

Benefits and Challenges of Agricultural Students' International Research Collaboration

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ABSTRACT

International collaboration is the key element to expand the horizons of knowledge and technology and to solve sustainability problems. To plan and implement this issue as effectively as possible, this study analyzed the lived experiences of agricultural students about the benefits and challenges of international research collaboration. This applied research used a mixed-method approach in two steps. First, an interview was done with PhD-agriculture students at the University of Tehran, who had published at least one article with international co-authorship in an international journal. Interviews were continued with 19 participants until the saturation point was reached. Interviews were transcribed and analyzed using the six stages of thematic analysis of Clarke and Braun (2006) and by conducting MAXQDA software. Secondly, a questionnaire was developed and conducted to investigate the importance of each of the items from the same 19 students who participated in the interview step. In this step, descriptive statistics were done by using SPSS software/ver23. Percentage, mean, and standard deviation were calculated for descriptive analysis. The findings showed that the international research collaboration had 24 benefit codes in the four dimensions of communication, scientific-research, academic, and personal-professional. On the other hand, 17 challenge codes were categorized into three groups of personal, motivational, and attitudinal group; managing the research and publication process; and cultural, technical, and economic group. Based on the means of benefits and challenges of students' international research collaboration, the first ranks were "academic" with a mean of 4.06, and "personal, motivational, attitudinal" with a mean of 4.28 for benefits and challenges, respectively. According to the findings, building teamwork skills in higher education is recommended as it can positively promote students' collaboration with others for research projects. This original and innovative study has theoretical and practical implications and value. The results are beneficial for universities to make decisions and plan activities that enhance students' international research collaboration.

Keywords: Agricultural higher education, Co-authorship, Teamwork skills.

INTRODUCTION

Different factors impact the progress of developing countries, among which the most important is agriculture (Tugendhat and Alemu, 2016). In many countries, the agricultural sector significantly leads to the overall growth and development of their economies and, undoubtedly, agricultural development has special potential for employment (Osabohien *et al.*, 2019). Agriculture has a key role to play in achieving sustainable food security

throughout the world and is an essential determinant in the quest for reducing and ending poverty at all levels (Osabohien *et al.*, 2018 and 2019; Anderberg, 2020; Gunnarsson and Wingborg, 2022). But at the same time, there are several challenges: Agriculture has to produce more food on less available land. That means it is crucial to raise the efficiency of agriculture in the future to serve the increasing need for food and to stop hunger (Horváth, 2016). The understanding of the complexity of agricultural systems in the past decades and

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increasing emphasis on sustainable agricultural development have stimulated researchers in the field of agriculture to look for research approaches to effectively link scientific advancement for more benefits and consequences (Galmiche-Tejeda, 2013). So, the productivity and effectiveness of agriculture have to be raised by using and applying the novel findings of the research and development activities associated with agriculture (Fekete *et al.*, 2014).

Research is the foundation of development and progress across different fields, shaping individuals' awareness, knowledge, and understanding of the world, driving innovation, and solving complex issues and problems (Mendonca, 2009). Giving importance to research and increasing research in each country causes development and progress and brings real independence to that country (Hakkak *et al.*, 2018). So, the idea of progress without paying attention to research seems far and unlikely. Today, the main criterion for determining the scientific status of different countries is the degree of participation in the production of science, technology, and innovation, and the role that the country plays in the process of global scientific development (Taghizadeh Kerman *et al.*, 2014). Accordingly, scientific research plays a critical role in the field of agricultural development through knowledge generation, innovation, and evidence-based solutions for emerging challenges in agriculture and for improving sustainable practices and enhancing the productivity, development, and resilience of farming systems (Mohamed El Mahdy, 2021).

In the present era, most scientific research is collaborative effort as opposed to individual efforts of the past decades. In other words, collaboration is a 21st-century orientation in academia; especially as research questions are larger and more complex and complicated, requiring the efforts of more researchers and investigators from a broader variety of perspectives and disciplines (Penniston, 2022). In academic research, collaboration usually means an equal partnership between two or more

