

Design and Validation of Educational Resources for Household Sustainable Consumption

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Abstract

Community's sustainability is significantly affected by households day-to-day decisions and choices impacts, so it is important that families are aware and informed to make more sustainable choices. For this, several educational materials and tools are being produced, but not all promote efficiently sustainable consumption. The aim of this work is to assess the quality of educational resources on household sustainable consumption and to propose a set of practical recommendations for development and validation of household sustainable consumption educational resources. Portuguese resources available in the internet were used as a case study. A sample of materials available on the web were analyzed and evaluated by an expert panel with experience and knowledge in the area. Several weaknesses were found: some of the materials do not address all areas of sustainable consumption, few have households as the main target audience, they were not designed for good communication and understanding of sustainability issues, and there is a lack of an integrated vision of environmental, economic, social and cultural values. Taking this into account it was proposed a set of conditioning factors and practical recommendations for the development and evaluation of household sustainable consumption educational resources.

Keywords: sustainable consumption, households, educational resources, evaluation criteria.

1. Introduction

In 1992, in the United Nations Conference on Environment and Development in Rio de Janeiro, it was introduced the concept "Sustainable Consumption" (SC). The political framework of the measures for this purpose is found in the commitments made at the United Nations World Summit for Sustainable Development held in Johannesburg in 2002, and in the Marrakech Process, initiated in 2003. The concept was included by the European Union among the seven main objectives of the Sustainable Development Strategy (EEA, 2007).

In recent decades the European household's consumption has grown simultaneously with the gross domestic product (GDP), however, the consumption pattern has changed (EEA, 2005a). The rising incomes stimulated the increase in consumption with the demand for more food and beverages, for more large, warm and comfortable housing, for more appliances, furniture, clothing, cleaning materials, more transport and energy consumption (EEA, 2007).

Companies have a social and environmental responsibility so that the products and services on the market are sustainable, but consumers are who makes the final decision, therefore household

consumption is an important part of the production-consumption chain (Caeiro et al., 2008; EEA, 2005a).

Households choices affect the environment taking into account their day-to-day decisions (the goods and services that are bought and how they are used), where they live and work, what kind of housing they have, the way they manage waste, the chosen vacation spot, among many others (OECD, 2002). How families use their free time and how traveling also affect the environment (EEA, 2005a).

The promotion of sustainable consumption and production patterns was recognized at the World Summit for Sustainable Development in 2002 as one of three major goals of sustainable development (SD) (UNDESA & UNEP, 2010).

According to UNEP (2011), it is required a fundamental change in how goods and services are produced and consumed if we want to avoid a worse scenario of the environment, including climate disruption and depletion of natural resources.

In recent years, consumers have become co-responsible for creating environmental problems, through its elevated consumption levels, and in the same row are required to do something in respect of this (Halkier, 1999).

Sustainable consumption can be constructed based on changing behaviors and attitudes, by companies (responsible for production) and by households (responsible for consumption). Information is an important factor for SC: it is necessary to provide and to make available educational resources to educate and aware families to make more conscious and responsible choices in relation to their consumption patterns, making sustainable choices, enabling better resource management.

Education is one of the most powerful tools for providing people with the right skills to become sustainable consumers (OECD, 2008). Throughout the world it is recognized that current trends of economic development are not sustainable and that public awareness, education and practice are the key to change society towards sustainability (Hopkins & McKeown, 2004). Sustainability requires a population that is aware of the goals of a sustainable society and has the knowledge and skills to contribute to these goals (UNESCO, 2006a).

An essential step on the path to Sustainable Development (SD) is to educate citizens to recognize the problems the world is facing today as well as opportunities for innovation and progress (such as new energy technologies) and empowering them to act responsibly for a sustainable future (IISD, 2008). Education has a key role helping communities to understand how individual and collective behavior affects the environment, and how to move towards sustainability (NSW, 2006).

SC cannot simply be imposed, but arise as a result of an informed choice of sustainable goods and services by individuals, households, corporations and governments (OECD 1999).

Households with environmental literacy understand environmental issues and how environmental quality is affected by human decisions. Additionally, they use this knowledge to make informed and well-founded choices, which also take into account social and political considerations (NAAEE, 2009b). Governments should develop or encourage the development of general consumer education and information programs, including information about environmental impacts of consumer choices and behaviors and the possible implications, including benefits and costs of changes in consumption, taking into account the cultural traditions of the people concerned. The goal of these programs should be to empower people to act as demanding consumers, able to make informed choices of goods and services, and aware of their rights and responsibilities. In the development of information programs should be given special attention to the needs of disadvantaged consumers, in both rural and urban areas, including low-income consumers and those with low levels of literacy or non-existent literacy (UN, 2003).

