

# NON-FORMAL EDUCATION AS A TOOL FOR REDUCING THE IMPACT OF THE FASHION INDUSTRY - THE CONTRIBUTION OF TO-BE-GREEN APP

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## Abstract

The fashion industry (textiles and clothing) is very important in the Portuguese economy, with a turnover of 7,700 million euros in 2019, representing 10% of Portuguese exports and about 138,000 workers (20% of employment in the manufacturing industry) [1]. However, the excessive production of fashion products around the world negatively affects the environment because the fashion industry is extremely polluting, a strong consumer of natural resources and a big producer of wastes in its complete value chain, including the transport to the final markets from the manufacturers overseas.

Chinasamy from Greenpeace said in 2019, “every year, global emissions from textile and clothing production are equivalent to 1.2 billion tons of CO<sub>2</sub>, a number that exceeds the carbon footprint of international flights and maritime transport together” [2]; also the French Minister of Ecology adds that “the textile sector represents 6 percent of global greenhouse gas emissions and 10 to 20 percent of pesticide usage; washing, solvents and dyes used in its manufacturing processes are responsible for one fifth of industrial water pollution; and fashion accounts for 20 to 35 percent of the microplastic flows into the ocean”[3].

“New” challenges have been imposed to the consumer society - overconsumption society - mainly by younger generations, millennials (Y) and zoomers (Z), aware of the impact of human activity, where personalities such as activist Greta Thunberg assume an increasingly predominant role, an active and respected voice for the preservation of the environment. Thus, “the preservation of the environment depends on an ecological conscience and the formation of conscience depends on education”, and it can assume formal, non-formal or informal configuration, as states Gadotti [4].

This article intends to study how the implementation of the TO-BE-GREEN project ([www.to-be-green.pt](http://www.to-be-green.pt)) influences the way how these young students (participants) perceive the impact of the fashion industry on the environment and how their participation in this non-formal education project can change the perception of their role as consumers. This app aims to modify their behaviour of disposal of fashion products by granting a longer use of them or by assuming a “green” attitude to recycle new products. After the implementation of TO-BE-GREEN solution in these three schools, involving more than 1.000 students in three municipalities in Portugal, it's a main goal of the project to prepare the students to seek more sustainable practices in their choices, treatment and disposal of their clothing, using an app focused on Circular Economy and digitization of the disposal clothing.

Keywords: Non-formal education, disposal of clothing, fashion, app TO-BE-GREEN.

## 1 INTRODUCTION

In recent decades, with the increase of environmental concerns caused by human activity, such as the excessive consumption of natural resources, water and energy, the emission of greenhouse gases, pollution, climate change, the adoption of more sustainable behaviours has become paramount, not only by individuals in a personal capacity but also by all industries and at a governmental level. The escalate of these environmental issues are fundamentally due to the growth of the global population, the improvement of people's lifestyles and the increase of their income, and for the fashion industry, besides all the other problems that emerge from one of the most polluting industries, this intensification in the consumption of textiles and clothing also resulted in the rose of textile waste.

In the search for more sustainable behaviours, researchers, policy makers and practitioners, were determined to close the loop with Circular Economy that “unlike the linear model of ‘take-make-dispose’, (...) is intended to be restorative and regenerative by having better product design and processes to promote maximum reuse of resources and prevention of waste” [5]. Having this concept in mind, and mainly due to the excessive volume of textile waste produced around the globe, textile and clothing “reuse and recycling can be a sustainable solution for reduction in solid waste in landfill,

reducing the production of virgin materials and energy consumption as well as producing a smaller environmental footprint” [6]. With this premise in mind, the conscious disposal of clothes, giving them the possibility of being reused or recycled, is a strategy that is easy to reach for the common citizen and that allows them not only to contribute positively to the environment but also to their family budget.

Awareness of the environmental problems that planet Earth faces are already a constant worldwide, with multiple initiatives led by various government agencies, personalities and groups of citizens. However, the theme of one of the harms that fast fashion brought, the excess of production and consequently the quick disposal of clothes and their "normal" end in landfills, has not yet been properly addressed. Thus, conscious disposal, which involves the possibility of reusing clothes (second-hand clothes) or recycling is essential, with initiatives that focus on this subject. In this way, the To-Be-Green project presents as its main tool an app focused on Circular Economy and digitization of the disposal clothing, it is a non-formal education initiative implemented in the school context, with the generation Z (zoomers), whose main objectives are the promotion of consciousness for the correct disposal of clothes that participants no longer use and the raising awareness for more sustainable consumption habits.

