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# Factors Affecting Students' Value Co-creation to Institutionalize Sustainability in Academic Structure: The Case of Iranian Agricultural and Natural Resources' Universities

Feyzallah Monavvarifard <sup>a</sup>, Masoud Baradaran <sup>b,\*</sup> and Bahman Khosravipour <sup>c</sup>

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## Abstract

Value co-creation process as a mutual interaction between individuals is a key issue across the management network. Recently, studies have placed a special emphasis on people's interaction in order to accomplish value co-creation. Given that the process of experience exchange enables us to identify our resources in transactional processes and make collaboration to achieve common values, the purpose of this study was to identify factors affecting student value co-creation to institutionalize sustainability in agricultural and natural resources universities. Statistical population of the research consisted of 2248 students of which 204 students were selected using stratified random sampling. The main research tool was a researcher-made questionnaire whose face and content validity was confirmed by a panel of experts and whose construct validity was confirmed by using explanatory factor analysis (KMO=0.752;  $P<0.01$ ). The reliability was checked by calculating ordinal theta ( $\theta \geq 0.89$ ). Data was analyzed by SPSS<sub>20</sub>. Descriptive findings showed that student value co-creation level was moderate (43.060 %). The findings of exploratory factor analysis revealed that seven factors including teaching quality, support from top management, students' social capital, confidence to faculty member, self-efficacy, pro-environmental values, and infrastructures of information and communication technology (ICT) captured 77.74 percent of student value co-creation variance.

### Keywords:

*Sustainability; sustainable development; university structure; value co-creation*

<sup>a</sup> Ph.D. Graduated student of Agricultural Education, Agricultural Sciences and Natural Resources University of Khuzestan, Ahvaz, Iran

<sup>b</sup> Associate Professor of Agricultural Extension and Education Department, Agricultural Sciences and Natural Resources University of Khuzestan, Ahvaz, Iran

<sup>c</sup> Professor of Agricultural Extension and Education Department, Agricultural Sciences and Natural Resources University of Khuzestan, Ahvaz, Iran

\* Corresponding author's email: [Baradaran@ramin.ac.ir](mailto:Baradaran@ramin.ac.ir)

## INTRODUCTION

Universities accelerate the human society's movement toward sustainable development by providing environmental education and information (Jackson, 2009; Musti et al., 2011). This has been widely supported by regional and international policies (Lozano et al., 2013). Examples include the UNESCO training and 21<sup>st</sup>-century agenda for sustainable development during 2005 to 2014, which expanded green university movement and established a training program for sustainable development in a wider scale (Thomas, 2009). These programs contributed to progress in the context of sustainable development at universities, but sustainability and sustainable development issues still are in their early stages in higher education since these programs have focused on top-down approaches. Moreover, the lack of considering real stakeholder's viewpoints in programs, the lack of students' interest for voluntary engagement in sustainability process, the limitation of universities to support and commitment to education for sustainable development, and the lack of cooperation between the internal and external stakeholders of universities are the other reasons hindering the integration of sustainable development issues in to academic structure (Ferrer-Balas et al., 2008; Leal Filho, 2009; Leal Filho et al., 2015).

Educational researchers have carried out extensive research to cope with these challenges. The results indicate that co-design and co-production sustainability programs can solve many challenges of the universities in institutionalizing sustainability in their structures (e.g. goals and perspectives, education, research, campus operation, assessment, and reporting) (Trencher et al., 2013, 2014). In addition, participatory approaches can not only act as a tool for changing paradigms to achieve sustainability in universities, but they can also contribute to integrating sustainable development into academic culture (Disterheft et al., 2015).