Education and learning are not limited to formal environments (OECD, 1999). We cannot wait until the school environmental education (EE) may influence our entire population, which would take many decades. Much of the literature is centered on formal education, which is one where is required the use of educational resources. However, education of families for a more SC should go beyond the formal education and the concepts that are assigned. The goal of environmental education should be to

prepare citizens to be active in the world they inhabit, and not just spectators leaving the task to a small elite (Forbes, 1987).

In this sense, educational resources prove to be extremely important since it can lead to families that have "environmental literacy" and access to information. Educational resources for household sustainable consumption (HSC) are materials designed with an educational purpose, in order to inform, aware and change behaviors of families on SC, meeting correct scientific, educational, technical and values and attitudes criteria. The first aim of this work was to assess the quality of educational resources on HSC, using Portuguese resources available in the internet, as a case study. A second aim was to propose a set of practical recommendations for development and evaluation of HSC educational resources.

2. Methodology

A web survey was conducted in order to search and select online resources developed in Portugal for HSC (for a target population older than 15th years hold). The Portuguese keywords "household sustainable consumption" were searched in the Google, from September to November 2011. Only internet pages from Portugal were considered and selected for the analysis.

The first 150 web search results were verified and selected for further analysis. Beyond this value the results mainly began to repeat. Some of the unselected sites and respective resources contained inadequate or insufficient information for this analysis, such as: newspapers, conferences, unstructured and informal texts from several sources, outdated issues and events on SC, SC practices in other sectors; or led to a repeated resource. The principal methodological steps for the sample selection of educational resources are presented in figure 1. The final sample includes a set of nine resources which represent the core material to be evaluated by an expert panel, integrating academics and practitioners.

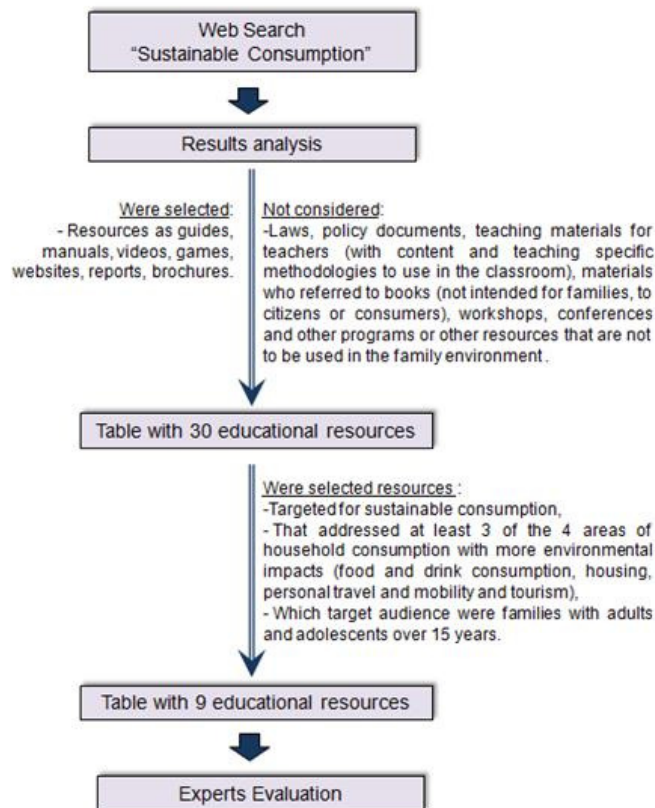


Figure 1: Methodological steps for sample selection and expert evaluation.

Each selected resource was characterized in terms of resource type, name, target audience, responsible entity, general description of the resource, and web address of the resource (Table 1).

Table 1: Set of resources selected for evaluation.

