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# Metaphors about sustainability used by academicians in the department of preschool education

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**Abstract**

Sustainability is a term that is expressed as the necessary conditions for the ecosystem to maintain its existence in a long process belonging to the science of ecology. It is a concept that has become widespread since the second half of the 20th century and has been associated with different fields such as social life, culture, law, politics, economy, education, environment, agriculture, ecology and even welfare level. The importance of this concept, which we encounter a lot today and which is associated with issues from different perspectives, whether interrelated or not, is increasing. In the literature on the subject, it is seen that there is no common or single definition accepted by everyone and the fields that the concept of sustainability is associated with. In this context, the aim of the research is to determine the opinions of the academicians working in the Department of Preschool Education on the fields of sustainability with which they associate the metaphors they use with the metaphors they use for sustainability. The data collected for the purpose were statistically analyzed and evaluated.

***Keywords:*** Sustainability, preschool education, academicians, metaphors



## 1. Introduction

The fact that the traditional environmental education approach has recently started to be insufficient in some issues has resulted in the evolution of environmental education towards sustainability. The report Our Common Future, published by the World Commission on Environment and Development in 1987, endorsed sustainable development as a possible solution to global environmental problems, recognized that education would benefit progress, and stated that education for sustainability (EfS) should be present at all levels of formal and non-formal education (WCED, 1987). Afterwards, the goals of sustainable development were determined in 2012, and thus, studies on sustainability education accelerated. The United Nations (UN) is increasing

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its efforts to gather nations on a common platform regarding sustainability and sustainable education.

For an education understanding that will be effective in the age we live in, environmental education processes oriented to sustainability focus on the necessity of raising awareness of "one world" and "world citizenship" (Morin, 2003). The said awareness can be achieved through sustainable education with the competence of "overcoming complex situations" and "making decisions in multivariate situations". Sustainable education is focused on development, value and ability (Rost, 2002).

While the foundations of priority areas and social change are laid with the multifaceted education provided in universities, the training of leaders who shape the society, managers in the decision-making mechanism and teachers who are the cornerstones of education is also realized by virtue of universities. The UN introduced the concept of sustainability to universities for the first time with the International Environmental Education Program (1975-1995). Later, many decisions were made for this purpose in many declarations including notably the 1987 Report on Our Common Future, also known as the Brundtland Commission, the Talloires Declaration 1990, in which university administrators signed their sustainable development commitments, the Earth Summit (Rio de Janeiro, 1992) and the 1997 Kyoto Protocol. Subsequently, the statement and commitment that culminated in the UN Decade of Education for Sustainable Development (DESD) (2005–2014) (UNESCO 2005) action plan was made (Bekessy et al. 2003; Cortese & Hattan 2010; Sherren 2006; UNESCO 1990; WCED 1987).

Accordingly, sustainability trainings should include creativity that will enable individuals to think about the future of our world and its transfer to next generations, and encourage them to try different paths and ideas in taking action (Jickling 1992; McKeown and Hopkins 2003; Shephard, 2010). Statements and commitments to sustainability in universities have been abundant and ambitious since the late 1990s. However, reflecting these to the programs is not as easy as imagined. Problems arise due to the inability to find a common point in the information about sustainable education and the inability to determine the curriculum. This delay in inclusion in the curriculum is partly due to problems with the concept of sustainability itself because there is no universally accepted definition of sustainability.

Sustainability is mostly seen as the field of environmental educators and "those who advocate sustainability in higher education are the ones conducting environmental studies" (Fien, 2002). In fact, sustainability is a multi-disciplinary concept and a holistic sustainable education program can be created by bringing together every discipline that constitutes sustainability in terms of gaining skills and perspective in practice and creating value (McKeown & Hopkins 2003).

In our country, faculties of education have started to implement a common program since 2018 and the field education to be given in all departments and departments has been standardized with the curriculum of vocational and elective courses. In line with this determined framework program, there is no course with this name in education faculties for sustainable education. Sustainability (sustainable, development or education) is mostly taught by placing it in field or elective courses such as science education, entrepreneurship and 21st century skills.

An academic's perception of sustainability will affect whether they are able to teach it and, in turn, the quality of their students' understanding and potential implementations of the concept (Cotton et al., 2007; Prosser & Trigwell 1997; Reid & Petocz 2006). For this reason, sustainable education (ESD) should be provided in every university student's classroom, and research should be conducted to understand how those responsible for teaching value, understand and apply sustainability (Reid & Petocz, 2006). Academicians who provide sustainability training to teacher candidates should have a holistic perspective on the concept of sustainability in order to convey it to teacher candidates because these academics are responsible for educating teachers on sustainability concepts and approaches (Lozano, 2006; Yuan et al., 2013).

Teaching sustainability requires reflection on normative, ethical and spiritual beliefs (Wals & Jickling, 2002). Differences in the understanding of the said values can be determined by qualitative research studies. On the one hand, qualitative research shows that the limitation of concepts related to a subject is often associated with the limitation of approaches related to teaching that subject, while on the other hand comprehensive or holistic concepts lead to a broader approach to teaching and learning (Petocz & Reid 2002; Prosser & Trigwell 1997). One of the qualitative research methods is the use of metaphors. Metaphors are fundamental linguistic tools discovered by human beings in order to understand, explain, construct and organize the world. Metaphors are helpful in understanding how people construct their own reality and how they perceive the world (Lakoff & Johnson, 2005).