## 2 BACKGROUND

The power of the fashion industry is undeniable, it generates “EUR 1.5 trillion a year” in revenue and “employs more than 75 million people worldwide”, being, according to the report The Fashion Pact [7], one of the largest, most dynamic, and most influential industries on the planet. This power is accentuated when analysing the expected growth of this industry - “a 7% compound annual rate until 2024, even correcting for economic instability caused by the pandemic”, The Fashion Pact report states [7]. According to CEO Agenda 2020 [8], “the world population will exceed 8.5 billion people by 2030, and global garment production will increase by 81%”, with “the total sale of clothing items reaching 160 million tons in 2050”.

In Portugal, the textile and clothing industry also plays a very important role in the national economy, by comprising, in 2019, “6 thousand societies and 5.900 individual companies, employing in total about 138 thousand direct workers, producing 7,5 billion euros and generating a turnover of 7,6 billion euros, of which 5,3 billion euros are the result of export activity (...) 10% of the national exports, 19% of the manufacturing industry employment and 8% of the manufacturing industry turnover”, according to the Portuguese Textile and Clothing Association [1].

Despite the notoriety recognized to the fashion industry in terms of its economic and, consequently, social impact, the harm to the environment that this industry causes are unquestionable: it is extremely polluting, a strong consumer of natural resources and highly waste producer. There are several data and statistics that show us this frightening impact: according to Chinasamy “every year, global emissions from textile and clothing production are equivalent to 1.2 billion tons of CO<sub>2</sub>, a number that exceeds the carbon footprint of international flights and maritime transport together” [2]; the French Minister of Ecology adds that “the textile sector represents 6 percent of global greenhouse gas emissions and 10 to 20 percent of pesticide usage; washing, solvents and dyes used in its manufacturing processes are responsible for one fifth of industrial water pollution; and fashion accounts for 20 to 35 percent of the microplastic flows into the ocean” [3]. These facts demonstrate the enormous threat not only for biodiversity, but also for human beings, as “clean drinking water, sanitation and water for plantations are becoming increasingly scarce” [8] with this impact being more noticeable in developing countries.

In the years 2016 and 2017, Greenpeace called the public's attention to the need to rethink fashion - in addition to the impact of water consumption and the use of chemicals in the dyeing process, it creates a focus on excessive production and rapid disposal of textile products - “Each year, more than 80 billion pieces of clothing are produced worldwide, and after its short lifespan, 3 out of 4 garments will end up in landfills or be incinerated” [9]; an average person “buys 60 percent more items of clothing and keeps them for about half the time he did 15 years ago”[10]. More recent data show that “less than 15% of clothes are recycled and less than 1% of the material used to produce clothing is recycled into new clothing”, and “every second a garbage truck full of textiles is thrown out” [8]. The Portuguese reality accompanies the global one with “200 thousand tons of textiles per year thrown away, equivalent to 4% of the total waste produced in Portugal”, according to data from the Portuguese Agency Environment (APA) [11]. These figures show the importance of bringing this subject to the discussion and, more important than its discussion, the promotion of initiatives that change the course of discarded clothes to landfills or incinerators, giving them new purposes (reuse or recycling) is an

urgent need, because “reuse of clothing is associated with reducing the amount of disposed clothing, thereby reducing environmental pollution” [12].

Despite this extremely worrying scenario, it should be noted that many initiatives, not only governmental but also with non-governmental associations and even public initiatives, are discussing the problem and keep trying to find solutions and raise awareness that seek to reduce the environmental impact of human behaviour. At the intergovernmental level, we emphasize the Agenda 2030, of the Organization for the United Nations [14], with the establishment of the 17 Sustainable Development Goals (SDGs) adopted by all Member States, which have as their maximum goal to promote prosperity while protecting the environment. The fashion industry, especially some giant fashion companies, are already responding to the United Nations SDGs, as Cai and Choi demonstrate in their study (2020) - the two researchers divided the 17 SDGs into three categories (social, economic and environmental), and their analysis shows that not all objectives are equally important to stakeholders, but “textile and apparel industry is on the track to pursuing the sustainable development” [13].

