

Perception of Eco-innovation Based on Educational Attainment

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Abstract

Aim: To evaluate the influence of educational attainment on the perception of ecological innovation was the main objective of the paper. The depth of attention paid to the interdisciplinary impact of innovations and education in society ultimately affects the level of the culture of education and whether the innovations that arise respect people and their environment.

Design/methodology/approach: Input data gathered via survey of customers using the Kano questionnaire. The research applied the Kano model to data processing. The analysis allowed us to measure and explore the emotional reactions of Slovak customers to products.

Findings: If multidisciplinary innovations positively affect the environmental, economic, and social development of society, they also tend to increase competitiveness of regions and lead to sustainability, development, and the knowledge economy. It can be concluded that the level of education achieved affects attitudes towards ecological innovation. The higher the education level of the respondents, the more sensitively they perceived the issue of eco-innovation. The interpretation of the results is a contribution to the discussion about the importance of education with an interdisciplinary overlap, as well as a view on innovation that respects individuals, society, and the environment.

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Research limitations/implications: Even though the results demonstrate the influence of the attitudes of Slovak customers depending on their educational attainment, it is necessary to verify whether they are reflected in real purchasing behavior.

Originality/value: The originality of the research lies in the methodical approach of connecting the perception of ecological product innovations and the socio-demographic aspect (educational attainment) in the market conditions of the Slovak Republic.

Keywords: eco-innovation, perceptions, education, society, Kano model, Slovakia.

JEL: O35, O36, O39

Wpływ poziomu wykształcenia na postrzeganie ekoinnowacji

Streszczenie

Cel: celem artykułu była ocena wpływu poziomu wykształcenia na postrzeganie innowacji ekologicznych. Głębokość uwagi poświęconej interdyscyplinarnej roli innowacji i edukacji w społeczeństwie ostatecznie wpływa na poziom kultury edukacji oraz szacunku powstających innowacji wobec ludzi i ich środowiska.

Metodologia: dane wejściowe zebrano za pomocą ankiety przeprowadzonej wśród klientów przy użyciu kwestionariusza Kano. W badaniu zastosowano model Kano do przetwarzania danych. Analiza pozwoliła zmierzyć i zbadać emocjonalne reakcje słowackich klientów na produkty.

Wyniki: w przypadku gdy multidyscyplinarne innowacje pozytywnie wpływają na środowiskowy, gospodarczy i społeczny rozwój społeczeństwa, mają one również tendencję do zwiększania konkurencyjności regionów i prowadzą do zrównoważonego rozwoju i gospodarki opartej na wiedzy. Można stwierdzić, że osiągnięty poziom wykształcenia wpływa na postawy wobec innowacji ekologicznych. Im wyższy poziom wykształcenia respondentów, tym bardziej wrażliwi byli na kwestię ekoinnowacji. Interpretacja wyników stanowi wkład w dyskusję na temat znaczenia interdyscyplinarnej edukacji, a także spojrzenie na innowacje, które szanują jednostki, społeczeństwo i środowisko.

Oryginalność/wartość: oryginalność badań polega na metodycznym podejściu do łączenia postrzegania ekologicznych innowacji produktowych z aspektem społeczno-demograficznym (poziom wykształcenia) w warunkach rynkowych Słowacji.

Słowa kluczowe: ekoinnowacje, postrzeganie, edukacja, społeczeństwo, model Kano, Słowacja.

1. Introduction

We live in a changing, hyper-connected world and face increasingly global, complex, and dynamic problem situations, such as poverty, income disparities, environmental crises, organized crime, and health quality problems. The complex or “serious” problems cannot be adequately solved through one scientific discipline (Rittel et al., 1973; Özbekhan, 1970) but comprehensively, through the cooperation of several scientific disciplines, leading to multidisciplinary and thus to multidisciplinary innovation. They represent any positive quantitative or qualitative change in which cooperation of several scientific disciplines in the implementation of professional and scientific activities is required. Simply put, solve problems through the cooperation of several scientific disciplines, because they are not individual

problems, but they are in a mutual relationship and “internally connected in the meta-system of problems”. They cannot be solved in isolation and require what has been defined as a transdisciplinary approach (Jantsch, 1972). As part of the approach, education leaders are paying increasing attention to building a culture of cooperation (Jones & Harvey, 2017). This means interdisciplinarity should be a natural part of the educational and research process. Going beyond the field of our own expertise, we must be aware of the fact that Penalva (2022) specifies as follows: culture is becoming ambiguous, uncertain, volatile, and complex in a complicated world, a multidimensional organization, which also brings together several pluralistic institutions (Penalva, 2022).

