
Environmental Education Based on The Potential of Kuala Selangor Nature Park Through Experiential and Joyful Learning-Marine Edutourism

Riza Sativani Hayati^{1*}, Ainun Jariah¹, Julia Astutik²

¹Faculty of Teacher Training and Education, Muhammadiyah Makassar University, Makassar, South Sulawesi, Indonesia

²Science Teacher of Sekolah Indonesia Kuala Lumpur, Wilayah Persekutuan Kuala Lumpur, Malaysia

*Email: rizasativani.hayati@unismuh.ac.id

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Abstract.

It is very urgent that environmental education is carried out to increase students' environmental literacy. Effective methods need to be developed to provide environmental experiences while increasing students' contribution to the environment. Malaysia has natural potential as a learning resource for environmental education, one of which is the Kuala Selangor Nature Park. This research aims to 1) conduct a study of the potential of the Kuala Selangor National Park mangrove ecosystem for the development of environmental education learning tools and 2) implement the experiential and joyful learning-marine edutourism (EJoy-ME) learning model based on the potential of Kuala Selangor National Park to increase students' environmental literacy. The method used was observation of the natural resource potential of Kuala Selangor Nature Park and quasi-experimentation of the EJoy-ME learning model. The results of the study show that Kuala Selangor Nature Park has the potential to be developed as a learning resource for environmental education through EJoy-ME. The implementation of EJoy-ME has been proven to be able to increase students' environmental literacy. The EJoy-ME learning model also received positive responses from students, namely providing satisfaction with environmental materials, satisfaction with the learning process, and providing a pleasant learning experience.

Keywords: Environmental Education, Joyful Learning, Experiential Learning, Marine Edutourism, Environmental Literacy

Introduction

Environmental education is very important to be given to students. In accordance with the main aim of environmental education is to increase literacy. Increasing environmental literacy needs effective learning methods. Innovation in learning methods needs to be carried out so that students' environmental literacy increases and encourages students' positive contributions to the environment. Damage to marine ecosystems due to human activities shows the low environmental literacy (Santoso, et al., 2021). Until now, we still hear reports of environmental damage due to human activities such as destructive fishing, illegal fishing, use of protected animals, and sand mining by local communities

(Nawang Sari, et al., 2018). Practices found in Indonesia like destructive fishing by bombing and cyanide, over fishing, settlement pollution, coral mining, and uncontrolled tourism development (Monintja, 2001; Supriharyono & Monintja, 2001; Dirhamsyah, 2012; Asri et al., 2019). It's done by both communities and industries. This environmental literacy crisis needs to be solved through effective education efforts.

Environmental conditions continue to change due to human activities which require people to have literacy towards environment. Knowledge and attitudes about environment are components of a broader concept known as environmental literacy (Ramdas and Mohamed, 2014). According to the North American Association for Environmental Education (NAAEE) in the framework for assessing environmental literacy proposed for PISA 2015, someone who is environmentally literate must have at least four domains, namely knowledge, competence or skills, disposition, and environmentally responsible behavior (Hollweg et al., 2011). The aspect of environmental literacy that will be measured in this research is knowledge domain where student tested about the ability to analyze a problem and apply scientific knowledge to explain the causes of environmental problem and make predictions about its consequences.

Malaysia has local marine wisdom in the form of an extraordinary mangrove ecosystem. Malaysian mangroves are one of the largest mangroves in Southeast Asia. Malaysia's mangrove ecosystem provides ecosystem goods and services for the environment and its surroundings, namely coastline protection, storm protection, water quality maintenance, microclimate stabilization, tourism, fishing, and supply of various forest products (Omar, et al., 2020). The mangrove ecosystem in Malaysia has at least 114 species of flora which are divided into true and derivative mangroves (Shin, et al., 2015). The mangrove ecosystem is a complex part of the marine discussion that can lead students to have environmental literacy. This local potential can be used as a learning resource for students to instill environmental literacy.