All these goals must be embraced and implemented in all branches of daily life, and although the efforts of the fashion industry are already significant, they are not enough to promote real change. For these reasons, the To-Be-Green project incorporates and highlights two goals, the 12 and 13, "Ensure sustainable consumption and production patterns" and "Take urgent action to combat climate change and its impacts" [14], respectively. Although textiles and clothing are not mentioned specifically, these goals are closely related to the project under study as it promotes more conscious consumption, focusing on the disposal of clothes, by making available for the young participants, in the online app, all second-hand items that can be "acquired" (all items of clothing that are not fit for reuse will be recycled).

For this reason, it is important to have in mind that other initiatives were very important for the awareness of the younger generations, was the ones led by a spokesperson for her generation (zoomers), Greta Thunberg, who, at the age of 15, in 2018, went on strike to school to call for climate change, took the topic of environmental sustainability to the media and gave rise to the Fridays For Future (FFF) movement [15]. Activist Greta Thunberg assumes an increasingly predominant role, an active and respected voice for the preservation of the environment, as we could witness in September 2019, with more than 7.6 million people from around the world being inspired to participate in the Global Climate Strike [16].

This younger generations, millennials (Y) and zoomers (Z), driven by concern and activism, are more alert of the impact of human activity on the environment, as seen by the increase in references to sustainability in social networks, “(this growth) was three times faster than the global growth of social networks” [17]. Also, for fashion there is an increase on internet searches on the topic “sustainable fashion”, by tripling between 2016 and 2019, and the hashtag #sustainablefashion quintupled, in the same homologous period, not only in the USA but also in Europe [18].

If we have in consideration that the majority target audience of the To-Be-Green project is the generation Z, we may assume that they are more receptive to the implementation and connected with the project's objectives, because this data shows us that the younger generations are more concerned with environmental sustainability topics. This growing involvement can be justified not only by worldwide dissemination of initiatives such as the ones we stand out, but also by the “green” involvement of the city they live in. Thomas has a very interesting study that ends up proving the aforementioned - “social movements and cultural trends help to shape people’s commitments to certain kinds of sustainability and condition their adoption of particular sets of (“green”) practices” [19]. We may see all this social movements and cultural trends as informal education, especially if we have in consideration that “the preservation of the environment depends on an ecological conscience and the formation of conscience depends on education” [4], and it can assume formal, non-formal or informal configuration.

With both premises in mind, that environmental initiatives, perceived as informal education initiatives, have resulted in positive effects on young people's awareness of environmental problems and that the preservation of the environment depends on education. To-Be-Green app, a non-formal education project, and others with similar goals, should be present in a maximum of counties, so that the conscious consumption and disposal of clothes becomes a new reality.

These types of initiatives and projects, as well as formal education curriculum, will shape mentalities to what Gadotti calls the “another possible world” [4]. For this “new” world to be (re)created it is imperative to change the people mindsets, the way they perceived themselves and the surroundings, only this way the world itself will change. For this to happen, education (in its very forms) is crucial and the information that is passthrough assumes a very important role, being for this matter extremely vital for it to be accurate, clear and reliable. If we take in account that we live in an era of information technology, it is essential to have a critical spirit to proceed to the analysis of all information and filter it trustworthy. The education for the “another possible world” must be a “training space critical”, playing “a decisive role in creating other possible, fairer, more productive and sustainable world for everyone” [4].

In short, the To-Be-Green Project presents itself as an online platform for non-formal education, which allows young users to rethink their position as consumers, not only in the way they discard the clothes they no longer use, but also in rethinking what, how and where they buy their clothes (expecting it to go above and beyond for all the products they buy). Its main objective is to raise awareness among young people to rethink and adopt new consumption habits, what they wear, how they treat their clothes and how they discard it.

### **3 METHODOLOGY**

The research methodology can be quantitative or qualitative: the qualitative analysis is often mentioned as the most recommended when the researcher wants to study a small sample of entities or organizations and the study is focused on a theme, subject or sector [20],[21].

The methodology followed to develop this project in the schools was different according the requirements of the municipal authorities. The coordination and organization of the functioning of the schools in the Portuguese municipalities (all the levels until the university level) are local not central. So, each territory (municipality) did the rules to apply this project in their schools. The methodology is experimental (measure the number of participants and the quantities of clothing disposed by the students) and can be upgraded to focus group and wardrobes studies in future steps.

But the pandemic situation last months in Portugal changed dramatically the approach to the schools, requiring a different strategy for the first phase of this work: the authors decided to make some virtual meetings with some students, more engaged with the sustainability and climate changes.