Recently, studies on management have emphasized on value co-creation process as a

participatory approach to achieve organizational goals. Some features that differentiate the value co-creation process from other participatory approaches include (1) acquiring the stakeholders' knowledge, (2) improving level of production services ownership, (3) reducing the contradictions, (4) innovation encouragements (management perspective); (5) comprehensive decision making, (6) equal promotion, (7) increasing the social capital level (ethical perspective); (8) promoting the dialogue level, (9) reflecting individuals' attitudes and values, and (10) developing common goals and viewpoints (social learning perspective) (Mathur et al., 2008). Therefore, Reed et al. (2009) conclude that promoting participatory and value co-creation culture in which goals are based on dialogue and results are necessarily unclear (e.g., creating a pro-environmental culture or respecting human rights in the university) is inevitable. In order to achieve this goal, it is imperative to identify the factors that affect value co-creation in universities. However, research in this area is very scarce and it is necessary to conduct research in this respect –especially in agricultural and natural resources universities as leaders of social movement toward sustainability. Therefore, the purpose of this exploratory research is to identify factors underpinning students' value co-creation in Iran's agricultural and resources universities to institutionalize sustainability.

Various definitions of value co-creation have been discussed in management literature from marketing, service, interaction, design, and innovation perspectives (Table 1). Kambil et al. (1996) used the term 'value co-creation' at first to emphasize customer role in business and marketing strategy, but it was popularized and disseminated by Prahalad and Ramaswamy (2004) who conceptualized value co-creation as "co-creation of personalized experiences with customers". They expressed that managers should emphasize experience creation with customers in multiple points of exchange as a basis of value co-creation instead of focusing on an organization's prod-

ucts. The concept of value co-creation shows how a product or service is created through collaboratively interactions among producers, customers, and other stakeholders (Golooba & Ahlan, 2013). Therefore, wherever value co-creation is discussed, it should be visualized as a social context in that a large group of stakeholders interacts to one another systematically because all processes of value co-creation are created in a social context by interaction and dialogue (Edvardsson et al., 2011). The focal point of value co-creation concept is a focus on group participation and activity in a real exchange with each other through engagement in interactive processes (Grönroos & Voima, 2013; Yi & Gong, 2013). Based on the presented definitions of value co-creation, we define it as collaboration, multilateral and direct activity between major academic actors (students and faculty members) in order to institutionalize sustainability in agricultural and natural resources-related universities.

Gummesson and Mele (2010) explain how value co-creation happens through the integration and interactions of resources. They argue that value co-creation actors engage in those types of social networks by that they could share and shape their experiences. In these networks, each actor plays different social roles that provide resources to access desirable social status and experience exchange. These network-driven interactions stimulate the integration of resources and, in turn, provide value creation context. Value co-creation actors remain in a unique value chain based on their capabilities and shared capacities and information (Lusch et al., 2010).

As educational organizations, universities need to integrate and use their resources in a way that helps to integrate students' activities towards sustainability in order to promote students' value co-creation (Storbacka et al., 2016). The direct relationship between different student groups and their collaboration with managers have a critical role in the transition of universities towards sustainability by focusing on students' values and experi-

ences (Hoyt & Huq, 2000).

Alves et al. (2016) analyzed the role of self-efficacy and social capital on customers' value co-creation in a service company. They considered four distinct parts in their theoretical framework: The first part was related to organizational activity (including customer education), the second part was related to customer effective resources (including self-efficacy and social capital), the third part was related to value co-creation (value co-creation with the organization), and the fourth part was related to perceived usefulness of the organization's services. The results of the structural equation model showed that customer education and self-efficacy have a significant and direct effect on value co-creation and that the social capital indirectly affected value co-creation by mediating self-efficacy.

In an explanatory study, Hasan et al. (2015) attempted to identify factors underpinning value co-creation in higher education institutions. They revealed that three categories of factors affected value co-creation in higher education: a) factors related to managers (universities' clear policies, management style, and financial remuneration); b) factors related to stakeholders (personal, psychological, and other factors); and c) infrastructure of information and communication technology.

Finally, in order to provide a comprehensive view of the factors underpinning value co-creation in higher education to achieve sustainability, we illustrated the results of the related studies in Table 1. Moreover, the research conceptual framework is depicted in Figure 1.

## METHODOLOGY

This study focused on factors affecting students' value co-creation in agricultural and natural resources universities. Statistical population of the research consisted of 2,248 students, from which 204 students were selected by stratified random sampling. To measure value co-creation, the 29-item customer value co-creation scale developed by Yi and Gong (2013) was used.