academic faculty members, researchers, and students involved in a research project (Delgadillo, 2016). In research collaboration, researchers with diverse views and perspectives work and collaborate on interdependent research tasks in order to knowledge production and achieve knowledge integration (Cooke and Hilton, 2015). The world today has recognized the importance and influence of collaboration in finding solutions for people, societal and global issues and problems (Bature and Atweh, 2019). Additionally, issues that were restricted to national borders have now become international such as climate change, food security, health, environmental sustainability, etc. Finding solution to these problems requires the collaborative effort of researchers from all around the world. So, international research collaboration as one of the hottest topics in recent years (Chen *et al.*, 2019) is considered as one of the most important aspects of academic careers (Bond *et al.*, 2021). There is a greater need for internationally collaborative projects for knowledge and technology transfer for sustainable agricultural development (Cakir and McHenry, 2014). There are diverse levels of international research collaboration, which range from exchanging ideas and insights, networking with international researchers, participating in grant applications, and publishing paper and research findings (Wai-Chan, 2017). In today's increasingly globalized world, countries and institutions can benefit from international research collaboration (Marginson, 2019), which is suggested by many as an indicator of high-quality research (Kim, 2006).

Studies on research collaboration show that international collaboration in higher education presents both challenges and opportunities. Networking with others, having shared interests, sharing and exploring different ideas, and learning from others are some of the most important reasons for conducting international research collaboration (Bond *et al.*, 2021). Expanding access to global knowledge resources

(Waham *et al.*, 2023), sharing knowledge and skills, resources and costs between institutions (Abramo *et al.*, 2019; Niederkrotenthaler *et al.*, 2020), improving research quality (Kumar and Ratnavelu, 2016; Mali *et al.*, 2018), enhancing research productivity (Waham *et al.*, 2023), improving university quality indices and preparing students for a global workforce (Aldieri *et al.*, 2018; Waham *et al.*, 2023), wider networking (Yemini, 2019), increasing the likelihood of collaborating with multiple authors in the future (Kumar and Ratnavelu, 2016) were other benefits stated by different researchers. Studies on the impact of international collaboration on citations showed a positive relationship between international collaboration and the number of citations (Ni and An, 2018; Abramo *et al.*, 2019; Alamah *et al.*, 2023). Ni and An (2018) found that papers published by more than three countries received more citations.

According to the studies on the challenges of international collaborations, Caniglia *et al.* (2017) identified two major challenges: institutional policy challenges and intercultural challenges. Confusion over authorship order (Bukvova, 2010; Bozeman *et al.*, 2016), language barriers (Wöhlert, 2020), lack of clarity on who has responsibility for the results of the collaboration (Bukvova, 2010), potentially less productivity, particularly as a result of navigating differing work cultures (Abramo *et al.*, 2019; Yemini, 2019), fiscal constraints (Kogan & Teichler, 2007), and high costs of collaboration (Cummings & Kiesler, 2007) are considered as important challenges in different studies. Ensuring academic quality and standards, cultural differences, funding and resource constraints, and managing complexities were also stated as challenges of research collaboration (Waham *et al.*, 2023). International partnerships in research cause additional financial costs that can be related to individuals, translators, travel, and equipment (Freshwater *et al.*, 2006).

In universities and higher education institutions, teaching and research missions form the core functions that contribute as a key measure in evaluating the quality of universities and their performance and contribution to society (Liu *et al.*, 2022; Parr, 2022). It is expected from the agricultural higher education system that, while performing their educational and research missions, they move towards the production and dissemination of new knowledge and technologies in the agricultural sector (Pouratashi and Zamani, 2020; Karimi Etemad *et al.*, 2022). So, international collaboration in higher education has become necessary for universities seeking to foster cultural exchange, enhance academic excellence, and address global challenges (Waham *et al.*, 2023).

Like many countries, Iran has paid attention to the need for internationalization of higher education, and universities and higher education institutions emphasize and implement various measures towards internationalization, among them are international research collaborations. Hence, research collaborations, both within and between higher education institutions, are becoming increasingly vital in the light of progressively complex problems (Bond *et al.*, 2021).

In general, international research collaboration is an efficient and valuable process and can serve as an opportunity to benefit. But, at the same time, it can be complex and challenging. Since international academic research collaboration is linked with many benefits, it is one of the researchable issues in universities. However, there is limited research on the experiences of individuals with international academic research collaboration. Accordingly, and given the need for an in-depth investigation of higher education internationalization programs on the one hand, and the lack of a study on the international academic research collaboration of agricultural students on the other, the present study aids in fulfilling the



gap in the literature. Accordingly, this study intends to provide answers to the following research questions by focusing on agricultural higher education research in Iran: (a) What are the benefits of international research collaboration? and (b) What are the challenges of international research collaboration?

