

# Generation Z perspectives on museum sustainability using Q methodology

Katalin Ásványi – Zsuzsanna Fehér

Katalin Ásványi, PhD.  
Department of Sustainable Development and Environmental Economics  
Corvinus University of Budapest  
8 Fővám Square  
1093 Budapest  
Hungary  
e-mail: [katalin.asvanyi@uni-corvinus.hu](mailto:katalin.asvanyi@uni-corvinus.hu)  
<https://orcid.org/0000-0002-1594-8879>

Zsuzsanna Fehér  
Ludwig Museum  
1 Komora Marcell Street  
1095 Budapest  
Hungary  
&  
Tourism Department  
Corvinus University of Budapest  
8 Fővám Square  
1093 Budapest  
Hungary  
e-mail: [feher.zsuzsanna@ludwigmuseum.hu](mailto:feher.zsuzsanna@ludwigmuseum.hu)  
<https://orcid.org/0000-0002-7700-2966>

*Muzeológia a kultúrne dedičstvo*, 2023, 11:1:19-35  
doi: 10.46284/mkd.2023.11.1.2

## *Generation Z perspectives on museum sustainability using Q methodology*

Museums and researchers require knowledge of how museums think about and practice sustainability to understand how sustainability considerations can further be incorporated and institutionalised into museum practice on four pillars: environmental, social, economic and cultural. A systematic literature review was carried out to explore the theoretical background of sustainable museums. This study, which used Q methodology, was designed to determine museum visitors' preferences related to the most important sustainability elements of museums. The participants in the study were 24 museum visitors from Generation Z in Hungary. Data were collected through 37 Q statements. According to the findings of the research, young museum visitors can be distinguished into three groups (factors): Conscious, Experience-seeking, and Enthusiastic-to-learn visitors.

Keywords: sustainable museum, Q methodology, Generation Z

## Introduction

Museums play a unique role in cultural sustainability in preserving the heritage of their communities and ensuring the accumulation and transfer of cultural capital from current generations to future generations. However, in addition to these basic tasks of museums, some have additional functionality. From a modern approach, education is an essential function of

a museum. The post-modern perspective even emphasises the role of museums in sustainable development.<sup>1</sup>

Museums and researchers require knowledge of how museums think about and practice sustainability to understand how they stand in relation to this issue, and how sustainability considerations can further be incorporated and institutionalised into museum practice. The principles of sustainability associated with museums are related to two main aspects: (i) building deep, long-term relationships with a range of audiences; and (ii) responding to changing political, social, environmental and economic contexts, and having a clear long-term purpose that reflects society's expectations.<sup>2</sup>

The study examines the sustainability of museums in four dimensions: cultural, social, economic and environmental. In connection with the concept of sustainability, museums generally aim to achieve the greatest possible cultural, social and economic impact while having a minimal impact on the environment.<sup>3</sup>

Multidimensional diagnostic approaches in museum sustainability studies are required to detect problems and identify solutions. In the current literature, problems are identified using conventional qualitative and quantitative methods. However, problem details are ambiguous, and methodologies may presently be inadequate for their solution. Therefore, it is important to use different methods to identify issues in more detail before tackling them. For this reason, in this study we attempt to reveal museum-related challenges of previously unknown dimensions using Q methodology.

In our research, we focus on the preferences of museum visitors, as these individuals are some of the main stakeholders of museums. Among them, our special interest is in Generation Z, as it is this group that will comprise future museum visitors. To explore the problem, we identify the following research question:

RQ: What are the elements of museum sustainability that Generation Z prefers?

The remainder of this paper is organised as follows. First, we discuss the literature and relevant research background, followed by the proposed theoretical framework. Next, we present an overview of our empirical studies, followed by the details and results of the study. The paper concludes with a discussion of the theoretical and managerial implications as well as limitations and avenues for future research.

## Sustainability in museums

The turbulent economic, social and political changes of the twenty-first century are also encouraging museums to rethink their roles and develop sustainable strategies for their operations. Museums have become public forums, shifting their primary mission from art collecting to mediation, addressing societal issues and strengthening their educational role.<sup>4</sup> In a sustainable society, culture is important from a social, economic and environmental perspective, which is why it is of increasing relevance to museum professionals and academic researchers how museums practice sustainability. Researchers are seeking to explore how sustainability

---

<sup>1</sup> POP, Izabela Luiza and BORZA, Anca. Factors influencing museum sustainability and indicators for museum sustainability measurement. In: *Sustainability*, 8(1), 2016, 101.

<sup>2</sup> VIRTO, Nuria Recuero, LÓPEZ, María Francisca Blasco and SAN-MARTIN, Sonia. How can European museums reach sustainability? In: *Tourism Review*, 72(3), 2017, pp. 303–318.

<sup>3</sup> POP and BORZA, Factors influencing..., 101.

<sup>4</sup> HEDGES, Emily. Actions for the future: determining sustainability efforts in practice in Arizona museums. In: *Museum Management and Curatorship*, 36(1), 2021, pp. 82–103.

can be integrated into museum practice.<sup>5</sup> Museums collect, preserve and present tangible and intangible heritage and pass on knowledge and skills to future generations. Therefore, they can be considered essential components of cultural sustainability. Cultural sustainability is a transdisciplinary, constantly evolving term that can be organised around seven narratives: heritage, cultural vitality, economic viability, diversity, locality, ecocultural resilience and ecocultural civilisation.<sup>6</sup> According to the authors, while many of these “stories” are linked to economic, social and environmental sustainability, narratives of heritage and cultural vitality can be seen as forming the fourth (cultural) pillar of sustainable development. These two narratives, which focus on promoting and preserving cultural capital for future generations, are essential for museums and can thus be seen as essential tools for maintaining and building cultural sustainability. The principles of the sustainability of museums are related to two main aspects:<sup>7</sup>

- Building a deep, long-term relationship with the widest possible audience;
- Responding to changing political, social, environmental, and economic contexts and developing a clear, long-term set of goals that reflect society’s expectations.

In many ways, the crucial question here is how museums need to change in order to play a catalytic role in promoting human culture. A more precise and comprehensive definition of cultural sustainability is needed to improve the contribution of museums to cultural sustainability, and there is a need to recognise and value the contribution of these institutions to a sustainable future.<sup>8</sup>

Institutional survival alone is important, but ultimately not a sufficient goal for public and non-profit organisations.<sup>9</sup> Moldavonova’s study approaches institutional sustainability as a two-tier concept that encompasses both institutional survival and the fundamental objective of sustainability in relation to ensuring intergenerational access to cultural values. By this, she means the ability of public institutions to persevere and fulfil their mission in the long run.