N.	Type	Name	Target public	Entity	Link
Guide 1	Manual/ guide	One day of sustainable consumption	Citizens consumers	Lipor/deco	http://www.consumosustentavel.org/index.php?recursos/consumo_respons_wei/2044.html
Guide 2	Manual/ guide	Sustainable Consumption Guide	Community of the municipality of Ferreira do Alentejo	Vasco da Gama – Centro de Estudos e Desenvolvimento do Instituto Politécnico de Beja	http://www.ferreirasustentavel.com/index.php?option=com_content&view=article&id=21&Itemid=49
Guide 3	Manual/ guide	Responsible Consumption - Issues, Challenges and Practical Guide for a Sustainable Future	Generally Consumers	CIDAC - Centro de Intervenção para o Desenvolvimento Amílcar Cabral	http://www.cidac.pt/CadernosConsumoResponsavel.pdf
Pdf 1	PDF file	What is sustainable consumption?	Citizens in general	Câmara Municipal do Seixal	http://www.cm-seixal.pt/pt/instancias/53f5783e-f00f-4d80-b62a-14d990d8f38f/5329/Consumo_sustentavel1.pdf
CD 1	CD-ROM	Ecopraça	Youths from 7 to 97 years	Valor Sul	http://www.valor.sul.com/ecopraça/index.html
Web 1	Website	Blue Planet: environment and sustainability portal	General public	Planeta Azul	http://www.planetazul.pt/edicoes/1/planetazul/index.aspx
Guide 4	Manual/ guide	Citizens and Sustainability	Citizens	Câmara Municipal de Águeda	http://gis.cm-agueada.pt/agenda21/Outros/guia_idadeo_net.pdf
Guide 5	Manual/ guide	Responsible Consumption Guide 2009	Portuguese citizens	Impactus / Sustentare	http://www.impactus.org/pdf/GUIA_final.pdf
Web 2	Website	Sustainable Consumption	Consumers in general	Dolceta	http://www.dolceta.eu/portugal/Mod5/

For the evaluation process it was developed a checklist of scientific and technical, communication, educational, values and attitudes criteria (Table 2) to evaluate the quality of selected resource set. For this purpose, it was constructed an evaluation matrix, taking into account the conducted literature review (in particular: OECD, 1999; Oskamp, 2002; Hopkins & McKeown, 2004; Michaelis & Lorek, 2004; EEA, 2005a; UNESCO, 2006a; IISD, 2008; PEI, 2008; EPA, 2009; NAAEE, 2009a). Without compromising a proper and robust resource evaluation approach, we attempted to develop an evaluation matrix that was not too much extensive and detailed, to avoid being very time consuming and complex, and allow a feasible fulfill by the evaluators. The content evaluation of the resources was conducted by an expert panel with different experience and knowledge in the area, from sustainable production and consumption to awareness and environmental education, based upon the defined criteria. The evaluation matrixes were filled as an interview, after a brief presentation of the research problem and an explanation of the resources to be evaluated. The selected online resources were scored on a scale of 1 to 5, where 1 represents very weak quality and 5 very good quality. The data collected were analyzed statistically using descriptive statistics, including frequencies, modes, and medians.

Based upon the case study results, literature review and expert knowledge, a set of conditioning factors, methodological procedures and practical recommendations for the development and evaluation of HSC educational resources were proposed.

3. Results and discussion

3.1 Assessment of the Portuguese SC educational resources

The nine selected educational resources are of various types from e-Guides/Manuals, small texts/leaflets (that we called "PDF files"), CDs online, and websites (see figure 2).

Table 2: Checklist of scientific and technical, communication, educational and value and attitude criteria.

Dimension	Criteria	
Scientific and technical	Scientific accuracy	
	Adequacy of content to the aim	
	Appropriate level of detail	
	Cover the main components of sustainability (environment, economic, social, cultural and ethical)	
	Cover the major areas of sustainable consumption	Food and drink consumption
		Housing
Travel and personal mobility		
Tourism		
Cover the national geography		
Communication	Attractive to target public	
	Integration of different formats (text, image, sound, video)	
	Good design and graphic organization (typefaces, colors, highlights, spaces, titles, subtitles, etc.) facilitates its use and contribute to the learning	
	Interactivity	
	Use of simplified illustrations, diagrams and messages	
Educational	Comprehensive and understandable by households	
	Clear and objective language	
	No grammatical errors	
	Relevance of titles and adequacy with the corresponding sections	
	Ease of understanding and practical use	
	Coherent and functional organization	
	Stimulates the autonomy and creativity	
	Ability to motivate and interest the user	
	Encourages the use of other sources of information and knowledge	
	Updated information	
Appropriate to the daily reality of household		
Values and attitudes	Transmission of the environmental values and attitudes, conducting to a proper HSC	
	Transmission of the economic values and attitudes, conducting to a proper HSC	
	Transmission of the social values and attitudes, conducting to a proper HSC	
	Transmission of cultural and ethical values and attitudes, conducting to a proper HSC	
	Promote education for sustainable consumption covering all components of sustainability	
	Suggestion of best practices for a household sustainable consumption	