With the ever-increasing rate of environmental degradation in countries around the world, ways are being sought to limit environmental deficiencies to achieve future sustainability. In this pursuit of green development, economies are motivated to adopt ecological practices that can help in the effort to conserve resources and increase efficiency in achieving green ecosystems (Afshan et al., 2022). The way to achieve innovative performance and build a sustainable competitive advantage is to access innovative resources and strengthen capabilities through ecological integration (Zang et al., 2022). In the professional literature on entrepreneurship, a new trend has begun in recent years examining business strategies that focus on the environmental dimension (Rodríguez-García et al., 2019; Mikušová, 2017) but they also do not neglect the social and economic dimensions of sustainability. The concept of such business models is based on innovation, environmental care and long-term sustainability (Hultman et al., 2016). For this reason, it is necessary to examine how they react to innovative activities not only those of distributors, and manufacturers but also consumers (Jonh et al., 2019). Consumers are primarily characterized by the adoption of environmentally responsible behavior and the adoption of ecological innovations.

According to Brekhus (2015), our culture of perception is “shaped by the groups and social networks we belong to and the structural and social conditions under which we operate”. Individuals pay selected attention towards any given activity developed unconsciously through culturally acquired schemas of perception, classification, judgement, and satisfaction (Bourdieu, 1984). Nowadays, we often come across the interpretation of consumer satisfaction as based on the theory of contradiction, which we can apply in various areas – it is the most often used in product evaluation. When monitoring the quantities representing consumers’ satisfaction (their perception, classification, and judgement) with products, it is appropriate to confront them with the characteristics of the given product, where their experiential feeling of conformity or contradiction with their expectations occurs. The issue of defining individual quantities has been followed by several authors, who are basically based on the theory of different perceptions of product parameters derived from two-factor motivation, while

varying the conceptual apparatus for product requirements. One of the methodologies is the Kano model. Traditionally, the Kano model has been used in product development and creation of attractive quality, including studies on conceptual design aimed at improving product's life cycle (Dace et al., 2020; Hassan et al., 2017) etc. There are also some “untraditional” applications, for example, in the assessment of Eco-city, or in the assessment of implications for the open-innovation, but also application of the Kano model for a better understanding of customer requirements in higher education (Li et al., 2021; Madzik et al., 2019; Loučanová et al., 2021).

In the paper we are presenting results of the research focused on examining perception of eco-innovation in relation to the level of educational attainment through the Kano model. Such research complements the profile of Slovak consumers in relation to the given issue. We see a research gap in the understanding. By identifying the part of the profile of consumers who pay selective attention to any given activity unconsciously developed through culturally acquired schemes of perception, classification, judgment, and satisfaction, it represents a key role in the design and implementation of sustainable strategies (Rodríguez-García et al., 2019, Akehurst et al., 2012).

2. Literature Review

Nowadays, innovations influence and are closely connected with all areas of society. Therefore, innovations are also closely connected with sustainable development because limits of natural resources have to be considered in economic growth. Continuous climate change and environmental problems also affect it to a large extent. Due to the deterioration of the environment, the issue of ecological innovation, sustainability and the entire environmental agenda became an important part of innovation strategies (Loučanová et al., 2018). Reconciling the economic and environmental performance of businesses through ecological innovations represents an opportunity to increase competitiveness while eliminating environmental impacts.

