

Building adult competences in Zero Waste circular  
economy in Europe

**IQ1: Baseline report and innovative training curriculum**

Q1A1- Trends in zero waste CE and baseline report

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## Building adult competences in Zero Waste circular economy in Europe

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## Building adult competences in Zero Waste circular economy in Europe

### 1. Introduction

Building adult competences in Zero Waste Circular Economy in Europe (Zero-Waste) is an innovation project that is co-funded by the Erasmus + of the European Union. It aims to identify the current state of development of the zero-waste circular economy in the EU zone, as well as to encourage change of behavior and promote resource maximization in the most effective way among public and private actors. In order to achieve this, the project will include an innovative curriculum and training guide to increase the competences of adult learners on the zero-waste circular economy. The project also aims to boost the self-employment and entrepreneurial opportunities that a circular economy offers.

This questionnaire's main goal is to assess the current knowledge base regarding Zero Waste Circular Economy and Zero Waste Cities, especially when it comes to the associated needs and benefits that could derive from it.

As a first activity (*Q1A1- Trends in zero waste CE and baseline report*), we have elaborated state of the art and a baseline report. It provides information on the waste infrastructure and a baseline of current zero waste CE and zero waste city concept. This provides information on the zero waste CE and zero waste city infrastructure in each partner country. This part of the project included a questionnaire given to adult educators and education providers to determine the baseline of current knowledge. The Questionnaire was developed by the Output Leader and finalized by getting the partners comments and contributions. The partners decided that one question in the questionnaire separated for the national knowledge. Each partner collected at least 25 questionnaires. A gap analysis was done based on the results of the questionnaire highlights best practice in each region providing opportunities for sharing educational materials and to provide a focus for the guide for adult educators, students and residents.

Major expected outputs of this activity (Q1A1) are design and implementation of a training strategy based on the analysis of the current state of development and application of the zero waste CE in the partners' countries, needed to detect which our baseline is and to trace the way forward.

### 2. Methodology

The questionnaire was prepared by the SWIDEAS and Balikesir University and shared with the partners to review it and get the comments. According to the request, specific question related to the national policy implementation in partners' countries were added. It was translated to national languages.

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In total there were 17 questions, out of which 4 were related to the general information about the respondents and 13 to the knowledge and/or experiences with the Zero Waste and Circular economy. Afterwards, the online survey was created using google docs.

The survey was launched on February 2021 and the request to fill in the survey was distributed through communications channels of Zero-Waste team, social media and mailing lists. The online survey was opened for three weeks. The survey was closed with quite a low return rate of at least 25 respondents for each partner, but the initial goal was reached. However, the expectation of the evaluation team was higher. Given the circumstances of pandemic situation and low interest of people in general to participate in any surveys it was considered as satisfactory. It was most probably also affected by very low knowledge and understanding of the topic of the Zero Waste and Circular Economy implementation. Evaluation of the survey outcomes also proved that those 25 respondents were predominantly from the stakeholders that have a direct experience with the Zero Waste and Circular Economy.

In Turkey, a total of 174 respondents participated in the survey. In Slovakia total number of the respondents was 25, in Spain 26, in Sweden 30 and 36 in Republic of North Macedonia. The total number of the respondents was 291. By this way more respondents (291) than we aimed on the project proposal (175) participated in the questionnaire.

### 3. Results

#### Personal data

##### *Institutions:*

*In Turkey*, the institutions of the participants are mostly higher education institutions (academics and students), municipalities, public bodies active in education, higher education institutions, adult educators, teachers and mechanical engineers and civil engineers. They have worked on adult education, public bodies such as Ministry of Education, universities, municipalities and the private sector and SMEs active in recycling.

*In Slovakia*, the most institutions of participants are mostly academic institutions, professors (33%), followed by students (MSc. And PhD) and persons at manager position, such as director/CEO/manager.

*In Spain*, most of participants come from higher institutions, people are working in a position that requires a doctoral degree and students.

*In Sweden*, the respondents represented the higher education institutions, students and/or had a master degree. and other institutions related to CE education. The majority of the

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respondents identified themselves as “Individual who wishes to know more about how to implement Zero Waste-related educational activities”.

*In Republic of North Macedonia*, the most institutions of 36 participants are mostly business private companies but also academic institutions, professors, followed by students (MSc. And PhD.) And persons at manager position, such as director/CEO/manager as highest.

*In general*, the data collected related to the institutions of the participants indicate that they come from adult educations (adult educators) students and residents. They represent the higher education institutions (academic, students have MSc and PhD, staff of the municipalities, business private/managers/directors/CEO and workers in CE related sector. It is seen that evaluation of the survey outcomes also proved that much of the respondents were predominantly from the stakeholders that have a direct experience with the Zero-Waste and Circular Economy.

### ***Role and Education:***

*In Turkey*, most of the respondents have BSc in mechanical engineering and motor vehicles technology departments, PhD and MSc degrees. There are workers and managers mostly working at municipalities have BSc and MSc degrees.

*In Slovakia*, the most of participants are are professors, followed by students (MSc. and PhD.) and persons at manager position, such as director/CEO/manager have higher education degrees.

*In Spain*, persons have indicated that they are working in a position that requires a doctoral degree.

*In Sweden*, most of respondents were either students and/or had a master degree.

*In Republic of North Macedonia*, the most of the participants are business private companies, academic staff, and students in MSc/PhD.

In general, the participants in the survey were mostly have a BSc, MSc and/or PhD degrees. The managers/CEOs/staff of municipalities and workers have also higher education degrees.

### ***Years of experience:***

*In Turkey*, most of the participants have less than 5 years, followed by 10 participants with 6-10 years of experience.

*In Slovakia*, most of the participants has professional experiences less than 5 years, followed

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by professionals with 21-25 years of experiences.

*In Spain*, the distribution corresponding to the question years of experiences is relatively homogeneous, 40% of the participants have equal or more than 16 years of experience.

*In Sweden*, 55% of respondents had less than 5 years of experience.

*In Republic of Macedonia*, the participants (22.9%) have professional experiences less than 5 years, equally followed by professionals with 21-25 years of experiences also (22.9%). Then with experience of 11-15 years and 26-30 years with (14.3%)

*In general*, most of the participants in five partner countries have less than 10 years of experience.

### ***How do you define yourself:***

*In Turkey*, most of the participants defined themselves „Individual who wishes to know more about how to implement Zero Waste-related educational activities“ and „Organization that provides educational activities/support“.

*In Slovakia*, most of the participants defined themselves as a “Individual working with education”, followed by “Individual who wishes to know more about how to implement Zero Waste-related educational activities“.

*In Sweden*, one- third of the participants are working with education. Meanwhile, few of them were individuals who wish to know more about how to implement Zero Waste-related educational activities.

*In Republic of Macedonia*, most of the participants were willing to hear and learn more and they define themselves as “Individual who wishes to know more about how to implement Zero Waste-related educational activities“ followed ‘work for SME and/or Company generating waste’.

*In general*, most of the participants are working with education and they defined themselves „Individual who wishes to know more about how to implement Zero Waste-related educational activities“.

### **Self-assessment results – what do the respondents think they know**

*(from the first question)*

## Personal Knowledge/Experience

### *Please rate your level of knowledge on:*

*In Turkey*, most of the participants voted „Fair and „Good for their knowledge level on circular economy and recycling/reuse of waste except the question „Business and entrepreneurship opportunities for Zero Waste Circular Economy“. The participants mostly voted „Poor“ and „Fair“ for this question. The responses for ‘Very Good‘ were not much for all the questions.