Kuala Selangor Nature Park (KSNP) is one of Malaysia's mangrove ecosystems that has the potential to be developed as an environmental learning resource. KSNP has more than 90 hectares of mangrove area. 19 main types of flora were found in this ecosystem (Kobayashi et al, 2021). The main mangrove species found include *Avicennia*, *Rhizophora* and *Bruguiera* (Jahid, 2021). The nickname bird park shows the variety of bird species, there are at least 156 types of aves and 57 of them are from abroad such as Russia and Siberia. In 1997, KSNP was considered an (IBA) by Birdlife International (Latif et al., 2020). KSNP is home to various species such as silver-leaf monkeys, smooth otters, pangolins, and mangrove tiger butterflies (Joseph, 2021). Apart from the biodiversity potential above, the mangrove area here still has good cover, so it has the potential to be developed as an environmental learning resource.

Marine tourism objects have great potential to be packaged as environmental education learning resources through marine edutourism (ME). ME is the integration of marine environmental education with marine tourism. ME is an environmental learning activity at ME locations which aims to increase students' marine environmental literacy. ME has previously been used as a method of learning biology and environmental education which has been proven to be able to increase environmental literacy (Hayati, 2017; Hayati et al., 2021). This ME allows students to study ecosystems, biodiversity, environmental issues and conservation efforts. Students learn directly in the marine ecosystem with a variety of enjoyable learning experiences, so that in developing this ME, it integrates experiential learning models and joyful learning strategies. Experiential learning facilitates students opening their senses to nature and bonding with nature to increase their acceptance of environmental realities. Maloof in Koutsoukos et al., (2015) said that environmental education based on experiential learning has been widely accepted, this

method seems more appropriate, more effective and beneficial for students. Mangrove ecosystems can be used as a learning resource for environmental education based on experiential learning through the marine edutourism model. This research aims to 1) conduct a study of the potential of the Kuala Selangor National Park mangrove ecosystem for the development of environmental education learning tools and 2) implement the experiential and joyfull learning-marine edutourism (EJoy-ME) learning model based on the potential of Kuala Selangor National Park to increase students' environmental literacy.

Methods

The main method are developmental research on the preparation of EJoy-ME learning tools and experiments when testing the effectiveness of EJoy-ME on students' environmental literacy. Field observations were carried out in the Kuala Selangor Nature Park mangrove ecosystem to analyze the potential of nature as a learning resource for EJoy-ME. The fieldwork carried out consisted of (1) observation and identification of true and associated mangrove species; (2) observation and identification of mangrove ecosystem biota; (3) interviews with managers related to the use and management of mangrove ecosystems; (4) area observations and manager interviews related to threats and damage to the mangrove ecosystem; (5) assessment of the suitability and potential of existing ecosystems for learning about the environment; (6) assessment of the safety of visitors or students as research subjects. This is also aimed at choosing the right location for implementing EJoy-ME for students. This ecosystem was chosen based on consideration of its potential as an environmental learning resource, its strategic location, and safety or student security considerations. Next, the development of the EJoy-ME learning tool according to the potential of Kuala Selangor National Park was carried out. The tools developed are student worksheets, mangrove ecosystem material booklet, and knowledge aspect environmental literacy assessment instrument.

Samples were taken by purposive sampling. The subjects of this research were 44 class VII students at the Sekolah Indonesia Kuala Lumpur (SIKL). Students are taken based on research needs, namely suitability of levels that have environmental material curriculum targets and all students are taken at one level. Students receive environmental education through the EJoy-ME learning model based on the potential of Kuala Selangor Nature Park and using learning tools that have been developed. Data collection was carried out by giving pretests and posttests to research subjects. Students are given a pretest and posttest before and after EJoy-ME learning. This environmental literacy measuring tool is a multiple choice test developed from the environmental literacy indicators of the North American Association for Environmental Education (NAAEE). The instruments used have been validated by biology learning experts and ecology experts. The instrument has also been declared valid in construct, content and empirically as a tool for measuring environmental literacy. Students are also given a response questionnaire to see student satisfaction and experience with learning activities. Quantitative data resulting from environmental literacy measurements were analyzed quantitatively, while data resulting from research subjects' responses regarding the implementation of EJoy-ME were analyzed qualitatively. These two things were done to find out whether EJoy-ME was able to increase environmental literacy and how research subjects responded to EJoy-ME.