Museums could become valuable and exemplary actors in sustainable development.<sup>10</sup> In most of the studies sustainability is based on three pillars: the economy, society and the

<sup>5</sup> CAMPOLMI, Irene. What is Sustainability in Modern Art Museums? Archétype Art Museums and Shifting Paradigms of Knowledge. In: *The International Journal of the Inclusive Museum*, 6(1), 2013, pp. 13–24.; WORTS, Douglas. Museums: Fostering a culture of “flourishing?”. In: *Curator: The Museum Journal*, 59(3), 2016, pp. 209–218.; PENCARELLI, Tonino, CERQUETTI, Mara and SPLENDIANI, Simone. The sustainable management of museums: An Italian perspective. In: *Tourism and hospitality management*, 22(1), 2016, pp. 29–46.; LOACH, Kirsten, ROWLEY, Jennifer and GRIFFITHS, Jillian. Cultural sustainability as a strategy for the survival of museums and libraries. In: *International journal of cultural policy*, 23(2), 2017, pp. 186–198.; HEDGES, Actions for the future..., pp. 82–103.; JAGADZISNKA, Katarzyna. Museums as Landscape Activists. In: *Muzeológia a kultúrne dedičstvo*, 9(2), 2021, pp. 5–26.

<sup>6</sup> SOINI, Katriina and BIRKELAND, Inger. Exploring the scientific discourse on cultural sustainability. In: *Geoforum*, 51, 2014, pp. 213–223.

<sup>7</sup> VIRTO, LÓPEZ and SAN-MARTIN, How can European museums..., pp. 303–318.

<sup>8</sup> LOACH, ROWLEY and GRIFFITHS, Cultural sustainability..., pp. 186–198

<sup>9</sup> MOLDAVANOVA, Alisa. Two narratives of intergenerational sustainability: A framework for sustainable thinking. In: *The American Review of Public Administration*, 46(5), 2016, pp. 526–545.

<sup>10</sup> GUSTAFSSON, Christer, and IJLA, Akram. Museums: A catalyst for sustainable economic development in Sweden. In: *International Journal of Innovative Development & Policy Studies*, 5(2), 2017, pp. 1–14.

environment,<sup>11</sup> although in the case of museums more and more studies point to the importance of a fourth pillar: cultural sustainability.<sup>12</sup> In connection with the concept of sustainability, the general aim of museums is to achieve the greatest possible cultural, social and economic impact, while having a minimal impact on the environment.<sup>13</sup>

- Environmental sustainability: the efficient use of resources.
- Social sustainability: community involvement.
- Cultural sustainability: preserving collections and maintaining their quality.
- Economic sustainability: maintaining a balanced and diverse budget.

## Systematic literature review

A systematic literature review was carried out to explore the theoretical background of sustainable museums. The process of literature review was conducted in four steps: The first, conceptualisation, involves the selection of the database, the definition of search terms and the definition of selection criteria (S1). The second and third steps constitute the two-phase review process, which involves selection based on the titles of studies and the abstracts (S2), followed by selection based on reading the full content of the articles (S3). The fourth step is the analysis and processing of the articles (S4).

### S1. Conceptualisation – research design and criteria

The search was carried out in the Scopus database using the keywords “museum” and “sustainability”. The search was carried out with the following criteria: keywords searched in the title, abstract and keywords of articles published in scientific journals on the subject of museum and sustainability.

The relevant articles had to meet the following criteria:

- Should focus on sustainability, including different aspects: environmental, social, economic and cultural.
- Must be a published journal article from the period 2000–2020 to identify recent sustainability trends in the museum field.
- Must be published in English in an international peer-reviewed journal.
- Must have a SCImago journal rank of Q1–Q3.

### S2–S3. Two-stage review process

The search run with keywords resulted in 245 records. A two-phase review process was used to select the articles.

---

<sup>11</sup> WICKHAM, Mark and LEHMAN, Kim. Communicating sustainability priorities in the museum sector. In: *Journal of Sustainable Tourism*, 23(7), 2015, pp. 1011–1028.; MERRIMAN, Nick. Museum collections and sustainability. In: *Cultural trends*, 17(1), 2008, pp. 3–21.

<sup>12</sup> STYLIANOU-LAMBERT, Theopisti, BOUKAS, Nikolaos and CHRISTODOULOU-YERALI, Marina. Museums and cultural sustainability: Stakeholders, forces, and cultural policies. In: *International Journal of Cultural Policy*, 20(5), 2014, pp. 566–587.

<sup>13</sup> POP and BORZA, Factors influencing..., 101.

S2. The number of relevant studies included in the sample based on the title and abstract of the articles was reduced from  $n = 245$  to  $n = 79$ . The reasons for exclusion were as follows:

- Articles that were related to open-air museums or libraries in addition to museums were not included, and research where the context was archaeological sites or museums dealing with the presentation of intangible intellectual heritage were excluded.
- From the geographical aspects of the research, we excluded regions that are considered to be very different from the European cultural area and irrelevant in this sense (different cultural background, indigenous).
- Based on the focus of the research, we excluded articles that dealt with sustainability issues with a strong engineering focus (e.g. building solutions, climate control, energy management, humidity measurement, restoration techniques, information technology issues).
- We excluded articles where abstracts were not available.

S3. After reading the full content of the articles to ensure compliance definition, the number of studies was reduced from  $n = 79$  to  $n = 64$ . Articles were excluded at this stage if only the abstract was available and the full article was not available online or only for a fee, or if the topic was not focused on museum sustainability.

#### S4. Analysis

The qualitative analysis was based on the identification of the theoretical underpinnings of our research, the main contributions to the topic, research questions, new insights, empirical methods and data sets for sustainability models.

The time period was defined as 2000–2020. In the early 2000s, very few articles were published on the subject, the number increasing from 2011, the most important research being published in 2016–2018, and then the number decreasing again in the 2020s.

The published articles appeared in a very wide range of journals ( $n = 64$ ). The journal with the highest number of relevant studies was *Sustainability* (Q1). The other major publication was the journal *Museum Management and Curatorship* (Q1), which also focuses on sustainability issues in museums. From a thematic point of view, we also consider the tourism-related journals to be important, but there are only a few articles in these. Within tourism, the problem of sustainable museums is an under-researched topic, and museums are not a focus of tourism research, which is also mentioned in the literature as a shortcoming.