### **4 RESULTS**

TO-BE-GREEN project ([www.to-be-green.pt](http://www.to-be-green.pt) and [www.to-be.green.com](http://www.to-be.green.com)) influences the way how these young students (participants) perceive the impact of the fashion industry on the environment and how their participation in this non-formal education project can change the perception of their role as consumers, “green consumers”. This app (Fig.1) aims to modify their behaviour of disposal of fashion products by granting a longer use of them or by assuming a “green” attitude to recycle new products. After the implementation of TO-BE-GREEN solution in these three schools, involving more than 1.000 students in three municipalities in Portugal, it’s a main goal of the project to prepare the students to seek more sustainable practices in their choices, treatment and disposal of their clothing, using an app focused on Circular Economy and digitization of the disposal clothing. They are also the “AS – Agentes de Sustentabilidade” in their families, with the task of search, gather and upload all the old-fashioned clothes (or damaged) through their devices (mobiles, tablets or PC) and after to transport them to the schools and deliver to the TO-BE-GREEN “GLAD – Gestor Local da App e Demonstrador” to validate the deliveries. All the clothes disposed and shared by the users are shown in the app (Fig.2) and can be obtained using the points accumulated.

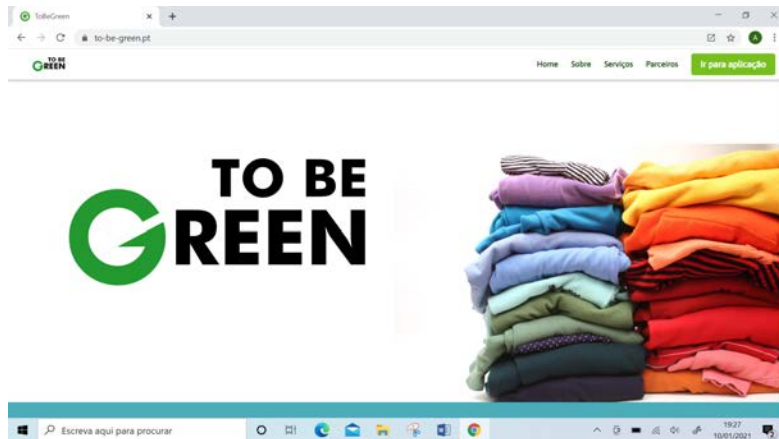


Figure 1 – App TO-BE-GREEN.

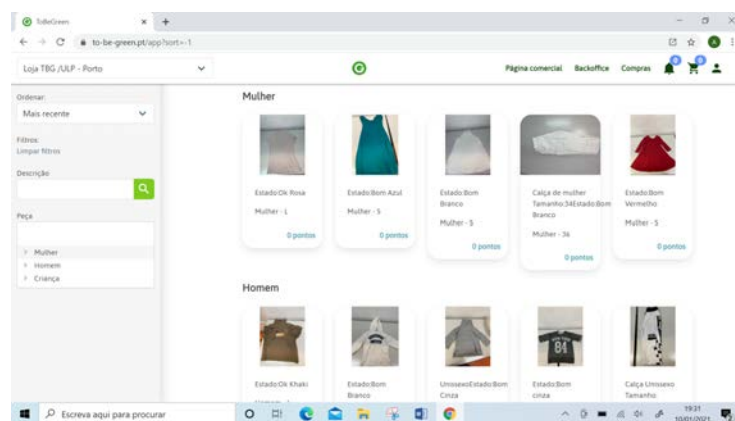


Figure 2 – Clothes disposed by the users.

Private schools are using uniforms to identify their students. In these cases, the clothes are known to the school community and the sizes and styles (different categories of clothes) are clear and recognized by the parents. The children grow and do not fit in their uniforms and they can exchange (or swap) with other colleagues and accumulate points to obtain sizes fitting.

