic entrepreneurship activities

Although in some studies Klosthen & Jones-Evans (2000) academic entrepreneurship has been equated with the formation of spin-offs, various mechanisms for academic entrepreneurship are common. To evaluate academic entrepreneurship activities in the sport science faculties, seven specific types of academic entrepreneurship are outlined Table 5.

Table 5	
ACADEMIC ENTREPRENEURSHIP ACTIVITIES IN SPORT SCIENCE FACULTIES	
Activity	Activity description
Large-scale scientific projects	Obtain large-scale research projects funded by external sources
Research contracts	Contractual or custom research: undertaking specific research projects for sports and non-sport organizations
Patent / Licensing	Patents and licensing of research results to the sports industry
Spin-offs	Formation of a new company or organization or commercialization of results or exploitation of research results
Crafting workshops	Holding short-term entrepreneurial skills courses inside or outside the faculty to deliver technological innovations
Selling technological products	Commercial sale of sports technology products manufactured and in the faculty

Consequences

The final issue concerns the implications of academic entrepreneurship in ISSF. The implications reflect the internal and external results and effects of entrepreneurial activities employed by academic activists, both students and faculty members. In general, entrepreneurship at the individual or organizational levels has many consequences, and entrepreneurship at sport science faculties has more effects Table 6. At the individual level, there are specific implications, such as student employment and monetization, entrepreneurial attitude implementation and expertise, and widespread competition among student-created businesses that focus more on the intrinsic effects of academic entrepreneurship. At the organizational level, academic entrepreneurship activities will lead to outcomes such as faculty reputation, funding, industrial

projects, national and international competitiveness, that refers more to the external effects of entrepreneurial activities in ISSF.

Table 6 CONSEQUENCES OF ACADEMIC ENTREPRENEURSHIP IN SPORT SCIENCE FACULTIES	
Consequences	Description of Consequences
Academic Satisfaction	Applying knowledge and research, Increasing interest in education and Increasing applicants for sports science
Quantitative and qualitative improvement of events	Standardization of sports venues and equipment, Application of technological innovations in sporting events, Increasing event competitiveness
Individual and organizational wealth creation	Employment, Financing, Reputation, Implementation of entrepreneurship-based education, Aligning academic functions and activities
Health sector optimization	Activation of health centers, Induction of preventative thinking instead of treatment, Reduction of medical costs, Promotion of motor literacy and Realization of active community
Modernizing the sports industry	Entering technological innovations in manufacturing and services, Specialization and knowledge-based sports businesses, Increasing the economic share of sports

Schematic Presentation of Focused and Theoretical Codes

In the final step, for the purpose of displaying centralized and understandable code, the layers are separated and finally the final model of the research is drawn based on the layers. In the Figure 1 below, the research achievement in the form of concepts and categories from the interviews is presented creatively in a model.

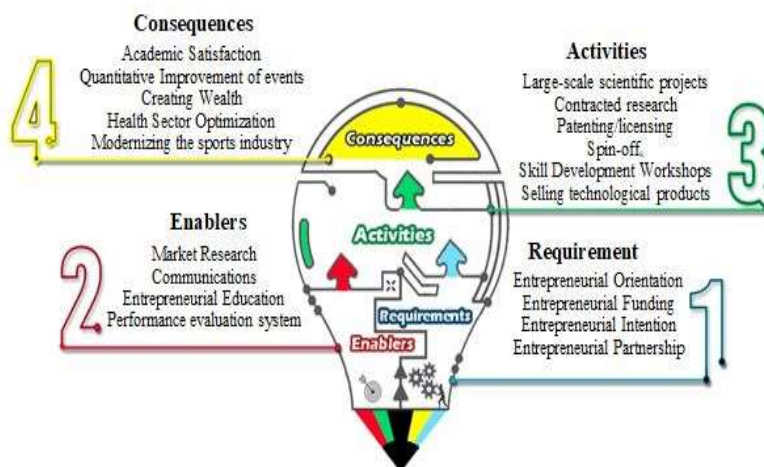


FIGURE 1
MODEL OF ACADEMIC ENTREPRENEURSHIP ASSESSMENT IN ISSF

DISCUSSION

The layout of the components of the interviews reveals several important points: First, the order of the components according to the model depicted Figure 1 shows the impact of each of the components of the requirements and enablers on the entrepreneurial activities and then the consequences thereof. This indicates that the benefits of academic entrepreneurship in the field

of sport are derived from the requirements and enablers that are known as the underlying components (hardware and software) in this model. In addition, enhancing entrepreneurial performance in ISSF requires integrating entrepreneurial orientation, funding, intention, participation, and training, as well as collaboration, communication, improving performance system, and marketing research achievement. This means that the simultaneous guidance and attention to entrepreneurial and marketing approaches in management and traditional practices (educational and research) can further the sport science faculties' path to academic entrepreneurship.

The second point is that improving the active capacity of ISSF in socio-economic development in a non-role-playing environment requires a balance of functions, the provision of an empowering institutional environment and supportive policymaking, as well as the availability of resources and effective and efficient management. Policymakers and planners, especially the Ministry of Sport and Youth, the Ministry of Education, the National Olympic Committee and the Federations must always go beyond politicized slogan support, believe the valuable place of ISSF in the development of sport and next, in the field of economic and social development, and Crystallize their beliefs in the form of practical support for them to move the ISSF on the path to the third and fourth generation of universities. On the other hand, academic activists, such as students, faculty members, and faculty administrators, must always keep their mission in the development of the sports industry and the community around it as a responsible and accountable community and In the light of continuous institutional self-assessment, ensure the efficiency and effectiveness of the ISSF as an ever-learning and leading organization committed to achieving excellence and continuous improvement and fulfillment of expected missions.

The third point is that the entrepreneurial process and creativity required in academic work is illustrated by the lamp symbol. This model, which is displayed in the form of a lamp, contains steps that will lead to the interpretation of the model. The base of this model is a pencil. The pencil in this model is a definition of sports science knowledge that emerges from the educational and research functions of ISSF. Earlier it was argued that traditional functions of ISSF could move to third-generation universities by integrating entrepreneurial and marketing approaches. Therefore, sport science knowledge is the basis of academic entrepreneurship activities and outcomes, which is one of the technological entrepreneurship examples of universities.

CONCLUSION

The final point to be taken into account in the research model is that the entrepreneurial process is shown in different colors based on the knowledge of sports science represented by a lamp and pencil symbol. The colors used in this model are those of the Olympic rings. These colors (red, green, black, yellow and blue) indicate that the process of academic entrepreneurship in ISSF should emerge and be implemented in the sport context (from/for sport). This is particularly associated with the concept of 'improving the performance appraisal system' to align the functions of business-scientific activities and goals.

Based on the findings of the study, it is suggested that the set of introduced components that have appropriate research credibility in different aspects can be used to evaluate the entrepreneurial activities of academic actors and managers of ISSF. These components can also be used to evaluate, rank and compare ISSF, an inter-university process (between disciplines, departments, actors). In addition, these components can be used in the evaluation, ranking, and

allocation of support and credits to units related to academic business and entrepreneurship such as technology transfer offices, entrepreneurship growth centers, and so on in ISSF.

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