So far, no research has been found on the personal conceptual sustainability understanding of academicians who train teachers on sustainability in the department of preschool education. Therefore, the aim of the present study is to reveal the metaphors of the academicians working in the department of preschool education about the concept of "sustainability" and to determine the sustainability areas that they associate their metaphors with.

The number of respondents to the present research conducted to determine the views of academicians working in the department of preschool education on the metaphors they use for sustainability and the fields of sustainability with which they associate the metaphors they use is 68. The results of the descriptive statistical analysis for the answers given by the participants regarding their personal information are given below.

### *1.1. Aim of the study*

The present study was conducted to investigate the metaphors of the academicians working in the department of preschool education regarding the concept of "sustainability" and to determine the sustainability areas with which they associate their metaphors with the sustainability concept.

Within the scope of this general purpose, answers to the following questions were sought:

- What are the metaphors of the academicians working in the department of preschool education regarding the concept of "sustainability"?
- Under which conceptual categories can the metaphors be grouped in terms of their common characteristics?
- What are the sustainability areas that academics working in the department of preschool education associate with their metaphors regarding the concept of "sustainability"?
- Under which conceptual categories can the sustainability areas that academics working in the department of preschool education associate with their metaphors regarding the concept of “sustainability” be grouped?

## 2. Method

The present study was conducted with a mixed methods study in which qualitative and quantitative data were collected and analyzed together. Mixed methods research refers to studies that include the use of qualitative and quantitative research methods or paradigms together and provide a better understanding of a certain phenomenon by using the research problems and questions together with these methods (Gay, et al., 2009; Johnson & Christensen, 2019).

### *2.1. Research model*

This study is descriptive in nature since it aims to determine the existing situation. The phenomenography model, which is one of the qualitative research models, was used in the research. The phenomenography model focuses on phenomena that we are aware of but do not have an in-depth and detailed understanding about. In this model, perceptions and events are presented in a realistic and holistic way in their natural environment. Phenomenography creates a suitable research ground for studies that aim to investigate phenomena that are not completely foreign to us but whose meaning we cannot fully comprehend (Yıldırım & Şimşek, 2018). Both quantitative and qualitative research methods were used in the collection, analysis and interpretation of the data obtained in the study.

### *2.2. Sample*

The study was conducted with academicians working in the department of preschool education (N=68). Purposive sampling method was used in the study in accordance with the qualitative research approach. In addition, "homogenous sampling" and "convenience sampling" techniques were used. In this technique, the researcher chooses situations that are close to him and easy to access (Yıldırım & Şimşek, 2018). Therefore, the research sample is based on easy accessibility for academicians, who are assumed to have rich ideas about sustainability and who voluntarily agreed to participate in the research. Participants filled out the consent form on a voluntary basis.

The number of participants was determined according to data saturation, and a total of 83 data were collected from academicians working in the department of preschool education on a voluntary basis. However, 15 forms were excluded from the study because some participants did not comment or have incomplete answers. The data of the study were analyzed with the metaphors of 68 participants and their views on the fields of sustainability that they associate metaphors with (n=68).

In Table 1 presented below, the data of the academicians working in the preschool education department participating in the research are given on the gender, type of university they work, academic titles and professional seniority.

Table 1. Information on academicians working in the department of preschool education

| | | f | % |
|---|---|---|---|
| Gender | Female | 61 | 89.7 |
| | Male | 7 | 10.3 |
| Type of University They Work | Public | 39 | 57.4 |
| | Private | 29 | 42.6 |
| Academic Title | Research Associate | 9 | 13.2 |
| | Assistant Professor | 38 | 55.9 |
| | Associate Professor | 13 | 19.1 |
| | Professor | 8 | 11.8 |
| Professional Seniority | 1-5 Years | 10 | 14.7 |
| | 6-10 Years | 12 | 17.6 |
| | 11-15 Years | 22 | 32.4 |
| | 16-20 Years | 18 | 26.5 |
| | 21-25 Years | 5 | 7.4 |
| | 26 Years and Above | 1 | 1.5 |
| TOTAL | | 68 | 100 |

It is seen that 89.7% (n=61) of the 68 academicians participating in our study and working in the department of preschool education are female and 10.3% (n=7) male. In terms of the type of universities they work at, it is seen that 57.4% (n=36) work in public universities, while 42.6% (n=32) work in private universities. In terms of professional seniority, it is seen that 14.7% (n=10) worked for 1-5 years, 17.6% (n=12) for 6-10 years, 32.4% (n=) 22) for 11-15 years, 26.5% (n=18) for 16-20 years, 7.4% (n=5) for 21-25 years and 1.5% (n) =1) for 26 years or more years. Finally, 9 research associates (13.2%), 38 assistant professors (55.9%), 13 associate professors (19.1%) and 8 professors (11.8%) participated in our research.

### *2.3. Data collection tool*

Metaphor is a powerful mental tool that can be used to understand and explain a highly abstract, complex or theoretical phenomenon (Saban, Koçbeker & Saban, 2006). In education, metaphors can be used to visualize an abstract concept and describe it more concretely (Singh, 2010).