*In Slovakia*, all participants vote „Fair” or „Good” for their knowledge level only on Circular economy concept. The responses evaluate on the Fair/Good level for “Relevant Policies for Zero Waste Circular Economy” and for Business and entrepreneurship opportunities for Zero Waste Circular Economy. The largest number of “Poor” level of knowledge has been linked with the Smart waste for Smart city.

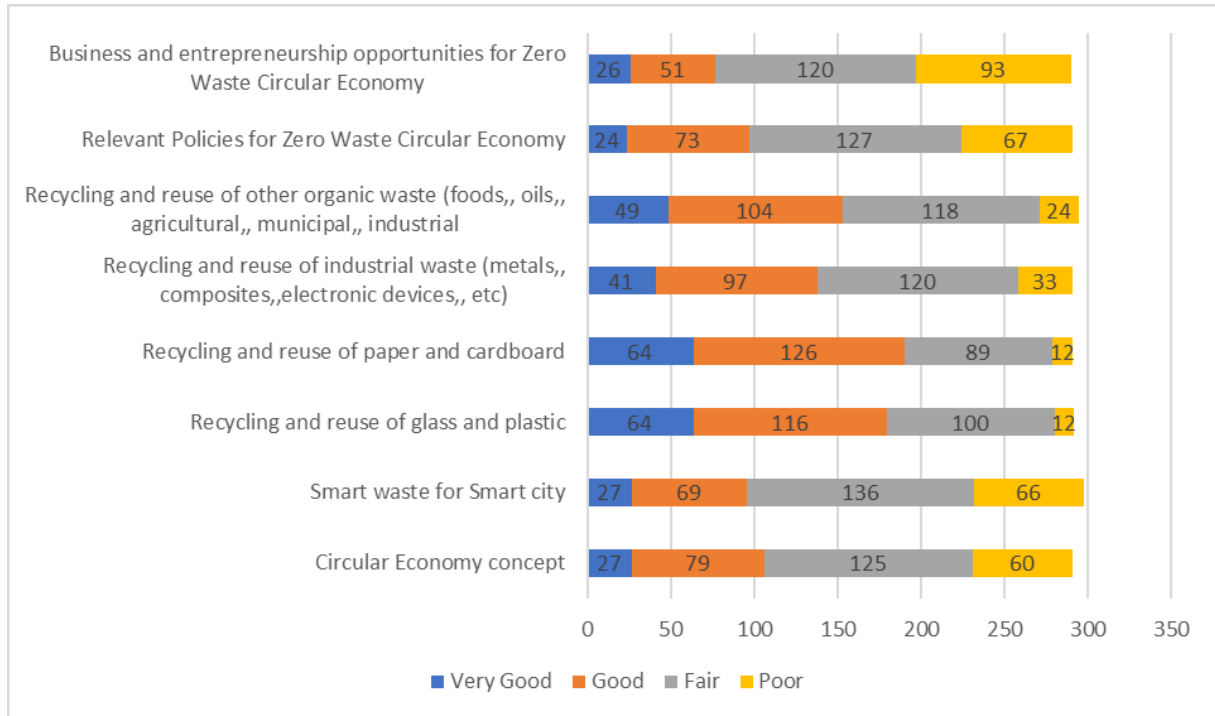
*In Spain*, the lack of knowledge for “Smart waste for Smart city”, “Relevant Policies for Zero Waste Circular Economy” and “Business and entrepreneurship opportunities for Zero Waste Circular Economy” highlights. On the contrary, the participants assume a good or very good knowledge of recycling common materials (glass, plastic bottles, and carton). Meanwhile, the knowledge for the rest of the items has punctuated average (between fair and good).

*In Sweden*, the respondents lack of knowledge (fair/poor) for „smart waste for smart city“, recycling and reuse of industrial waste and relevant policies for zero waste circular economy, business and entrepreneurship opportunities for zero waste circular economy.

*In Republic of Macedonia*, the participants vote „Poor” or 23% of all answers, „Fair” or 36% and „Good” or 30% of all participants to the questionnaire and “Very Good” or 11% for their knowledge level only on Circular economy concept. However, 44% evaluate on the Poor/Fair level for “Relevant Policies for Zero Waste Circular Economy” and 14 for Business and entrepreneurship opportunities for Zero Waste Circular Economy. The largest number of “Poor” level of knowledge has been linked with the relevant policies, which means that there is poor governmental activity in this area.

*In general*, the results indicate that the level of the participants in basic circular economy knowledge are not high, mostly „Fair/Poor in all partner countries“.

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### ***Please rate the following according to your knowledge:***

*In Turkey*, the participants mostly voted “Somewhat applies to me” and „Completely applies to me” for the questions. However, the responses for the question „I am aware of what the "9Rs" stand for” were mostly ‘Does not apply to me”.

*In Slovakia*, for this question the participants mostly indicated “Somewhat applies to me”, followed Does not apply to me.

*In Spain*, in these questions, the results were similar to Slovakia, Turkey, Sweden and Republic of North Macedonia which „Somewhat applies to me”, followed „Does not apply to me” voted by the participants. The best results were similar to the other countries obtained for the questions regarding the circular economy's definition. Contrary to this, the worst results appear for the concept „9Rs”, for including zero waste education in learning activities and waste ends up in my city/country when it isn't recycled/reused.

*In Sweden*, the participants indicated that the definition of the circular economy „Completely applies to me”. However, the worst results appear for the concept „9Rs”, for including zero waste education in learning activities and waste ends up in my city/country when it isn't recycled/reused.

