

# EDUCATION FOR THE CIRCULAR ECONOMY: ANALYSIS OF THE HIGH SCHOOL CURRICULUM FOR FASHION DESIGN COURSES IN PORTUGAL

**Sofia Moreira, António Dinis Marques**

*University of Minho (PORTUGAL)*

## Abstract

An education for the circular economy is increasingly vital these days, especially if we consider the training of future fashion designers. This is because, as is commonly known, fashion is one of the most polluting industries in the world, and like all young people, future fashion designers are required to rethink not only the way garments are experienced (purchased, handled, and discarded) but specially how they are designed. Unrestrained consumption, driven by Fast Fashion's linear model of "take-make-dispose" [1], one-way model "from cradle to grave" [2], still prevails and it is essential to change the way fashion is perceived.

The circular economy thus presents itself as an undeniable guideline for the fashion industry - in the search for more sustainable behaviours, researchers, politicians, and educators are determined to close the cycle ("from cradle to cradle" [2]). The Circular Economy, unlike the Fast Fashion model, "is intended to be restorative and regenerative by having better product design and processes to promote maximum reuse of resources and prevention of waste" [1]. Thus, this circular model aims to reduce as much as possible the amount of waste during the entire production chain, and its design ends up being the basis for waste reduction to be possible.

For this reason, it is essential that the education of young fashion designers take on a more sustainable component, in which design for the circular economy is at the heart of the curriculum. For this to happen, it is important to understand how the curriculum of fashion design courses are structured and the importance this subject assumes.

This article intends to analyse whether the curriculum of fashion design courses in high schools address the theme of circular economy in fashion and if so what methodologies and strategies are used for its implementation in the classroom context. It is aimed to study how the guidelines proposed by the Ministry of Education for the sustainable development in fashion are approached by educators with students of this age group (generation Z or Zoomers). With this goal in mind, a survey of all fashion design courses in Portugal will be carried out at this level of education.

Keywords: Circular Economy, Curriculum, Fashion Design, High School.

## 1 INTRODUCTION

The fashion industry assumes itself as one of the most important and dynamic industries in the world, however, the excess production of fashion items around the world negatively affects the environment, as the fashion industry is very polluting, a strong consumer of natural resources and a major producer of textile waste throughout its value chain.

It is imperative that something must be done to change the course of this enormous impact on the environment, not only through public policies that have repercussions on the industry, but also through governmental or public initiatives that make the population aware of the excessive impact of the human activity. The circular economy (CE) emerges as an alternative to the current model (Fast Fashion), becoming a guide for the fashion industry, promoting the development of more sustainable garments and the reuse and recycling of products.

These changes in the fashion industry should also start from the awareness of young people for the power that those changes assume, and only the shift in behaviour on the part of consumers will shift what the industry offers. Education for sustainability consequently has the function of opening young people's horizons to this problem and to the role they play with the choices they make. The importance of these choices become even higher if we are talking about future fashion designers - "fashion design must act responsibly, because the role played by it works as a link between industry, commerce and society" [3]. Hence the significance and need to study how the curriculum of fashion design courses are

contemplating this component. The target audience is high school, with the Professional Fashion Design Technician Course, for two reasons, the first one is related to the fact that there are already some studies in a university context and the second one because it is considered that the sooner the awareness for this subject is introduced into the curriculum the more benefits it will bring in the long run.

## 2 METHODOLOGY

The methodology used for this study focuses essentially on research of official information available. It is divided into three distinct moments:

- The definition of the object of study - Professional Fashion Design Technician Course;
- The list of high schools that teach this course in Portugal;
- The comparison between the curriculum plans of the different schools and the guidelines of the Ministry of Education, paying particular attention to the presence of circular economy in those curriculums.