Table 1.  
Summary of Some Researches Associated with Factors Affecting Value Co-Creation

Researches topic	Authors	Year	Focuses points
Factors affecting value co-creation	Alves et al.	2016	Education, self-efficacy, social capital
	Hasan et al	2015	Support from university top management, psychological factors, ICT infrastructure
	Tseng & Chiang	2015	Knowledge shearing, communication quality, perceived usefulness
	Jorge et al.	2015	Support from university top management, universities financial resources
	Sammalisto et al.	2015	Support from university top management, education
	Krasny & Delia	2015	Education, teaching quality
	Hsiao et al.	2015	Support from university top management, student self-efficacy
	Disterheft et al.	2015	Condition of university structure, communication skills
	See-To & Ho	2014	Confidence to organization's product and services
	Blok et al.	2015	Internal factors (individual norms, perceived behavior control, attitude toward pro-environmental behaviors, awareness about environmental problems, and environmental values); external factors (support from university management and conditional factors)
	Sidiropoulos	2014	Education, discussion during teaching
	Zsóka et al.	2013	Education, pro-environmental values
	Grissemann & Stokburger-Sauer	2012	Support from university top management
	Brown & Reed	2012	Pro-environmental values
	Kurland	2011	Knowledge and commitment to sustainability
	Da Silva & Aibar	2010	Organization size
	Reverte	2009	Organization size
	Zsóka	2008	Sustainability-oriented knowledge, attitude and values
	Lukman & Glavic	2007	Support from university top management
	Stern et al.	2000	Pro-environmental values

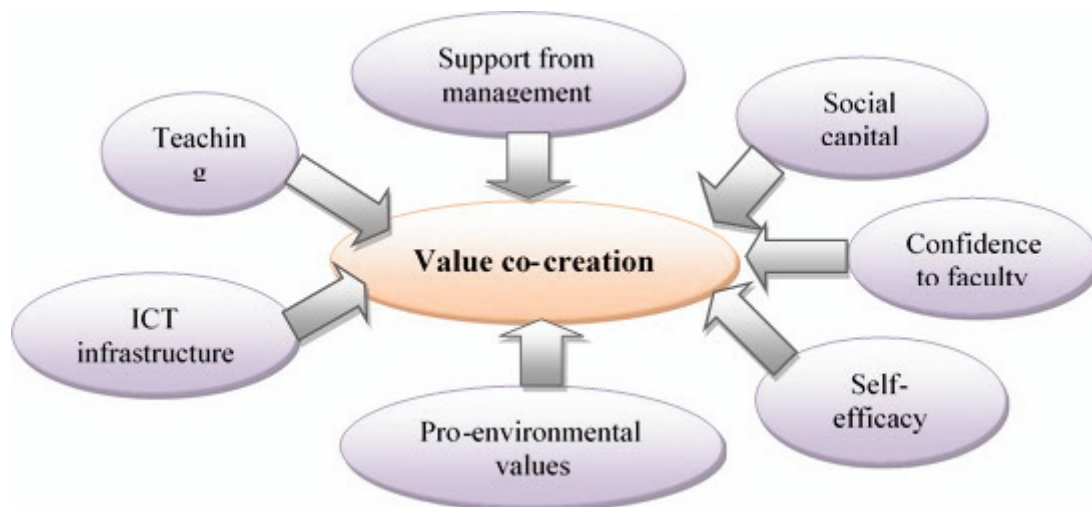


Figure1. Research conceptual framework



The scale consists of two higher-order factors: customer participation behavior and customer citizenship behavior. Customer participation behavior consists of information seeking, information sharing, responsible behavior, and personal interaction. Customer citizenship behavior consists of feedback, advocacy, helping, and tolerance. Students were asked to respond on a 10-point Likert scale (from 1=strongly disagree to 10= strongly agree). To find out factors that affect students' value co-creation, a researcher-made questionnaire was developed that was composed of seven dimensions: teaching quality (15 items), support from management (16 items), social capital (12 items), confidence to faculty (10 items), self-efficacy (11 items), pro-environmental values (14 items), and ICT infrastructure (6 items). The questionnaire's face and content validity were confirmed by a panel of experts and its construct validity was confirmed by explanatory factor analysis (KMO = 0.752;  $P < 0.01$ ). Also, its reliability was confirmed by calculating ordinal theta ( $\theta \geq 0.89$ ).