Studies that take a theoretical approach see museums as social institutions whose focus is on fulfilling their cultural role and function and communicating this to society.<sup>14</sup> Eleven articles were found that discuss the context relevant to the theoretical grounding and focus not only on one pillar of sustainability, but address the issue of museum sustainability in a complex way. The research pair Pop and Borza, who wrote several papers between 2015 and 2019, are the most prominent researchers on the topic and have examined museum sustainability upon 4 pillars, a complex approach that is unique in the literature. However, the majority of studies typically approach sustainability on just 1 pillar of sustainability. Of the selected journals, studies related to museum social sustainability were the most numerous ( $n = 23$ ) followed by economic ( $n = 13$ ), cultural ( $n = 10$ ) and environmental ( $n = 7$ ). A complex approach to sustainability fills the gap in the literature.

<sup>14</sup> CAMPOLMI, What is Sustainability..., pp. 13–24.; HEDGES, Actions for the future..., pp. 82–103.

Articles were typically published in Europe (n = 24) and the United States (n = 14). Within Europe, a larger number of studies have been published in Italy, the United Kingdom and Romania. No such research published in an international journal has yet been conducted in Hungary.

Research has examined less the preferences of major stakeholder groups about sustainability in museums, so it is worthwhile to study the perceptions of museum visitors about sustainability.

Qualitative methods were mainly used in the articles (case study, in-depth interview, observation, etc.), much less research being done with the quantitative method (n = 7), the mixed methodology being used in 2 pieces of research. The use of the Q method is also novel in terms of methodology.

### Environmental sustainability

In the case of environmental sustainability, we can interpret the role of museums on two levels: on the one hand, related to their function as organisations (e.g. how much museums pay attention to their environment in terms of the museum building(s) and operation), and on the other hand as cultural institutions.<sup>15</sup> Reducing the energy demand<sup>16</sup> and minimising the carbon footprint of museum buildings is part of environmental sustainability,<sup>17</sup> which can be enhanced by the environmental benefits of technological improvements,<sup>18</sup> while at the same time promoting environmental awareness among visitors<sup>19</sup> through education<sup>20</sup> and activities,<sup>21</sup> and involving communities and volunteers in their conservation activities.<sup>22</sup>

### Social sustainability

The museum is a holistic and ecological institution in society,<sup>23</sup> with a responsibility to promote a more sustainable society,<sup>24</sup> which can be achieved by reaching out to the widest possible

---

<sup>15</sup> ÁSVÁNYI, Katalin, FEHÉR, Zsuzsanna and JÁSZBERÉNYI, Melinda. The criteria framework for sustainable museum development. In: *Tourism in South East Europe*, Opatija, 6, 2021, pp. 39–51.

<sup>16</sup> SILVA, Hugo Entradas, HENRIQUES, Fernando MA, HENRIQUES, Telma AS and COELHO, Guilherme. A sequential process to assess and optimize the indoor climate in museums. In: *Building and Environment*, 104, 2016, pp. 21–34.

<sup>17</sup> STERRETT, Jill, and PANTAVIGNA, Roberta. Building an Environmentally Sustainable San Francisco Museum of Modern Art. In: *Studies in Conservation*, 63(sup1), 2018, pp. 242–250.

<sup>18</sup> CHUNG, Namho, TYAN, Inessa and LEE, Seung Jae. Eco-Innovative Museums and Visitors' Perceptions of Corporate Social Responsibility. In: *Sustainability*, 11(20), 2019, 5744.

<sup>19</sup> BÄTTIG-FREY, Petra, JÄGER, Monica Ursina and TREICHLER BRATSCHI, Regula. Combining art with science to go beyond scientific facts in a narrative environment. In: *Journal of Museum Education*, 43(4), 2018, pp. 316–324.; HAN, Wei, MCCABE, Scott, WANG, Yi and CHONG, Alain Yee Loong. Evaluating user-generated content in social media: An effective approach to encourage greater pro-environmental behavior in tourism? In: *Journal of Sustainable Tourism*, 26(4), 2018, pp. 600–614.

<sup>20</sup> AGUAYO, Claudio, EAMES, Chris, and COCHRANE, Thomas. A Framework for Mixed Reality Free-Choice, Self-Determined Learning. In: *Research in Learning Technology*, 28, 2020, p. 2347.

<sup>21</sup> ARANEO, Phyllis. Re-imagining Cultural Heritage Archetypes Towards Sustainable Futures. In: *Journal of Futures Studies*, 21(4), 2017, pp. 37–50.

<sup>22</sup> STANFORTH, Sarah. Slow conservation. In: *Studies in Conservation*, 55(2), 2010, pp. 74–80.

<sup>23</sup> JUNG, Yuha. The art museum ecosystem: A new alternative model. In: *Museum Management and Curatorship*, 26(4), 2011, pp. 321–338.

<sup>24</sup> CLARK, Barbara and BUTTON, Charles. Sustainability transdisciplinary education model: Interface of arts, science, and community (STEM). In: *International Journal of Sustainability in Higher Education*, 12(1), 2011, pp. 41–54.

audience<sup>25</sup> and by sensitising society.<sup>26</sup> Distance learning and technological developments are also helping to widen the range of visitors.<sup>27</sup> Showing socially sensitive themes,<sup>28</sup> engaging visitors through the use of technology<sup>29</sup> and museum education<sup>30</sup> are shaping a sustainable approach to society.<sup>31</sup>

### Economic sustainability

The economic sustainability of museums is understood in the literature from the perspective of financial sustainability,<sup>32</sup> which is influenced by the market, innovation and technology. Advances in technology enable museums to achieve greater outreach, which increases their revenues.<sup>33</sup> Quality, prestige, innovation, value for money and reputation have a positive and significant impact on the economic sustainability of museums.<sup>34</sup> There is a positive and significant relationship between market orientation and the economic and social performance of museums, but the greatest performance-enhancing impact is due to technological and organisational innovation.<sup>35</sup> However, there is often a trade-off between an artefact-based and visitor- and market-oriented approach.<sup>36</sup> Museums can also contribute to sustainable development by adding economic value to creative industries in the economy: by contributing to wealth creation, job creation and employment for regional and local economies and tourism through innovation, creativity and problem solving.<sup>37</sup>

<sup>25</sup> LOACH, ROWLEY and GRIFFITHS, Cultural sustainability..., pp. 186–198.; ARANEO, Re-imagining Cultural Heritage..., pp. 37–50.