In professional literature, we often encounter not only the term ecological innovation but also green innovation, sustainable innovation, sustainability-oriented innovation, etc. According to Fussler and James (1996), eco-innovations are equivalent to sustainable innovations and similar types of innovations such as green innovations, because each eco-innovation contributes to sustainable development and uses the commercial use of knowledge to obtain direct or indirect ecological improvements.

In addition to the sustainable use of resources, it deals with solving environmental problems in an effort to develop and improve the quality of social conditions and the environment through eco-innovation, which should clearly ensure environmental sustainability while ensuring socio-economic development (Kollár & Brokeš, 2005). While innovations were mainly associated with products in the past, the innovative approach in the area

of services was minimal. Later, innovative development spread to all business activities, internal and external, in production and services (Hečková, 2007). At present, eco-innovation supporting sustainable development leads in all sectors of society (Loučanová et al., 2019; Straka, 2013; Štofková, 2013; Havierníková, 2012). Eco-innovation represents socially acceptable innovative paths and must be sensitive to the fundamental bonds between social and ecological systems. Eco-innovation can, however, also create undesired and “rebound effects” in the economy, environment and/or society. Ideally, they bring positive effects on the environment (eco-innovation) and society at large (social eco-innovation) (Inno4sd, 2022).

Over the centuries, human development has been based on education. The key factor for success in the education sector depends on creative processes. For this purpose, it is necessary to distinguish between the nature of “efficiency” and “innovation”. The success of Steve Jobs has become popular, and a number of studies analyzed what brought him to success, describing the patterns of his success, and then suggesting the “application” of what they consider to be the “pattern” of success. From a scientific and methodological point of view, when trying to determine the cause of something, it is one thing to proceed “from consequence to cause” and another to proceed from “cause” in that meaning (Penalva, 2022). The first of them work under the premise of efficiency; the other one is finding innovation. The first relies on given techniques and procedures; the latter relies on the creative process itself. The first works under the “application” of knowledge; the other works under the perspective of “design”. When looking for innovation in higher education, research is better understood as a matter of design rather than an application of knowledge. This difference between efficiency and innovation is particularly important in our time. At present, international comparisons in higher education lead policy to an evidence-based agenda. Pedagogical research pays attention to the research-evidence approach and practice is gradually becoming a research-informed activity. “Efficiency” or what is essentially the same as “what works” is the dominant perspective. In this context, innovation is understood as an effective adaptation to a given context. However, innovation is not adaptation to context; innovation rather means the transformation of context into educational goals, the transformation of context into worldviews.

As Penalva (2022) states, productivity growth and the economic success of innovations and the entire society depend on the diffusion and spread of innovations. It is a challenge for companies all over the world. This is conditioned by the dissemination strategy implementation, the dissemination of innovations as well as knowledge. The idea that this effort essentially consists of building learning communities, social relations and an ecological approach is gaining momentum every day in education, and especially university education plays an important role here (Pei-Ling et al., 2017; Crosling, Nair, & Vaithilingam, 2015; Eckel & Hartley, 2016; Hall et al., 2013). Such social-

ecological innovations do not drive the world as opposed to a sustainable future, but as ensuring equitable human development (Graid, 2022).

Social eco-innovation should be a natural means applied to fulfilling the development strategies of Higher Education Institutions (HEIs). They are key institutional players especially influencing local communities with their significant economic and social impacts (Glasson, 2003). Higher education goals assume not only to acquire those skills that will enable permanent employability but also those that will equip students for active citizenship (Baturina, 2022). In addition to social areas, active citizenship is often manifested in environmental attitudes and actions. Thus, the term environmental citizen is widely used. The meaning of the term environmental citizenship often includes its social and economic dimension, not only purely as a person's relationship to the environment. Consortium ENEC (2018) broadly defined Environmental Citizenship "as the responsible pro-environmental behaviour of citizens who act and participate in the society as agents of change in the private and public sphere, on a local, national and global scale, through individual and collective actions, in the direction of solving contemporary environmental problems, preventing the creation of new environmental problems, achieving sustainability as well as developing a healthy relationship with nature. Environmental citizenship includes the exercise of environmental rights and duties, as well as the identification of the underlying structural causes of environmental degradation and environmental problems, the development of the willingness and the competencies for critical and active engagement and civic participation to address those structural causes, acting individually and collectively within democratic means, and taking into account inter- and intra-generational justice".