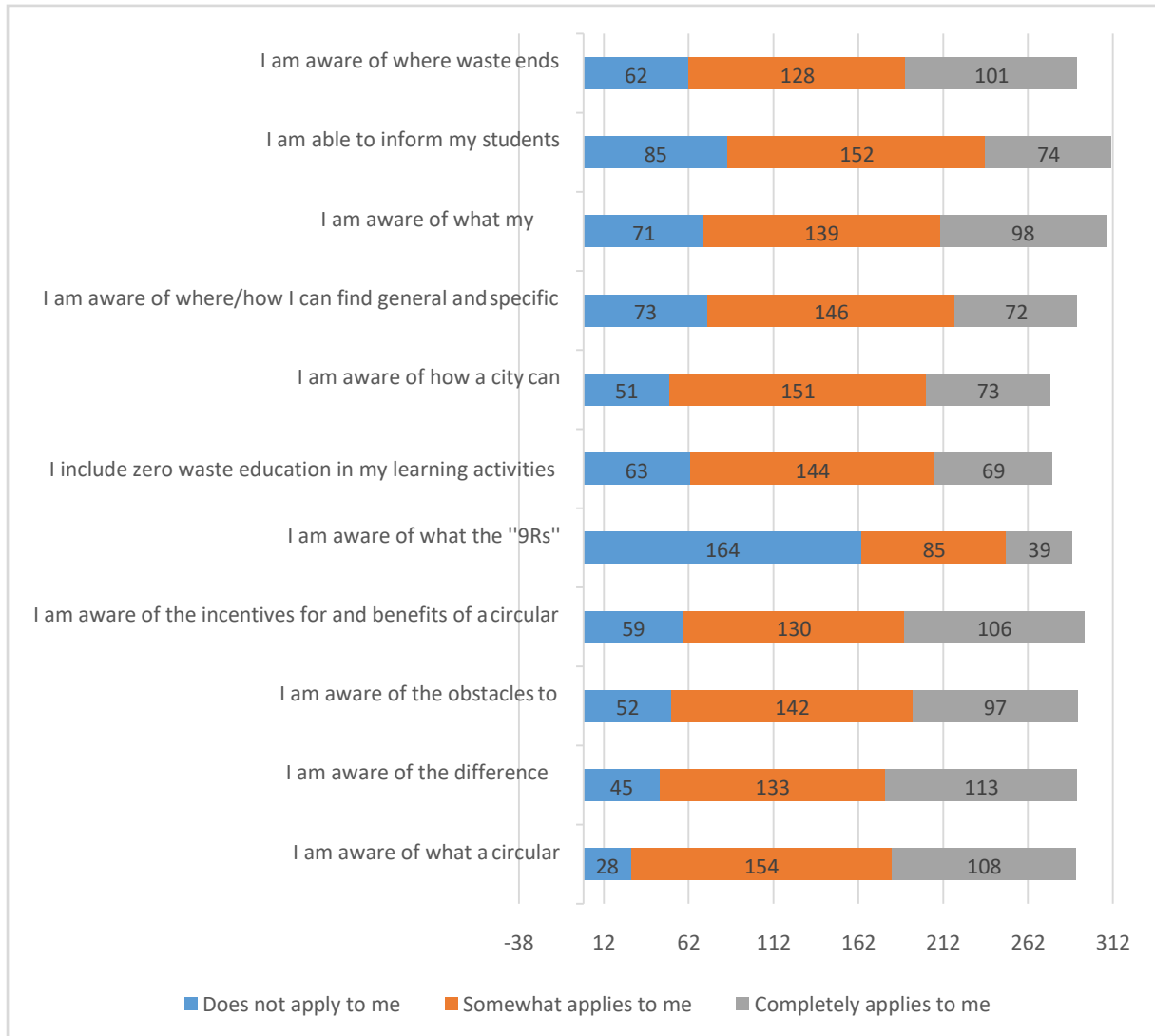


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*In Republic of Macedonia*, for this question is significant relatively high amount of answers – from 10 to 20 – for following questions: “I am aware of what the '9Rs' stand for”, “I include circular economy education in my learning activities”, “I am aware of what my municipality/country has been doing to promote the zero waste and circular economy ” and “I am aware of where/how I can find general and specific information related to the circular economy and/or zero waste” . On the other hand, the highest votes for “Completely applies to me to me“ have been received for the questions “I am aware of what the circular economy is” and “I am aware of the incentives for and benefits of a circular economy”.

*In general*, the results obtained from five partner countries showed that the participants mostly have knowledge on circular economy definition (Completely applies to me) but they don't have sufficient knowledge (Does not apply to me) on 9Rs“, for including zero waste education in learning activities and waste ends up in my city/country when it isn't recycled/reused. The results indicate they need to have knowledge on these specific issues of the circular economy.

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## What the respondents actually know General Knowledge

### *Please rate the following affirmations as True/False:*

*In Turkey*, the participants found the correct choices for the questions. However, the participants voted wrong choice for the questions: „The EU requires member states to recycle 80% of the waste they produce by 2020“ and "waste management" is the same as "resource management".

*In Slovakia*, most of participants correctly respond on the following questions: “The European Green Deal (EGD) aims at making Europe the first climate neutral continent by 2050”, “Programmes that reduce, reuse and recycle (3Rs) municipal waste do not make a difference in reducing greenhouse gas emissions”, “The EU required member states to recycle 80% of the waste they produce by 2020” and “The EU defines the following waste hierarchy: 1) Prevention; 2) Reuse; 3) Recycle; 4) Other recovery. However, the biggest number of wrong answers were received for the two questions: “The Earth Overshoot Day (the date when humanity uses up all of the resources that can be renewed in a year) is currently reached by August each year and ‘Waste management is the same as "resource management"”.

*In Spain*, the participants replied correctly to the questions but have answered a higher number of wrong answers to „The Earth Overshoot Day“, and „The EU requires member states to recycle 80% of the waste they produce by 2020“. Other questions with wrong answers were related to the EU waste hierarchy and equivalence between waste and resource management.

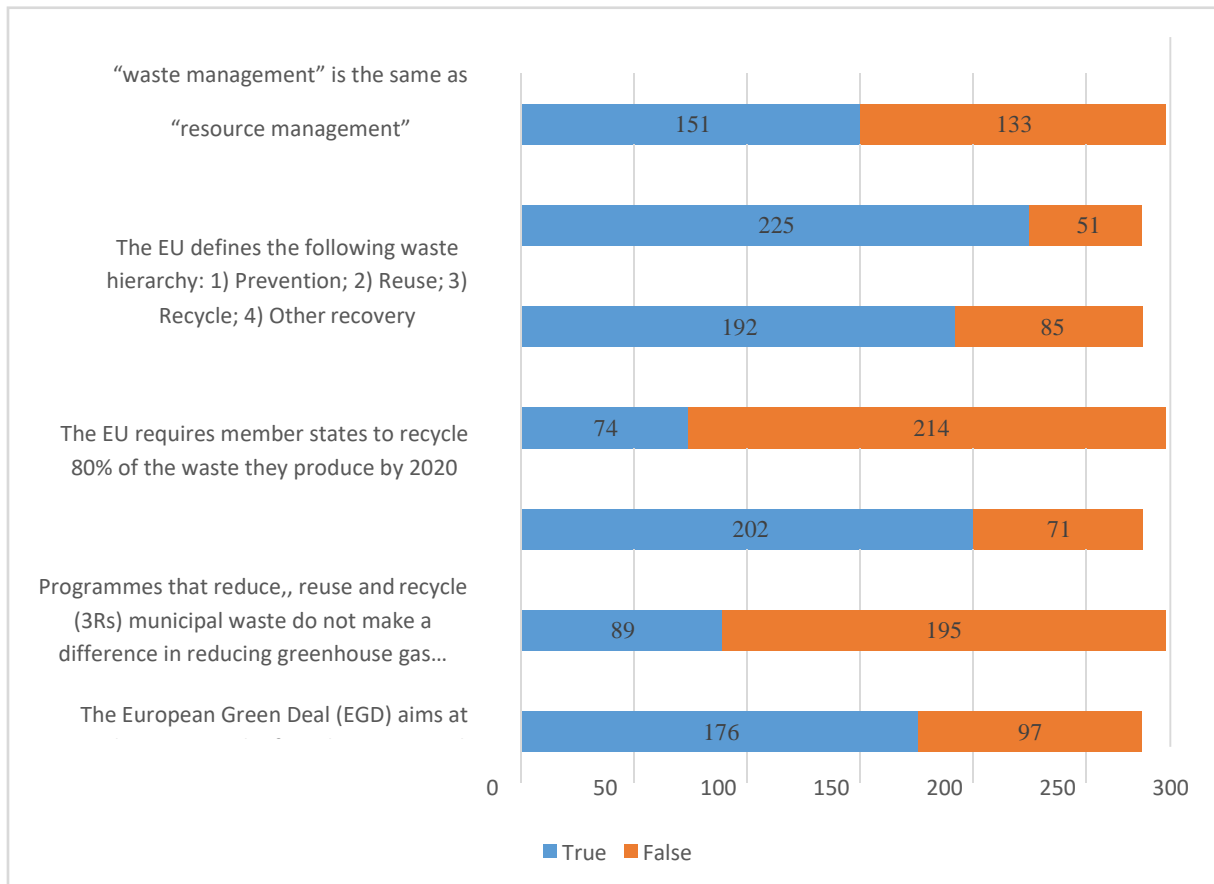
*In Sweden*, most of participants correctly respond on the questions but they couldn't find the correct choice for the question “The EU required member states to recycle 80% of the waste they produce by 2020”.

*In Republic of Macedonia*, most of participants correctly respond on the following questions: “The European Green Deal (EGD) aims at making Europe the first climate neutral continent by 2050”, “Programmes that reduce, reuse and recycle (3Rs) municipal waste do not make a difference in reducing greenhouse gas emissions”, “The EU required member states to recycle 80% of the waste they produce by 2020” and “The EU defines the following waste hierarchy:

1) Prevention; 2) Reuse; 3) Recycle; 4) Other recovery. Wrong and correct answers that were received for the two questions: “The Earth Overshoot Day (the date when humanity uses up all of the resources that can be renewed in a year) is currently reached by August each year“

and „Waste management is the same as "resource management".