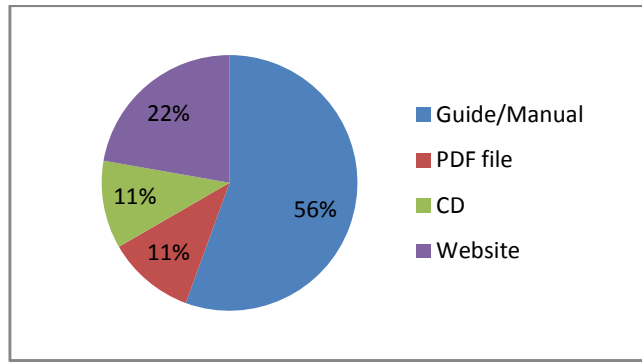


Figure 2: Types of selected educational resources.

In a general classification the resources Web 1, Guide 4 and 5 were the ones that obtained the highest ratings in the four set of criteria (median of 4) (figure 3). Lower ratings were obtained for the resources Guide 3, PDF 1 and Web 2. Nevertheless there are resources that were best classified in some criteria and were less classified in other criteria, and vice-versa.

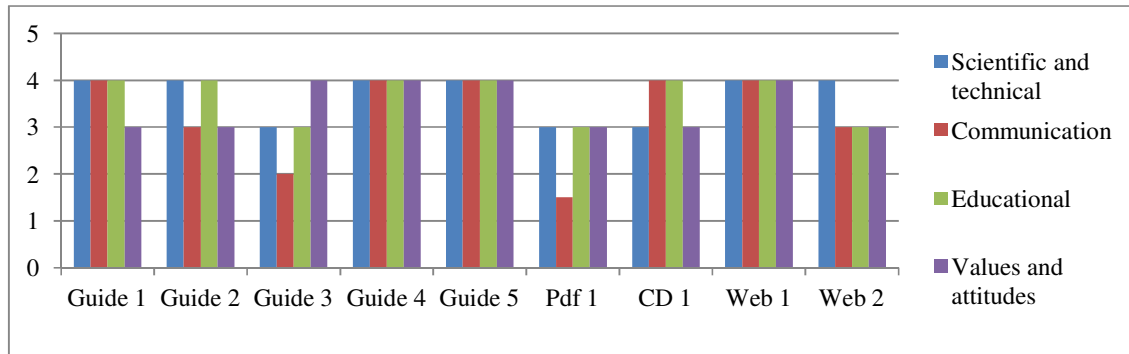


Figure 3: Median of classifications obtained in the set criteria of evaluated resources. The median was used, because of some bimodal cases.

The selected online resources were scored on average between 3 and 4 but a large deviation of the central value was obtained, due to different classifications of a specific criteria in each set (see values of the relative frequencies), as explained further on the text (see figure 4 and table 3).

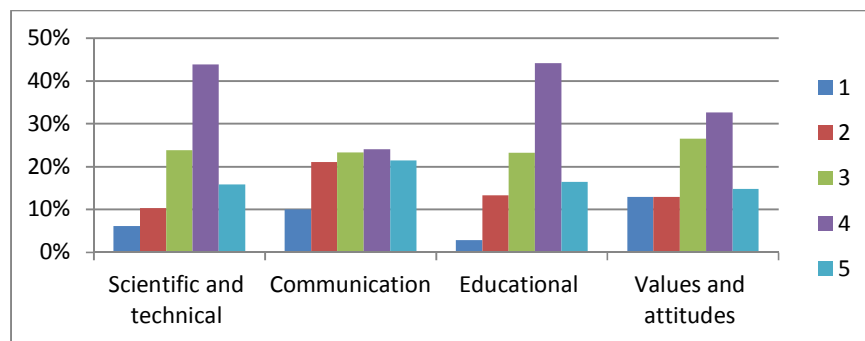


Figure 4: Percentage of classifications 1, 2, 3, 4 and 5 obtained in each set criteria in all the resources evaluated.