<sup>26</sup> KRAYBILL, Anne and DIN, Herminia. Building capacity and sustaining endeavors. In: *Journal of Museum Education*, 40(2), 2015, pp. 171–179.

<sup>27</sup> AGUAYO, EAMES and COCHRANE, A Framework for Mixed..., 2347.

<sup>28</sup> GHEORGHILAS, Aurel, DUMBRĂVEANU, Daniela, TUDORICU, Anca and CRĂCIUN, Ana. The challenges of the 21st-century museum: Dealing with sophisticated visitors in a sophisticated world. In: *International Journal of Scientific Management and Tourism*, 3-4, 2017, pp. 61–73.

<sup>29</sup> JAMALUDIN, Azilawati, and HUNG. David Wei Loong. Digital learning trails: Scaling technology-facilitated curricular innovation in schools with a rhizomatic lens. In: *Journal of Educational Change*, 17(3), 2016, pp. 355–377.; ROWE, Jonathan P., LOBENE, Eleni V. BRADFORD, Mott, W. and LESTER, James C. Play in the museum: Design and development of a game-based learning exhibit for informal science education. In: *International Journal of Gaming and Computer-Mediated Simulations (IJGCMs)*, 9(3), 2017, pp. 96–113.

<sup>30</sup> COLLINS, Trevor. Enhancing outdoor learning through participatory design and development: A case study of embedding mobile learning at a field study centre. In: *International Journal of Mobile Human Computer Interaction (IJMHCI)*, 7(1), 2015, pp. 42–58.

<sup>31</sup> BEFIORE, Eleonora and BENNETT, Oliver. Rethinking the social impacts of the arts. In: *International Journal of Cultural Policy*, 13, 2007, pp. 135–151.

<sup>32</sup> EPPICH, Rand, and GRINDA, José Luis García. Sustainable financial management of tangible cultural heritage sites. In: *Journal of Cultural Heritage Management and Sustainable Development*, 9(3), 2019, pp. 282–299.

<sup>33</sup> KRAYBILL and DIN, Building capacity..., pp. 171–179.

<sup>34</sup> VIRTÓ, LÓPEZ and SAN-MARTÍN, How can European museums..., pp. 303–318.

<sup>35</sup> CAMARERO, Carmen and JOSÉ, Garrido María. The role of technological and organizational innovation in the relation between market orientation and performance in cultural organizations. In: *European Journal of Innovation Management*, 11(3), 2008, pp. 413–434.

<sup>36</sup> ERRICHIELLO, Luisa, and MICERA, Roberto. Leveraging smart open innovation for achieving cultural sustainability: Learning from a new city museum project. In: *Sustainability*, 10(6), 2018, 1964.

<sup>37</sup> LINDQVIST, Katja. Museum finances: Challenges beyond economic crises. In: *Museum Management and Curatorship*, 27(1), 2012, pp. 1–15.; KRISKOVÁ, Zdena. Specific Forms of the Safeguarding and Showcasing of Cultural Heritage as Part of Tourism in the High Tatras. In: *Muzeológia a kultúrne dedičstvo*, 9(2), 2021, pp. 61–77.

## Cultural sustainability

Cultural sustainability was first defined by the World Commission on Culture and Development as ensuring intergenerational and transgenerational access to culture.<sup>38</sup> Cultural sustainability also implies that development takes place in a way that respects the cultural capital and values of society.<sup>39</sup> Cultural sustainability is based on the principle that present generations can only use and adapt cultural heritage to the extent that it does not limit future generations in their access, understanding and ability to live.<sup>40</sup> Thus, this dimension of sustainability is primarily concerned with ensuring the continuity of cultural values that link the past, present and future. Cultural sustainability has been differentiated according to two functions: on the one hand, the sustainable management of collections;<sup>41</sup> and on the other hand, the preservation of the quality of and responsibility for the content of art. In terms of the content of the collection, the museum is responsible for stimulating the interest of visitors in its different themes and for educating them about the issues related to sustainability,<sup>42</sup> thereby shaping the public's tastes.<sup>43</sup>

## Research methodology

For our research we chose Q-methodology, which appeared to be appropriate for an exploratory analysis. With the help of the method, we could classify into groups the opinions of the sample (15–50 respondents). The method shows which of a set of statements are typical or representative ones, and thus which ones characterise each group – that is, which statements differ among opinion groups (“compromise statements”) and which ones cannot be used to distinguish one factor from any other (“consensus statements”). With the Q-method, the selection of statements related to the topic of research is of central importance. We examined the criteria for sustainable museums in line with the four pillars explored in the literature based on the results of earlier empirical research, in-depth interviews with museum professionals related to the topic, and sustainability concepts.

From the selected statements, a Q-sample can be constructed that participants are typically given in printed form and asked to arrange using a scale of (dis)agreement ranging from -3 to +3, but we conducted the present research online because of the pandemic situation, replacing the set of cards with an Excel table. Preliminary pilot studies have demonstrated that such online research can be conducted that is of the same quality as that which uses physical materials.<sup>44</sup> When formulating statements, care should be taken to ensure that they are comparable, as subjects are asked to classify them in pairs according to the different values of the classification scale. Factor analysis was undertaken on the completed Q sample using the computer program PQMethod to reveal typical opinion groups.

---

<sup>38</sup> JÄRVELÄ, Marja. Social and cultural sustainability. In: KOHL, Johanna. *Dialogues on sustainable paths for the future: Ethics, welfare and responsibility*, 2008, pp. 46–65.

<sup>39</sup> MPOFU, Phillip. The dearth of culture in sustainable development: The impact of NGOs' agenda and conditionalities on cultural sustainability in Zimbabwe. In: *Journal of Sustainable Development in Africa*, 14(4), 2012, pp. 191–205.

<sup>40</sup> PEREIRA, Honório Nicholls. Contemporary trends in conservation: Culturalization, significance and sustainability. In: *City & Time*, 3(2), 2007, pp. 15–25.

<sup>41</sup> MERRIMAN, Museum collections..., pp. 3–21.; STERRETT and PIANTAVIGNA, Building an Environmentally..., pp. 242–250.

<sup>42</sup> BÄTTIG-FREY, JÄGER and TREICHLER BRATSCHEI, Combining art with science..., pp. 316–324.

<sup>43</sup> GUSTAFSSON and IJLA, Museums—A catalyst..., pp. 1–14.

