

## Article

# Shedding Light on Realized Sustainable Consumption Behavior and Perceived Barriers of Young Adults for Creating Stimulating Teaching–Learning Situations

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**Abstract:** Sustainable consumption behavior has a central impact on climate balance. Research on sustainable consumption behavior of young adults is still in its infancy. To boost sustainable consumption behavior for young adults in vocational education training, it is necessary to reveal insights on their behavior during their sustainable consumption processes and in its barriers. To get insights of young adults' sustainable consumption intention, we used a questionnaire ( $N = 60$ ). To identify young adults' consumption behavior as well as the perceived barriers, we also conducted a semi-structured interview ( $N = 14$ ). Results show that young adults primarily consider the acquisition and bear less in mind the phases of use and disposal during their realized sustainable consumption behavior. The main barriers identified are high price, lack of information, as well as knowledge and abilities. They do not want to spend time for housekeeping and are not ready to disclaim from fashion or habits. Based on that, stimulating teaching–learning situations can be constructed to broaden the view on all consumption phases. Strategies of already realized behavior can be assured.

**Keywords:** sustainable consumption behavior; barriers; young adults

## 1. Introduction

With regard to sustainable consumption behavior, we observe a diametric situation: On one side, the biannual survey on consciousness for sustainable consumption certifies the Germans a high awareness and sensibility [1]. The intention to behave sustainably is omnipresent. On the other side, the ecological footprint (<https://www.footprintnetwork.org/>), contrasting the demands of individuals, governments, and businesses with the natural resources of the earth and its potential for renewal (biocapacity), certifies the Germans that they need “2.5 earths” with their current behavior. In comparison to the other analyzed 200 countries, Germany corresponds with this result to the last 20%. Thereby, an immense intention–behavior gap becomes obvious.

Taking these contradictions and analyzing barriers for sustainable consumption behavior, current studies show that most research focuses on factors prior to the realized sustainable consumption behavior (e.g., on concepts like intention, attitude, reasons [2,3]), rather than on the realized sustainable consumption process itself. Other studies point out that consumption processes are different with regard to gender [4], age [5], education [6,7], income [5], but also between adults and young adults (adolescents) as they have other needs, follow other trends, live in other contexts, and have other budgets for their disposal [8,9]. Moreover, some studies show that the sustainable consumption behavior of young adults is less distinct than those of older people [5,10]. In this study, we therefore

address young adults' realized sustainable consumption behavior and try to identify their perceived barriers that influence the intention–behavior gap. By this, we are able to mark criteria guiding this behavior, identify barriers influencing the intention–behavior gap, and create tailored suggestions for purposeful teaching–learning situations.

Although sustainability is an overarching societal commitment and endeavor, private consumption has a central impact and needs to be considered as one point of departure [5,11–13]. Thereby, *sustainable consumption* is defined as satisfying own and others' individual needs without compromising current and future generations in their consume and ecological system [14,15]. For shedding light onto the sustainable consumption behavior, we use the Sustainable Consumption Behavior (SCB)-Cube model [5,16] as a theoretical framework, as it disentangles individuals' decisions on *sustainability dimensions* (ecological, economical, and social) with regard to *sustainable consumption phases* like acquisition, use, and disposal considering several alternatives [17,18] in different *consumption areas* (like food, clothing, etc.) as they differ tremendously: the production of food, its transport, and its packages are identified as one main driver for a negative climate balance [19]. Furthermore, individuals waste 30% of the world's food production [20–23] or consume resource intensive products like meat or dairy products [21,22]. Regarding textiles, fast fashion is growing rapidly (Sustainable fashion, in contrast to fast fashion, is clothing that is produced under “sweatshop-free working conditions”, which do not harm employees and environment, which is made of bio-degradable material, and which secures a long living in time space [24] (p. 135)). Hereby, clothing is primarily made of synthetic materials for cost reasons, but this is hardly to recycle [24–26]. The assumption holds that consumers have and make different choices for their sustainable consumption in respect to the particular consumption area [5,17]. As there is a high heterogeneity on the markets, consumers get influenced (and sometimes hindered) by personal issues like individual needs, knowledge, abilities, interest, beliefs, values, and habits; by social issues such as norms, individual communication on sustainability, and media presence; or by institutional issues such as incentives (like prices for sustainable products), infrastructure (availability of products, disposal utilities), or politics [14,27,28]. These aspects might also be responsible for the intention–behavior-gap [29].