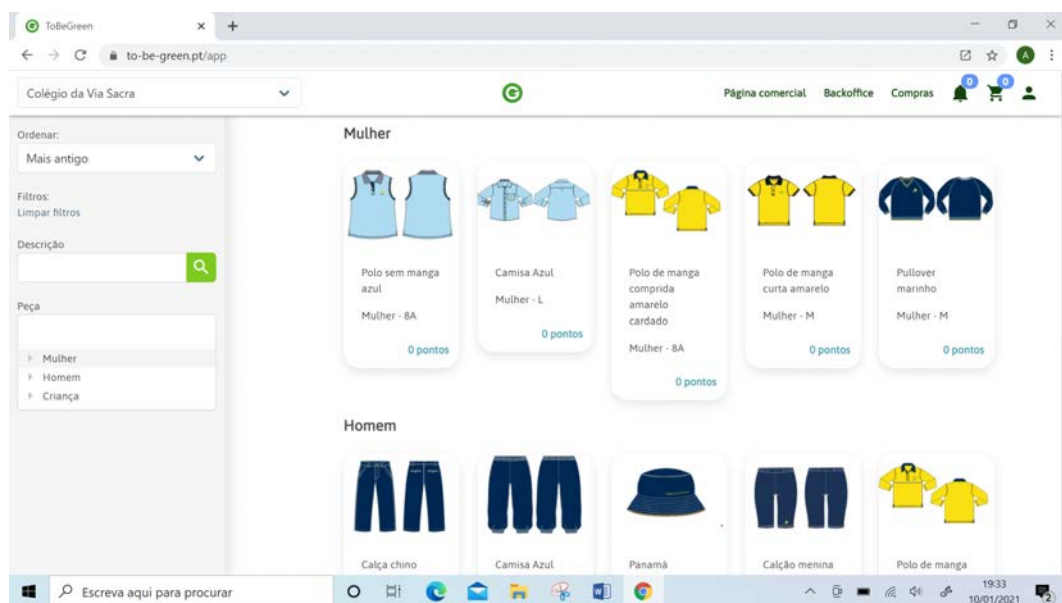


Figure 3 – App TO-BE-GREEN with uniforms of private school.

## 5 CONCLUSIONS

New approaches and strategies have to be prepared to address all these climatic challenges, from consumer behaviour (more conscious, committed and active) until national and municipal policies. A new consumer, more conscious and “green”, a Homo Sustentabilis [22] can play a central role in this common task (and critical).

New solutions as it is the To-Be-Green Project presents itself as an online platform for non-formal education, focused in Zoomers generation, which allows young users to rethink their position as consumers, not only in the way they discard the clothes they no longer use as well as their family disposal clothes, but also in rethinking what, how and where they buy their clothes (expecting it to go above and beyond for all the products they buy). Its main objective is to raise awareness among young people to rethink and adopt new consumption habits, what they wear, how they treat their clothes and how they discard it. The local authorities - municipalities- need to promote these new solutions and to increase their recycling rates as required by European Union. Latest legislation in Portugal (Dec-Lei nº 102-D/2020) regarding wastes put all the stakeholders committed with hard goals to achieve in next years.

Also the integration of digitalization, big data and other approaches of Industry 4.0 can contribute to optimize and maximize all the solutions focused in promoting the “green” attitudes of all the communities, including the new generations Y, Z and Alfa.

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## REFERENCES

- [1] P. Vaz (dir), *Fashion From Portugal 4.0 - Diretório 2019*, Associação Têxtil e Vestuário de Portugal, 2019, Retrieved from: <https://atp.pt/wp-content/uploads/2019/06/ATP-Diretorio-2019-1.pdf> (accessed on 27<sup>th</sup> December 2020).
- [2] J. Chinasamy, “A monstrous disposable industry: Fast facts about fast fashion”, *Unearthed*, 2019. Retrieved from: <https://unearthed.greenpeace.org/2019/09/12/fast-facts-about-fast-fashion/> (accessed on 15<sup>th</sup> October 2020).
- [3] L. Guilbaut and S. Kent, “Kering Chief to Present Industry Sustainability Pact to G7”, *Business of Fashion*, 2019. Retrieved from: <https://www.businessoffashion.com/articles/news-analysis/kering-chief-to-present-indus-try-sustainability-pact-to-g7> (accessed 15 October 2020).
- [4] M. Gadotti, *Educar para a sustentabilidade: uma contribuição à década da educação para o desenvolvimento sustentável*. São Paulo: Editora e Livraria Instituto Paulo Freire, 2008.
- [5] M. A. Bukhari, R. Carrasco-Gallego and E. Ponce-Cueto, “Developing a national programme for textiles and clothing recovery”, *Waste Management & Research*, vol. 36 (4), 321–331, 2018.
- [6] K. Shirvanimoghaddama, B. Motamed, M. Naebe and S. Ramakrishna, “Death by waste: Fashion and textile circular economy case”, *Science of the Total Environment*, vol. 718, 1 – 10, 2020.
- [7] Boston Consulting Group, “*The Fashion Pact – First Steps to Transform Our Industry*”, 2020 Retrieved from: <https://thefashionpact.org/wp-content/uploads/2020/10/038906e111abca13dce4c77d419e4f21.pdf> (accessed on 5<sup>th</sup> December 2020).
- [8] G. Araci, M. Lehmann, E. Kruse, F. Robinson and A. R. Taylor, “*CEO Agenda 2020 - Eight Sustainability Priorities for the Fashion Industry*”, Global Fashion Agenda, 2020. Retrieved from: <https://wordpress.globalfashionagenda.com/report/ceo-agenda-2020/> (accessed on 23<sup>rd</sup> November 2020).
- [9] S.-W. Chung, “Fast fashion is “drowning” the world. We need a fashion revolution!”, Greenpeace, 2016. Retrieved from: <https://www.greenpeace.org/international/story/7539/fast-fashion-is-drowning-the-world-we-need-a-fashion-revolution/> (accessed on 15<sup>th</sup> October 2020).