Results and Discussion

Studies and observations of the Kuala Selangor Nature Park show that the mangrove ecosystem of the Kuala Selangor Nature Park has great potential to be used as a resource for environmental learning through EJoy-ME. Topics that can be used in learning to use this potential include: (a) components of the mangrove ecosystem; (b) mangrove biodiversity; (c) interactions in the mangrove ecosystem; (d) the role and function of the mangrove ecosystem; (e) threat of damage to the mangrove ecosystem; and (f) efforts to preserve the mangrove ecosystem. Threats and damage in the mangrove ecosystem can be used as study material for students through case studies so that students find solutions to problems. Students can make direct observations of the mangrove ecosystem. Apart from the mangrove ecosystem itself which is a tourist attraction, there are other attractions in the ecosystem area, namely views of the beach next to the mangrove ecosystem, attractive fauna in the ecosystem such as monkeys and salamanders, tracking in the mangrove ecosystem area, and other interesting attractions. Therefore, activities in the EJoy-ME learning model can integrate the use of tourist objects or attractions in the mangrove ecosystem with learning activities, such as planting mangrove seedlings, observations, case studies, and interviews with local residents.

The EJoy-ME learning model is implemented by following the EJoy-ME syntax and using learning tools that have been developed previously. This activity involves Kuala Selangor Nature Park guides who act as EJoy-ME teachers or facilitators. The following are the steps for implementing the EJoy-ME learning model:

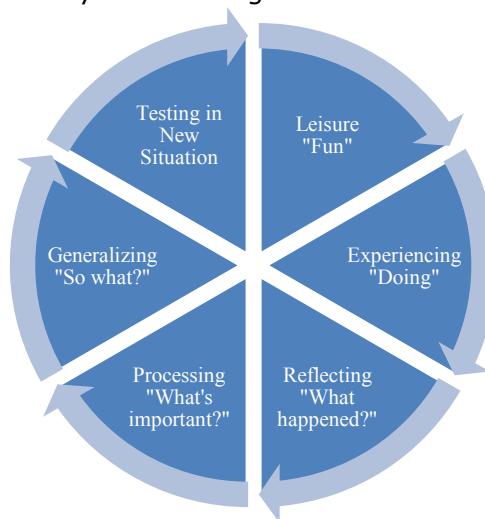


Figure 1. Sintaks of EJoy-ME Learning Model

1. "Fun" or Leisure

This activity builds students' enthusiasm in studying the mangrove ecosystem. Ecotourism objects at marine tourism locations are a fun way to interact with the marine ecosystem. Marine tourist attractions are an alternative to provide a fun atmosphere for learning. In the mangrove ecosystem at Kuala Selangor Nature Park, the attractions provided are interacting and observing the monkey population and planting mangrove seedlings.

2. "Doing" or Experiencing

Students are given learning experiences. Students learn about the mangrove ecosystem and its conservation efforts, so it is hoped that from this activity students will have

environmental literacy aspects of knowledge. Learning experiences are provided in the form of case studies, observations, interactions with tourist attractions and discussions with guides.

3. Reflecting "What Happened?"

Students share the results of their learning experiences with their friends. Students exchange experiences and discuss feelings resulting from their experiences. The results of this reflection will determine students' views and actions towards the environment.

4. Processing "What's Important?"

Students analyze the results of their reflections to form new abstract concepts in their minds. Understanding this new concept will influence decision making regarding environmental problems.

5. Generalizing "So What?"

Learners relate experiences to real world examples. Students are given environmental problems, then generalize and make decisions on these problems.

6. Testing in New Situations

Students apply learning outcomes to new environmental problems and implement pro-environmental actions in everyday life. EJoyME can be started by looking at students' pro-environmental attitudes while at marine tourism locations. Students can also be asked to propose solutions to environmental problems that exist in everyday life.

The EJoy-ME learning model based on the local potential of Kuala Selangor Nature Park has proven to be effective in increasing the environmental literacy of SIKL students. This is shown by the increase in the environmental literacy score for the knowledge aspect of the results of students' pretest and posttest measurements (presented in figure 2). The positive results of this model cannot be separated from the basic development of the model syntax, namely the integration of experiential learning models and joyful learning strategies. Experiential learning provides students with concrete experiences and opportunities to use their active cognition to intentionally increase knowledge (Kalafatis *et al.*, 2019). Students will seek continuity between past and present experiences, so that personal decisions will maintain continuity either by rejecting new information or to update previous understanding. Students' experiences interacting with the environment or being exposed to environmental problems will be constructed in memory and influence students' pro-environmental decisions. Environmental education and experiential learning are closely related. Methods such as case studies, simulations, visits, debates, projects, and guided inquiry facilitate learning and support students in understanding real-world problems (Kalafatis *et al.*, 2019). In addition, experiential learning facilitates students opening their senses to nature and bonding with nature to increase their acceptance of environmental realities. The joy of learning has a positive influence on students. Happiness can increase intrinsic motivation, provide educational experiences through positive emotions, and people who feel happy tend to function better in life (Lucardie, 2014). EJoy-ME provides joy during learning through interaction with the marine environment which amazes him and the diversity of marine tourism attractions. Reflection in the EJoy-ME syntax is a process in which an individual becomes aware of an environmental problem and then considers the best way to solve the problem. The results of reflection on experiences with environmental problems will influence one's actions towards the environment. Therefore, the EJoy-ME model can be an alternative environmental education to increase students' environmental literacy.