Linking this SCB-Cube with our sustainable creative competence model [30], we are able to additionally identify competence facets related to the sustainable consumption behavior (meaning: are the individuals lacking an instrumental understanding of sustainable concepts like quality seals/labels, a systemic thinking about production chains, or do they stick with a particular belief about ‘fresh food’?).

Research on sustainable consumption behavior for young adults is still in its infancy [5]. Young adults are different as they are at “a reflective stage of consumer socialization” [5] (p. 312). They are just beginning to develop advanced decision-making strategies and a sensitiveness for materialistic tendencies [5,31]. This transition phase from leaving their family households and taking responsibility for their own household is critical. Studies show that young adults tend to lag behind older generation households with regard to sustainability [5,10]. This increases additionally the relevance to foster sustainable consumption behavior for young consumers. The consumption process of young consumers is marked by the following issues [32]: within the acquisition process they like to own brand products independently of sustainable considerations, alternative products especially in clothing and electronic devices are not known, and sustainable food does not seem to have priority in itself rather than for healthy nutrition; within usage they try to extend the duration by preferring high quality items; with regard to disposal, they practice waste separation.

Regarding the barriers of young adults' sustainable consumption and, therefore, potential causes for an observed intention–behavior-gap, as known so far, high prices for sustainable products, habits, lack of knowledge, doubts about own influence on climate change (powerlessness), lack of time to prepare own meals but also to gather information, or egoism and self-serving, but also distrust against seals/labels are referred to. Furthermore, these barriers depend tremendously on the context [5,33–37]. Again, what is still missing are further systematic insights into the reasons for deviations between intended and realized consumption behaviors. By using the impact-based cube model of Geiger,

Fischer and Schrader [16], we get insights into the prioritized high impact behaviors of young adults, having most important consequences for ecology [16].

These insights are invaluable for creating powerful and stimulating teaching–learning situations for boosting young adults’ sustainable consumption behavior. This is not at least in line with the goals of the “Agenda 2030” of the United Nations [38].

Addressing young adults, vocational education and training (VET) has to be especially focused on in this topic, as we are dealing with young adults in their transition phase from school to work. Here, young adults (aged 18 to 24 [39]) have to master several life challenges such like emancipating from parents; building relationships with friends, partners, and also at the workplaces with colleagues and supervisors, customers, etc.; organizing own financial budgets; and being responsible for own housekeeping, including time management [40] (see also [41]). In order to boost sustainable consumption behavior according to the national sustainability strategy for young adults in VET, it is necessary to reveal insights into their behavior during their sustainable consumption processes (e.g., [18,42]).