- [10] Greenpeace, “*Fashion at the crossroads. A review of initiatives to slow and close the loop in the fashion industry*”, 2017. Retrieved from: <https://storage.googleapis.com/planet4-international-stateless/2017/09/76e05528-fashion-at-the-crossroads.pdf> (accessed on 15<sup>th</sup> October 2020).
- [11] J. Capucho, “Portugueses Deitam Fora 200 mil Toneladas de Roupa Por Ano”, *Diário de Notícias*, 2019. Retrieved from: <https://www.dn.pt/edicao-do-dia/08-abr-2019/portugueses-deitam-fora-200-mil-toneladas-de-roupa-por-ano--10764484.html> (accessed on 15<sup>th</sup> October 2020).
- [12] H. J. Park and L. M. Lin, “Exploring attitude–behavior gap in sustainable consumption: comparison of recycled and upcycled fashion products”, *Journal of Business Research*, vol. 117, 623-628, 2020.
- [13] Cai, Y.-J. and Choi, T.-M., “A United Nations’ Sustainable Development Goals perspective for sustainable textile and apparel supply chain management”, *Transportation Research Part E: Logistics and Transportation Review*, Elsevier, vol. 141, 1 – 21, 2020.
- [14] United Nations. Retrieved from: <https://unric.org/en/united-nations-sustainable-development-goals/> (accessed on 23<sup>rd</sup> November 2020).
- [15] Friday for Future Movement, 2020. Retrieved from: <https://fridaysforfuture.org/> (accessed on 25<sup>th</sup> November 2020).
- [16] Global Climate Strike. Retrieved from: <https://globalclimastrike.net/> (accessed on 25<sup>th</sup> November 2020).
- [17] G. Arici, S. Boger, B. Carrière-Pradal, M. Lehmann, C. Martinez-Pardo, F. Kruegger and D. Schou, *Pulse of the Fashion Industry – 2019 Update*. Global Fashion Agenda, Boston Consulting Group and Sustainable Apparel Coalition, 2019. Retrieved from: <http://media-publications.bcg.com/france/-Pulse-of-the-Fashion-Industry2019.pdf> (accessed on 24<sup>th</sup> November 2020).
- [18] A. Berg, L. Haug, S. Hedrich and K.-H. Magnus, *Time for change – How To Use the Crisis To Make Fashion Sourcing More Agile and Sustainable*, McKinsey & Company, 2020. Retrieved from: <https://www.mckinsey.com/industries/retail/our-insights/time-for-change-how-to-use-the-crisis-to-make-fashion-sourcing-more-agile-and-sustainable> (accessed on 10<sup>th</sup> November 2020).
- [19] K. Thomas, Cultures of Sustainability in the Fashion Industry. *Fashion Theory – The Journal of Dress, Body & Culture*, no. 24(5), pp. 715-742, 2020.
- [20] M. Saunders, P. Lewis & A. Thornhill, *Research Methods for Business Students*. 5<sup>th</sup> edition. Harlow/Essex: Pearson Education Limited, 2009.
- [21] J. W. Creswell, *Research Design: qualitative & quantitative approaches*. Thousand Oaks: Sage Publications, 1994.
- [22] Marques, A., Marques. A, & Ferreira, F. Homo Sustentabilis: circular economy and new business models in fashion industry, *SN Applied Sciences*, 2:306, 2020.