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Criteria	Resources evaluation			
	Score	Rel. freq. (%)	Mode	Median
Scientific and technical	1	6	4	4
	2	10		
	3	24		
	4	44		
	5	16		
Communication	1	10	4	3
	2	21		
	3	23		
	4	24		
	5	21		
Educational	1	3	4	4
	2	13		
	3	23		
	4	44		
	5	16		
Values and attitudes	1	13	4	3
	2	13		
	3	27		
	4	33		
	5	15		

A mode equal to 4 (44% according to the calculated relative frequencies) was obtained in the **scientific and technical criteria** for the total of criteria and resources (see Table 3). In general, the resources were assessed with 4 (according to the mode) with respect to the scientific accuracy, adequacy of content to the aim and the appropriate level of detail taking into account the objective. Families should acquire a good knowledge base of several sciences (Hopkins & McKeown, 2004 and UNESCO, 2006a) and solid information (Oskamp, 2002). The transmitted information must be of quality (Agenda 21, 2009), based on primary sources and bibliography (NAAEE, 2009a), appropriate to the objective and target public (NAAEE, 2009a and PEI, 2008). According to Zsóka (2008), the importance of environmental knowledge lies in the fact that knowledge, in general, plays a decisive role in shaping individuals' thinking, attitudes and values and indirectly in their behavior. The evaluated resources do not cover the main components of sustainability (environment, economic, social, cultural and ethical). Usually, resources give more weight to the environmental pillar. The other pillars are less covered, especially the social, the cultural and ethical pillars, which in some resources is not addressed. For this reason, the criteria "Principles of sustainability, addresses the pillars of sustainability (environment, economy, social, cultural and ethical)" had a mode of 3 and 4 (bimodal with relative frequency equal to 35%). In addressing the key areas/domains of household consumption with environmental impacts, the evaluated resources are also irregular. "Food and drink" consumption and "Housing" obtained a mode equal to 4 (each one with 50%, according to calculated relative frequencies). The "Personal travel and mobility" also had a mode equal to 4 (but with 44% according to the frequency) closely followed by classification 3 (with 31%), taking into account that this area is less explored in resources. "Tourism" was classified with mode 3 (with only 28%), followed by classifications 1 and 2 (both with 24%), so the less explored area. Some resources contain only a short phrase related to tourism. Thus, resources are not able to transmit in a complete and integrated way the already mentioned knowledge base and solid quality information in relation to this SC component. Most of the resources have a national geographical scope (the criteria presents a bimodal evaluation with ratings 4 and 5, with relative frequency equal to 41%). Resources should educate families to understand that the consumption impacts are generalized and are not confined to a particular area, so the examples used and supplied contacts must have a national scope (NAAEE, 2009a). Nevertheless it is necessary to take into account that according to the geographic location where the family lives so the resources should be addressed (e.g. rural or urban area). However, the materials must show that the impacts are not local but global.

In the total of the **communication criteria** and resources evaluated, a mode equal to 4 (with 24% according to the relative frequencies calculated) immediately followed by the classification 3 (with

23%), was obtained (see Table 1). In this criteria set, the resources had lower classifications (mode equal to 2) given to the almost complete lack of interactivity between user and resource except for the on-line CD-Rom and websites. This is one of the weaknesses of the analyzed resources, taking into account that to facilitate learning, the resources should promote interactivity, where families take an active role (Agenda 21, 2009 and IISD, 2008). Also in the integration of different formats (text, image, sound, video) the evaluated resources had a lower classification (mode 3 with 30% according to the relative frequencies) taking into account that most of the resources have only text and image (and some only text). Resources should use more illustrations, diagrams and summaries, which help users to better retain the transmitted information. This criteria obtained a mode equal to 4 (31%) followed by classification 2 (26%). The visual presentation of the educational resources is very relevant, should be interesting and should effectively promote learning, making appropriate use of graphics, images, illustrations, colors, flow charts, diagrams, tables, animations, graphics, among others (PEI, 2008 and NAAEE, 2009a). Also the design and graphic organization (including typographic characters, colors, highlights, spaces, titles and subtitles, should be appropriate, according to PEI (2008). In some of the evaluated resources, design and graphic organization facilitate their use and contribute to learning. This criteria has obtained a mode of 4 and 5 (bimodal, with 28% each). Although with a mode 5, the resources are not always attractive to target public. Classification 5 had a relative frequency of 30%, followed by classification 4 with 28% and 3 with 24%. The set of communication criteria already discussed, makes the resources more attractive. Nevertheless the use of different communication supports (e.g. leaflets, manual, CD, websites) should be adapted according to the type of family member. For example an digital educational resource could not be appropriate for elder people not so familiar with new technologies, where a simple brochure may respond to the intended goal.