<sup>44</sup> DAVIS, Charles H., and CAROLYN, Michelle. Q methodology in audience research: Bridging the qualitative/quantitative “divide”. In: *Participations: Journal of Audience and Reception Studies*, 8(2), 2011, pp. 559–593.



Targeted and theoretical sampling was used. One condition was that respondents should be active museum visitors. A total of 28 responses were received, of which 24 were evaluable. Participants received written explanations and instructions about how to complete the task, according to which we asked them to first arrange statements into three groups based on whether they agreed with them, disagreed, or were uncertain/neutral.<sup>45</sup> After the statements were sorted, they were placed on the Q-sample grid according to values ranging between -3 and 3. As is common in Q-sample studies, the grid was forced, and quasi-normally distributed. The placement of each statement creates a custom sorting pattern, which can then be examined in relation to the sorting patterns of other participants. The opinions of adult members of Generation Z (typically born between 2004 and 2010) were examined, as it is this group that will comprise future museum visitors. Born in the late 1990s or later, they have grown up in a world of digital technologies in which it is no longer possible to live without the use of Web 2.0, mobile phones or other digital and communication tools.<sup>46</sup> Sustainability is important to them, as is the need for change towards sustainable development.<sup>47</sup> All participants were university students undertaking a BA or MA in different fields.

### Findings and interpretation

To analyse the data, we used PQMethod 2.35 software. First, a correlation matrix between the Q-sorts was produced. The intuition behind Q methodology is that if Q-sorts are correlated between respondents, there is a degree of congruence in their opinions about a subject. Such clusters of respondents with shared viewpoints can be identified using factor extraction. When determining the four dimensions of sustainability preferences, we first examined whether there is any shared understanding of the latter between respondents. For this purpose, basic component analysis and varimax rotations were conducted. The distribution of the scores is shown in Table 1.

**Tab. 1:** Q-sort template

-3	-2	-1	0	+1	+2	+3

Source: Authors' compilation

With the Q method, factor analysis is used to assign each respondent to each factor. Respondents with a high factor weight for a given factor can be said to have a similar Q-order (or a different Q-order from respondents assigned to other factors) – i.e. they have roughly

<sup>45</sup> DAVIS and CAROLYN, Q methodology ..., pp. 559–593.

<sup>46</sup> DABIJA, Dan-Cristian, BEJAN, Brândsua Mariana and DINU, Vasile. How sustainability oriented is Generation Z in retail? A literature review. In: *Transformations in Business & Economics*, 18(2), 2019, pp. 140–155.

<sup>47</sup> SU, Ching Hui, TSAI, Chin Hsun, CHEN, Ming Hsiang and LV, Wan Qing. US sustainable food market generation Z consumer segments. In: *Sustainability*, 11(13), 2019. 3607.

similar opinions about a given statement and thus they have the same “group of opinions”. Individuals who belong to different factors thus tend to have different (groups of) opinions. Statements for which the absolute value of  $Z$  is greater than “1” are generally considered to be characteristic of a given factor.<sup>48</sup> Based on the individual preference sequences, the method generated eight factors, of which three were left after Varimax rotation (these factors explained 62% of the variance, which satisfies the condition of a minimum 60% variance level). Of the 24 participants, 21 were automatically assigned to a group through this factoring process. Using manual factor rotation, the remaining three participants were categorised to one of the three factors according to the largest value. The distribution of respondents in each factor was not uniform (12-8-4).

## Characteristics of the factors

### Factor 1. Conscious visitors

Regarding the preferences of visitors associated with this factor, all dimensions of sustainability are considered important, and the four preferences rated most strongly are related to one of these four dimensions (environmental, social, economic and cultural). The statements considered most valid were that a museum should be environmentally conscious, and that the economic dimension of museum sustainability is important. According to respondents’ opinions, museums are important actors in cultural tourism, indicating that the respondents believe that this element can be one of the cornerstones of museum sustainability, as social institutions play an important role in shaping society, should not be afraid of taboo topics, and must react boldly to social phenomena. For the members of the factor, innovation is of paramount importance, and in this context knowledge transfer in a fun way is also expected, as individuals in this group consider museums to be places of entertainment. In terms of the cultural dimension, sustainable collection management related to the core activity of the museum was identified as important. Also important is that museums are comprehensively and physically accessible. In terms of the environmental dimension, activities related to environmental protection are considered important, as is the fact that a museum uses renewable energy sources.

The opinions of members of the factor differ most in relation to the role of museums’ use of digital information materials, and whether it is important to adapt to new technological expectations. There is also uncertainty about whether museums should be “understandable” to everyone, while the claim that museums should not be required to maintain themselves from income from visitors was also a divisive issue.

### Factor 2. Experience-seekers

Members of this factor most strongly agreed that the education-related element of the social dimension of sustainability is important. According to these individuals, it is important for museums to be a place for enjoyable learning – and in connection with this they expect museums to be innovative, and to keep up with the times, but they do not think that this only involves the use of digital information materials. A museum is basically considered a social institution, and is expected to be barrier-free in terms of both physical access and comprehensibility.

---

<sup>48</sup> VAN EXEL, Job and GRAAF, Gjalte De. Q methodology: A sneak preview 2005. 2005, accessed January 14th, 2022, <http://qmethod.org/articles/vanExel.pdf>

In terms of the economic dimension, similarly to respondents of the previous factor, the role of museums in cultural tourism is preferred, but respondents classified into this factor do not think that a museum should be profit-oriented or market-oriented. Among a museum's cultural responsibilities, the maintenance of collections in a sustainable way is highlighted. Environmental issues were not particularly valued. The views of members of this factor differed most about the issue of cooperation with sponsors (in relation to the economic dimension), and regarding which goals a museum should strive for most: to represent professional quality, or to be more comprehensible to visitors. Related to this dilemma is another divisive issue: should a museum only be for those who want to learn? Respondents were also divided about whether a museum should respond to the social phenomena of our time. Members of this factor did not from the outset favour awarding museums a prominent role in environmental issues, so it is not surprising that one of the most divisive issues was whether museums should have environment-related exhibitions.

### Factor 3. Enthusiastic-to-learn visitors

For the members of this factor the most important function and task of a museum is to be barrier-free in physical terms and regarding comprehensibility. In their view, museums are for those who want to learn, yet they do not think that museums cannot play an important role in providing experience, entertainment and recreation. It is more important for respondents classified into this factor that museums organise professional and high-quality exhibitions and programmes, even if these are not understandable to everyone. Members of this group believe that museums still have the task of sensitising visitors to social issues. In terms of the management of collections (an issue belonging to the cultural dimension), respondents also consider it to be important that museums manage their collections in a sustainable way.