MATERIALS AND METHODS

This research was a descriptive, non-experimental, and applied study that used a mixed-method approach to properly answer the research questions. In different stages of this research such as collection and analysis of data, the ethical standards were observed and effort was made to ensure the accuracy to obtain verifiable and valid results.

First, a qualitative approach was conducted, using interviews and thematic content analysis. Thematic analysis, which is a proper method to identify and analyze different patterns in the data, was used to achieve an understanding of patterns of meanings from data on the lived experiences of individuals. The interviews were conducted through a telephone conversation and the average time of each interview was about 45 minutes. Before conducting the interviews, the interview protocol was provided to the participants and they were assured that the interviews would remain completely confidential and the conversations would be analyzed only for the purpose of the research and without mentioning any personal information of the participants.

The participants of this study comprised PhD-agriculture students at the University of Tehran, who had published at least one article with international co-authorship in an international journal. The selection of participants was purposeful of PhD-students who had experiences related to the subject of the research and with diversity from the departments of horticulture, soil science, agricultural extension and education, food science and technology, irrigation and

reclamation engineering, and agricultural management and development. In qualitative research, the number of participants is not predetermined and a fixed number of participants is not defined from the beginning. So, after the data becomes repetitive and reaches the point of saturation, the researcher comes to the conclusion that interviews and data collection are enough. In this way, the process of conducting interviews continued until the saturation point was reached and 19 students were interviewed.

After collecting the data, the interviews were transcribed and coding was used to analyze the collected information, with the stages of thematic analysis introduced by Clarke and Braun (2006) in the six stages including familiarization, codes formulation, themes generation, review of themes, naming and defining themes, and formation and writing the report. Accordingly, the texts of transcribed interviews were studied several times and the coding was determined in the form of words and concepts. MAXQDA software, which is a powerful tool for analyzing qualitative data to obtain accurate results from data analysis, was used to analyze the collected information and to identify the concepts and dimensions in the data. In order to check the accuracy and validity of the data, the criteria of reliability, transferability, and verifiability were used.

For the second step of data collection and in order to study the importance of each of the items from the views of the same 19 students who participated in the previous step, a quantitative approach was conducted. A questionnaire, in which items were extracted from the data of the first step, was developed for gathering data. The respondents were asked to express their views about the importance of each item on a Likert scale from 1 to 5. Face validity of the questionnaire was confirmed by a panel of experts consisting of faculty members. After that, data were analyzed descriptively, including percentage, mean, and standard deviation, using SPSS (Statistical Package

for Social Science, Chicago, IL)/Windows version 23.

RESULTS

Step 1: Qualitative Findings

The participants were asked to express their experiences of international research collaboration with foreign partners and to identify the benefits of the collaboration. The findings showed the extraction of 24 codes in the form of four categories: (a) Communication, (b) Scientific research, (c) Academic, and (d) Personal-professional. The findings are shown in Table 1.

Another question asked from the participants was about the challenges of international academic research collaboration according to their experiences of research collaboration. As can be seen from Table 2, the 17 codes were categorized in the form of three groups including: (a) Personal, motivational, attitudinal, (b) Managing the research and publication process, and (c) Cultural, technical, and economic.

Step 2: Quantitative Findings

Participants' views on the benefits of international academic research collaboration are shown in Table 3. Due to the participants' views, amongst the items in the communication category, the mean of "networking with experts" was 4.18, indicating that this item was at a relatively very high level of importance. The mean of "publishing the research findings at the international level", "active participation in the internationalization of higher education", and "increasing the number of citations" were 4.12, 4.37, and 4.68, respectively, showing the great value of the aforementioned items in the other benefit categories.

Due to the students' views on the challenges of international research

collaboration (Table 4), the first rank in the category of "personal, motivational, attitudinal" was related to "lack of sufficient motivation to conduct joint international research" ($M = 4.62$). In the categories of "managing the research and publication process" and "cultural, technical, economic", the first ranks were related to "confusion on authorship order" ($M = 4.62$) and "funding" ($M = 4.56$), respectively.

Based on the means of each of the categories related to the benefits and challenges of conducting a successful international research collaboration, the first rank on benefits of international research collaboration was related to the "academic" variable ($M = 4.06$). The other ranks related to personal-professional ($M = 4.00$), scientific, research ($M = 3.90$), and communication ($M = 3.89$), respectively. Regarding the challenges, the first rank was related to the "personal, motivational, attitudinal" variable ($M = 4.28$). The other ranks were managing the research and publication process ($M = 4.21$) and cultural, technical, economic ($M = 3.96$), respectively.