In a first phase, it became extremely important to define the object of study, the Professional Fashion Design Technician Course, as there are similar courses but with different qualification levels, namely the Higher Professional Technical Course in Fashion Design (TeSP). In order to do so, not only was used the legislation in force that defines it - Ordinance no 1291/2006 of 21<sup>st</sup> of November [4] and Ordinance no 601/2007 of 18<sup>th</sup> of May [5] – as well as the National Catalog of Qualifications (CQ) [6], of the National Agency for Qualification and Professional Education, I. P. (Agência Nacional para a Qualificação e o Ensino Profissional, I. P. - ANQEP), that adds the professional profile of the fashion design technician, with regard to what he will do professionally and what skills he will acquire during the course (knowledge, skills and attitudes).

With the aim of listing all Portuguese schools that teach the Professional Fashion Design Technician Course the main methodology used was the research, which focused on government institutions. Of all the research carried out, three institutions stood out that helped in the process of identifying these schools - General Directorate of Schools (*Direção Geral dos Estabelecimentos Escolares* – DGEstE) [7], Professional Schools in Portugal (*Escolas Profissionais de Portugal* – EPP) [8] and National Association of Professionals Schools (*Associação Nacional de Escolas Profissionais* – ANESPO) [9]. There was a need to combine information present in these three institutions, as the DGEstE is more omnibus and identifies all high schools, public and private, with regular and professional education. As EPP and ANESPO focus only on professional high schools, and it would be very reductive if only these schools were covered.

After identifying and listing all the schools that teach the course under study, research was used to obtain the curriculum plans for the different schools. A qualitative comparative analysis was carried out between the curricular plans of the various schools and the guidelines of the Ministry of Education, present in the CQ, paying particular attention to the presence of the topic of circular economy in those curricula, the results of this research can be perceived in the next chapter.

## 3 RESULTS

The results are presented according to the order used in the chapter methodology, therefore this section is subdivided into three parts.

### 3.1 Study object

The object of the present study is the Professional Fashion Design Technician Course, which, according to the aforementioned references, obtains this designation and the code 542107. It is included in the education and training area 542, referring to the Textile, Clothing, Footwear and Leather Industries and acquires a total of 191.25 credit points, of which some are related to practical training in a work context. This way, students who successfully complete all the Short-Term Training Units (UFCDs) of this professional course will be awarded a high school diploma and a level 4 professional qualification certificate - dual certification.

According to the Interpretive Guide of the National Qualifications Framework (Guia Interpretativo do Quadro Nacional de Qualificações QNQ), “the QNQ is structured into 8 qualification levels, each defined by a set of indicators that specify the results of corresponding to qualifications at that level, in terms of

Knowledge, Skills and Attitudes” [9]. In this way, each qualification level has an associated set of expected results, and these learning outcomes are defined in Ordinance No. 782/2009, of 23<sup>rd</sup> July [11], as can be seen in Table 1, for qualification level 4. Therefore, qualification level 4 does not correspond to a level of university education, but to high school education with a professional component, by having a mandatory integrated internship.

Table 1. Learning outcomes for qualification level 4 [11].

<b>Knowledge</b>	<b>Skills</b>	<b>Attitudes</b>
“Factual and theoretical knowledge in a broader context in an area of study or work.”	“A range of cognitive and practices skills necessary to design solutions to problems specific to an area of study or work.”	“Manage the activity according to the guidelines laid down in study or work contexts, generally predictable, but susceptible to change; Supervise routine activities of third parties, assuming certain responsibilities in evaluation and improvement of the activities in study contexts or work.”

More specifically for the Fashion Design Technical Professional Course, table 2 presents the expected learning outcomes at the end of this course, which have, according to National Catalog of Qualifications (CQ) [6] the following overview “plan, conceive and design new clothing products and collections for men, women, children, jeanswear and streetwear, taking into account international market and fashion trends, quality standards, functional requirements, constraints production techniques, among other factors.”

Table 2. Learning outcomes for the Fashion Design Technical Professional Course [6].