*In general*, the answers on these questions indicate the necessity to educate target groups in the field of legislation related to the waste management and circular economy as well to explain the basic terms, waste management and resource management. The answers on these questions indicate the necessity to educate target groups in the field of circular economy and zero waste.



***Please rate the following affirmations as True/False in relation to the "Circular Economy":***

*In Turkey*, the participants found the correct choice for the questions on circular economy but they incorrectly know ‘the circular economy’ means ‘better recycling’.

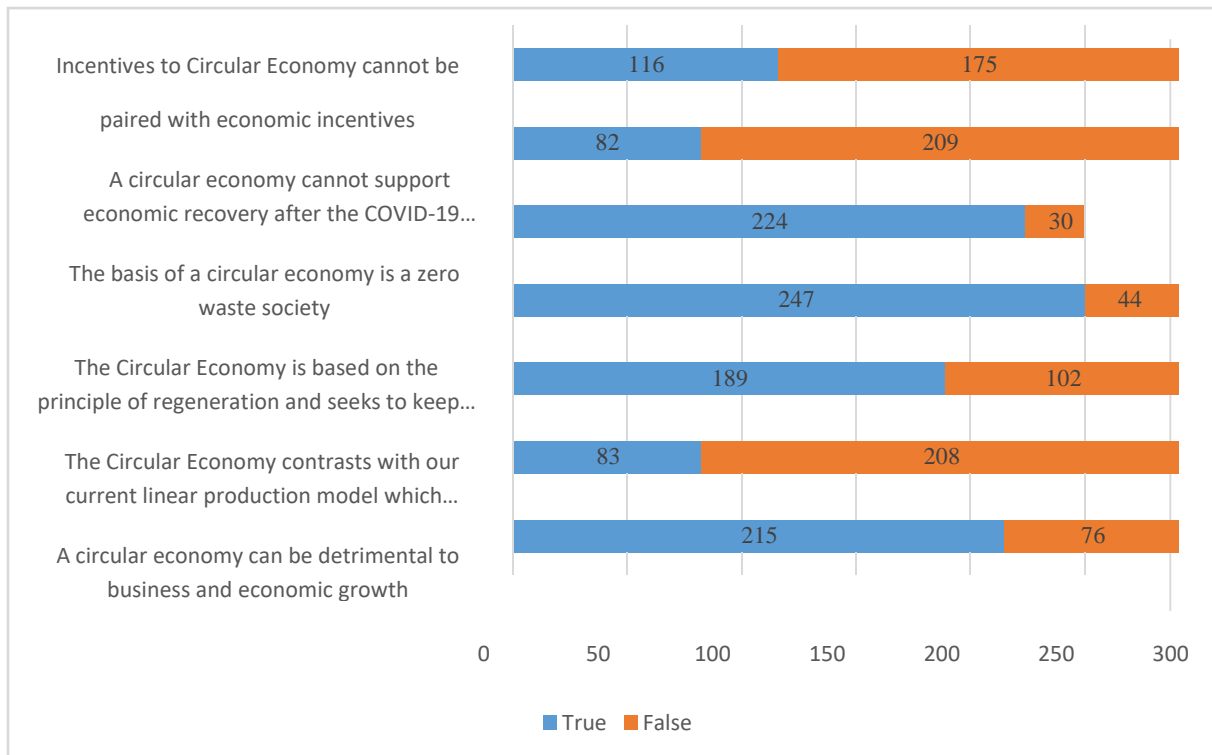
*In Slovakia*, participants did not find correct answers for two questions: “the circular economy” means „better recycling” and “Incentives to Circular Economy cannot be paired with economic incentives”. The questions “The Circular Economy contrasts with our current linear production model which operates as „take-make-dispose” and “The Circular Economy is based on the principle of regeneration and seeks to keep resources in circulation” were correctly answered by the highest number of the respondents.

*In Spain*, most of the participants answered this set of questions correctly. The only less participants remark corresponds to the equivalence between „the circular economy“ and ‘better recycling‘.

*In Sweden*, similar to the other partner countries most of the participants answered this set of questions correctly. However, they only remark corresponds to the equivalence between „the circular economy“ and „better recycling“.

*In Republic of Macedonia*, participants did not find correct answers for two questions: “„the circular economy“ means „better recycling“” and “Incentives to Circular Economy cannot be paired with economic incentives”. The questions “The Circular Economy contrasts with our current linear production model which operates as „take-make-dispose“” and “The Circular Economy is based on the principle of regeneration and seeks to keep resources in circulation” were correctly answered by the highest number of the respondents.

*In general*, the participants found the correct choices for the questions on circular economy but they incorrectly know ‘the circular economy‘ means ‘„better recycling‘. It means they need to educate on the differences between circular economy and beter recycling concepts.



***Please rate the following affirmations as True/False in relation to "Zero Waste" and "Zero Waste Circular Economy":***

*In Turkey*, the participants voted mostly correct answers for 11 questions on "Zero Waste" and" Zero Waste Circular Economy" but five of them were not correct choice.

*In Slovakia*, “Zero Waste focuses on people first”, “Zero waste businesses establish collaboration along the supply chain” and “Some zero waste businesses sell a service rather than a product, such as reusable and returnable containers” are the questions that most of participants correctly answered.

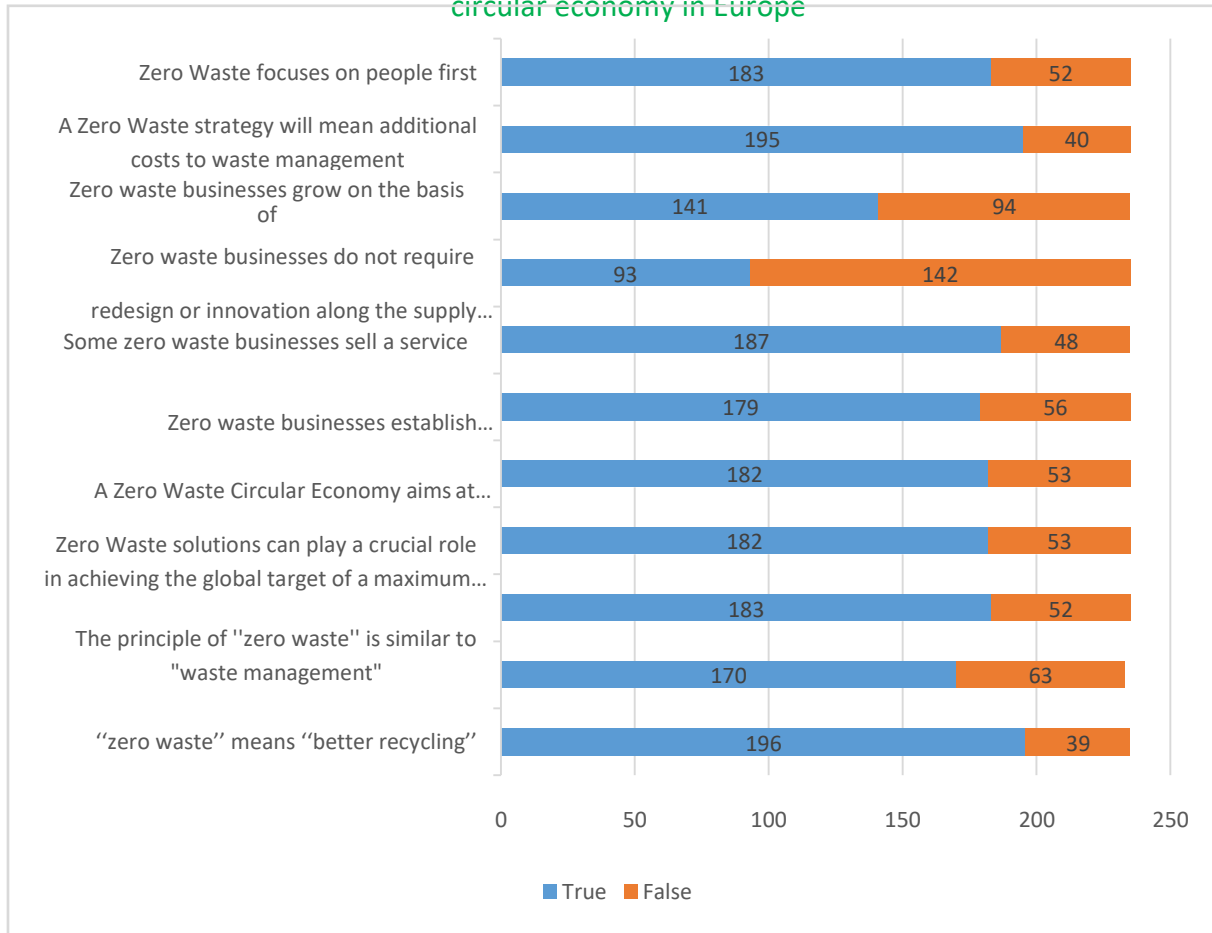
On the other hand, there is clear that participants do not understand the term „zero waste“, because only 5 correctly answered that it does not mean „better recycling“. Participants do not have knowledge how the role of the zero waste in global warming can be played, too.