DISCUSSION

In the age of global science, higher education plays a significant role in the social, cultural, and economic development of a country (Fitriani and Muljono, 2019). On the other hand, according to the fact that agriculture has a very important role in the life of humankind, improving sustainable agricultural management and achieving the goals of agricultural and rural development requires the comprehensive attention of universities and academics to conduct problem-oriented research. International research collaboration is a specification of rapidly changing research systems and a key element of a university's research reputation. So, research is becoming ever more international, and international collaboration in higher education research has increased rapidly in the last two decades (Avdeev, 2019). Accordingly, this paper emphasized

**Table 1.** Extracted categories of benefits of international research collaboration.

Core category	Category	Code	Sample of statements
Benefits of international research collaboration	Communication	Networking with experts	<p>– Academic research is becoming more international. The joint research project that I did, made my networking wider and I was in contact with several other professors and researchers who were active in my field of interest and expertise. We will soon submit a joint proposal to receive an international grant.</p> <p>– Well, science is an international endeavor. So, collaboration with a person who is aware of the current issues in a foreign context and university helps to expand research ideas international perspectives, and research knowledge.</p> <p>– In recent years, there has been a lot of dialogue about the internationalization of higher education, and this issue is important. Well, when I publish an article with the name of a professor from whom I take advice; it is valuable for me and the brand of my university to be highlighted and known.</p> <p>– Citation of articles is considered one of the indicators in some university ranking systems. When we publish quality research work with the name of a prominent professor, it not only increases the brand and visibility of the person, but also increases the reputation and scientific standing of the university.</p> <p>– A paper I published with a team of foreign colleagues in a prestigious high-impact journal was highlighted in my resume and was noticed in the academic interview at the university.</p> <p>– International collaboration on research helped me understand and experience other people's cultures.</p>
		Create professional connections with peers in other countries.	
		Forming multidisciplinary and specialized teams to conduct research	
	Scientific, research	Exploring new ideas for research	
		Publishing the research findings at the international level	
		Increasing the number of students' articles in international Journals	
		Accelerating the research process	
		Improving the quality of research	
	Academic	Creating synergy and broadening research experiences	
		Active participation in the internationalization of higher education	
		Enhancing reputation of the university	
		Sharing costs and resources between participating universities	
		Strengthening the research performance of the university	
	Personal-professional	Help to improve one's scientific status	
		Negotiation for acquisition the postdoctoral position	
		Opportunity to learn and update experiences	
		The formation of complementary capabilities and skills	
		Strengthening students' cultural skills	
		Increasing visibility	
		Sharing different ideas	
		Increasing the number of citations	

Table 2. Extracted categories of challenges of international research collaboration.

Core category	Category	Code	Sample of statements
Challenges of international research collaboration	Personal, motivational, attitudinal	Limited English proficiency	– It is very difficult and time-consuming to find a foreign colleague who has worked in my research field and is interested in the joint activity. I emailed and reminded a professor more than 5 times and asked him to help me in writing a part of an article. But I did not receive any answer.
		Long time to find a foreign professor/partner and get a positive response to the request	
		Weakness in establishing multicultural interaction and communication	
		Wrong choice of research partner	
		Negative mental records from some previous joint collaborations	
		Lack of sufficient motivation to conduct joint international research	
		Ignorance of international joint research activities in the university	
		Lack of trust to provide data and information to others	
		Time and research management	
	Managing the research and publication process	Work overload	– We conducted joint research with the collaboration of 4 people, and since we had not discussed the order of names from the beginning when submitting the article, the name of the first professor was included and we had a disagreement about the order of the other three. This factor caused us to somehow lose our motivation for further collaboration.
		Confusion on authorship order	
		Responsibility of results	
	Cultural, technical, economic	Technology issues	– I met a PhD student in another country who was doing research in my research field and had published an article. We talked about a topic to do a joint scientific activity. That student benefited from the financial support of his professor, but I had to pay the research costs personally and the university did not have any financial support for this scientific activity from me.
		Funding	
		Different time zones and geographical distance	
		Cultural difference	
		University policy	