About the **Educational criteria** the resources must be explored and constructed as best as possible, according to various characteristics defined for example by NAAEE (2009a) and PEI (2008). A mode equal to 4 (with 44% according to the relative frequency) followed by the classification 3 (with 23 %) was obtained for the set of criteria in the total of resources (see Table 1). In educational resources it is intended a comprehensive and inclusive discourse to all the age group of the households, and it should be taken into account the different level of knowledge of children, adults and elders. According to NAAEE (2009a) and PEI (2008), the content of educational resources should be appropriate (in terms of level, depth, and language) to the target public. This specific criteria obtained a classification mode equal to 4 (with 44%) followed by classifications 3 and 5 (both with 20%). A clear and objective language and no grammatical errors are also important criteria and were satisfied in most of the evaluated resources. The language used in educational resources should not be complex in order to be understood by families (OECD, 1999 and NAAEE, 2009a) and the technical terms used should be explained (PEI, 2008). Also a classification mode equal to 4 was obtained about the relevance of titles and adequacy with the corresponding sections (48%), ease of understanding and practical use (41%), and coherent and functional organization (44%). After a classification of 4 the classification mostly attributed in these three criteria was 3. Any of these characteristics is considered essential according to NAAEE (2009a) and PEI (2008). The resources should be developed in order to stimulates the autonomy and creativity, as advocate NAAEE (2009a) and PEI (2008). In this criteria, the evaluated resources obtained a classifications mode equal to 3 (with 35%), followed by the classification 4 (with 30%). In respect to the ability to motivate the user the evaluation of these resources the classification by experts was bimodal: 3 and 4 (37% each). Resources should be developed to motivate the target public (EPA, 2009; Agenda 21, 2009; NAAEE, 2009a) because motivation is an essential factor to achieve the goal that requires a behavior change (Oskamp, 2002). In addition to the information transmitted by educational resources, it is also necessary that they stimulate the use of other sources of information and knowledge, which is not the case of all the evaluated resources. According to NAAEE (2009a), resources should encourage research and provide a list of organizations or other resources to explore. This criteria obtained a classification mode equal to 3, with only 26% according to the relative frequencies, obtaining similar percentage in classifications 2 e 4 (24%), and 22 % in the classification 5. This classification dispersion is because some resources stimulate access to other sources of information and knowledge (such as websites, books, games, simulations, etc.) and other resources do not refer such sources. Some resources do not contain the date of last update or are hold, so that the criteria "Updated information" obtained a classification mode equal to 4 (43%) followed by classification 2 (26%). As stated in PEI (2008) resources content should be current and accurate.

Resources are not always appropriate to households daily reality, so that this criteria obtained a classification mode equal to 4 (37%). According to NAAEE (2009a) and PEI (2008), educational resources must have a connection with daily life with examples and tips for the families to put in practice. For this correct connection it is important that in HSC educational resources development factors such as family member's occupation (in example, if they are students, workers, pensioners) and the household economic situation should be taken into account. Also important factors are the kind of environment where the family is from (e.g. rural or urban) and house type (e.g. dwelling or apartment). Resources must take into account these factors that may be considerably different from household to household.

With **values and attitudes set criteria**, it is intended to verify if evaluated resources can transmit values and attitudes promoting an education for a correct SC and covering all components of sustainability. According to Agenda 21 (2009), it is necessary to promote public awareness to strengthen attitudes, values and actions that are compatible with the SD. The attitudes and values capacity building is part of a quality education (UNESCO, 2005) and is part of Education for Sustainable Development (ESD) (UNESCO, 2006a; Hopkins & McKeown, 2004; IISD, 2008). Taking this into account it is necessary that the values and attitudes transmitted by educational resources cover the four pillars of the SD and should transmit environmental, economic, social and cultural and ethical values and attitudes in order to lead to a correct SC. The values and attitudes set criteria obtained in the total of criteria and resources, a classification mode equal to 4 (33% according to the relative frequencies calculated) followed by classification 3 with a frequency of 27%. This was one of the set criteria that got more worst classifications (13% of relative frequency with classification of 1, and 13% of classifications 2 - see table 3). In general, resources transmit environmental values and attitudes (with a classification mode of 4, 61%, followed by the classification 5, 19%). In relation to transmitted economic values and attitudes, the classification is lower: mode classifications is equal to 3 (41%) followed by the classification 4 (26%). The transmission of social values and attitudes were classified with mode 4 (31%) but it follows immediately, with similar percentage, the classification 3 (28%), and also with the classification 1 obtained in 13% of relative frequency. The evaluated resources do not transmit cultural and ethical values and attitudes that lead to a correct SC, except for one resource. This criteria had a classifications mode equal to 1 (44%) followed by classification 2 (24%). As already mentioned, recent studies show that this pillar is crucial: the culture was considered the fourth pillar of the SD considering that creates solid bridges with each of the other three pillars (Agenda 21 Culture, 2011). In relation to ethics, Jarva (2011) states that the necessary change in consumption patterns cannot be achieved without a strong consumer education oriented towards the future with emphasis on the ethics of consumption. Therefore, evaluated resources do not provide an education for a correct SC because they do not cover all sustainability components, even less in a integrative way. According to NAAEE (2009a) environmental issues should be presented with a range of possible solutions, as well as individual and community strategies for citizen involvement. Some resources suggest tips and best practices for a correct SC, and that families can put immediately into practice. However, in other resources tips and best practices are only suggested for some areas or are poorly covered. This criteria obtained a bimodal classification: 3 and 5, with 30% of relative frequency, followed by classification 4 (28%).