*In Spain*, most of the participants answered this set of questions correctly. The only remark corresponds to the equivalence between „the circular economy“ and „better recycling“.

*In Sweden*, the results show the questions that most respondents replied questions „zero waste“ means „better recycling“ and „A Zero Waste strategy will mean additional costs to waste management“ wrongly. However, the respondents have less knowledge on circular economy.

*In Republic of Macedonia*, “Zero Waste focuses on people first”, “Zero waste businesses establish collaboration along the supply chain” and “Some zero waste businesses sell a service rather than a product, such as reusable and returnable containers” are the questions that most of participants correctly answered. On the other hand, there is clear that participants do not understand the term „zero waste“, because low number of responders correctly answered that it does not mean „better recycling“. Participants do not have knowledge how the role of the zero waste in global warming can be played, too.

*In general*, the respondents mostly wrong for the questions "Zero Waste" and "Zero Waste Circular Economy" „A Zero Waste strategy will mean additional cost to waste management“. It means that the participants confuse the meaning of the zero waste, recycling, and waste management. They don't have sufficient knowledge on these concepts. There is clear that participants do not understand the term „zero waste“, because correctly answered that it does not mean „better recycling“. Participants do not have knowledge how the role of the zero waste in global warming can be played, too.



***Please rate the following affirmations as True/False in relation to "Zero Waste Cities":***

*In Turkey*, the participants mostly voted the correct choice for the "Zero Waste Cities". However most of them incorrectly know that the principle of „Zero Waste cities is dependent on the principle of "smart cities".

*In Slovakia*, most of the participants of our survey is not familiarize with the concept of a Zero waste city, as prevalence part of them correctly answer only on the two questions – “Zero waste cites can be prompted with or without smart technologies” and “Maker spaces are resourceful to prompt zero waste cities”.

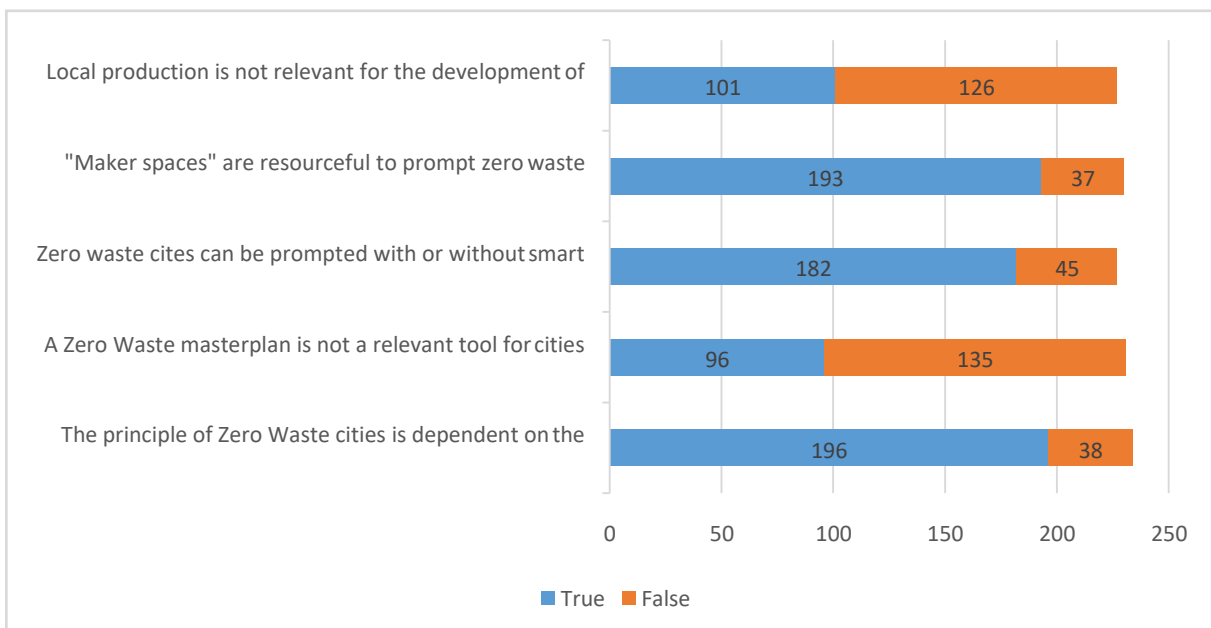
*In Spain*, these questions had a good percentage of right answers. The only question that caused doubts in the participants was the number of cities in Europe following a Zero Waste strategy.

*In Sweden*, The principle of Zero Waste cities is dependent on the principle of "smart cities".

*In Republic of Macedonia*, most of the participants of our survey is not familiarize with

the concept of a Zero waste city, as prevalence part of them correctly answer only on the two questions – “Zero waste cities can be prompted with or without smart technologies” and “Maker spaces are resourceful to prompt zero waste cities”. Only 5 respondents correctly identified that the principle of Zero Waste cities is dependent on the principle of "smart cities".

*In general*, the respondents dont have any sufficient knowledge on „Zero Waste cities is dependent on the principle of "smart cities" concept. The results also indicated the knowledge of the participants on "Zero Waste Cities" are not good. The reason for this status probably lay on the fact that the citizen are well aware about the technological principles of smart cities, but the concept of Zero waste cities is not familiar for them. The concept "Zero Waste Cities" should be incorporated into the curriculum.



***Do you agree with the following statements?***

*In Turkey*, the advantages of the circular economy to create new and good job opportunity mostly understood well by the participants.

*In Slovakia*, the most of respondents gave the correct answer on these questions. The highest number of correct answers has been found on the two questions related to the potential of the recycling economy to produce new job positions – “The development of a circular economy could generate as many as 326,000 net jobs by 2030, accounting for job losses in other sectors” and “Job creation in the reuse economy is significant”.