From the point of view of economic sustainability, like the members of the other two factors, enthusiastic-to-learn visitors consider this important and agree that museums should not be profit-oriented. This may be related to the fact that the latter believe that museums should play a role in the acquisition of knowledge and the transfer of knowledge, rather than seeking to strengthen their market-based position. As with members of the second factor, they do not prioritise environmental issues, and believe that there is no significant relationship between visitor expectations and museums' environmental awareness.

The most divisive issue for this group, as well as for members of the second factor, was whether a museum should collaborate with sponsors, and whether the museum should be free. Opinions are also divided as to whether museums have a role to play in helping solve problems that affect society.

### Distinguishing and consensus statements

One of the more interesting uses of Q is that it can help clarify what groups of individuals agree or disagree about. Such results can be very helpful for building consensus or overcoming conflict. Toward this end, it is helpful here to present results from three categories:

- Points of agreement across dimensions (consensus points).
- Points of disagreement across dimensions (compromise points).
- Non-consensual and non-confrontational points regarding each dimension.

The first item highlights the areas which are mutually agreed on. The second identifies points of disagreement where compromise may be possible. The third looks at each dimension independently and highlights areas that were not consensual, but also not subject to strong disagreement (i.e. “non-confrontational” issues).

### Similarities among factors

Based on the typical Q-ordering created using Z values we can determine those statements about which there were similarities among the factors. Members of all three factors think very similarly about two issues: they agree and consider important that museums should manage their collections in a sustainable way and preserve them for future generations, and they also agree that museums need active communities. Members of the factors awarded similarly low importance values to some issues: for example, with regard to museums being free of charge, there is a slight agreement that museums should be free, and there was also a consensus that museums can hardly keep up with the times. The role of museums in solving social problems and cooperating with sponsors is also uniformly considered of little importance.

### Differences among factors

The differences between the factors point out which elements are most divisive. The contrast between the first and second factors is sharpest along the environmental dimension: members of the first factor agree that museums should have environmental activities, whether these involve eco-buildings and the use of renewable energy, or the use of only digital information sources, while members of the second factor consider this to be less important. Members of the first and third factors also think completely differently about many things. The sharpest contrast between them is perceived in relation to the educational function of museums. Members of the third factor say that museums do not have to reach out to all social groups, as museums and their contents are not understood by everyone. Also, they believe that artefacts themselves are more important than visitors, and consider it important that museum staff continue to maintain their training. In these matters, the members of the first factor have completely contrasting views. The contrast between the second and third factors becomes obvious in relation to the social dimension: members of the third factor value the professional and educational functions of museums more, claim that museums are for those who want to learn, that quality is more important than comprehensibility, and that a museum’s role is to sensitise. In contrast, the second group believes that museums should not be afraid of addressing taboo subjects and reacting to social phenomena, and that comprehensibility is more important to them than quality. Another important difference is that members of the second factor believe that museums should not be sustained by visitor-related income alone, while the members of the third factor are in favour of museums generating their revenue this way.

### Non-consensual and non-confrontational points from each perspective

Among the factors, it is worth examining those statements for which there is no consensus, yet no major dissensus. These are the areas where mutual agreement may be reached. Examples include the opinion (social dimension) that museums are not understood by everyone, and that a museum’s task is to engage visitors. In terms of claims about the environmental dimension

of museums, the importance of a museum's environmental awareness and whether museums should organise exhibitions related to environmental protection are evaluated similarly.

## Discussion

This study, which used Q methodology, was designed to determine museum visitors' preferences related to the most important sustainability elements of museums. The participants of the study were 24 young museum visitors in Hungary. Data were collected through 37 Q sentences. The main research question was the following: What are the sustainability elements of museums that Generation Z prefers?

Regarding the findings derived from the young museum visitors' opinions about sustainable museums, in general it can be concluded that members of Generation Z agree that it is important that museums manage their collections in a sustainable way and preserve them for future generations, and they also agree that museums need active communities. The results clearly agree with those of earlier research about the sustainability of museums, according to which the main task of the latter was found to be caring for and preserving their collections and establishing an active relationship with communities, as this is the only way to maintain their importance and value in the long run, and gain the support of society. These aspects were also identified in previous research.<sup>49</sup> Cultural sustainability is seen as the fourth pillar of sustainable development, and can be defined as taking into account the need for the preservation and presentation of tangible and intangible heritage, artistic production and the knowledge and skills of different social groups, communities and nations. Previous research linked the sustainability of museums to whether the latter meet the cultural needs of the community.<sup>50</sup>

According to the findings of the research, young museum lovers can be distinguished into three groups (factors): Conscious-, Experience-seeking-, and Enthusiastic-to-learn visitors. The opinion preferences of Conscious visitors show that a sustainable museum is envisioned according to the four dimensions of sustainability, and the economic, environmental, social and cultural dimensions of museums are considered equally important. Regarding Experience-seeking visitors, we can say that museums are basically considered social institutions and expected to be accessible both physically and comprehensively, and they are primarily seen as places for fun learning. In connection with this, museums are expected to be innovative and keep up with the times. The difference between the members of the Enthusiastic-to-learn factor and the other two factors is that the former think that museums are for those who want to learn, that professionalism is much more important than comprehensibility, that museums should cater to all social groups and that artefacts are more important than visitors.

Considering the proportion of respondents of the three factors, the majority of the members of Generation Z (12) consider that twenty-first-century museums should operate responsibly in line with the principles of sustainability, the most important issue among members of the second factor (8) being that museums should be places of knowledge transfer through fun, while according to the most held view of the third factor (4) museums should strengthen their professionalism, even if this runs counter to the clarity of their presentations. In terms of examining preferences for the three factors, it is also worthwhile dealing with statements for which there is neither consensus nor contradiction. These are the areas that are easiest to

<sup>49</sup> STYLIANOU-LAMBERT, BOUKAS and CHRISTODOULOU-YERALI, *Museums and cultural...*, pp. 566–587.