To create the data collection tool of the research, respective studies in which metaphors were used as a tool to reveal the perceptions of individuals were examined and it was seen that the participants were asked to complete open-ended sentences (Alger, 2009; Cerit, 2008; Guerrero & Villamil, 2002; Kuyucu, Şahin & Kapıcıoğlu, 2013; Saban, et al., 2006; Saban, 2008a, 2008b, 2009, 2011; Akça Üşenti & Bektaş, 2019). Considering previous research, academicians working in the department of preschool education were asked to complete the following sentence in order to identify the metaphors they have regarding the concept of sustainability: "Sustainability is like……. Because……". In addition, the academicians working in the department of preschool education were asked to complete the following sentence in order to identify the sustainability areas with which they associate their metaphors with the concept of "sustainability": "Sustainability is related to the subject(s) of …… Because……"

### *2.4. Data collection process*

Since the population includes all 78 departments of preschool education in Turkey, a separate sample selection was not made during the data collection process. In this study, it was aimed to reach all department of preschool education academicians in Turkey, and this resulted in the necessity of considering a very large geographical area. Thus, it was decided to apply the measurement tool online, taking into account the easy accessibility, affordability and willingness to participate. The scale form was created electronically and delivered to the academicians working in the department of preschool education via a link. Data collection via the Internet is a method that has been widely used in recent years in relation to the rapid developments in technology. This method offers the

opportunity to quickly apply a scale to a very large population using electronic communication addresses or internet sites by making use of various package programs (Büyüköztürk, 2005). The scale form was filled online by the academicians who participated voluntarily. The time to fill out the research form took approximately 15 minutes. The data collection process continued for 30 days and 83 preschool academicians provided feedback during this process. The scales applied on the internet provide benefits both in terms of easy filling and easy distribution, and also eliminates the problem of transferring data on paper to the computer environment (Özüsağlam, et al., 2009).

### *2.5. Data analysis*

The following process was followed in the analysis of the data collected from the academicians working in the department of preschool education:

The analysis and interpretation process of the metaphors developed by the academicians was carried out in the following stages: 1. Naming, 2. Classifying, 3. Reorganizing, 4. Categorizing, 5. Providing validity and reliability, and 6. Transferring the data to the SPSS package program for quantitative data analysis.

1. Naming: At this stage, the metaphors developed by the academicians working in the department of preschool education were temporarily listed in alphabetical order and it was checked whether a certain metaphor was clearly expressed in the answers of the academicians. Metaphors developed by each academician were also coded at this stage.

2. Classifying: At this stage, each metaphor is broken down into parts and analyzed in terms of similarities or common features with other metaphors by using metaphor analysis and content analysis (Yıldırım & Şimşek, 2018) techniques. Metaphors developed by preschool education academicians were read and analyzed one by one. In this study, forms in which it was observed that some academicians could not produce a valid metaphor or filled in incompletely were excluded from the study.

3. Reorganizing: After removing the metaphors (n=15) that were excluded from the study, the list was created by sorting the metaphors included in the study (n=68) in alphabetical order once more.

4. Categorizing: At this stage, categories were created based on the individual metaphor expressions obtained and the data were compiled based on these categories. Each metaphor image produced by preschool education academicians was analyzed in terms of (1) the subject of the metaphor, (2) the source of the metaphor, and (3) the relationship between the subject and the source of the metaphor.

5. Providing Validity and Reliability: At this stage, metaphors created by preschool education academicians were reported in detail. “Reporting the collected data in detail and explaining how the researcher reached the results are important criteria of validity in a qualitative research” (Yıldırım & Şimşek, 2005). Afterwards, in order to ensure

reliability in the research, a domain expert in science and environmental education was consulted for their professional opinions in order to confirm the congruity of the categories created and the metaphors representing these categories to the determined categories. Domain the expert was provided with the metaphors and categories and was asked to pair the metaphors in the first list with the 5 conceptual categories in the second list (without excluding any mental images) by using these two lists. The agreement and disagreement numbers were determined by comparing the expert's pairings with the categories created by the researcher. After matching, the reliability was found to be .95 according to the reliability formula of Miles and Huberman (1994) (Reliability = Agreements / Agreements + Disagreements x 100).

In qualitative research, a desired level of reliability is obtained when the agreement between expert and researcher evaluations is 90% or more (Saban, et al., 2006; Saban, 2008; Saban, 2009). In the reliability study carried out specifically for this study, a reliability (consensus) of 93% was obtained. The expert, whose opinion was consulted within the scope of the reliability study, placed 5 mental images (network, part of the whole, tap, justice and water) in a different category from the researcher's. In this case, the reliability was calculated as = 68 / (68+5 x 100) = 0.93.

6. Transferring Data to SPSS Package Program for Quantitative Data Analysis: After defining the metaphors of a total of 68 academicians, categorizing them, classifying the sustainability fields they associate metaphors with, and grouping these fields into categories, the demographic information of the forms and all the data belonging to the metaphors were transferred to the SPSS statistical program. After this step, the number (*f*) and percentage (%) of academicians representing each metaphor, associated field and categories with personal information were calculated.