In an effort to determine factors affecting students' value co-creation behavior and purify the measurement toll on the basis of its psychometric properties, this research collected data from 208 graduate students in agricultural and natural resources universities of Iran. Then, we first examined corrected

item-to-total correlations and item correlations for each set of items representing factors that affect students' value co-creation behavior and then, items that had corrected item-to-total correlations of smaller than 0.50 and item correlations of smaller than 0.20 were excluded. Then, the remaining items were evaluated by exploratory factor analysis (principal component factor analysis with varimax rotation).

Data were analyzed with SPSS version 20. Prior to analysis of the data, skewness and kurtosis were checked. All variables had values in the acceptable range of a normal distribution, defined as values lower than 2 for skewness and lower than 7 for kurtosis (Curran et al., 1996).

**RESULTS**

Descriptive findings showed that the mean age of respondents was 26.57 years with a standard deviation of 3.46 and their age range was in 24-38 years. Also, 47.5% of the participants were male and 52.5% were female. Students were classified into three categories (low, medium, high) by Gangadharappa et al. (2007)'s formula in terms of their value co-creation level towards sustainability. Accordingly, 29.90% of respondents were in low, 43.60% were in medium, and 26.50% were in high level. These findings are presented in Table 2.

Table 2  
Distribution of Students' Frequency Based on Value Co-Creation Level towards Sustainability

Level	Value co-creation	Frequency	Percent	Cumulative percent
Low	Lower than 226	61	29.9	29.9
Medium	226-332	89	43.6	73.5
High	Higher than 332	54	26.5	100
Total	-----	204	100	-----

Explanatory factors analyses were conducted in SPSS with the maximum likelihood estimator and Varimax rotation. The calculations showed that the internal consistency of

data was suitable for factor analysis (KMO=0.752) and Bartlett's statistic was significant ( $P < 0.01$ , Bartlett = 11246.714). To determine the number of factors to be retained,

we used eigenvalues of higher than 1.0. In total, 76 items were included in the factor analysis according to which 32 items belonged to different factors. We next subjected the 32 involvement items to another factor analysis

and according to Kisser's criterion, seven factors were derived with maximum eigenvalues for the randomly created variables. These findings are presented in Table3.

Table 3  
Summary of Factor Analysis about Factors Affecting Students' Value Co-creation towards Sustainability

Factors	Eigenvalue	% of variance	Cumulative %
1	9.479	19.539	19.539
2	6.762	12.447	31.985
3	6.623	12.219	44.204
4	4.878	9.208	53.412
5	4.552	8.823	62.235
6	4.517	8.765	71.000
7	3.280	6.738	77.738

Finally, according to the nature of factors and value co-creation process, we named these factors as teaching quality, support from management, social capital, and confidence to faculty, self-efficacy, student pro-environmental values, and ICT infrastructures. An eigenvalue was derived for each factor according to which the factor teaching quality had the highest contribution in students' value co-creation towards sustainability followed by support from management (eigenvalue= 6.762), social capital (eigenvalue= 6.623), confidence to faculties (eigenvalue= 4.878), self-efficacy (eigenvalue= 4.552), pro-environmental values (eigenvalue= 4.517), and ICT infrastructures (eigenvalue= 3.280). These factors altogether accounted for 77.74% of students' value co-creation towards sustainability in agricultural and natural universities. The wording of the items and factors loading are presented in Table 4.