Summarizing the weaknesses identified in the sample of SC educational resources were: i) some of the materials are basic to a public over 15 years, ii) few have families as target public, iii) do not address the four pillars of sustainability, iv) do not address equally at least three areas of household consumption with more impact, especially tourism, which in these resources is poorly addressed, v) there is a lack of interactivity, vi) do not encourage autonomy and creativity and do not motivate the user, vii) does not encourage the use of other sources of information and knowledge, and viii) there is a lack of an integrated vision of environmental, economic, social and cultural and ethical values and attitudes (especially the cultural and ethical). Nevertheless some strengths were found: i) the resource domains more complete were "Food and drink" consumption and "Housing", ii) the thematic domains covered by the educational resources mainly had a national geographic scope, iii) the language used is clear and objective and without grammatical errors, iv) transmit environmental values and attitudes, and v) suggest tips and best practices for a SC.

3.2 Practical recommendations for the development and evaluation of HSC educational resources

Based on the above results and considering the specificities of an household/family and the concept of SC there are aspects and key areas that should be taken in to account when evaluating or developing new educational resources. The main factors that should be considered in the development and evaluation of HSC educational resources are: age group (childs, adults and elders), professional occupation (e.g. student, worker, retired), household economic and financial situation, type of environment (e.g. urban, regional, mixed), communication support (e.g. banners, leaflets, reports, digital resources), spatial scale (e.g. local, regional, national, international) and household type (e.g. house, flat, condominium) (see figure 5).

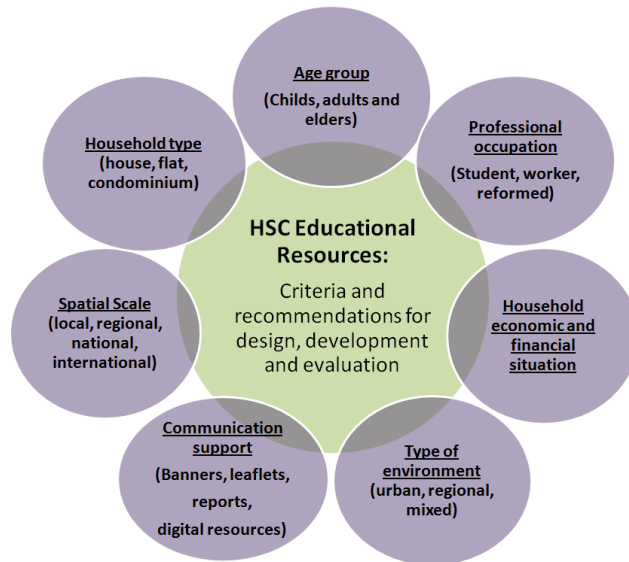


Figure 5: Conditioning factors for HSC educational resources development.

Depending on these factors, there is the need to produced different educational resources or a package for type of families that should consider and cover that diversity. For example an educational resource target for a child leaving in a rural house environment with low income should be developed differently from an elder people living in a dense urban and richer environment.

Also there are key areas for HSC educational resources, usually lacking on them, but that are fundamental to accomplish a correct education towards HSC: i) need to integrate the main sustainability components (environmental, economic, social and cultural and ethical), ii) include all the HSC domains (food and drink consumption, housing, personal travel and mobility, tourism, and others), and iii) consider the changes of values, attitudes and behaviors towards HSC. These are key areas to take in to account in the development and validation of educational resources for HSC.