*In Spain*, these questions had a good percentage of right answers. The only question that caused doubts in the participants was the number of cities in Europe following a Zero



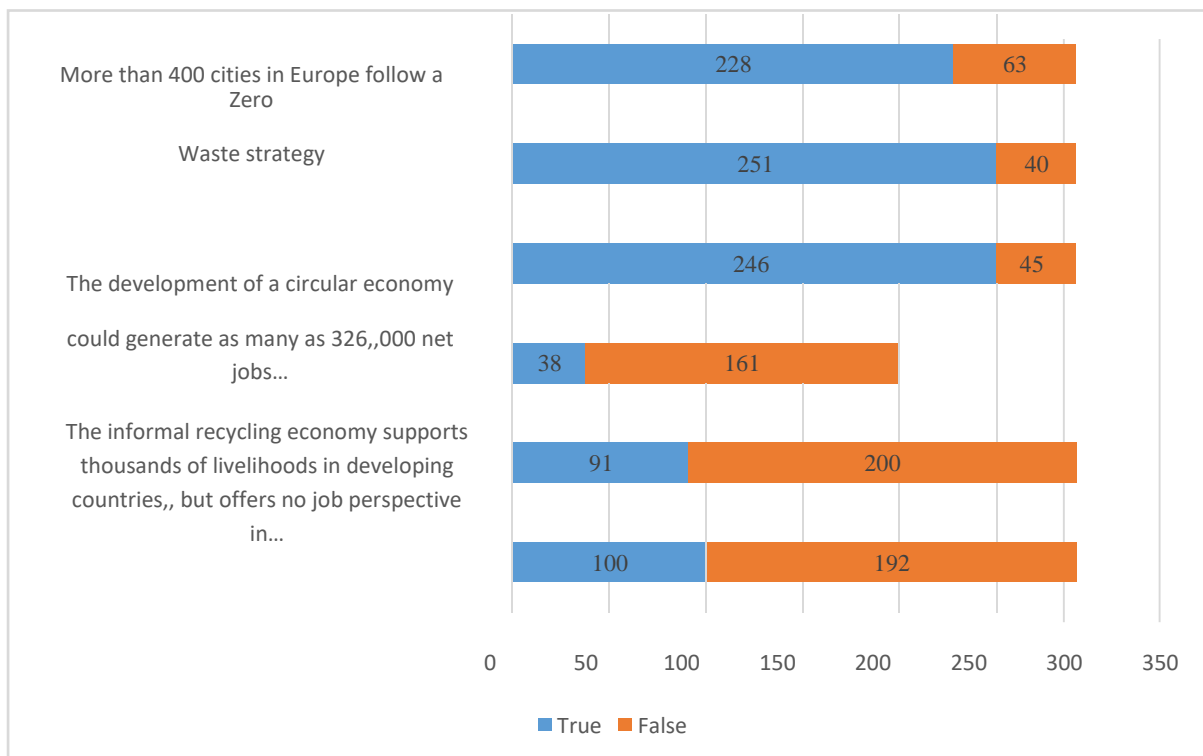
Waste strategy.

*In Sweden*, the participants mostly answered correctly the questions.

*In Republic of Macedonia*, the most of respondents gave the correct answer on these questions. The highest number of correct answers has been found on the two questions related to the potential of the recycling economy to produce new job positions – “The development of a circular economy could generate as many as 326,000 net jobs by 2030, accounting for job

losses in other sectors” 91% and “Job creation in the reuse economy is significant” by 91%.

*In general*, the most of respondents gave the correct answer on these questions. However, the respondents have less knowledge on „the informal recycling economy supports thousands of livelihoods in developing countries, but offers no job perspective in developed countries“. They have knowledge of the beneficial side of the zero waste circular economy can create new jobs.



### ***What are "circular economy" and "recycling economy?"***

*In Turkey*, the participants intensively voted the correct choice „Circular economy seeks to keep products in use, reducing waste and creating more jobs; while recycling economy does not reduce waste, but recycles it and does not create as many jobs. It means that they mostly have correct knowledge on "circular economy" and "recycling

economy.

*In Slovakia*, even if 73% of respondents correctly identified differences between circular and recycling economy, there is still 27% of them, who did not recognize them.

*In Spain*, 81% of the participants have chosen the correct answer for this question. However, few of the participants has given a different approach through the answer “others” and few participants consider that circular economy is the same as that recycling economy.

*In Sweden*, , most of the participants have chosen the correct answer for this question.

*In Republic of Macedonia*, even if 77.8% of respondents correctly identified differences between circular and recycling economy, there is still from 2.5% to 16.7% to 25% of them, who did not recognize them.

*In general*, the respondents have less knowledge on the informal recycling economy supports thousands of livelihoods in developing countries, but offers no job perspective in developed countries. Meanwhile, they have less knowledge on "circular economy" and "recycling economy when regarding the high rates of incorrect answers.

### ***How do you believe individuals can help promoting a circular economy?***

*In Turkey*, the correct answers for this question were „, by supporting actions that demand more circularity from local governments“ and „by changing their everyday behaviours - changing and being more conscious about how they shop, what they shop, when they shop“. Most of the respondents voted correct answers.

*In Slovakia*, the most frequent answers (they were correct) were “By repairing products or donating the ones you wish to throw away” – 83%, “By using reusable product” and “By recycling materials such as plastic” – 80%. The plastic recycling is the most aware form of recycling process, so this should be a reason why participants chosen it. Donating or swapping is another very popular way how to give to things new life. “By making a meal plan and freezing leftovers or starting a compost”, and “By life-long education creating more sustainable and circular habit” preventing food waste & losses does not seem to have public awareness, so the education in circular habits is more than necessary.

*In Spain*, all participants have selected a correct answer, and only 42.3% have also selected a second correct answer. More attention must be devoted to the demands of individuals to local governments to promote more circularity.

*In Sweden*, the correct answers for this question were the same for the other partner

countries.

*In Republic of Macedonia*, this multiple question presents the opinion of the respondents that the theoretical background (14% of responses) is not so important as the positive vision and sharing good practices.

*In general*, the results pointed out that the education in circular habits is more than necessary for the target group.

### ***What does "upcycling" stand for?***

*In Turkey*, the correct answer was 'It means giving a new life or upgrading a product that would otherwise be turned into waste'. Most of the respondents (69%) found the correct answer and they believe that the upcycling gives a new life.

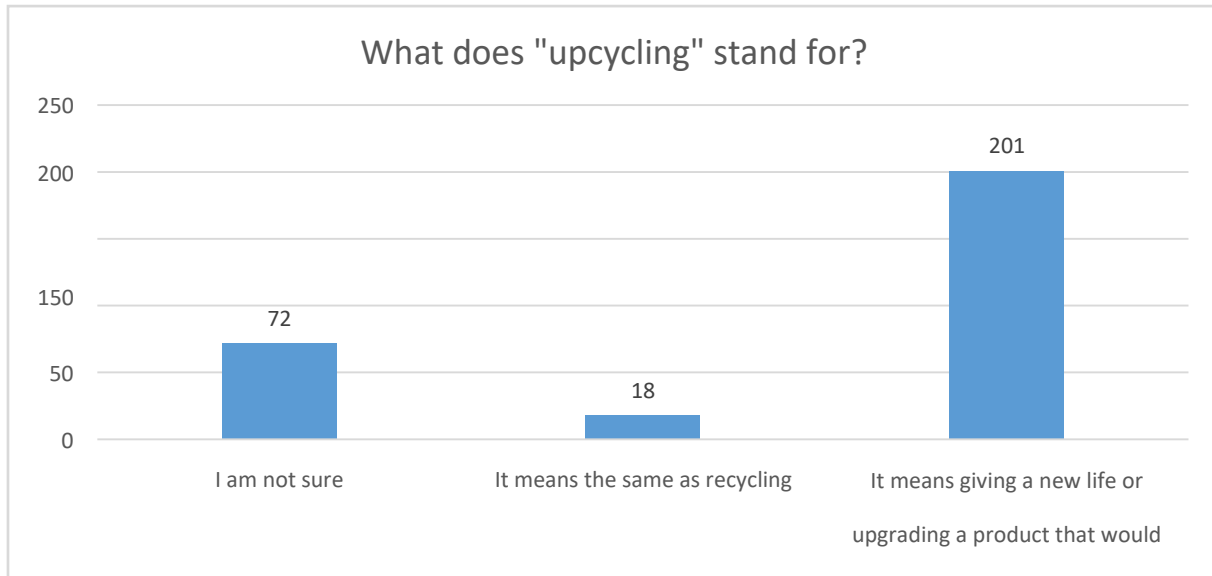
*In Slovakia*, the term "upcycling" has been correctly identified by 93,3% of the participants in the survey. Almost 10% is not sure what this term means.