<b>Knowledge</b>	<b>Skills</b>	<b>Attitudes</b>
<p>“Notions of: Marketing.</p> <p><u>Knowledge of:</u> English language; Computing from the user's point of view; Fashion trends; Fashion history; Color theory; Human figure; Fashion illustration; Computer aided design CAD; Information collection and analysis processes; Collection planning methodology; Patterns; Technology and manufacturing processes; Organization and presentation of collections; Quality standards and procedures; Environment, safety, hygiene and health at work.</p> <p><u>In-depth knowledge of:</u> Fashion design applied to various clothing sectors; General and technical design; Characteristics and behavior of raw materials.”</p>	<p>“Use processes of collection and analysis of information for the design of clothing models and collections; Interpret and use the information in the design of models and clothing collections; Apply collection planning methods; Apply the methods and techniques of manual design of clothing models; Apply the methods and techniques of computer-aided design of clothing models; Use the techniques of selection of raw materials and accessories, with a view to their combination in the model of clothing to be made; Identify and match colours and textures; Determine the elements relating to the definition of the model, with a view to drawing up technical sheets; Apply methods and techniques for preparing technical sheets; Apply adequate quality standards and procedures to the design of clothing models; Apply the methods and techniques for launching and promoting collections; Use the technical documentation regarding the registration of the activity carried out; Apply safety, hygiene and health and environmental protection standards and procedures regarding professional activity.”</p>	<p>“Adapt to different organizational contexts and new technologies; Reveal creativity, initiative, openness to change and team spirit; Integrate safety, hygiene, health and environmental protection standards in the exercise of their professional activity; Demonstrate an aesthetic sense in the combination of shapes, colours and textures; Communicate and interact with others and the environment; Decide on the most appropriate solutions in solving specific situations.”</p>

For the learning results to be achieved, the course is structured in two parts - School Competencies and Professional Competencies, and for each of them there is a set of UFCDs, as can be seen in table 3. The analysis carried out on the curriculum of this course focuses essentially on the professional part, regarding fashion design specifically. This subject will be taken up again in point 3 of this chapter.

Table 3. Dual Certification Training Benchmark for the Fashion Design Technical Professional Course [6].

	<i>Type of Training</i>	<i>UFCDs</i>
School Competencies	Sociocultural	Portuguese or Portuguese Non-Mother Language   Foreign Language   Integration Area   Physical Education   Information and Communication Technology
	Scientific	Geometry   Math   History and Culture of the Arts
	Citizenship and Development	Citizenship and Development
Professional Competencies	Technological	Jeanswear Basics   Jeanswear Design Project   Streetwear Basics   Streetwear Design Project   Development of Women's Classics   Women's Clothing Design Project   Development of Men's Classics   Men's Clothing Design Project   Transformation of Dress Patterns   Transformation of Shirt Patterns   Transformation of Patterns for Skirts and Pants   Coat Patterns   Assembly of Garments   Clothing Production   Relationship Between Bitmap Image and Vector Drawing   Fashion Design Using CAD   Illustration by CAD   Graphic Composition   Commercial Fashion Project   Creative Fashion Design   Individual Collection Planning   Individual Collection Development   Volume Experimentation   Prototype Modeling   Making of Prototypes   Confection of final pieces

### 3.2 List of Portuguese high schools with the professional fashion design technician course

As mentioned earlier, in order to develop the list of Portuguese high schools that have the Professional Fashion Design Technician Course in their training offer, it was necessary to collect information from several sources, favouring three governmental institutions - DGEstE, EPP and ANESPO. This compilation, which can be analysed in table 4, becomes important as it allows, in a first phase, to understand which and how many schools offer this course, and which provide the curriculum plan online.

Table 4. Portuguese high schools with the Professional Fashion Design Technician Course [7] [8] [9] - public schools are identified in darker grey, private schools in lighter grey and schools with no information in white.