It is obvious that even if the social side is not explicitly stated in the definition, such citizens actively influence the creation of social awareness of various social structures – from the local to the transnational level. The design of such a social climate is often created by HEIs in cooperation with local communities. Not only do they spread awareness of social and environmental challenges, but they also inspire solutions. It happens precisely because of their innovative potential. Citizens with such a background can be described as agents of change leading to beneficial attitudes and behaviour at the social (citizen and politician), economic (consumer and entrepreneur) and environmental (men and their environment) levels. A person as a consumer and his purchasing decisions represent a probe for the investigation of a relatively broad platform of attitudes. For the purposes of the study, we analyzed the perceptions resulting from the customer survey, specifically the differences in the perception of ecological innovation from the point of view of educational attainment. The approach to the literature review was semi-systematic, which is typical for scientific articles as stated by Snyder (2019).

3. Methodology

Based on the above mentioned review of the literature, we can state the inevitability of ecological innovations in the present and the need to investigate how not only distributors, manufacturers, but also consumers react to innovative activities, as reported by Jonh et al. (2019) and other mentioned authors in the literature. Likewise, the literature points to the significance of our perception of culture as being formed by the groups and social networks to which we belong and the structural and social conditions in which we operate, as Brekhus (2015) states. The need for the creation and implementation of ecological innovations in the present basically consists of efforts to build educational communities, social relations and an ecological approach, as it is stated by Pei-Ling et al. (2017) and other authors mentioned in the literature. Therefore, our research question is formulated as: “Does educational attainment affect the perception of ecological innovations in Slovakia?”. To define the individual quantities, we followed the theory of different perceptions of the parameters of the quantities derived from the two-factor motivation, while they changed the conceptual apparatus for the requirements of the investigated quantity, for which the Kano model is used. It was the primary method to investigate the perception of eco-innovative attributes of products by customers in relation to the education they have achieved. The Kano questionnaire was constructed based on the identified elementary requirements for the issue, where positive and negative questions were created for each attribute examined. The examined attributes were:

- Environmental safety of products
- Importance of eco-innovation
- Origin of eco-innovation
- Slovak products with enviro brand
- Ecology of innovation
- Concept of eco-innovation
- Availability of eco-innovation
- Information on eco-innovation
- Attractiveness of eco-innovation
- Advertising of eco-innovations
- Price of eco-innovation

The mentioned parameters for evaluating ecological innovations from the point of view of education in Slovakia were incorporated into the Kano questionnaire. The Kano questionnaire was formulated according to the principles of the Kano model; i.e., two statements were prepared for each parameter – one positively conceived and one negatively conceived (example from the Kano questionnaire, positively formulated statement: “When choosing a product, the environmental label is important to me.”;

negatively formulated statement: “I clearly do not prefer Slovak products marked with an environmental label”. Subsequently, consumers had the opportunity to express their consent or disagreement with the statement on a 5-point Likert scale, where 1 means “I like it” and 5 means “I don’t like it”.

Subsequently, with respect to the given questionnaire measures, a survey was realized. The sample of respondents was determined at a confidence level of 95%, the allowable margin of error $\pm 5\%$ with a standard deviation of 0.5 which represents 384.16 respondents (385 respondents). A total of 1.345 respondents participated in the research, which fulfilled the required sample size with an overlap to the set level of significance, standard deviation, and acceptable range of error.

The survey was carried out from September 2021 to February 2022. Table 1 presents descriptive statistics of the sample of respondents. The sample of respondents consisted mainly of respondents who studied at a university – 52.12%, 32.79% of respondents attended a secondary school with a school leaving exam and 15.09% of respondents graduated from a secondary school without a school leaving exam. Men were 64.09% of all respondents, the rest 43.42% were women. In terms of age, 24.39% of respondents were between 18 and 30 years old, 24.54% of respondents were between 31 and 50 years old, 25.5% of respondents were between 51 and 60 years old and 25.58% of respondents were over 61 years old.