*In Spain*, 65.4% has chosen the right option "upcycling means giving a new life or upgrading a product that would otherwise be turned into waste". 34.6% of the participants do not know the meaning of upcycling. Any participant believes that upcycling is the same as recycling.

*In Sweden*, the term "upcycling" has been correctly identified by most of the participants in the survey.

*In Republic of Macedonia*, the term "upcycling" has been correctly identified by 86.1% of the participants in the survey. Almost 14% is not sure what this term means.

*In general*, the term „upcycling“ is seen known well but there are there are a significant number of the respondents don't know the upcycling. This subject needs to be incorporate into the curriculum.



**How do you believe individuals can contribute to the principle of "zero" or "minimized" waste?**

*In Turkey*, the correct answers were „by using reusable product“, „ by making a meal plan and freezing leftovers or starting a compost“, „repairing products or donating the ones you wish to throw away“ and „by life-long education creating more sustainable and circular habit“ . This question was a free choice type question and the respondents mostly believe that individuals can contribute the principle of zero or minimized waste by recycling materials such as plastic and by getting to know the rules of recycling and how to recycle in your country. The reason for these wrong answers of the participants is the recycling of the plastics are the main environmental problem in Turkey they faced.

*In Slovakia*, the most frequent answers (they were correct) were “By repairing products or donating the ones you wish to throw away” – 83%, “By using reusable product” and “By recycling materials such as plastic” – 80%. The plastic recycling is the most aware form of recycling process, so this should be a reason why participants chosen it. Donating or swapping is another very popular way how to give to things new life.

“By making a meal plan and freezing leftovers or starting a compost”, and “By life-long education creating more sustainable and circular habit” preventing food waste & losses does not seem to have public awareness, so the education in circular habits is more than necessary.

*In Spain*, most of the right answers were correctly chosen except for the contribution of ‘making a meal plan and freezing leftovers or starting a compost‘. Then, the wrong options were wrongly selected by approx. nearly half of the participants.

*In Sweden*, most of the right answers were correctly chosen but there were much wrong answers beside the correct answers.

*In Republic of Macedonia*, the most frequent answers (they were correct) were “By repairing products or donating the ones you wish to throw away” – 66%, “By using reusable product” and “By recycling materials such as plastic” – 77.8%. The plastic recycling is the most aware form of recycling process, so this should be a reason why participants chosen it. Donating or swapping is another very popular way how to give to things new life. 55.6% “By making a meal plan and freezing leftovers or starting a compost”, and (83.3%) “By life-long education creating more sustainable and circular habit” preventing food waste & losses does not seem to have public awareness, so the education in circular habits is more than necessary.

*In general*, the individuals need to have education to contribute to the principle of "zero" or "minimized" waste.

### **What role do you believe education plays in promoting a circular economy and waste reduction?**

*In Turkey*, the correct answers were „to both teach the theory and support outside the learning environment the cultivation of a sustainability mentality and eco-responsible citizenship“, „to instill new visions for our society and economy with respect to sustainability and eco-friendly growth“ and „to encourage the cultivation of sustainability-mentality and eco-responsible citizenship“. Most of the respondents voted the choice to both teach the theory and support outside the learning environment the cultivation of a sustainability mentality and eco- responsible citizenship.

*In Slovakia*, this multiple question presents the opinion of the respondents that the theoretical background (13% of responses) is not so important as the positive vision and sharing good practices.

*In Spain*, most of the participants selected at least two rights answers to this question. In general, the idea about this item is clear but must be completed.

*In Sweden*, regarding the role that education can play in promoting a circular economy and waste reduction, most respondents seem to have a positive and hopeful overview of how education can support this transition. Therefore, utilizing this potential of the educational sector seems to be an area worth exploring.

*In Republic of Macedonia*, this multiple question presents the opinion of the respondents that the theoretical background (14% of responses) is not so important as the positive vision and sharing good practices.

*In general*, most of the respondents voted the choice to both teach the theory and support outside the learning environment the cultivation of a sustainability mentality and eco-responsible citizenship. They believe that education plays role in promoting a circular economy and waste reduction.

**Please rate the following statements as True/False based on your knowledge of local policies:**

*In Turkey*, a group of question was to learn the national/local policies on the circular economy concept, zero waste cities, entrepreneurship in CE and job opportunity in recycling of waste. The participants indicated that the zero waste concept is applied in Turkey, entrepreneurship in recycling is increasing and the recycling creates new jobs and employment in Turkey. However, they mostly voted false for the „All waste is recycled in your city“ and „there is zero waste implementation in the entire country“.

*In Slovakia*, the waste management are first of all linked with the secondary energy sources, as the waste is also used for producing heat and energy. This is also the reason that the 88% of respondents think that our legislation reflect mainly recycling, reuse of waste for other purposes (upcycling) or recovery of waste as an energy source. On the other side, it is true, that new or improved production technologies that reduce waste generation and the use of environmentally friendly products and less packaging are not part of our legislation as they should be.

*In Spain*, most of the questions were clear for the participants, except regarding the number of strategic plans of the 2030 Agenda, followed by the priority sectors and the amount of waste generated by schools in Spain. For the rest of the questions, there was a uniform response for the item “One of the strategic plans of the 2030 Agenda is to implement responsible consumption and thus protect the environment”. However, most of the participants agreed with the response for the rest.

*In Sweden*, in regard to the respondents“ knowledge when it comes to policies and status of the circular economy and zero waste matters in Sweden, the results showed that the respondents have knowledge on the Sweden zero waste circular economy strategy. However, they less knowledge on the taxes for air travel and energy, and the pant system for plastic bottles and and aluminium cans, and the recycling of all packaging materials.

*In Republic of Macedonia*, most of participants correctly respond on the following questions on the above stated graphic pictures that was created as questions for the national issue. Evidently from the questions and answers that the National Government, and the local governments does not pay attention to waste, waste treatment, disposal of waste nor the relevant law frame on this issue. This is affected to the circular economy and the zero waste in the most populated areas in the country. This was confirmed in the last “European Commission report for Macedonia” where the Environment issues were highly placed on the agenda as the worst accomplished in the past 2 years. However, the academic community is much more aware of this topic and there are several curricula where the subject for Circular Economy is implemented as regular. This is good for students to introduce more with the topic of Circular Economy and/or Zero Waste.

*In general*, the respondents have knowledge on the zero waste circular economy, mostly they know that the recycling is using in their countries. Their knowledge on the strategies for zero waste and the specific concepts for the zero waste circular economy is not sufficient.

#### 4. Conclusions

*In Turkey*, the institutions of the participants are mostly municipalities, public bodies active in education, higher education institutions, adult educators, teachers and mechanical engineers, civil engineers, academicians concentrated on circular economy concept and recycling/reuse of waste. They participated from many parts of the Turkey not only from Balıkesir and Izmir. There were participants from the municipalities and educational institutions and teachers/students from adult education. Most of the participants defined themselves „Individual who wishes to know more about how to implement Zero Waste-related educational activities“ and „Organization that provides educational activities/support“. Most of the participants voted „Fair and „Good for their knowledge level on circular economy and recycling/reuse of waste. The results indicate that the level of the participants in basic circular economy knowledge are not high, mostly „Fair“.