	<i>City</i>	<i>Website or Curriculum Plan</i>	<i>DGEstE</i>	<i>EPP</i>	<i>ANESPO</i>
Escola Secundária Campos de Melo	Covilhã	<a href="https://www.camposmelo.pt/">https://www.camposmelo.pt/</a>	X		
Escola Secundária Avelar Brotero	Coimbra	<a href="http://www.brotero.pt/documentos/doc_2021_22/Oferta_Formativa/DC-PROF21.pdf">/http://www.brotero.pt/documentos/doc_2021_22/Oferta_Formativa/DC-PROF21.pdf</a>	X		
Escola Profissional de Vouzela	Vouzela	<a href="https://epvouzela.com/tecnico-a-de-design-de-moda/">https://epvouzela.com/tecnico-a-de-design-de-moda/</a>	X		
Escola Básica e Secundária Dr. Azevedo Neves	Amadora	<a href="https://www.agan.pt/index.html">https://www.agan.pt/index.html</a>	X		
Escola Profissional Magestil	Lisboa	<a href="https://escolamodalisboa-pro.s3.amazonaws.com/uploads/courses/7921og14/documents/course_document.pdf">https://escolamodalisboa-pro.s3.amazonaws.com/uploads/courses/7921og14/documents/course_document.pdf</a>	X	X	X
ETAP - Escola Profissional	Vila Nova de Cerveira	<a href="https://www.etap.pt/cursos/designmoda/">https://www.etap.pt/cursos/designmoda/</a>	X		
Escola Artística e Profissional Árvore	Porto	<a href="https://www.arvore.pt/cursosProfissionais.php#dm">https://www.arvore.pt/cursosProfissionais.php#dm</a>	X	X	X
Escola de Moda do Porto – EMP	Porto	<a href="https://emp.pt/formacoes/design-de-moda/">https://emp.pt/formacoes/design-de-moda/</a>	X	X	X

Escola Profissional CENATEX	Guimarães	<a href="https://cld.pt/dl/download/26099bba-7e1b-41a4-91a7-56748d4a2e81/PLANO%20CURRICULAR_DM.pdf">https://cld.pt/dl/download/26099bba-7e1b-41a4-91a7-56748d4a2e81/PLANO%20CURRICULAR_DM.pdf</a>	X	X	X
Escola Secundária Camilo Castelo Branco	Vila Nova de Famalicão	<a href="https://www.aeccb.pt/oferta-educativa/">https://www.aeccb.pt/oferta-educativa/</a>	X		
Escola Profissional de Tecnologia e Gestão de Barcelos – ETG	Barcelos	<a href="https://www.webout.pt/etgbarcelos/cursos-profissionais/#designmoda">https://www.webout.pt/etgbarcelos/cursos-profissionais/#designmoda</a>	X	X	X
Escola Profissional do Minho – ESPROMINHO	Braga	<a href="https://23ea76aa-4abb-43e6-8691-abd1fc42af5d.filesusr.com/ugd/cd3bb0fae5093979a64fb0b8e7ad686566b325.pdf">https://23ea76aa-4abb-43e6-8691-abd1fc42af5d.filesusr.com/ugd/cd3bb0fae5093979a64fb0b8e7ad686566b325.pdf</a>	X	X	X
Escola Secundária de Vila Verde	Vila Verde	<a href="https://esvv.edu.pt/">https://esvv.edu.pt/</a>	X		
Escola Secundária Professor Doutor Flávio F. Pinto Resende	Cinfães	<a href="https://eseccinfaes.pt/">https://eseccinfaes.pt/</a>	X		
Escola Secundária de Marco de Canaveses	Marco de Canaveses	<a href="https://www.ae1marco.pt/2020/06/11/oferta-formativa/">https://www.ae1marco.pt/2020/06/11/oferta-formativa/</a>	X		
Escola Profissional Vértice	Paços de Ferreira	<a href="https://www.epvertice.com/">https://www.epvertice.com/</a>	X		
Agrupamento de Escolas de Lousada Oeste	Lousada	<a href="http://www.lousadaoeste.org/attachments/article/63/Plano%20curricular%20Design%20Moda.pdf">http://www.lousadaoeste.org/attachments/article/63/Plano%20curricular%20Design%20Moda.pdf</a>			
EPAVE – Escola Profissional do Alto Ave	Póvoa de Lanhoso	<a href="http://www.epave.pt/index.php?option=com_content&amp;view=article&amp;layout=edit&amp;id=166&amp;Itemid=101">http://www.epave.pt/index.php?option=com_content&amp;view=article&amp;layout=edit&amp;id=166&amp;Itemid=101</a>			
ESPE – Escola Profissional de Espinho	Espinho	<a href="https://espe.pt/">https://espe.pt/</a>		X	
ESCOLA PROFISSIONAL DE TORREDEITA   Projeto Plural Escola Profissional	Viseu	<a href="https://eptorredeita.pt/">https://eptorredeita.pt/</a>			X
Escola Profissional Gustave Eiffel	Entroncamento	<a href="https://gustaveeiffel.pt/">https://gustaveeiffel.pt/</a>			X
EPRAL - Escola Profissional da Região do Alentejo	Estremoz	<a href="http://epral.pt/">http://epral.pt/</a>			X
Escola Profissional de Moura	Moura	<a href="https://www.comoiprel.pt/escola-profissional-de-moura/">https://www.comoiprel.pt/escola-profissional-de-moura/</a>			X