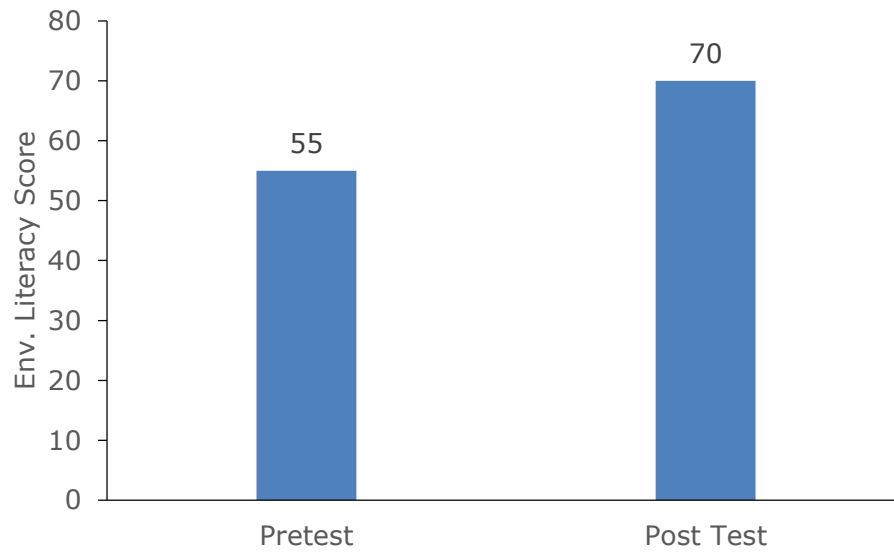


Figure 2. Graph of Increasing Environmental Literacy

Apart from that, the results of the student response questionnaire to EJoy-ME based on local KSNP potential show the positive impact of EJoy-ME, namely as follows.

1. Environmental education through EJoy-ME provides satisfactory information/material services for students. This is shown in figure 3, the data from students who stated that 41% were very satisfied and 57% were satisfied with the service providing environmental education materials.

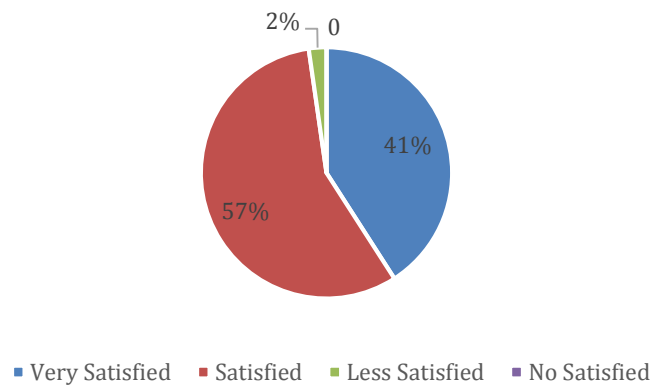


Figure 3. Material Service Satisfaction Response Diagram

2. The learning process through the EJoy-ME syntax provides satisfaction for students in receiving environmental education services. This is shown in figure 4, from the response data that 75% of students were satisfied with the stages of the learning process or activities provided in EJoy-ME.