The results about whether the circular economy suits for them show that it somewhat applies to them and completely applies to them. This show the participants want to know more about the circular economy and recycling/reuse.

The participants indicated that the zerowaste concept is applied in Turkey, entrepreneurship in recycling is increasing and the recycling creates new jobs and employment in Turkey.

The results implemented that the participants mostly have knowledge on EU waste management policies. However, the participants was wrong on „The EU requires member states to recycle 80% of the waste they produce by 2020“ and "waste management" is the same as "resource management".

The participants have correct knowledge on circular economy but they incorrectly know that „„the circular economy““ means „„better recycling““.



The participants confuse the meaning of the zero waste, recycling, and waste management . They don't have sufficient knowledge on these concepts.

The knowledge of the participants for "Zero Waste Cities" are correct . However, most of them incorrectly believe that the principle of „Zero Waste cities“ is depend on the principle of "smart cities". They confuse Zero Waste City and Smart City concepts.

The advantages of the circular economy to create new and good job opportunities mostly understood well by the participants. They voted wrong choice for the question „the informal recycling economy supports thousands of livelihoods in developing countries, but offers no job perspective in developed countries“.

They indicate that „Circular economy seeks to keep products in use, reducing waste and creating more jobs; while recycling economy does not reduce waste, but recycles it and does not create as many jobs.

They mostly believe that individuals can help promoting a circular economy „ by supporting actions that demand more circularity from local governments“ and „by changing their everyday behaviours - changing and being more conscious about how they shop, what they shop, when they shop“. They also mostly believe that that the upcycling gives a new life.

The results indicated that the individuals can contribute to the principle of "zero" or "minimized" waste mostly „by recycling materials such as plastic and by getting to know the rules of recycling and how to recycle in Turkey. However, the participants know that the recycling of the plastics are the main environmental problem in Turkey they faced.

They believe that education plays role in promoting a circular economy and waste reduction if it both teach the theory and support outside the learning environment the cultivation of a sustainability mentality and eco-responsible citizenship.

These results from Turkey provide information on the waste infrastructure and a baseline of current zero waste CE and zero waste city concept. The results should incorporated into designing and implementing of a training strategy.

***In Slovakia***, the results of the survey revealed that respondents have a relatively good knowledge what the "circular economy" and "waste management" mean, although they quite often confused activities related to these concepts.

As ecology is not a separate part of Slovak curricula and is taught just as part of natural sciences/biology, it would be necessary to expand the content of education in the field of environmental education in this direction and try to include the principles of circular economy and zero waste economy in the curricula at all levels of education. The role of zero waste in relation to smart cities / villages also needs to be emphasized. It is also necessary to emphasize that recycling does not mean automatic minimum, resp. zero waste.

***In Spain***, the main findings of this questionnaire, in which mainly people involved in education have participated, can be summarized as follows:



The respondents have a good understanding of recycling basics. Still, it demands more training in policies and business opportunities for the Zero Waste Circular economy and other recently appeared concepts such as „9Rs“.

The participants present a good knowledge of concepts linked to the European regulations' objectives, but they miss questions related to concrete definitions or quantifying parameters or amounts.

The questions with the worst results correspond to those that make direct connections between concepts. It is important to identify a training necessity.

Training is required for individuals about zero or minimized waste. Traditional recycling is confused with zero or minimized waste, and individuals are not prepared for zero waste behaviour.

Results were better with items related to Circular economy than for Zero Waste. Therefore, more focus must be devoted to the latter concept.

***In Sweden***, from the results of this research, it is possible to conclude that although the respondents tended to undermine about their level of knowledge in the self-assessment part, when it comes to their actual knowledge it can be noted that most of the responses have had a majority of correct answers. This indicates that the level of knowledge within the Swedish society may be considered good. However, the points indicated in wrong answers in the self- assessment part should be better stressed, which indicated that the respondents could be benefited from more practical information, such as how to properly recycle.

It is important to note, however, that most of the respondents could benefit from more information about what “zero-waste” means. That is because as most of them seem to believe that practices such as recycling contribute to minimized waste. Nevertheless, not all forms of recycling are able to do that, especially when it comes to single-use plastic or materials that are hard to recycle. It is therefore important to stress this different and inform people that “zero-waste” is different from “waste management” and therefore does not necessarily imply “recycling”. In fact, recycling is at the bottom of the zero-waste hierarchy, which can be defines as “Rethink, Reduce, Reuse, and Recycle”.

***In Republic of Macedonia***, The results of the survey revealed that respondents have a relatively moderate and/or good knowledge what the "circular economy", “zero waste” and "waste management" mean, although they quite often confused activities related to these concepts.

The “Environment” and “ecology” are not a separate part of Macedonian HE“s curricula and is taught just as part of natural sciences/biology, it would be necessary to expand the content of education in the field of environmental education in this direction and try to include the principles of circular economy and zero waste economy in the curricula at all levels of education.

The knowledge of the participants for "Zero Waste Cities" are correct.

However, most of them incorrectly believe that the principle of „Zero Waste cities“ is

depend on the principle of "smart cities".

They confuse Zero Waste City and Smart City concepts. The advantages of the circular economy to create new and good job opportunities mostly understood well by the participants. They voted wrong choice for the question „the informal recycling economy supports thousands of livelihoods in developing countries, but offers no job perspective in developed countries“.

They indicate that „Circular economy seeks to keep products in use, reducing waste and creating more jobs; while recycling economy does not reduce waste, but recycles it and does not create as many jobs.

The role of zero waste in relation to smart cities / villages also needs to be emphasized. It is also necessary to emphasize that recycling does not mean automatic minimum, resp. zero waste.

The results pointed out that the education plays role in promoting a circular economy and waste reduction if it both teach the theory and support outside the learning environment the cultivation of a sustainability mentality and eco-responsible citizenship.

Finally, regarding the role that education can play in promoting a circular economy and waste reduction, most respondents seem to have a positive and hopeful overview of how education can support this transition, as illustrated below. Therefore, utilizing this potential of the educational sector seems to be an area worth exploring.

***In conclusion***, the knowledge of participants from partner countries on circular economy, smart city, CE entrepreneurship model and recycling/reuse of the of main wastes such as glass and plastic bottles, paper and cardboard and packaging waste, industrial wastes and other organic wastes, and relevant policy, business and entrepreneurship for zero waste CE are not high but they want to know about these subjects. Results were better with items related to Circular economy than for Zero Waste. Therefore, more focus must be devoted to the latter concept. However, the points indicated in wrong answers in the self-assessment part should be better stressed, which indicated that the respondents could be benefited from more practical information, such as how to properly recycle. They have interested in zero-waste concept but they need to learn more about them. Training is required for individuals about zero or minimized waste. Traditional recycling is confused with zero or minimized waste, and individuals are not prepared for zero waste behaviour. Regarding the role that education can play in promoting a circular economy and waste reduction, most respondents seem to have a positive and hopeful overview of how education can support this transition. Therefore, utilizing this potential of the educational sector seems to be an area worth exploring. Single- use plastics, for example, cannot be considered zero waste as the material produced after recycling is of a lesser quality than the original. The same is true for paper and cardboard, and while aluminum and glass are theoretically infinitely recyclable into a material of the same quality, inefficiencies in sorting and processing often lead to contamination. These subjects which the respondents have less knowledge and wants to learn about them should be incorporated into the developed curriculum as proposed in the submitted Project.