



Circular Behavior Index

EXECUTIVE SUMMARY



Introduction

The philosophy of circular economy can be explained by a paradigm shift where not only the producers but also the consumers apply a totally circular mindset. Today's young people will be the major force for implementing changes towards a circular, sustainable future. The Erasmus+ project [„Closing the Loop Along with the Youth“ \(CLAY\)](#) develops and provides a set of tools that can help young people fully understand the necessity of a circular economy.

The primary objective of the project is to raise the awareness of future generations for the concept of circular economy that eliminates waste by design, keeps products and materials in use at their highest value for as long as possible, and aims at regenerating the ecosystem.

In order to find and develop tools that raise young people's awareness for circular economy, it is important to understand their *current perceptions* and *behaviors* towards circular economy, and a specific tool is needed to measure these perceptions and behaviors. Therefore, the development of a Circular Behavior Index is part of project CLAY.

This executive summary gives an overview of the development of the Circular Behavior Index in project CLAY.

Circular Behavior Index

The Circular Behavior Index developed in project CLAY is a benchmarking tool to assess young people's perceptions and behaviors regarding circular economy. It is also a statistical tool to measure the change of perceptions and behaviors regarding circular economy over time.

The Circular Behavior Index is based on a specifically developed questionnaire (43 items/questions with 5 answer options). By applying a statistically developed formula, an index score (range 0 to 100) can be calculated for single respondents and enables comparisons between respondents and with the same respondents over time.

Methodology

In a first step, a preliminary set of items for the index was developed, based on the research done and the outputs developed in the Circular Economy Methodological Framework. The lead partner of this output, SBTC from Turkey, developed the preliminary index items (a question pool of 54 questions), which were then reviewed by all project partners.

The preliminary set of items was then evaluated by five external experts in each project partner country. The experts were asked to evaluate the items regarding their necessity (from “the item is not necessary”, “the item is necessary but major revision required”, “the item is necessary but minor revision required”, “the item is necessary”) and give their opinions/suggestions on each of the items. The expert feedback was used to calculate the Content Validity Ratio of the items. Items outside acceptable value ranges were deleted, and



items within acceptable value ranges were reviewed and updated according to the experts' opinions/suggestions. The items in the questionnaire were divided into a "perception" and a "behavior" part.

The updated items were then translated into all partner languages, and a pilot test was conducted by all partners in their respective countries. The index items were tested for their understandability by the young people (answer options from "completely understand" to "not understand at all") and each partner collected at least 40 responses. The results of the pilot test were again used to update the index items.

With the pilot tested index items, the validity and reliability of the index was measured. The updated 54-item questionnaire was again tested with the target group, this time with answer options from "completely agree" to "totally disagree". Each partner collected 180 or more responses from the target group, yielding a total of 780 usable responses.

The construct validity of the index was tested with Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). For this purpose, the data set was randomly divided into two parts, and while exploratory factor analysis (EFA) was applied to one half, confirmatory factor analysis (CFA) was applied to the other. Statistical analysis was also carried out to determine the normality of the distribution, as well as skewness and kurtosis coefficients.

Kaiser Meyer Olkin (KMO) value and Bartlett Sphericity Test (BST) were used to examine the data, to determine whether the data was suitable for factor analysis. For both parts, the "perception" and the "behavior" set of items, KMO and BST significantly confirmed the suitability of the data for factoring.

Results

With the results of the reliability and validity test, the final set of items for the Circular Behavior Index was created. The final version of the CBI consists of 43 items, which measure two main and eight sub-dimensions of circular economy perception and behaviors of young people. The following table gives an overview of the final version of the index items.



CLAY perception index items
IT1. I have an interest in circular economy.
IT2. I know what circular economy is about.
IT3. I am interested in circular economy practices at a global level.
IT4. I am interested in circular economy practices at my country level.
IT5. I know the meaning of the circular economy labels (ecolabel).
IT6. The products and services design is an important feature of a circular economy.
IT7. Digital technology plays an important role in the circular economy.
IT8. Business models need to be re-thought for the circular economy.
IT9. Waste needs to be used as a resource in a circular economy.
IT10. A circular economy needs to be based on regenerative resources.
IT11. Collaboration and cooperation are the main features of a circular economy.
IT12. I know the appropriate recycling process will reduce the waste of natural resources.
IT13. Within a circular economy, "zero waste" is the target and the added value.
IT14. I know the importance of separating waste at the household level for the circular economy.
IT15. I am aware that reuse is among the good practices (applications) of the circular economy.
IT16. I am aware that my country is working for the development of a circular economy.
IT17. I am aware that electronic waste (e-waste) can be recovered to generate new materials.
IT18. I am aware that plastics and packaging can be recovered and reused (to generate new materials).
IT19. I am aware that in the agricultural and food sector waste can be reduced and circularity increased.
IT20. I am aware that in the fashion and clothing sector waste can be reduced and circularity increased.
IT21. I am aware of the extent to which the Internet is contributing to the development and management of the circular economy.
IT22. I am aware of the benefits deriving from the efficient use of natural resources for a circular economy.
CLAY behavior index items
IT23. When purchasing computer equipment (PCs, laptops, etc.), I decide based on its durability.
IT24. When purchasing clothes, I decide based on its durability.
IT25. When purchasing computer equipment (PCs, laptops, etc.), I decide based on its reparability.
IT26. When purchasing a computer smartphone, I decide based on its reparability.
IT27. I follow a lifestyle that is as sustainable as possible (e.g. I don't waste water, I don't waste food, I don't use too much heating).
IT28. I contribute to the reduction of global environmental problems like climate change, global warming, etc.
IT29. I am interested in and follow on social media, the issues about waste management and recycling to apply them in my daily life.
IT30. I buy second-hand products.
IT31. I am keen on repairing and recycling.
IT32. I check out and recycle all material that can be recycled.
IT33. I use public transportation rather than a private car.
IT34. I bike for short driving (0-10 km) distances.
IT35. I bike for long driving (10-20 km) distances.
IT36. I collect used batteries and light bulbs for recycling.
IT37. I bring used jeans and clothes to clothing collection boxes.
IT38. I bring used jeans and clothes for swapping.
IT39. I find out about possible methods to reduce my energy usage.
IT40. I find out about possible methods to reduce my material usage.
IT41. I rent and borrow computer equipment (PCs, laptops, etc.) instead of buying them
IT42. I rent and borrow mobile phone accessories instead of buying them
IT43. I rent and borrow clothes instead of buying them.



Also, a digital calculator was developed to evaluate your personal CLAY index score.

[CLAY Index Calculator](#)

The digital calculator and an interactive version will be included in the CLAY OER platform together with the CLAY training materials.

Conclusion

The Circular Behavior Index developed in project CLAY represents an important benchmarking tool for countries, training providers and other stakeholders to assess young people's perception and behavior regarding circular economy.

The results of the development of the Circular Behavior Index will be used to structure the content of the CLAY training materials and will be integrated into the CLAY Open Educational Resources (OER) platform as well.

The full report (in English) on the Circular Behavior Index development is available on the [project website](#).