**Table 3.** Mean and standard deviation related to the codes of benefits of international research collaboration.

Core category	Category	Code	M	SD	Rank
Benefits of international research collaboration	Communication	Networking with experts	4.18	.54	1
		Create professional connections with peers in other countries	3.87	.80	2
		Forming multidisciplinary and specialized teams to conduct research	3.62	1.14	3
			3.89		
	Scientific, research	Exploring new ideas for research	4.00	.81	4
		Publishing the research findings at the international level	4.12	.80	1
		Increasing the number of students' articles in international Journals	4.06	.85	3
		Accelerating the research process	3.68	.94	5
		Improving the quality of research	4.06	.77	2
		Creating synergy and broadening of research experiences	3.50	1.03	6
			3.90		
	academic	Active participation in the internationalization of higher education	4.37	.83	1
		Enhancing reputation of the university	4.06	.53	3
		Sharing costs and resources between participating universities	3.62	.88	4
		Strengthening the research performance of the university	4.18	.83	2
			4.06		
	Personal-professional	Help to improve one's scientific status	4.25	.77	3
		Negotiation for acquisition of the postdoctoral position	4.00	1.09	5
		Opportunity to learn and update experiences	3.56	.89	6
		The formation of complementary capabilities and skills	3.43	.81	8
		Strengthening students' cultural skills	3.50	.87	7
		Increasing visibility	4.43	1.09	2
		Sharing different ideas	4.12	.80	4
		Increasing the number of citations	4.68	.47	1
			4.00		

the importance of enhancing international research collaboration and sought to analyze the lived experience of PhD-agriculture students of international academic research collaboration. As Freshwater *et al.* (2006) stated, international research is challenging, but at the same time, it has significant and remarkable outcomes. The findings of this study indicated that the research collaboration was potentially a valuable activity that had benefits in the dimensions of communication, scientific-research, academic, and personal-professional. The findings are consistent with previous studies (Mali *et al.*, 2018; Aldieri *et al.*, 2018;

Abramo *et al.*, 2019; Yemini, 2019; Bond *et al.*, 2021). As Altbach and Knight (2007) suggested, it is more important than ever to be engaged in advantageous collaborative international academic research. Although positive achievements can be expected from international research collaboration, which brings growth and skill empowerment to students; challenges and obstacles have been reported by participants, which can be categorized into the three groups of personal, motivational, attitudinal; managing the research and publication process; and cultural, technical, and economic. The findings are consistent with previous studies

Table 4. Mean and standard deviation related to the codes of challenges of international research collaboration.

Core category	Category	Code	M	SD	Rank
Challenges of international research collaboration	Personal, motivational, attitudinal	Limited English proficiency	4.50	.51	2
		Long time to find a foreign professor/partner and get a positive response to the request	4.37	.73	5
		Weakness in establishing multicultural interaction and communication	3.87	.95	7
		Wrong choice of research partner	4.18	.67	6
		Negative mental records from some previous joint collaborations	3.81	.98	8
		Lack of sufficient motivation to conduct joint international research	4.62	.71	1
		Ignorance of international joint research activities in the university	4.43	.62	4
		Lack of trust to provide data and information to others	4.43	.50	3
			4.28		
	Managing the research and publication process	Time and research management	3.68	.79	4
		Work overload	4.12	.51	3
		Confusion on authorship order	4.62	.62	1
		Responsibility of results	4.43	.81	2
			4.21		
	Cultural, technical, economic	Technology issues	4.12	.57	2
		Funding	4.56	.25	1
		Different time zones and geographical distance	3.81	.79	4
		Cultural difference	3.43	.51	5
		University policy	3.87	.62	3
			3.96		

(Bozeman *et al.*, 2016; Yemini, 2019; Abramo *et al.*, 2019; Wöhlert, 2020).

The findings revealed that personal-motivational-attitudinal was the biggest challenge in conducting successful international research collaboration. Students have a collection of strengths and weaknesses regarding research collaboration. The most important strength of students is benefiting from specialized knowledge and skills, which can be an effective factor for expanding scientific and research connections and conducting international research with foreign researchers and professors. In contrast, a weak point is the limited English proficiency of some students, which was also prominent in the findings of this study. Since a significant number of international scientific productions are published in English, students' mastery and proficiency in English

help them to communicate with foreign colleagues in a better way. In Wöhlert's (2020) study, language barriers were mentioned as one of the important barriers to international scientific cooperation. Language differences make several barriers. For example, a lack of clarity of the meaning of words can lead to misunderstandings, not only among the research team but also among audiences and participants (Freshwater *et al.*, 2006). Therefore, it is necessary for universities to increase students' awareness and skills so that they can benefit from more positive outcomes.