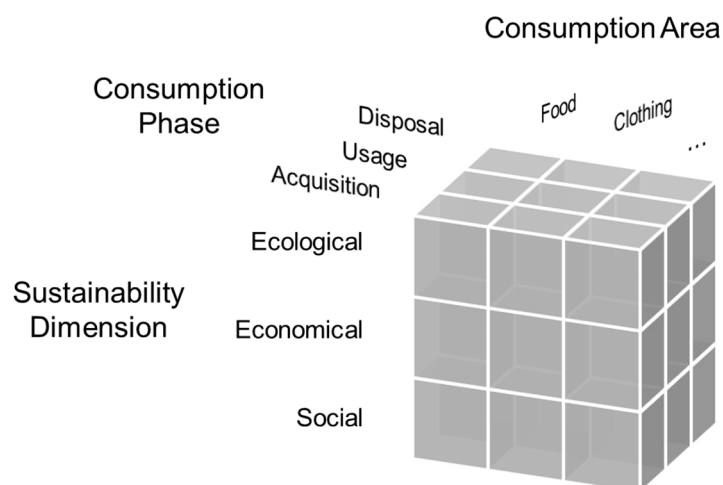
Considering the above and to explore young adults’ sustainable consumption behavior, we ran an interview study in which we asked young adults ( $N = 14$ )—from a similar bigger cohort—about the criteria guiding their sustainable consumption behavior in the consumption areas of food and clothing, in general. Additionally, and considering reasons for an arising intention–behavior-gap, we asked them what barriers they perceive. We focused on consumption areas of food and clothing. Food is one of the areas that are ecologically most relevant in terms of pollution and material requirements, and young adults often perceive food consumption primarily from the healthy nutrition perspective, which is just one part of the story [32,43]. Additionally, clothing is socio-economically relevant, as it touches living and working conditions of workers involved in the production process [43]. Furthermore, young adults are active consumers in these two areas [5]. Among the answers, 133 realized consumption behaviors (Tables 3 and 4) and 99 mentioned barriers (Tables 5 and 6) were categorized by a deductive content analysis using the Sustainable Consumption Behavior (SCB)-Cube model of Geiger, Fischer and Schrader [16], respective to the Young Consumers’ Sustainable Consumption Behaviors (YCSCB)-Model of Fischer, Böhme and Geiger [5] as framework as it is to our knowledge the only model focusing on young adults and helps us to prioritize sustainable learning issues for a limited teaching time. The results show that we could validate the cube model and specify it for the field of VET. Simultaneously, we got insights into situational challenges and affordances for sustainable behavior (e.g., calculating necessary amounts of food to avoid at it is going badly) and correspondingly required competence facets for successfully mastering sustainable behavior (e.g., the learner applies planning and implementation knowledge—here: for sustainable housekeeping). Therefore, we matched these results with our developed competence model on sustainable creative competence (*nachhaltige Gestaltungskompetenz*) [30]. By this merging, we are able to make goal-oriented and domain-specific suggestions for stimulating teaching–learning situations for fostering sustainable consumption behavior in the sense of the national sustainability strategy for young adults in VET [1].

## 2. Theoretical Background

### 2.1. Sustainable Consumption Behavior of Young Adults—The Cube Model

Geiger, Fischer and Schrader [16] developed a multidimensional cube model on sustainable consumption behavior for modeling and measuring sustainable consumption behavior of adults (Figure 1). Thereby, they link the *sustainability dimension* with the categories of ‘ecological’, ‘socio-economic’ as one edge, the *consumption phases* with the categories ‘acquisition’, ‘usage’, ‘disposal’ as the second edge, and *consumption areas* with the categories ‘food’, ‘clothing’, ‘housing’, ‘mobility’, etc. as the third edge. They assume that decisions in all these three edges form a sustainable consumption behavior, which has a higher or lower *impact* on ecology. As there are manifold combinations for sustainable consumption behavior in such a cube, Geiger, Fischer and Schrader [16] claim an

impact-based approach by which they can prioritize high-impact behaviors that have most important consequences for ecology [16].



**Figure 1.** Sustainable Consumption Behavior (SCB)-Cube model. Own figure. Adapted from Geiger, Fischer and Schrader [16] (p. 22).

*The sustainability dimension:* Traditional approaches are operationalizing this dimension by *ecological*, *economical*, and *social* aspects, which are linked in a tension-oriented manner. By *ecological*, the ecological integrity is meant by attentively handling the natural resources like land, water, and energy. This includes considering disposal, packaging, and regional production. By *economical*, the economic efficiency is meant to reach economical development and competitive strength in industrial as well as in developing countries, taking into account social and ecological aspects. By *social*, the social equity is meant by equality of opportunities and fair access to resources for all. That means the satisfaction of one's needs for food, clothing, and protection together with a high quality of life, including the recognition of human conditions of work, child labor, discrimination, and human rights. Geiger, Fischer and Schrader [16] follow in their cube model the suggestions of Leach et al. [44], distinguishing just between the inner socio-economic conditions of operating space for humanity and its constituting external environmental boundaries and the ecological condition.

*The consumption phase:* Based on a general consumption model dominant in consumer behavior research, Geiger, Fischer and Schrader [16] distinguish among the three phases of acquisition, usage, and disposal. Acquisition is related to the decisions of what products are bought: organic products, seasonal and regional products, products respecting adequate animal housing, or buying fair trade clothing, etc. The phase of usage is related to enjoying meals instead of eating fast food, being a self-caterer but also disclaiming fast fashion. The phase of disposal focuses on the utilization of food leavings (compost, regular trash, recycling), avoidance of waste, and spare handling of resources (cf. [16,17]).