In the figure 6 is the final checklist of criteria. This checklist is the result of a validation of the initial criteria checklist used in the evaluation matrix, after its application. Some of the initial criteria were eliminated or merged, when the criteria ratings were very similar in the same category. Others were added taking into account the maturity and further research in literature review and results discussion and the conditioning factors mentioned above.

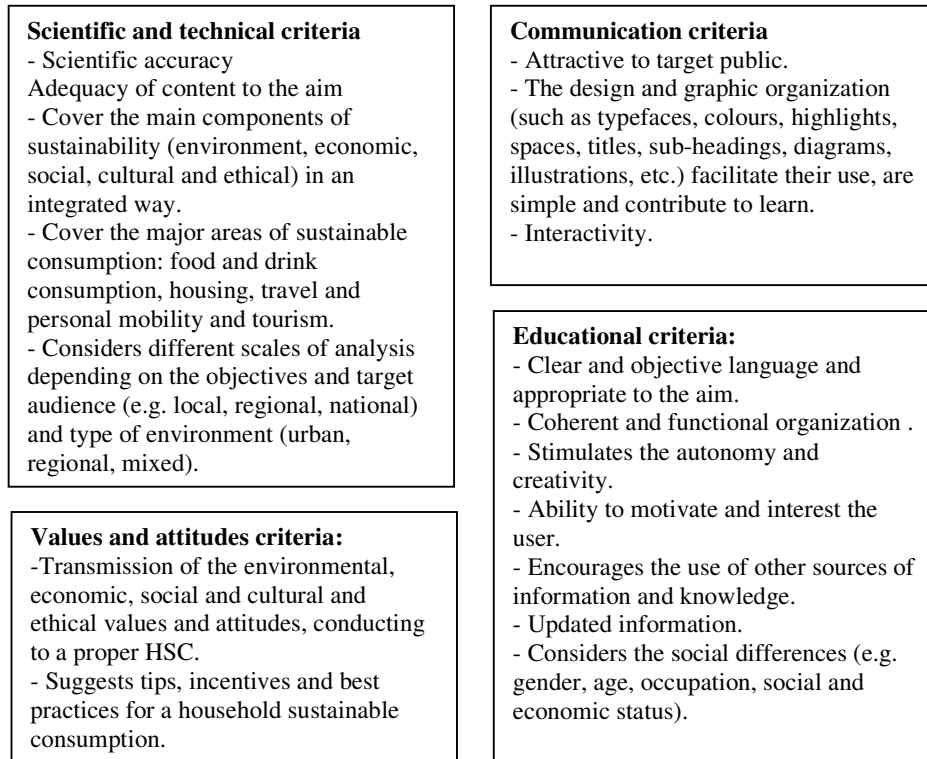


Figure 6: Scientific and technical, communication, educational and value and attitude criteria.

Conclusions

The active role of households is each time even more important for the contribution of more sustainable consumption practices. It is the families that do the last option in production and consumption chain through their choices and decisions. For HSC, it is necessary that households change behaviors and lifestyles. Therefore, it is essential to provide them with accurate and quality information, giving them access to educational resources so they can make more conscious and responsible choices in relation to their consumption patterns and realize the weight of their decisions and day-to-day choices, in ecosystems sustainability.

A sample of Portuguese web educational resources about HSC were evaluated based upon a checklist of criteria and expert evaluation. The main results allows to conclude that the selected educational resources analyzed (9 resources) have several significant weaknesses, in particular in terms of coverage and integration of SC key areas and components and the values and attitudes transmission. Additionally the evaluated educational resources were not designed for good communication and understanding of sustainability issues. Based upon the main findings, there are factors and key areas that should be taken in to account when evaluating or developing new HSC educational resources. Key-factors and criteria were highlighted for the development and evaluation of this kind of resources. Depending on these factors different packages types of HSC educational resources should be developed.

The methodology developed in this project can be applied to other population samples, in Portugal, or elsewhere, in order to evaluate other existing HSC educational resources.

Recognizing that there is still too much to know and do about the best way to promote the HSC, considering the difficulty of attitudes and behavior changing, it is expected that the dissemination of this preliminary and on-going results bring advantages to the development of new educational resources and for the evaluation of existing resources and thus contributing to promote more HSC patterns.

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