### 3.3 Curriculum plans

Analyzing the twenty-three identified schools that include the Professional Fashion Design Technician Course in their training plan, it is possible to verify that the universe is subdivided into seven public schools, nine private schools and seven schools for which information is not available. Thus, four public schools do not identify this course as being present in their training plan for the current academic year (20/21). In addition, one of the schools presents it as a possibility for enrollment, however it does not provide any more information. Unlike the other two schools that make a short description of the course and identify the UFCDs and their workload, however they do not do so as exposed in the CQ but in a more simplified way, as presented in the Ordinance no 1291/2006 of 21<sup>st</sup> of November [4] (Figure 1).

Componentes de formação	Total de horas (a) (ciclo de formação)
<b>Componente de formação sociocultural</b>	
Português .....	320
Língua Estrangeira I, II ou III (b) .....	220
Área de Integração .....	220
Tecnologias da Informação e Comunicação .....	100
Educação Física .....	140
<i>Subtotal</i> .....	1 000
<b>Componente de formação científica</b>	
História da Cultura e das Artes .....	200
Geometria Descritiva .....	200
Matemática .....	100
<i>Subtotal</i> .....	500
<b>Componente de formação técnica</b>	
Design de Moda .....	530
Organização de Coleções e Marketing .....	120
Tecnologias Produtivas .....	410
Tecnologias dos Materiais .....	120
Formação em Contexto de Trabalho .....	420
<i>Subtotal</i> .....	1 600
<i>Total de horas/curso</i> .....	3 100

Figure 1. Study Plan for the Professional Fashion Design Technician Course [4].

Of the nine private schools, one of them presents the information about the course exactly as the CQ - course description, professional profile and professional opportunities and references all the UFCDs (table 3). Six of these schools list the first three characteristics of the course according to the CQ, however in the identification of UFCDs they use the Ordinance where this is established (Figure 1). Finally, only one school does not identify this course as being present in their training plan for the current academic year.

Regarding the seven remaining schools, five of them do not identify this course as being present in their training plan for the current academic year. One of them presents the information about the course exactly as the CQ - course description, professional profile and professional opportunities and the other one does the same but adds the identification of UFCDs as showned in the Ordinance (Figure 1).

Studying the curriculum plan present in the CQ, the difference between the depth given to the school component compared to the professional component is evident. While for all UFCDs of school competences two documents are presented - essential learning and the UFCD program - for professional competences only a few topics - objectives and contents. This point is very important to emphasize because it denotes the importance that is still given to the educational component in detriment to the professional component. However, it may be a favorable point for the continuation of the present study as it leaves open the possibility of including the Circular Economy in some of the UFCDs, due to the imperative of the school or even the teachers.

#### 4 CONCLUSIONS

In a pragmatic way, the main conclusion to be drawn from this study is that the sustainable component, the circular economy applied to fashion design, is not present in the Professional Fashion Design Technician Course curriculum.