## 3. Findings

This section is presented under two headings. In the first part, metaphors about sustainability created by preschool education academicians and their categories were presented and in the second part the fields of sustainability associated with the metaphors of the concept of “sustainability” and their categories were discussed.

### *3.1. Metaphors of preschool education academicians on sustainability*

Table 2. Metaphors created by preschool education academicians on sustainability

| Metaphor | f | Metaphor | f | Metaphor | f | Metaphor | f |
|---|---|---|---|---|---|---|---|
| Nature | 6 | Democracy | 3 | Water | 2 | Prayer | 1 |
| Breath | 5 | Treasure | 3 | Investment | 2 | Butterfly | 1 |
| Life | 5 | Culture | 3 | Chain | 2 | Tap | 1 |
| Future | 4 | Compatibility | 3 | Web | 1 | Wind | 1 |
| Responsibility | 4 | Administration | 3 | Justice | 1 | Synergy | 1 |
| Hope | 4 | Oxygen | 2 | Boomerang | 1 | System | 1 |
| Knowledge | 3 | Forest | 2 | Part of the Whole | 1 | Railway Car | 1 |
| | | | | Vein | 1 | | |
| | | | | | | Total | 68 |

As can be seen in Table 2, a large number of (29) different metaphors have been created regarding the concept of sustainability by the academicians working in the department of preschool education. Metaphors are listed in alphabetical order from most used to least. Department of preschool education academics mostly associated the concept of sustainability with the metaphors of nature (n=6, *8.8%*), breath and life (n=5, *7.4%*). In addition, sustainability has been identified four times (n=4, *5.9%*) with the metaphors of the future, responsibility, and hope, and three times each with the metaphors of knowledge, democracy, treasure, culture, compatibility and administration (n=3, *4.4%*). In addition to investment, chain, oxygen, forest and water metaphors twice (n=2, *2.9%*); the metaphors of part of the whole, boomerang, prayer, synergy, web, tap, wind, vein, system, butterfly and railway car have been associated with sustainability once (n=1, *1.5%*) by preschool education academicians.

In a study have been conducted by Carew and Mitchell (2006) to determine the metaphors used by engineering academics to understand the concept of sustainability, four different metaphors were identified. These metaphors were found to vary be indecisive sustainability as adaptability and flexibility, sustainability as conservation (conservation of resources), sustainability as trade (cost-benefit analysis) and monitoring (existence/existent of borders) as sustainability boundaries.

#### *3.1.1. Categories of metaphors created by preschool education academicians on sustainability*

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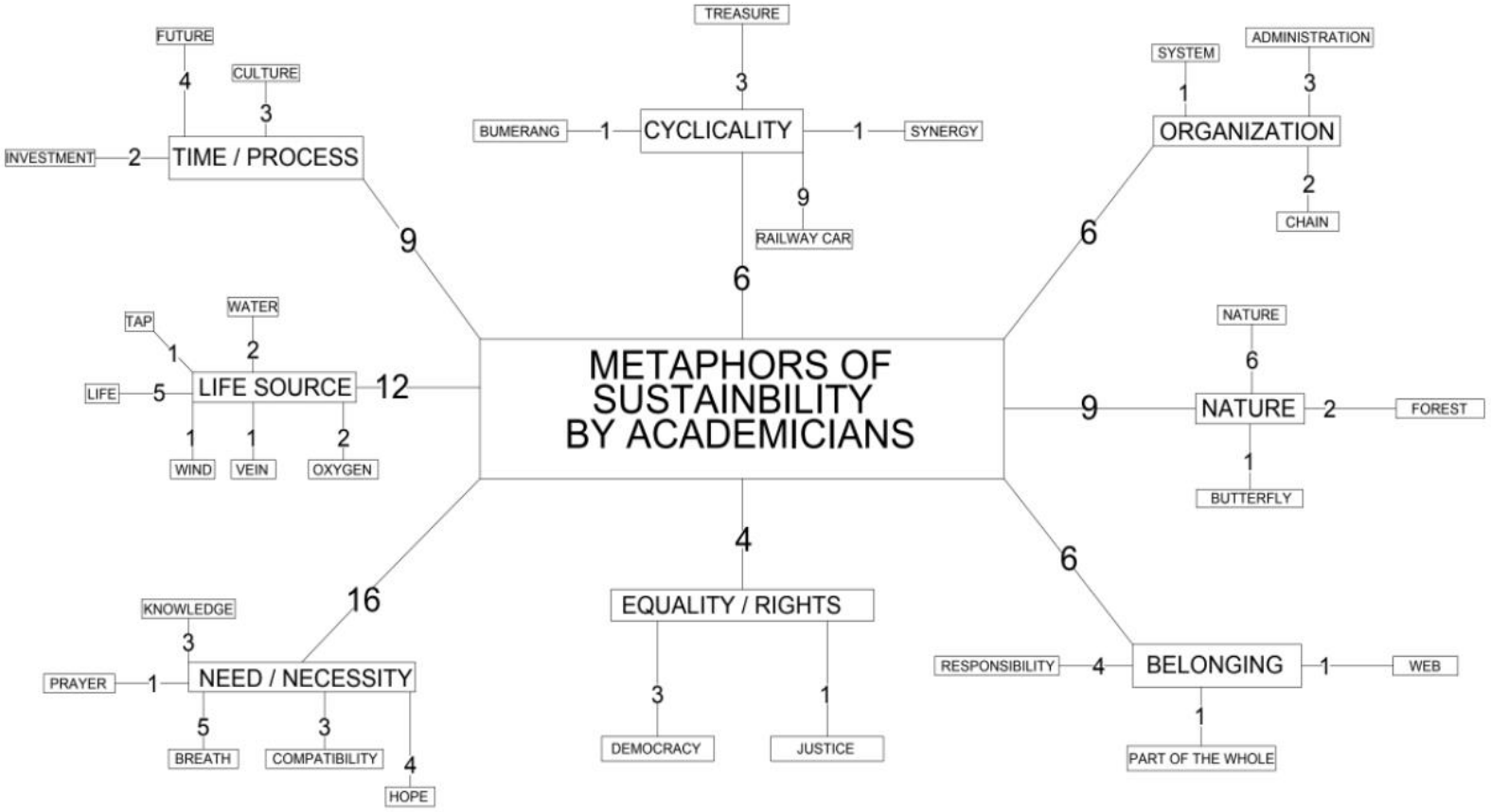