<sup>50</sup> GUSTAFSSON and IJLA, *Museums: A catalyst...*, pp. 1–14.

approach, and those for which we can make further suggestions for museums. The research pointed to two important areas. One is the social dimension, and within this, to two statements: that “museums are not understood by everyone”, and that “museums play an important role in engaging visitors”. These two statements are very closely related, and the second can be interpreted as a response and a solution to the first suggestion. The more a museum strives to engage its visitors, the more it can expand the range of people for whom the museum will be understandable and enjoyable. The other such area was identified from statements about the environmental dimension. The importance of museums’ environmental awareness and the question whether museums should host environment-related exhibitions represents an opportunity for museums to rethink how they can influence visitors’ attitudes toward the environment. Visitors are unlikely to expect museums to host outreach environmental exhibitions, but if they can approach the topic within their own field with a sensitivity that visitors find authentic, they can also influence the latter’s attitudes. For example, a museum of contemporary art may host an exhibition that showcases artistic reflections and practices that strongly influence visitors’ emotions and make them think, thus perhaps influencing the way their attitudes evolve. The other issue is the importance of the environmentally conscious operation of museums, in relation to which museums can do most by setting a good example and introducing as many such practices as possible.

Our research makes four main contributions to the research on the sustainability of museums. First, the research systematically examines criteria and requirements associated with sustainable museums. It points out that the primary task of museums is to preserve collections, so they should strive for cultural sustainability as a priority. Second, the research provides insight into the differences and similarities between Generation Z opinion preferences and thus contributes to a deeper understanding of the sustainability of museums from the perspective of future museum visitors. It should also be supplemented with demand-side research that investigates the expectations of museum visitors. Museums should strive to serve the communities around them effectively, and to do this, they need to explore their needs. By this we mean that they should recognise those expectations and also those visitors that they have not yet reached for different reasons, but whose quality of life could be significantly affected by them doing so. Museum management should support and encourage research that helps them learn more about pre-existing and potential visitors. Third, the research complements the empirical literature on sustainable museums and contributes to broadening the theoretical background with regard to sustainable museums. Fourth, the Q-method is used to explore the trends that characterise the engagement and mechanism of action of opinion groups. Research illustrates the current conditions, but also outlines desirable and possible future alternatives.

## Conclusion

Museums play a unique role in cultural sustainability by preserving the heritage of their communities and ensuring the accumulation and transfer of cultural capital from current generations to future generations. However, in addition to these basic functions, they increasingly have additional ones, including the essential role of education. The post-modern perspective emphasises the role of museums in sustainable development. To date, little empirical research has been published on this topic.

In order to define the criteria for sustainable museums the preferences that affect museum visitors have with regard toward this topic should be identified, and solutions found. This

study was designed to reveal the most important elements for sustainable museums from the perspective of members of Generation Z. The variety of results revealed through this study indicate that the Q methodology is a functional approach to diagnosing problems. Therefore, the findings may shed light on other studies related to the field. To sum up, the areas in which young museum visitors expressed a strong or moderate level of need reflect the idea that museums should manage their collections in a sustainable way and preserve them for future generations. These visitors also agree that museums need active communities. It is important for museums to pay attention to the needs of visitors who are increasingly aware, and to take into account that some visitors like to go to museums for leisure and entertainment purposes. Respondents desire that museums be accessible to everyone, while others mainly want to learn and expand their professional knowledge. In order to increase the range of knowledgeable audiences, museums need to involve their visitors. It is necessary to take into account the changing roles and professional skill-related needs of museum experts. Further studies may concentrate on understanding the more specific needs of young museum visitors in the context of these issues. Further qualitative research is advisable in relation to visitor opinions/needs regarding elements of sustainability (e.g. to identify similarities and differences). We conducted our research online, although it would be worthwhile replicating the research through face-to-face interaction with even a small sample, and exploring the reasons for each preference.

## References

- AGUAYO, Claudio, EAMES, Chris, and COCHRANE, Thomas (2020). A Framework for Mixed Reality Free-Choice, Self-Determined Learning. In: *Research in Learning Technology*, 28, 2347.
- ARANEO, Phyllis (2017). Re-imagining Cultural Heritage Archetypes Towards Sustainable Futures. In: *Journal of Futures Studies*, 21(4), pp. 37–50.
- ÁSVÁNYI, Katalin, FEHÉR, Zsuzsanna, and JÁSZBERÉNYI, Melinda (2021). The criteria framework for sustainable museum development. In: *Tourism in South East Europe*, Opatija, 6, pp. 39–51.
- BÄTTIG-FREY, Petra, JÄGER, Monica Ursina, and TREICHLER BRATSCHI, Regula (2018). Combining art with science to go beyond scientific facts in a narrative environment. In: *Journal of Museum Education*, 43(4), pp. 316–324.
- BELFIORE, Eleonora and BENNETT, Oliver (2007). Rethinking the social impacts of the arts. In: *International Journal of Cultural Policy*, 13, pp. 135–151.
- CAMARERO, Carmen, and JOSÉ, Garrido María (2008). The role of technological and organizational innovation in the relation between market orientation and performance in cultural organizations. In: *European Journal of Innovation Management*, 11(3), pp. 413–434.
- CAMPOLMI, Irene (2013). What is Sustainability in Modern Art Museums? Archétypy Art Museums and Shifting Paradigms of Knowledge. In: *The International Journal of the Inclusive Museum*, 6(1), pp. 13–24.
- CHUNG, Namho, TYAN, Inessa, and LEE, Seung Jae (2019). Eco-Innovative Museums and Visitors' Perceptions of Corporate Social Responsibility. In: *Sustainability*, 11(20), 5744.