Table 1
Sample of Respondents in Research – Descriptive Statistics

Factor n = 1345	Specification	Multiplicity	
		Absolute (Number of Respondents)	Relative (%)
Age	18–30	328	24.39
	31–50	330	24.54
	51–60	343	25.50
	61 and over	344	25.58
Gender	Female	584	43.42
	Male	761	56.58
Education	Secondary school without a school leaving exam	203	15.09
	Secondary school with a school leaving exam	441	32.79
	University degree	701	52.12

Subsequently, the set of data was adjusted for further analysis. Interpretation of the results was carried out using the Kano model cross rule to identify the perceived ecological innovation from the point of view of achieved education, as mandatory, one-dimensional, attractive, indifferent, questionable, and reverse requirements. In terms of how respondents perceive eco-innovation, the findings were divided into the following categories:

- M – obligatory requirements that customers consider normal and are automatically expected. The requirements can be identified as primary or basic. Customers consider the requirements as prerequisites if present. If not, they will be extremely dissatisfied (Hsin-Hung, Yung-Tai & Jyh-Wei, 2010).
- O – one-dimensional requirements that are represented by those product attributes that lead to fulfilment and satisfaction in the event of non-compliance to customers' dissatisfaction.
- A – attractive requirements that have a clear impact on customers' satisfaction because it is a requirement that customers did not expect.
- R – contradictory or reverse requirements in some literature (Loučanová, 2016).
- I – requirements which do not have any influence on customers. They are also called indifferent requirements.
- Q – questionable requirements (Grapentine, 2015; Loučanová et al., 2020).

“Based on the Kano analysis, a weight of requirements was assigned. Each identified request is a value of 1. This value is multiplied by the weight according to the identified category. Mandatory requirements (M) have a weight 3, attractive requirements (A) have a weight of 2, one-dimensional requirements (O) have a weight of 1, indifferent requirements (I) or those that have no effect have a weight of 0, backward requirements (R) have a weight of -1, question marks (Q) have a weight of -2. The innovation status then represents the sum of the weights identified on the basis of the respondents' requirements for the examined quantities. Innovation status can be characterized as the overall attitude of consumers towards the issue being addressed. The size of the factor represents the weighted arithmetic average of the relative share of the identified requirements and their weights of individually examined parameters. Based on the sum of the values, we can compare the results (Loučanová et al., 2020). Based on the results from the Kano model, a final analysis is performed by creating a typological matrix. Using the analysis, we find out the innovation status and the size of the impact of ecological innovation.

4. Results

Table 2 introduces the innovation status and the size of the impact of the eco-innovation from the point of view of educational attainment of customers in Slovakia.

Table 2

Basic Data for Compiling a Typology Matrix of the Perceived Ecological Innovation Issues from the Point of View of Educational Attainment, Part 1 – Focused on the Calculation of Innovation Status

Parameters	Educational attainment					
	Secondary school without a school leaving exam		Secondary school with a school leaving exam		University degree	
	Requirements	Weight	Requirements	Weight	Requirements	Weight
Environmental safety of products	I	0	I	0	I	0
Importance of eco-innovation	I	0	I	0	I	0
Origin of eco-innovation	I	0	I	0	I	0
Slovak products with enviro brand	I	0	O	1	A	2
Ecology of innovation	I	0	I	0	I	0
Concept of eco-innovation	I	0	I	0	I	0
Availability of eco-innovation	I	0	I	0	I	0
Information on eco-innovation	I	0	I	0	I	0
Attractiveness of eco-innovation	I	0	I	0	I	0
Advertising of eco-innovation	I	0	I	0	I	0
Price of eco-innovation	R	-1	R	-1	R	-1
Innovation status	-1		0		1	