*The consumption area:* This edge is introduced to reduce the complexity of sustainability issues, as they are different in the various areas. Thereby, relevant impacts could be identified more easily. The areas of food, housing, and mobility are detected as most relevant in terms of pollution and resource requirements. The area of clothing is mostly relevant with regard to its great impact on living and working conditions of workers involved in the production process (cf. [16]). We, here, concentrate on food and clothing.

Fischer, Böhme and Geiger [5] operationalized this SCB-Cube for young adults (YCSCB-Cube, age 14–17). They constructed a survey that enables deeper insight into the behavior of this relevant consumer group still living with their parents [5]. Results show that this group has on average a budget of 35 € per month at their own disposal. Their main acquisitions are related to mobile phones, music, video and electronic products and services, parties, cinema, and excursions. With regard to

food consumption, they rely on their parents who consume regularly resource-intensive meat and dairy products. When they buy food on their own, they prefer cheap and tasty take-aways without considering much the production line. Some prefer organic food, but primarily for own health, not for ecological or social reasons. More than half of the surveyed people grow vegetables in their own gardens [5].

Additionally, there are findings that show that young adults are virtually connected and communicate via social media. Thereby, they are principally able to search for lacking information on products, social work conditions, or disposal utilities and to share this information [33]. Hereby, their own and others' processes of sustainable consumption behavior can be supported [27].

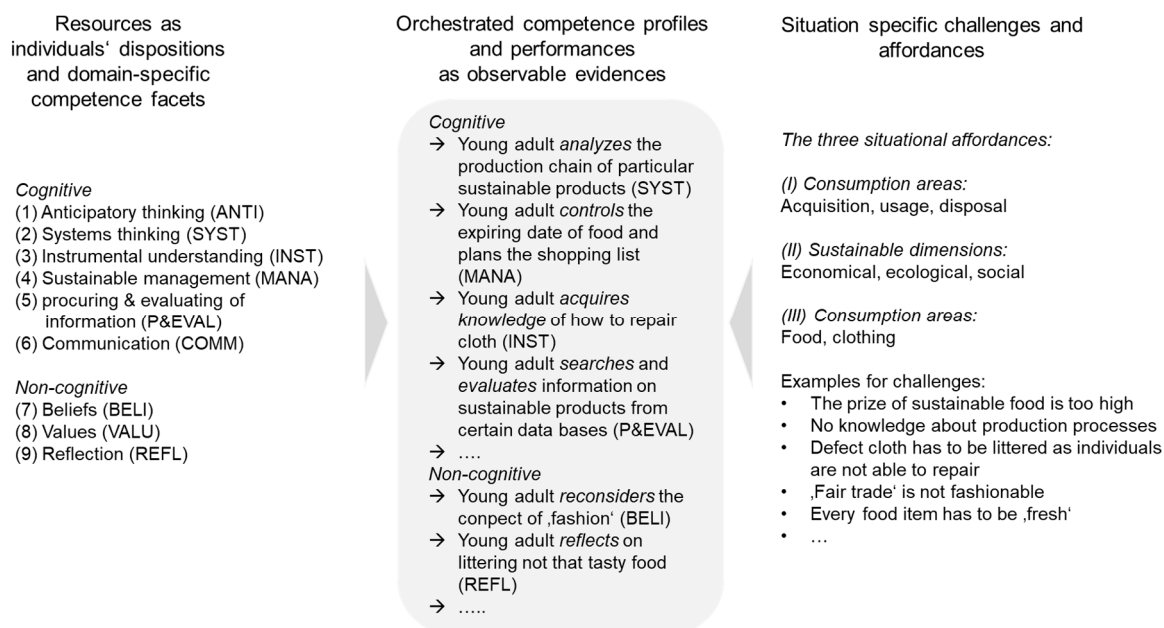
At the same time, we find very different reasons to consume sustainably or not. To illustrate this, one example of a sustainable consumption process: Several studies highlight the 'high price' problem for sustainable products [5,34]. Hereby, the price argument has different faces: (a) For some people, although accepting the high price of a sustainable product, it is too high with regard to their personal budget. Therefore, they decide within their acquisition phase to ignore ecological and social aspects for primarily economical reasons. They feel badly and try to balance their consumption behavior more in a sustainable way when they have money available. (b) For others the high price is not recognized as they do not understand price differences with regard to different production or trade chains. The impact is the same. However, changing towards a more sustainable consumption behavior, people must get more knowledge and reconsider their beliefs and values. (c) There are also people who know the value chain, accept the price and can principally afford it, but they try to find another solution for their sustainable purchasing behavior to balance economical, ecological, and social aspects by searching for new comparable alternative products [14].