Figure 1. Categories of metaphors created by preschool education academicians regarding sustainability

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An evaluation of the categories of metaphors created by the academicians working in the preschool education department regarding the concept of sustainability reveals that the density is in the need/necessity *(23.6%)*; life source *(17.7%)*; time/process and nature categories *(13.2%)*. It can be said that this is an appropriate association with the definition of sustainability. Distribution of other categories from highest to lowest; belonging, organization and circularity *(8.8%)*, equality/right *(5.9%)* determined as.

Metaphors grouped under the need/necessity category and are examples of the views of academicians in the department of preschool education under are as follows:

*"Sustainability is like knowledge because knowledge is an endless concept that is constantly learned and continues forward."*

*"It is like breath because it is necessary for the continuation of life."*

*"It's like hope. It follows each other, if one ends, it is reborn from another place, it never ends."*

*"It is like prayer, because it is necessary to work and strive to leave a clean world for our future."*

*"It's compatibility. Because it is the coexistence of human, nature and other living things without any problems."*

Metaphors grouped under the category of life source and are examples of the views of academicians in the department of preschool education under are as follows:

*"Sustainability is like oxygen because it is necessary for life to continue."*

*"It is like the main vein of nature. Because all life in nature is fed from the main vein."*

*"Sustainability is like a constantly flowing tap. Because sustainability requires continuity, a well-followed path and resources."*

*"It is like life because living life is continuous."*

*"It's like water. Because in addition to being the beginning of life, it is indispensable."*

*"It's like the wind. Because it is important for the continuation of insemination and vitality."*

Metaphors grouped under nature and time/ process category and are examples of the views of academicians in the department of preschool education under are as follows:

*"It is nature itself. Because it has already sustained itself for billions of years in spite of human beings"*

*"It is nature. Because if nature does not sustain, there is no life."*

*"It's like a butterfly. Because there is a delicate balance. Just as a butterfly cannot live when we touch it, the future and life of the world will be in danger if there is no sustainability."*

*"It is like the future. Because if we cannot sustain, we will have no future."*

*"It is like culture. It needs to be preserved and transferred."*

*"Sustainability is like an investment. Because it ensures that the future is protected and that future generations feel safe as a consequence.*

Metaphors grouped under the organization, cyclicality and belonging category and are examples of the views of academicians in the department of preschool education under are as follows.

*"It is like administration. Because there is a need for good administration in all matters in order to transfer the existing resources to future generations in the best way in every field."*

*"It is like a chain. Because all rings are included in the ecosystem. If one of the rings breaks, we lose our connection with the future."*

*"It's like a system. Because the whole system is interrelated and a whole."*

*"It's like a treasure. Because it is very valuable and unique."*

*"It's like a boomerang. Because what we do today will return to us in the future."*

*"It's like synergy. Because it increases with synergy and its continuity is ensured."*

*"It is like railway cars, because it expresses unity and continuity between them."*

*"It is like a web. Because everything in the universe is related and interconnected."*

*"It's like being a part of the whole, because it provides continuity."*

*"It is responsibility. Because we did not inherit the world from our grandfathers, but from future generations."*

Metaphors grouped under equality/rights category and are examples of the views of academicians in the department of preschool education under are as follows:

*"It's like democracy. Because resources need to be distributed and shared by all."*

*"It's like justice (fairness), because everyone has a responsibility and needs to do something."*

### *3.2. Sustainability areas with which preschool academicians associate their metaphors regarding the concept of "sustainability"*