As Table 2 indicates, the monitored parameters of eco-innovation supporting sustainability do not have a significant impact on Slovak respondents. They perceive the price of ecological innovation in contradictory (reverse) ways. From the point of view of education, we can see the differences in the parameters of Slovak products with the enviro brand. Respondents with secondary education without a school leaving exam perceive Slovak products with the enviro brand as an attribute that does not affect their purchasing decisions. The other two monitored respondent groups (regarding educational attainment) differ in their perceptions. The innovative status of respondents with secondary school without a school leaving exam is negative and has a value of “-1”. The respondents that graduated from a secondary school with a school leaving exam consider Slovak products with the enviro brand as a one-dimensional requirement representing a linear dependence between their satisfaction and dissatisfaction. Their innovation status is “0”. Respondents with a university degree perceive products with enviro brand attractive, which means that if this requirement is not met, the product meets their needs because this requirement is not expected in advance, but if it is met, they are very satisfied. Their innovation status is the highest and has a value “1”. In a comprehensive way, we can state that innovation status increases with increasing education.

As Table 3 indicates, the monitored parameters of eco-innovation supporting sustainability have a greater influence on the group of respondents with lower education. The impact size of respondents with secondary education without a school leaving exam is the highest and has a value of 0.719622, i.e., 71.9622% influence on respondents of this type of education. For secondary school with a school leaving exam and university degree, the differences are minimal.

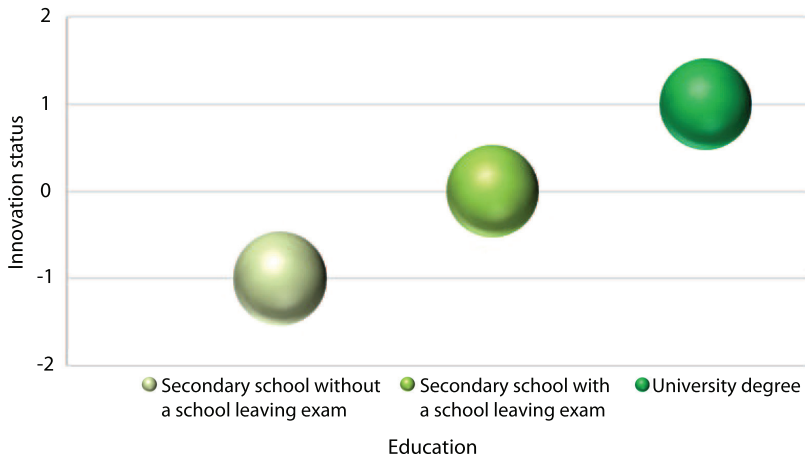
Table 3
Basic Data for Compiling a Typology Matrix of the Perceived Ecological Innovation Issues from the Point of View of Educational Attainment, Part 2 – Focused on the Calculation of Impact Size

Parameters	Educational attainment					
	Secondary school without a school leaving exam		Secondary school with a school leaving exam		University degree	
	Requirements	Relative frequency of identified requirements	Requirements	Relative frequency of identified requirements	Requirements	Relative frequency of identified requirements
Environmental safety of products	I	0.821782	I	0.76644	I	0.807418
Importance of eco-innovation	I	0.628713	I	0.680499	I	0.584879
Origin of eco-innovation	I	0.732673	I	0.61678	I	0.651926
Slovak products with enviro brand	I	0.554455	O	0.635147	A	0.582026
Ecology of innovation	I	0.688119	I	0.657596	I	0.634807
Concept of eco-innovation	I	0.767327	I	0.665329	I	0.704708
Availability of eco-innovation	I	0.806931	I	0.748299	I	0.747504
Information on eco-innovation	I	0.762376	I	0.716553	I	0.723252
Attractiveness of eco-innovation	I	0.886139	I	0.802721	I	0.810271
Advertising of eco-innovation	I	0.826733	I	0.773243	I	0.760342
Price of eco-innovation	R	0.440594	R	0.503401	R	0.479315
Impact size	0.719622		0.687819		0.680586	

The results of the investigation are subsequently shown in the matrix of the typology of perception of eco-innovation issues from the point of view of education, Figure 1.