## 2.2. The Sustainable Creative Competence of Young Adults

In the context of sustainable behavior in retail, Ritter von Marx, Kreuzer, Weber and Bley [30] developed in accordance with Blömeke, Gustafsson and Shavelson [43] a competence model for the sustainable creative competence with the explicit focus on the 'point of sales'. Thereby, they considered assumptions made in the international large-scale assessments like PISA and PIAAC. By this integrated model, the individual's dispositions and observable behavior (performance), as well as the self-regulated composition of situation-specific competence profiles are recognized. Thereby, domain-specific situational affordances challenge the individual to activate and orchestrate relevant competence profiles from his/her inner resources and dispositions (competence facets) to master the challenging domain-specific situation. This orchestration is a tailored self-regulated process on forming particular competence profiles fitting the situational affordances. People who are able to orchestrate their competence profiles in an efficient and effective way are called 'adaptive experts' [45]. The realized behavior (performance) can be observed and functions as evidence for the invisible competence. The foundation for this 'evidence-based' reasoning process is an identification of domain-specific situational challenges and corresponding necessary competence facets respective to the profiles and their linkages [46]. With regard to the sustainable consumption behavior, we can adapt the model in the following way (see Figure 2).

Facing the abovementioned situational challenge on the 'price problem', people might (a) procure information on alternative sustainable products that are able to fulfill the individual's needs and are less costly (P&EVAL); (b) gather information about the production or trade chain and evaluate the occurring costs and price calculation to understand the difference and interrelationships for gaining more acceptance (SYST); (c) reconsider their concepts of 'fashion', 'fresh food', etc. (BELI) (VALU).





**Figure 2.** Adapted model of sustainable creative competence in accordance with Ritter von Marx, Kreuzer, Weber and Bley [30].

Linking these nine competence facets to the sustainable consumption behavior categorized by the SCB-Cube model (Figure 1), we get additional insights into realized sustainable behavior, perceived barriers, as well as the intention–behavior gap ( $3$  (sustainability dimension)  $\times 3$  (consumption phase)  $\times 2$  (consumption areas)  $\times 9$  (competence facets) = 162 categories). By this, we can identify whether e.g., a barrier is caused by a lack of instrumental understanding (INST), a not-existing system thinking (SYST) or a certain belief (BELI).

With that approach, the authors contribute to the discussion on how to conceptualize and subsequently instruct sustainable consumption behavior [38]. They offer the important conceptualization of a competence, overcoming the pure acquisition of knowledge by adding a way to develop systematically a sustainable creative competence. Nevertheless, what is still lacking are concrete and realistic teaching–learning situations integrating findings regarding the situation-specific challenges and affordances.

Regarding the above and considering the stated research desiderates, we raise the following research questions for our study:

RQ1: Considering the sustainable consumption process itself, which criteria are guiding the *realized sustainable consumption behavior* of young adults in the consumption areas of food and clothing?

RQ2: Which *barriers* determine young adults to apply sustainable consumption behavior in the areas of food and clothing?

RQ3: How can suggestions for stimulating *teaching–learning situations* look like fostering competent sustainable consumption behavior in the areas of food and clothing?

### 3. Methodological Foundation

#### 3.1. Sample and Instruments

We conducted an exploratory study asking young adults in the field of business education for their sustainable consumption behavior. In a first step, we wanted to get information about their biographical data (such like age, gender, monthly budget) as well as their intention to consume sustainably. Through this, we were able to locate and adjust the young adults with regard to their living contexts, as sustainable behavior is highly context-specific [5]. For this purpose, we sent a questionnaire to 98 young adults, and 60 answered (response rate: 61%). The intention for sustainable