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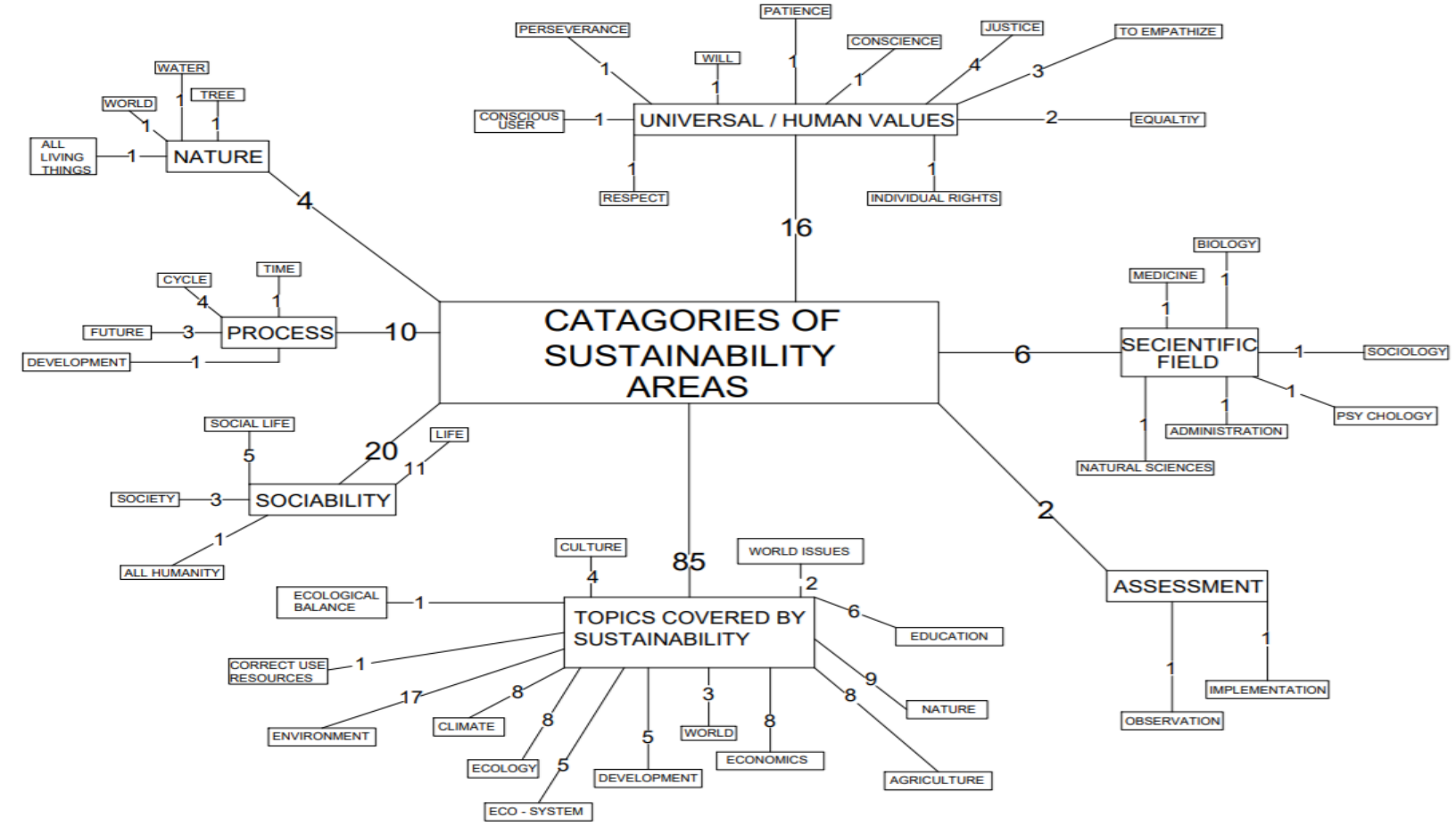


Figure 2. Sustainability areas with which preschool academicians associate the metaphors they created regarding the concept of sustainability

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In the second stage of the present study, sustainability areas were created with which academics working in the department of education associate their metaphors regarding the concept of sustainability and are presented in Figure 2, in order from the most associated to the least. The total number of sustainability fields associated with 44 different subjects by preschool teachers is 143. Some of the related subjects were preferred more by academicians (ex: environment, life/life, nature) and some were preferred only once (ex: perseverance, patience, tree, psychology, time, etc.).

Some of the exact quotations for the metaphors of the department of preschool education academics evaluated in this category are given below:

*"Sustainability, social life, environment/nature, society, economics. Because they are all connected and all in a cycle."*

*"It is related to economics, environment, social life issues. Because it enables the transformation and development of the life cycle in a compatible manner."*

*"Sustainability is related to environmental awareness and quality education. Because individuals who receive qualified education try to move the future of the world they live in to a better point with the developing environmental awareness they have."*

*"Sustainability is about nature. The future of the human race depends on it."*

*"It is associated with life, ecology, environment, economics. Because it takes place in life and is important for humans."*

*"It is associated with ecology, social and environmental conditions. Because they constitute the very nature."*

*"It is related to education, environment, ecology, agriculture, in short, everything that exists in life."*

*"It is related to the subjects of environment, agriculture, climate. Because if we develop a good administration strategy on these issues, we will ensure sustainability."*

*"It is about education, agriculture, environment. Because it is a process that must be preserved and taught to those who come after us."*

*"The concept of sustainability is about all humanity, the whole ecosystem, economics. Because the entire basis of the existence of all humanity depends on the future."*

*"It is about individual rights, culture, teaching, education. Because all the topics that I find relevant can be learned, taught and passed on through generations."*