The matrix of the typology of perception of eco-innovation issues from the point of view of achieved education in Slovakia shows that the university educated group has the highest innovation status. The innovation status for this group of respondents is 1 and the impact size is 0.680586, i.e., 68.0586%. The respondent group with secondary education has an innovative status of 0 with a similar impact. The negative innovation status is shown by the group of secondary school respondents without a school leaving exam, where it was identified as a value of -1 with a high size of influence being the highest.

Figure 1
Matrix of Typology of Perception of Eco-innovation Issues from the Point of View of Educational Attainment



5. Discussion

The graphic representation of Figure 1 illustrates the perception of ecological innovations with respect to the educational attainment of customers. Here, with increasing education, the innovation status, presenting the respondents' relationship to eco-innovation, is also growing. One area of innovation within this research was the exploration of social, environmental, and economic aspects in the context of alternative civic engagement. The results point to the connection of ecological innovation with the green brand, as it is presented by other authors (Lin et al., 2019; Harini et al., 2020).

As the results showed, the perception of eco-innovation has no effect on Slovak respondents. It is manifested only in the perception of Slovak products with the enviro brand and in the price. This is also confirmed by the approach of Penalva (2022), who mentioned the success and effectiveness of innovation and education under two preconditions. The first one works under the assumption of efficiency; the other seeks innovation. It relies on given techniques and procedures. The second one relies on the creation process. The first operates under the assumption of "application" of knowledge; the second one operates under a "design" perspective.

When we look for innovation in university education, research is better understood as a matter of "design" and not as an "application" of knowledge, which is also shown by the results that the eco-design – enviro brand is more attractive to respondents with university education than to those with lower education. Nowadays, the difference between efficiency and innovation is especially important. In this framework, innovation is

understood as effective adaptation to the given context. However, innovation is not adaptation to context; innovation rather means transforming the context into learning objectives.

Therefore, primary improvement is necessary to optimize consumers' perception of green brand innovativeness and green value and to increase their environmental knowledge (Lin, Lobo & Leckie, 2019), and subsequently their application. Eco-innovation can affect consumers' perception of corporate reputation and brand image (Yao et al., 2019).

Slovak products generally and Slovak products with green labels present performance attributes, which is in line with the theoretical basis. According to Panda et al. (2020), the country of origin is significantly important in influencing the degree of customer interest in the environment.

However, it is not the country of origin that is important in general, but rather the loyalty of the green brand to Slovak green products and their innovation. Martínez (2015) confirmed the hierarchy of effects theory to understand the process through which green brand images promote green consumer loyalty to examine consumers' loyalty and its predictions from a sustainable marketing perspective. Cognitive ties related to brand image influence consumer trust and loyalty (Bashir et al., 2020).

Based on the results and the definition of sustainable development as defined by the World Environment Commission (2017), there is a need to create and/or maintain dyadic consonance while respecting contextual needs (Cox, 1999, Darnall, Jolley & Handfield, 2008). Thus, ecological innovation represents challenges for changing the existing technological procedures and, as the research results show, social patterns of behavior.

The findings point to the fact that higher education leads to pro-eco-innovation attitudes (to increase sustainability). Therefore, as stated by LeVasseur and Ciarcia (2019), education based on communities, increased collaboration, building partnerships and projects in general, but also in the context of sustainability, is important. This must take place in the educational process at all degrees, as well as between them and their community partners. Finding specific literacy goals in the field of ecological innovation and sustainability requires partnerships not only among individual degrees of education, but also with practice. This approach brings a greater potential for social change.

As LeVasseur and Ciarcia (2019) and Orr (2019) present, in the period of democratic viability, when students need to acquire competences in the field of sustainability within a broader institutional context with sustainability taken seriously, the civic engagement incorporated into services is a powerful tool. Using the re-accreditation processes across the entire education process and building partnerships in the area of sustainability literacy can help educational institutions quickly and strategically integrate sustainability competencies into school curriculum and common curriculum. Overall, the partnerships based on reaccreditation can provide the tools needed

to create more socially environmentally healthier future and at the same time to provide students with competences to understand and change the serious problems of the century (Hanstedt, 2018). Young people are more capable of living in conditions of uncertainty, but they need a certain number of guarantees for the future, otherwise the society stagnates. Popek and Wanat (2016) studied the attitudes of university students (a sample of 2,000 respondents), most of them would be willing to give up having children just to ensure an adequate social and material position.