consumption behavior was measured by the domain-specific intention scale of Ziesemer et al. [47] (5-point Likert-scale: 1 = strongly disagree to 5 = strongly agree). In a second step, focusing on our primary goal, we wanted to get more insights into young adults' *realized sustainable behavior* (RQ1) and perceived *barriers* (RQ2), especially in the areas of food and clothing. Therefore, we conducted a semi-structured interview study. We did so as, in contrast to unstructured interviews, we built our interview guide [48] on prior findings on sustainable consumption behavior referring to the SCB-Cube model [16] as well as the identified barriers [5,33–37]. Thereby, the design allows for the development of comparable interviews. Nevertheless, if necessary, semi-structured interviews enabled additional questions so that additional barriers could be found [5,48,49]. We referred to a cross-sectional design because consumers' purchase habits and barriers are stable in medium-term [50–55]. Every participant was interviewed once. Fourteen young adults of our original study (23.3%) took part voluntarily. The interviewers were trained. Within the interviews we raised self-constructed questions like, “Which are the criteria guiding your sustainable consumption behavior?” or “Which barriers do you perceive when applying sustainable consumption behavior?” We got insight into 133 sustainable consumption behaviors (Tables 3 and 4) and 99 barriers (Tables 5 and 6). Overall, 232 units of analysis were generated through this procedure.

Regarding the sample descriptives, Table 1 illustrates central variables.

**Table 1.** Sample descriptives for the questionnaire study and the semi-structured interview.

| Variable (M(SD))                 | Questionnaire Study (N = 60) | Semi-Structured Interview (N = 14) |
|----------------------------------|------------------------------|------------------------------------|
| Age                              | 22.02 (4.06)                 | 22.83 (3.74)                       |
| Gender                           | 49 females                   | 10 females (2 missing)             |
| Budget                           | 609.95 (432.34)              | 600.00 (538.05)                    |
| Intention to consume sustainably | 3.45 (0.51)                  | 3.79 (0.32)                        |

We ran t-tests between the interview group ( $N = 14$ ) and the full sample ( $N = 60$ ) according to age, gender, budget, and intention for sustainable consumption behavior. By this, we were able to locate and adjust the young adults. Additionally, we secured that our interviewees correspond with regard to their context to the same peer group. The results show that there were no significant differences with regard to age, gender, and budget. Additionally, we find that 7% of the interview participants are engaged in extracurricular sustainable activities (e.g., member of a nature conservation organization).

### 3.2. Coding and Analyses

For answering RQ1 and RQ2, we analyzed the interview data by a deductively structured content analysis [56] referring to the SCB-Cube model [16]. The interviews were transcribed. The unit of analysis was defined by the smallest semantic unit. Thereby, a unit of analysis corresponds to one sustainable consumption behavior respective to one perceived barrier. The units regarding the *criteria for realized consumption behavior* (RQ1) and perceived *barriers* (RQ2) for acting in a sustainable way are assigned to the  $3 \times 3 \times 2$  categories of the three edges of the cube: *consumption phase* (acquisition, usage, disposal), *sustainability dimension* (economical, ecological, social) and the *consumption area* (here: food and clothing). Additionally, we built for each of the three cube edges a category “general” for overarching arguments. Table 2 depicts anchor examples of the coding scheme.

**Table 2.** Coding scheme and anchor examples.

|                                                                     | Anchor Examples                                                                                                                                                                      | Consumption Phase | Sustainability Dimension | Consumption Area |
|---------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------------|------------------|
| <i>Criteria for realized sustainable consumption behavior (RQ1)</i> | “When I buy a product, I keep an eye on whether it is organic and originated from the region ... ” (0404ADTR, Z 148).                                                                | acquisition       | ecological               | food             |
|                                                                     | “Fair trade chocolate, for example, is absolutely phantastic/super –I like it.” (0607NAZY, Z 218–219).                                                                               | use               | social                   | food             |
|                                                                     | [Clothing that I do not need any more] “ ... is not thrown away rather than sold to a second hand shop or via an internet platform” (2811EVBE, Z 173–175).                           | disposal          | ecological               | textile          |
| <i>Perceived barriers (RQ2)</i>                                     | “ ... I cannot go to the organics supermarket ... that does not work for financial reasons ... but in the long run I will change this situation” (0107BERO, Z 225–227).              | acquisition       | economical               | food             |
|                                                                     | “ ... we think that everything must be absolutely fresh” (0607NAZY, Z 318–322).                                                                                                      | use               | ecological               | food             |
|                                                                     | [After the expiration date, people do not eat the food although it is still fine but] “ ... they don’t do it because they are worried” (1103ANKR, Z 235–238).                        | disposal          | ecological               | food             |
|                                                                     | “ ... I am not fully sure whether the product is really produced under fair conditions –at least as I define fair. ... low transparency makes it complicated” (0508UTRE, Z 281–284). | acquisition       | social                   | textile          |