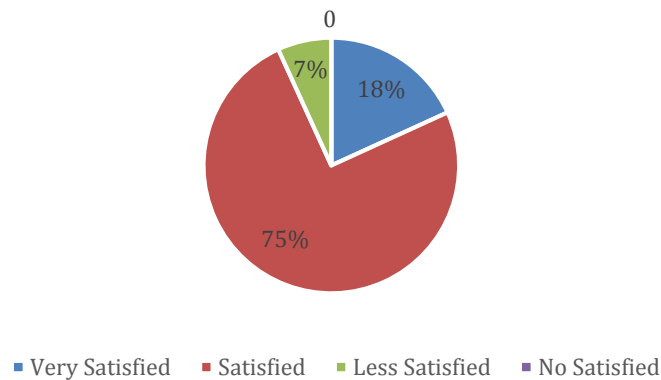


Figure 4. EJoy-ME Learning Process Satisfaction Response Diagram

3. EJoy-ME provides a fun environmental learning experience for students. This is shown in figure 5, from the response data that 80% of students said learning was fun and 20% of other students said it was very fun.

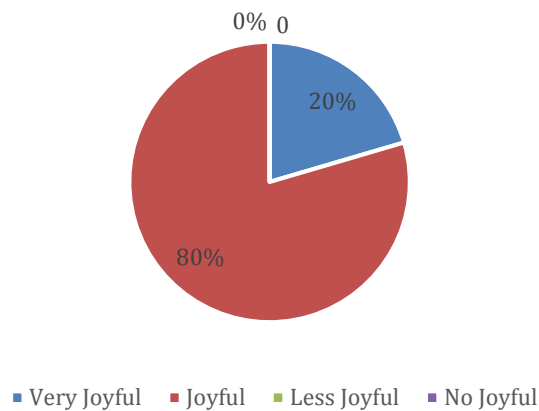


Figure 5. Joyful Learning EJoy-ME Response Diagram

4. The positive response to the EJoy-ME model based on the local potential of Kuala Selangor Nature Park provides reinforcement that this model is very good for application in environmental education or integrated into science or biology subjects.

Environmental education based on experiential learning is effective if carried out outdoors (Szczytko, et al., 2018) with field studies or field trips (Yang & Lau, 2019), so this fits the concept of ME. Travel is believed to foster the growth of enlightenment, broaden horizons, and enrich knowledge about history, culture, and community (Yang & Lau, 2019). Interacting with the environment is able to develop a closer relationship with nature and has a tendency to have pro-environmental actions. Outdoor experiences allow students to see directly the various components of the environment that influence each other (Jose, et al., 2017). Kossack & Bogner in Jose, et al. (2017) said that a one-day outdoor field experience has a positive effect on knowledge and attitudes and a sense of connection with nature. Learning with nature also allows students to explore natural problems (Doering & Veletsianos, 2008). Therefore, the EJoy-ME model by providing direct experience at Kuala Selangor Nature Park has a more effective impact in increasing environmental literacy.

Conclusion

This developmental research succeeded in assessing the potential of the Kuala Selangor Nature Park mangrove ecosystem. This potential is packaged in environmental learning through the experiential and joyful learning marine edutourism (EJoy-ME) learning model. The implementation of this learning activity succeeded in increasing students' environmental literacy. The EJoy-ME learning model based on the potential of Kuala Selangor Nature Park can increase the environmental literacy of Kuala Lumpur Indonesian School students. It's based on the increase of student's pretest posttest score during the implementation of Ejoy-ME learning model. Positive responses were also obtained from students regarding this learning model, namely providing material satisfaction, satisfaction with the learning process, and providing a pleasant learning experience.

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References

- Asri, M., Wahyuni, E.S., & Satria, A. 2019. Destructive fishing practices, *Sodality: Jurnal Sosiologi Pedesaan*. doi: 10.22500/sodality.v7i1.24782.
- Dirhamsyah. 2012. IUU fishing in Indonesia's live reef fisheries, *Australian Journal of Maritime & Ocean Affairs*, 4(2):44–52. doi: 10.1080/18366503.2012.10815700.
- Doering, A. & Veletsianos, G. 2008. What lies beyond effectiveness and efficiency? Adventure learning design, *Internet and Higher Education*, 11(3–4):137–144. doi: 10.1016/j.iheduc.2008.07.004.
- Hayati, R.S. 2017. Edutourism taka bonerate national park through scientific approach to improve student learning outcomes, *Journal of Physics: Conference Series*, 755(1):1–7. doi: 10.1088/1742-6596/755/1/011001.
- Hayati, R.S., Putu, I.G. & Paidi. 2021. Marine edutourism based on local wisdom of Bajo Tribe in Wakatobi National Park as an environmental education alternative, *International Conference on Education, Teacher Training, and Professional Development*, 45–50. doi: 10.23917/bkkndik.v5i1.22555.
- Hollweg, K.S., Taylor, J.R., Bybee, R.W., Marcinkowski, T.J., McBeth, W.C., & Zoido, P. 2011. Developing a framework for assessing environmental literacy. Washington, DC: North American Association for Environmental Education. <http://www.naaee.net>.