Obviously, this conclusion is a little reductive, especially if we consider that schools do not make their complete curriculum available online, but mere guidelines that are almost entirely adhered to the ordinances and the CQ that define this course. No other situation would be expected, as the guidelines of the Ministry of Education must be considered, however the technological component program is so wide that it becomes possible to have methodologies and strategies that focus on sustainability and the circular economy geared towards fashion design.

For this reason, it will be important to continue this study, carrying out exploratory interviews with the course coordinators in the various schools to infer whether this issue is addressed and if they do so in what way they approach it. This study aims to survey methodologies and teaching-learning strategies that focus on teaching sustainability in fashion design. Based on this, it is intended to create new teaching-learning strategies that can then be used in these courses in the near future.

## REFERENCES

- [1] Bukhari, M. A., Carrasco-Gallego, R. e Ponce-Cueto, E. (2018). “Developing a national programme for textiles and clothing recovery”, *Waste Management & Research*, vol. 36 (4), 321–331.
- [2] Braungart, M. e McDonough, W. (2002). *Cradle to cradle: Remaking the way we make Things*. New York: North Point Press.
- [3] Araujo, M., Broega, A. C. and Mota-Ribeiro, S. (2014). Sustentabilidade Na Moda e Consumo Consciente. In: XIX Seminário Académico da APEC, O Local, O Global e o Transnacional nas Produção Acadêmica Contemporânea. Barcelona, Espanha, 19-20 Junho. Available at: [https://repositorium.sdum.uminho.pt/bitstream/1822/34492/1/APEC2014\\_MARaujo%20CBroega%20SMRibeiro.pdf](https://repositorium.sdum.uminho.pt/bitstream/1822/34492/1/APEC2014_MARaujo%20CBroega%20SMRibeiro.pdf) [Accessed on 10th November 2020].
- [4] Diário da República Eletrónico. Portaria n.º 1291/2006 de 21 de novembro. Available at: <https://files.dre.pt/1s/2006/11/22400/80008001.pdf> [Accessed on 10th November 2020].
- [5] Diário da República Eletrónico. Portaria n.º 601/2007 de 18 de maio. Available at: <https://files.dre.pt/1s/2007/05/09600/33713371.pdf> [Accessed on 10th November 2020].
- [6] Agência Nacional para a Qualificação e o Ensino Profissional (2020). Catálogo Nacional de Qualificações – Técnico (a) de Design de Moda. Available at: <https://catalogo.anqep.gov.pt/qualificacoesDetalhe/7276> [Accessed on 20th November 2020].
- [7] Direção Geral dos Estabelecimentos Escolares – DGEstE. Available at: [https://www.dgeste.mec.pt/wp-content/uploads/2018/05/Rede-CP\\_2018-19-Nivel-4-QNQ\\_mai2018.pdf](https://www.dgeste.mec.pt/wp-content/uploads/2018/05/Rede-CP_2018-19-Nivel-4-QNQ_mai2018.pdf). [Accessed on 24th November 2020].
- [8] Escolas Profissionais de Portugal – EPP. Available at: <https://www.escolasprofissionais.com/>. [Accessed on 24th November 2020].
- [9] Associação Nacional de Escolas Profissionais – ANESPO. Available at: <http://www.anespo.pt/Ser-Associado/Lista-de-Associados>. [Accessed on 24th November 2020].
- [10] Rocha, A. L. (2014). Guia Interpretativo do Quadro Nacional de Qualificações. Agência Nacional para a Qualificação e Ensino Profissional, IP. Available at: [https://anqep.gov.pt/np4/file/312/QNQ\\_GuiaInterpretativoQNQ\\_2014.pdf](https://anqep.gov.pt/np4/file/312/QNQ_GuiaInterpretativoQNQ_2014.pdf). [Accessed on 29th November 2020].
- [11] Diário da República Eletrónico. Portaria n.º 782/2009, de 23 de julho. Available at: <https://files.dre.pt/1s/2009/07/14100/0477604778.pdf> [Accessed on 10th November 2020].