International collaboration in higher education is an important effort and endeavor that needs careful planning and serious institutional commitment (Waham *et al.*, 2023). The challenges of international research ask for smart and creative problem-solving and participants' commitment to the



overall purpose of the research project. Research collaboration requires a positive research culture to succeed (Gilmour, 2023). Effective collaborative teams bring significant outcomes, more than what could be done by individuals independently. So, the culture of teamwork, participation, and scientific collaboration among students should be taken into consideration by university professors and managers. Holding training workshops and encouraging teamwork in research projects by professors can positively promote this culture among students.

CONCLUSIONS

This study examined agricultural students' lived experiences and views on the benefits and challenges of international research collaboration. So, this study adds to the current body of knowledge and literature in the field of international research collaboration and internationalization of higher education. This study has theoretical and practical implications. At the theoretical level, the findings add to the existing literature on international research collaboration. At the practical level, the results are beneficial for universities to make decision and plan activities that enhance agricultural students' international research collaboration. Along with many benefits, this study has its limitations. This research measured the benefits and challenges of agricultural students' international research collaboration from the views of a limited sample. It would be helpful to examine the importance of the extracted items with a large statistical sample of agricultural students from different universities. Conducting such studies, along with examining and assessing similarities and differences between the views of different groups of respondents, is recommended for future studies.

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مزایا و چالش های همکاری پژوهشی بین المللی دانشجویان کشاورزی

مهتاب پورآتشی

چکیده

همکاری بین المللی عنصر کلیدی برای گسترش افق دانش و فناوری و حل مسایل پایداری است. برای برنامه ریزی و اجرای هرچه موثرتر این موضوع، مطالعه حاضر تجربیات زیسته دانشجویان کشاورزی را پیرامون مزایا و چالش های همکاری پژوهشی بین المللی مورد تجزیه و تحلیل قرار داد. برای این پژوهش کاربردی از

رویکرد ترکیبی استفاده شد. بدین منظور، ابتدا مصاحبه ای با دانشجویان دکتری کشاورزی دانشگاه تهران که حداقل یک مقاله با تالیف مشترک بین المللی در یک مجله بین المللی منتشر کرده بودند، انجام شد. مصاحبه با ۱۹ شرکت کننده تا رسیدن به نقطه اشباع ادامه یافت. مصاحبه ها با استفاده از روش شش مرحله تحلیل مضمون براون و کلارک (۲۰۰۶) و با استفاده از نرم افزار MAXQDA پیاده سازی و تحلیل شدند. در مرحله بعد، پرسشنامه ای برای بررسی اهمیت هر یک از موارد از همان ۱۹ دانشجویی که در مرحله مصاحبه شرکت کردند، تدوین و اجرا شد. در این مرحله آمار توصیفی با استفاده از نرم افزار SPSS/ver23 انجام شد. تحلیل داده ها با استفاده از آمار توصیفی و محاسبه درصد، میانگین و انحراف معیار صورت گرفت. یافته ها نشان داد که همکاری پژوهشی بین المللی دارای ۲۴ کد مزیت در چهار بعد شامل: ارتباطات، علمی-پژوهشی، دانشگاهی، و شخصی-حرفه ای بود. از سوی دیگر، ۱۷ کد چالش در سه گروه فردی، انگیزشی و نگرشی؛ مدیریت فرآیند پژوهش و انتشار؛ و فرهنگی، فنی و اقتصادی دسته بندی شدند. بر اساس میانگین مزایا و چالش های همکاری پژوهشی بین المللی دانشجویان، رتبه اول مزایا مربوط به عامل «دانشگاهی» با میانگین ۴/۰۶ و رتبه اول چالش مربوط به عامل «فردی، انگیزشی و نگرشی» با میانگین ۴/۲۸ بود. با توجه به یافته ها، ایجاد مهارت های کار گروهی در آموزش عالی توصیه می شود، زیرا این عامل می تواند به طور مثبت همکاری دانشجویان را با دیگران برای انجام اثربخش پروژه های پژوهشی ارتقا دهد. این مطالعه اصیل و نوآور دارای دلالت های نظری و کاربردی است. نتایج برای دانشگاه ها برای تصمیم گیری و برنامه ریزی فعالیت هایی که همکاری پژوهشی بین المللی دانشجویان را افزایش می دهد مفید خواهد بود.