Identifying approaches that are capable of overcoming universities challenges towards integrating sustainable development in their structure (including education, research, campus operations, and so on) has always been an important issue. In this regard, educational

researchers have proposed different approaches among which value co-creation process has attracted more attention. It should be noted that prerequisite for the effectiveness of any approach to achieving its intended goals is to identify the underpinning factors. This can be helpful for institutions and organizations' managers in their planning and decision-making. Therefore, this explanatory research attempted to identify factors affecting students' value co-creation with their teachers (faculty members) towards institutionalizing sustainability in the context of agricultural and natural resources universities. The results of factor analysis showed that seven factors (teaching quality, support from management, social capital, confidence to faculty, self-efficacy, students' pro-environmental values, and ICT infrastructures) affect students' value co-creation. These findings confirm the results reported by Alves et al. (2016), Hasan et al. (2015), Hsiao et al. (2015), Kheiri (2015), and Jorge et al (2015).

This research improves our understanding of the use of value co-creation in universities and helps university managers to create a coherent and effective program for institutionalizing

Table 4  
Item Wording and Factor Loading for Effective Factors on Students' Value Co-creation

Factor name	Items	Factor loading
Teaching quality	Teachers ability of classroom management	0.843
	Effective communication (eye, verbal, emotional) with students while teaching	0.815
	Attention to students' individual differences	0.803
	Use of various teaching methods (dialogue, discussion, brain stormy, and so on)	0.768
	Connect relationship between theoretical and practical topics	0.760
	Use of body language to present the educational material	0.756
	Matching educational contents with students' real needs	0.730
Support from management	Introducing pro-environmental technology to students	0.696
	Providing physical needs for conference meetings by university management	0.859
	Facilitating the basis of joint meeting between students and their teachers	0.858
	Inviting students who have ideas about sustainable development to give a lecture in scientific conferences	0.856
	University management support of holding conferences on sustainable development issues	0.786
Social capital	Designating incentives for students and faculty members to motivate their participation in value co-creation	0.704
	Respect to others' merits	0.823
	Respect to others' opinions	0.739
	Teamwork with other students	0.722
	Honesty	0.678
Confidence to faculty	Getting in touch with others	0.656
	Believing that students' behaviors are not misused by teachers	0.735
	Belief in teachers' secrecy	0.684
	Believe in teachers' academic abilities	0.623
Self-efficacy	Believe in teachers' honesty	0.608
	Students' ability to made decisions about important issues	0.889
	Students' ability to discuss with teachers about sustainable development issues	0.857
	The ability to analyze environmental, social, and economic problems and suggest a solution for each one	0.808
Pro-environmental values	The ability to summarize and conclude the discussion topic	0.681
	Students' ability to describe their ideas about other participators	0.666
	Believing in the fact that environment protection is the present generation's responsibility for the futures	0.722
ICT infrastructure	Use of public transport rather than personal vehicle	0.711
	Use of non-drinking water for bathing	0.573
	Internet speed	0.811
	Existence of a virtual social network in universities in which all members (students, faculty members, managers, and staff) can share their views	0.687



sustainability in universities by using value co-creation process. In addition, researchers that work in educational, sustainable development, and value co-creation field can use this research to design structural and theoretical models to facilitate integrating sustainability issues in academic structures.

### DISCUSSION AND CONCLUSION

As shown by the findings of factor analysis, teaching quality has the greatest effect on students' value co-creation. Among the items included in this factor, teachers' abilities in classroom management, effective communication (eye, verbal, emotional) with students while teaching, and attention to students' individual differences had the highest Factor Loading (FL). Support from universities management was the second factor that affected students' value co-creation. Among the items loaded in this factor, providing physical needs for conference meetings, facilitating the basis of joint meetings between students and their teachers, and inviting students who have ideas about sustainable development to give lectures in scientific conferences had the highest FL. Finally, the following suggestions can be drawn from the results of factor analysis:

1. The managers of agricultural and natural resources universities should hold workshops for faculty members with a focus on increasing their abilities in teaching, using effective communication with students, and using body language during teaching. Moreover, it is necessary that faculty members consider the principle of individual differences and regard it in their educational and teaching activities. This will provide further interaction between teachers and students, which will lead to students' value co-creation towards institutionalizing sustainability in academic structures and even society because the value co-creation process not only affects individual behaviors but also affects society through their communication with society.

2. It is essential that university managers provide the necessary physical and financial

resources for value co-creation and facilitate holding joint meetings between students and their teachers to integrate sustainability into academic structures.

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