The problem with some HEIs reaching the peak of success – and this is also the case of successful industries – is that they tend to repeat the initial success. It means strategies that led to their success. Management tends to institutionalize their previous success. In other words, an organization is a part of the “Ikea paradigm”. It relies on given techniques and procedures, and thus on the given content and not on the creative process itself. We could say that they look for innovation, when in fact they assume that innovation consists of effective adaptation to a given context and situation, so they work according to the paradigm of efficiency and not innovation. That is why they are the most vulnerable at the pinnacle of their success. That explains why successful organizations are under pressure to maintain their success, and why they put pressure on employees until no one in the organization has a gap in their schedule and eventually anxiety emerges in the organization. It is very important to determine the cause of the vulnerability.

As presented in the Matrix of typology (Fig. 1), education has an impact on the perception of ecological innovations in Slovakia and the posed research question “Does educational attainment affect the perception of ecological innovations in Slovakia?” can be answered in the affirmative (Yes, it does). The results present a synergy of practical research and theoretical knowledge of the investigated issue. This research presents a view of the perception of ecological innovations from the perspective of education in Slovakia.

The results help to better understand the relationship between the level of consumer satisfaction and the investigated parameters. It allows decision makers to improve the quality of the examined parameters and optimize strategies for better adaptation of ecological innovations in the market regarding customer requirements. Such approach leads to a higher level of customer satisfaction. Managerial implications are related to the knowledge of the perception of different groups of customers and lead to the limitation or elimination of the shortcomings of business strategies – in this case, also in the communication of the implementation of eco-innovations. Gaining knowledge about their perception with regard to the investigated parameter can help the more extensive introduction of ecological innovations in Slovakia.

As part of the limitations of the study, the methodological side of the Kano model (even if it is widely accepted by researchers) can be pointed

out, as stated by Jain and Singh (2020), that the limitation consists in forcing the respondent to mark only one answer for the functional and dysfunctional form of the question. Despite our efforts to include all relevant data and knowledge in the article, some important ones may also have been inadvertently omitted.

We see the future direction of research in the identification of other factors influencing the profile of the consumer's perception of ecological innovations, with a very practical focus on specific industries, but also types of eco-innovations. This will create a basis for comparing common differences or specifics in individual sectors of the economy.

6. Conclusions

One of the opportunities to solve the complex global problems is to increase innovation level and implement knowledge dissemination strategies. On the other hand, the problems cannot be solved only within one scientific discipline, but they require cooperation of several scientific disciplines, leading to multidisciplinary innovation. Besides business environment, the necessity of innovation is also manifested in the field of education, especially in university education. Most HEIs are multidisciplinary oriented. Paradoxically, individual academics are often confined to specific fields, leading to results applicable only within narrow frameworks. Consequently, they do not solve the society's needs holistically, but are oriented towards "niche markets". The fact is also reflected in education. Students mainly acquire knowledge from specific areas and they lack the ability to connect the view and other areas of life. Thus, the ability of critical thinking is weakened, which requires thinking through several disciplines when solving problems.

The study evaluates the perception of ecological innovation in relation to educational attainment in Slovakia. The results of the research prove that the degree of education influences perception towards ecological innovation. The higher achieved education, the closer relationship to eco-innovation. If such an attitude is also reflected in decision-making (for example, purchasing – not only by individuals, but also by companies) and subsequent actions, it logically contributes to the fulfillment of what we refer to as sustainability. We understand it as a concept of human endeavor leading society towards a paradigm based on prosperity of humankind that thrives socially and environmentally.

The educational process should consider local communities, intensify interdisciplinary cooperation, and build partnerships. This must take place in the educational process at all levels. Setting specific literacy goals in the field of ecological innovation and sustainability requires partnerships not only between individual levels of education, but also with practice. This approach brings greater potential for social change.

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