- CLARK, Barbara, and BUTTON, Charles (2011). Sustainability transdisciplinary education model: Interface of arts, science, and community (STEM). In: *International Journal of Sustainability in Higher Education*, 12(1), pp. 41–54.
- COLLINS, Trevor (2015). Enhancing outdoor learning through participatory design and development: A case study of embedding mobile learning at a field study centre. In: *International Journal of Mobile Human Computer Interaction (IJMHCI)*, 7(1), pp. 42–58.
- DABIJA, Dan-Cristian, BEJAN, Brândsua Mariana, and DINU, Vasile (2019). How sustainability oriented is Generation Z in retail? A literature review. In: *Transformations in Business & Economics*, 18(2), pp. 140–155.
- DAVIS, Charles H., and CAROLYN, Michelle (2011). Q methodology in audience research: Bridging the qualitative/quantitative “divide”. In: *Participations: Journal of Audience and Reception Studies*, 8(2), pp. 559–593.
- EPPICH, Rand, and GRINDA, José Luis García (2019). Sustainable financial management of tangible cultural heritage sites. In: *Journal of Cultural Heritage Management and Sustainable Development*, 9(3), pp. 282–299.
- ERRICHELLO, Luisa, and MICERA, Roberto (2018). Leveraging smart open innovation for achieving cultural sustainability: Learning from a new city museum project. In: *Sustainability*, 10(6), 1964.
- GHEORGHILAS, Aurel, DUMBRĂVEANU, Daniela, TUDORICU, Anca, and CRĂCIUN, Ana (2017). The challenges of the 21st-century museum: dealing with sophisticated visitors in a sophisticated world. In: *International Journal of Scientific Management and Tourism*, 3-4, pp. 61–73.
- GUSTAFSSON, Christer, and IJLA, Akram (2017). Museums—A catalyst for sustainable economic development in Sweden. In: *International Journal of Innovative Development & Policy Studies*, 5(2), pp. 1–14.
- HAN, Wei, MCCABE, Scott, WANG, Yi, and CHONG, Alain Yee Loong (2018). Evaluating user-generated content in social media: An effective approach to encourage greater pro-environmental behavior in tourism? In: *Journal of Sustainable Tourism*, 26(4), pp. 600–614.
- HEDGES, Emily (2021). Actions for the future: Determining sustainability efforts in practice in Arizona museums. In: *Museum Management and Curatorship*, 36(1), pp. 82–103.
- JAGADZISNKA, Kataryzna (2021). Museums as Landscape Activists. In: *Muzeológia a kultúrne dedičstvo*, 9(2), pp. 5–26.
- JAMALUDIN, Azilawati, and HUNG, David Wei Loong (2016). Digital learning trails: Scaling technology-facilitated curricular innovation in schools with a rhizomatic lens. In: *Journal of Educational Change*, 17(3), pp. 355–377.
- JÄRVELÄ, Marja (2008). Social and cultural sustainability. In: KOHL, Johanna. *Dialogues on sustainable paths for the future: Ethics, welfare and responsibility*, pp. 46–65.
- JUNG, Yuha (2011). The art museum ecosystem: A new alternative model. In: *Museum Management and Curatorship*, 26(4), pp. 321–338.
- KRAYBILL, Anne, and DIN, Herminia (2015). Building capacity and sustaining endeavors. In: *Journal of Museum Education*, 40(2), pp. 171–179.
- KRISKOVÁ, Zdena (2021). Specific Forms of the Safeguarding and Showcasing of Cultural Heritage as Part of Tourism in the High Tatras. In: *Muzeológia a kultúrne dedičstvo*, 9(2), pp. 61–77.



- LINDQVIST, Katja (2012). Museum finances: Challenges beyond economic crises. In: *Museum Management and Curatorship*, 27(1), pp. 1–15.
- LOACH, Kirsten, ROWLEY, Jennifer, and GRIFFITHS, Jillian (2017). Cultural sustainability as a strategy for the survival of museums and libraries. In: *International journal of cultural policy*, 23(2), pp. 186–198.
- MERRIMAN, Nick (2008). Museum collections and sustainability. In: *Cultural trends*, 17(1), pp. 3–21.
- MOLDAVANOVA, Alisa (2016). Two narratives of intergenerational sustainability: A framework for sustainable thinking. In: *The American Review of Public Administration*, 46(5), pp. 526–545.
- MPOFU, Phillip (2012). The dearth of culture in sustainable development: The impact of NGOs' agenda and conditionalities on cultural sustainability in Zimbabwe. In: *Journal of Sustainable Development in Africa*, 14(4), pp. 191–205.
- PENCARELLI, Tonino, CERQUETTI, Mara, and SPLENDIANI, Simone (2016). The sustainable management of museums: An Italian perspective. In: *Tourism and hospitality management*, 22(1), pp. 29–46.
- PEREIRA, Honório Nicholls (2007). Contemporary trends in conservation: Culturalization, significance and sustainability. In: *City & Time*, 3(2), pp. 15–25.
- POP, Izabela Luiza, and BORZA, Anca (2016). Factors influencing museum sustainability and indicators for museum sustainability measurement. In: *Sustainability*, 8(1), 101.
- ROWE, Jonathan P., LOBENE, Eleni V., BRADFORD, Mott W., and LESTER, James C. (2017). Play in the museum: Design and development of a game-based learning exhibit for informal science education. In: *International Journal of Gaming and Computer-Mediated Simulations (IJGCMS)*, 9(3), pp. 96–113.
- SILVA, Hugo Entradas, HENRIQUES, Fernando M.A., HENRIQUES, Telma A.S., and COELHO, Guilherme B.A. (2016). A sequential process to assess and optimize the indoor climate in museums. In: *Building and Environment*, 104, pp. 21–34.
- SOINI, Katriina and BIRKELAND. Inger (2014). Exploring the scientific discourse on cultural sustainability. In: *Geoforum*, 51, pp. 213–223.
- STANIFORTH, Sarah (2010). Slow conservation. In: *Studies in Conservation*, 55(2), pp. 74–80.
- STERRETT, Jill, and PIANTAVIGNA, Roberta (2018). Building an Environmentally Sustainable San Francisco Museum of Modern Art. In: *Studies in Conservation*, 63(sup1), pp. 242–250.
- STYLIANOU-LAMBERT, Theopisti, BOUKAS, Nikolaos, and CHRISTODOULOU-YERALI, Marina (2014). Museums and cultural sustainability: Stakeholders, forces, and cultural policies. In: *International Journal of Cultural Policy*, 20(5), pp. 566–587.
- SU, Ching Hui, TSAI, Chin Hsun, CHEN, Ming Hsiang, and LV, Wan Qing (2019). US sustainable food market generation Z consumer segments. In: *Sustainability*, 11(13), 2019. 3607.
- VAN EXEL, Job, and GRAAF, Gjalte De (2005). Q methodology: A sneak preview 2005. Accessed January 14, 2022, <http://qmethod.org/articles/vanExel.pdf>
- VIRTO, Nuria Recuero, LÓPEZ, Maria Francisca Blasco, and SAN-MARTIN, Sonia (2017). How can European museums reach sustainability? In: *Tourism Review*, 72(3), pp. 303–318.
- WICKHAM, Mark, and LEHMAN, Kim (2015). Communicating sustainability priorities in the museum sector. In: *Journal of Sustainable Tourism*, 23(7), pp. 1011–1028.