*"Sustainability is related to conscience, respect, empathy and patience. Because it is necessary to have these features in order to be sensitive to the future of humanity and the environment."*

*"It is about environment, agriculture, ecology. Because it is necessary for the continuity and welfare of future generations."*

*"This concept is related to the future. Because there are many ways to leave a livable, good, clean world to future generations, just like prayer."*

*"Sustainability is related to issues of justice and equality. Because it is necessary for everyone in the whole world to live equally and under the same conditions."*

*"It is associated with mother nature itself. Because nature is eternal giver and the continuation of the future is related to a clean, preserved nature."*

*"Sustainability is related to nature, environment, education, ecology, development and agriculture. Because there is a constant hope for improving and transferring all of these to the future."*

*"It is associated with the future, ecology, development and economics. Because if these issues that I find related are not compatible with each other, sustainability cannot be achieved."*

*"Sustainability is related to ecology, development, culture and social life. Because these issues affect and trigger each other."*

*"Sustainability is related to ecological life, agriculture and environmental issues. Because without one, the others will either be incomplete or they cannot even exist."*

*"It is related to the fields of oxygen, biology and medicine. Because they seek ways to explain life and existence and to ensure continuity."*

*"Sustainability is related to correct use of resources, healthy ecosystems and natural environment issues. Because, as in sustainability, there is a continuous cycle in flowing tap. Water is taken from the source. It is taken to the place it needs to go by pipes by following the right path. It is then made available to us. We use water and the excess water is transferred to another water source with the help of a correct pipeline, or it is purified and presented to our use again. At the same time, we should not waste the water flowing from the tap and use it in the most correct way."*

*"Sustainability is related to the continuation of life. Because nature continues to exist by itself, whether or not people exist."*

*"It is related to the subjects of life. Because as long as we live, we need to breathe. It is simple, effortless, but equally important, and it will continue without interruption."*

*"It is related to nature, environmental problems and being a willful conscious user. Because it is important for the sustainability of life."*

*"Sustainability is about development because we can say that knowledge is always sustainable like development."*

*"Sustainability is related to life, cycle, world issues. Because life happens in the world through cycle of life."*

*"Sustainability is related to administration because sustainability requires a plan and involves the future. For this, it requires a good time and administration process."*

*"Sustainability is about psychology, sociology and natural sciences. Because geography is destiny and human psychology and sociological structure of societies are completely related to nature."*

*"It is related to the concepts of vitality, nature, climate, environment, ecological balance. Because these concepts are interconnected, just like veins in our body. If the flow in one is disrupted, all are affected and deterioration begins."*

*"It is the world and everything that the world contains. Because the system that creates the world is a whole."*

*"It is related to sustainability, world, life, environment, justice, being empathetic and willful. Because the continuation of life in the world and the protection of the environment includes the will, the right to a fair life for all living things and to empathize with them."*

Categories of sustainability areas that preschool academicians associate their metaphors regarding the concept of "sustainability" are presented in Table 3 in order from the highest (*f*) value to the lowest.

Table 3. Categories of sustainability areas that preschool academicians associate their metaphors regarding the concept of sustainability

| Category | *f* | % |
|---|---|---|
| Topics Covered by Sustainability Category | 85 | 59.5 |
| Sociability Category | 20 | 13.9 |
| Universal/Values Category | 16 | 11.2 |
| Process Category | 10 | 7 |
| Scientific Field Category | 6 | 4.2 |
| Nature Category | 4 | 2.8 |
| Assessment Category | 2 | 1.4 |
| Total | 143 | 100 |

Among the sustainability fields that academicians working in the department of preschool education associate their metaphors about the concept of sustainability, the related fields gathered under the "universal/human values category"; justice (n=4, *2.8%*);

to empathize (n=3, *2.1%*); equality (n=2, *1.4%*); conscience, patience, will, perseverance, individual rights, conscious user and respect (n=1, *0.7%*) have been shows shaped distribution.

Medicine, biology, sociology, psychology, administration and natural sciences were included under the "scientific field category" among the fields of sustainability that academics associate their metaphors with the concept of sustainability. The related areas gathered under the “nature category” were specified as trees, water, world, and all living things, and each of the associated areas in both categories was used only once [(n=1), (*0.7%*)].

Among the sustainability fields that academicians working in the preschool teaching department associate their metaphors with the concept of sustainability, the related fields gathered under the "process category" are; cycle and future (n=4, *2.8%*); development and time (n=1, *0.7%*); Related areas under the category of “topics covered by sustainability” are environment (n=17, *11.9%*); nature (n=9, *6.3%*); economics, agriculture, ecology and climate (n=8, *5.6%*); education (n=6, *4.2%*); development and eco-system (n=5, *3.5%*); culture (n=4, *2.8%*); world (n=3, *2.1%*); world issues (n=2, *1.4%*); ecological balance and correct use of resources (n=1, *0.7%*) as have been determined.

Under the “sociability category”, life (n=11, 7.7%); social life (n=5, 3.5%); society (n=3, 2.1%); all humanity (n=1, 0.7%) subjects were associated; Under the “assessment category”, each of the implementation and observation subjects was associated once (n=1, 0.7%).