- Jose, S., Patricia, G., Patrick, & Moseley, C. 2017. Experiential learning theory: the importance of outdoor classrooms in environmental education, *International Journal of Science Education, Part B Communication and Public Engagement*. 8455. doi: 10.1080/21548455.2016.1272144.
- Joseph, M. 2021. Checklist of spiders in Kuala Selangor Nature Park checklist, *Journal of Wildlife and Parks*, 35:105-116. <https://www.wildlife.gov.my/index.php/en/penerbitan/403-jilid-35-2020>.
- Kalafatis, S.E., Neosh, J., Libarkin, J.C., Whyte, K.P., & Cladwell, C. 2019. Experiential learning processes informing climate change decision support. *Weather, Climate, and Society*, 11(3):681–694. doi: 10.1175/wcas-d-19-0002.1.
- Koutsoukos, M., Fragoulis, I. & Valkanos, E. 2015. Connection of environmental education with application of experiential teaching methods: a case study from Greece, *International Education Studies*. 8(4):23–28. doi: 10.5539/ies.v8n4p23.
- Latif, R.A., Sekaran, H.R., & Saaidin, M. 2020. Assessing ecotourism product at Kuala Selangor Nature Park. *International Journal of Management*, 11(12). doi: 10.34218/ijm.11.12.2020.035.
- Lucardie, D. 2014. The impact of fun and enjoyment on adult's learning. *Procedia - Social and Behavioral Sciences*, 142:439–446. doi: 10.1016/j.sbspro.2014.07.696.
- Monintja, S. & Supriharyono. 2001. Coral reef management in taka bonerate marine national park, South Sulawesi (a case study for the alternative to destructive fishing practices on coral reefs), *Journal of Coastal Development*, 5(1):1–11. Available at <https://ejournal.undip.ac.id/index.php/coastdev/article/view/4230/3856>.
- Nawang Sari, D., Muryani, C. & Utomowati, R. 2018. Pengembangan wisata pantai Desa Watu Karung an Desa Sendang Kabupaten Pacitan Tahun 2017, *Jurnal GeoEco*, 4(1):31–40. doi: 10.7667/PSPC171349.
- Omar, H., Husin, T.M. & Parlan, I. 2020. *Status of mangroves in Malaysia*, Forest Research Institute Malaysia. Selangor: Tihani Cetak. doi: 10.1021/ie50647a010.
- Ramdas, M. & Mohamed, B. 2014. Impacts of tourism on environmental attributes, environmental literacy and willingness to pay: a conceptual and theoretical review, *Procedia - Social and Behavioral Sciences*, 144:378–391. doi: 10.1016/j.sbspro.2014.07.307.
- Santoso, R., Roshayanti, F., & Siswanto, J. 2021. Analisis literasi lingkungan siswa SMP, *JPPS (Jurnal Penelitian Pendidikan Sains)*, 10(2):1976–1982. <https://journal.unesa.ac.id/index.php/jpps>.
- Shin, L.S., Muhamad, A., & Tong, J. 2015. *Mangrove: Guidebook for Malaysia*. Selangor: Wetlands International Malaysia.

- Kobayashi, K., Westlund, H., & Jeong, H., 2021. *Social capital and entrepreneurship development in rural areas*. Japan: Marginal Areas Research Group (MARG).
- Szczytko, R., Stevenson, K., Peterson, M.N., Nietfeld, J., & Strnad, R.L. 2018. Development and validation of the environmental literacy instrument for adolescents, *Environmental Education Research*, 1–18. doi: 10.1080/13504622.2018.1487035.
- Yang, F. X. & Lau, V. M. C. 2019. Experiential learning for children at World Heritage Sites: The joint moderating effect of brand awareness and generation of Chinese family travelers, *Tourism Management*, 72:1–11. doi: 10.1016/j.tourman.2018.11.011.