## 4. Discussion

The present study was conducted to reveal the metaphors of the academicians working in the department of preschool education regarding the concept of "sustainability" and to identify the categories of these metaphors, and also to identify the sustainability areas with which they associate their metaphors regarding the concept of "sustainability" and group them under certain conceptual categories.

In line with the data obtained in this study, an evaluation of the category distributions of the metaphors created by preschool education academicians regarding the concept of "sustainability" shows that the need/necessity category (23.6%), life resource category (17.7%), time/process and nature (13.2%) categories are placed in the first three places.

Sustainable development is defined (Pitelis, 2013) as a development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs, and this definition covers the need/necessity category.

Life resource category, on the other hand, emphasizes the most basic needs and requirements for the continuity of life. Nature category can be evaluated within the environmental factor and it corresponds to the definition of the Bruntdland Report (1987)

as a method of achieving economic growth and raising the level of welfare by protecting the environment and the quality of life of all people on earth.

One of the administration processes is organization. The Organization category (8.8%) is compatible with the decision of the Stockholm Conference on the Human Environment, which was held in Sweden in 1972, on the importance of environmental administration and the use of environmental assessment as an administration tool (Barral, 2012).

There are three dimensions of sustainability: economic, environmental and social. The statement that a sustainable system within the social dimension requires the distribution of equality (Holmberg & Sandbrook, 1992) coincides with the content of the equality/rights category (5.9%).

The expression "sustainability should ensure that social services including responsibility and participation are performed in a sufficient level" (Norgaard, 1994) in the definition of the social dimension meet the metaphor of responsibility (5.9%) in the belonging category (8.9%).

Promoting sustainability, protecting biodiversity, and sustainable use and continuity of ecosystems are among the important objectives (Gregorio et al., 2018, p. 2). Therefore, the principle of circularity for cyclical sustainable nature economics and healthy society is to encourage all resources to contribute to a more environmentally friendly use (Geisendorf & Pietrulla, 2018, p. 772). The metaphors and explanations under the cyclicality category quite overlap with the aforementioned definition and principle of cyclicality.

The concepts of time and future under the process category are included in the definition made by Kirchherr et al. (2017) on the necessity of adequately transferring the social equality, economy and environmental dimensions of sustainability to next generations in a sufficient manner.

In the second stage of the study, the areas that preschool academicians associated their metaphors with the concept of sustainability were gathered under the categories of topics covered by sustainability, sociability, universal/human values, process, scientific field, nature/nature, and assessment, in order of distribution from the most to the least.

Among these categories, topics covered by sustainability (59.5%) are encountered as environment, nature, economics, agriculture, ecology, climate, education, development, eco-system, culture, world, ecological balance, correct use of resources and all of these associated areas stand out as areas contained by sustainability.

The universal/human values category includes the concepts of justice, to empathize, equality, conscience, patience, will, perseverance, individual rights, conscious user and respect. The concepts of medicine, biology, sociology, psychology, administration and natural sciences are under the category of scientific field. Nature category includes the concepts of water, tree, earth and all living things. Process category contains the concepts

of cycle, future, development, time. The topics of life, social life, society and all humanity are under the sociability category. The assessment category includes the concepts of observation and implementation.

## 5. Conclusion

The present research is designed for the Education for Sustainable Development practice found in the final report of the United Nations' Decade of Education for Sustainable Development (DESD). The focus of this study is the academicians working in the pre-school department that trains teachers, which is the cornerstone of education. The results of this research showed that academicians working in department of preschool education created 29 different metaphors regarding sustainability. These metaphors offer a rich variety. In terms of the areas associated with the metaphors, 44 different areas were determined. However, preschool academicians used the subject of sustainable education considerably infrequently in these fields (n=6, 4.2%). This suggests that academics in the education community do not have sufficient knowledge about the sustainability of education.

Perhaps for this reason, as McKeown (2002) indicated; In order to reinvent and make progress in education to include sustainability, we need to identify and embrace the current contribution of disciplines, programs and teachers to sustainability education in our own school systems.

Sinakou et al. (2018) investigated the personal understandings of academicians in the field of Education for Sustainable Development and teacher training programs on "Sustainable Development". The tool used in the study, which was conducted with the participation of 56 academicians, consisted of 16 statements specially created to reflect different interpretations of sustainable development: In these statements, the participants were asked to decide which of the interpretations related to the concept of sustainable development in the context of education best represents sustainable development. It has been found that the most frequently chosen expressions prioritize an understanding of sustainable development in which two or three dimensions of the concept (environment, society, economics) are viewed separately. It has been seen that the academicians in the field of education for sustainable development do not grasp the concept of sustainable development holistically and a trend towards the social and economic aspects of sustainable development rather than education existed.

The findings of the present study conducted with preschool academicians are similar to the results of the research conducted by Sinakou et al. (2018) Increasing the number of studies on sustainability and sustainable education will ensure the enhancement and dissemination of information on the subject. We claim that the academicians who train preschool teachers, who play an important role in the first step of education, should

create and focus on education issues in order to convey sustainability and sustainable education to the teachers who will educate the children, who are essentially our future.

The importance of sustainable education and the role of academics in this education become even more important when the density of the young population in our country (TUİK, 2020) and the ratio of one third of the university students in the total population are considered.

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