Thereby, multiple codings were possible [57]. All units were coded by two trained coders independently. The interrater reliability can be judged as very good according to Cohen’s  $\kappa = 0.803$  [58]. Before further analysis, mismatches were consensually validated [59]. With regard to the size of our sample, we categorized the interview data just to the three edges of the SCB-Cube model. For the discussion of suggestions for the instructional design, we refer also to the nine competence facets.

#### 4. Results

##### 4.1. Considering the Sustainable Consumption Process Itself, Which Criteria Are Guiding the Realized Sustainable Consumption Behavior of Young Adults in the Areas of Food and Clothing? (RQ1)

The following overarching criteria that guide young adults’ *realized sustainable consumption behavior* according to the categories of the SCB-Cube of Geiger, Fischer and Schrader [16] are displayed in Table 3. Thereby, just the differences of criteria are mentioned.

For both consumption areas, the ‘price’ is decisive. Young adults have only a small to medium budget for their disposal. They are aware of fair trade products. Simultaneously, they try to realize a sustainable consumption by disclaiming and buying only something when really needed. Within the consumption phase of usage, young adults participate in the measures of returnable bottles, sharing conceptions, and waste separation. With regard to the social aspect of the sustainability dimension, young adults test fair trade products and donate their leavings and throw-outs (e.g., to the red cross).



**Table 3.** Criteria guiding young adults' realized sustainable consumption behavior.

| Consumption Phase | Sustainability Dimension                                                                                                |                                                                                                                                                                                       |                                                                                                                                         |
|-------------------|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
|                   | Economical                                                                                                              | Ecological                                                                                                                                                                            | Social                                                                                                                                  |
| Acquisition       | <ul style="list-style-type: none"> <li>price (F/C)</li> <li>quality (C)</li> <li>disclaimer (C)</li> </ul>              | <ul style="list-style-type: none"> <li>packaging (F)</li> <li>seals/organic products (F)</li> <li>secondhand shopping (C)</li> <li>buying only something when needed (F/C)</li> </ul> | <ul style="list-style-type: none"> <li>fair trade (F/C)</li> <li>working conditions (C)</li> </ul>                                      |
| Use               | <ul style="list-style-type: none"> <li>exploitation of all leavings (F)</li> <li>using returnable bottle (F)</li> </ul> | <ul style="list-style-type: none"> <li>extending use period of products (C)</li> <li>sharing products (C)</li> <li>avoiding leaving (F)</li> </ul>                                    | <ul style="list-style-type: none"> <li>fair trade products are also tasty (F)</li> </ul>                                                |
| Disposal          |                                                                                                                         | <ul style="list-style-type: none"> <li>donating clothings (C)</li> <li>waste separation (F)</li> </ul>                                                                                | <ul style="list-style-type: none"> <li>giving leavings to a food bank (F)</li> <li>donating throw-outs to people in need (C)</li> </ul> |

Note. Consumption area: food (F), clothing (C), general (G).

Counting all the coded 133 realized consumption behaviors of the interviews and linking them to SCB-Cube model of Geiger, Fischer and Schrader [16], we get the following distribution (Table 4).

**Table 4.** Extent of young adults' realized sustainable consumption behavior.

| Consumption Phase | Sustainability Dimension |    |   |       |            |    |    |       |        |   |   |         | Consumption Area |        |      | Total    | %   |
|-------------------|--------------------------|----|---|-------|------------|----|----|-------|--------|---|---|---------|------------------|--------|------|----------|-----|
|                   | Economical               |    |   |       | Ecological |    |    |       | Social |   |   |         |                  |        |      |          |     |
|                   | F                        | C  | G | ΣEcon | F          | C  | G  | ΣEcol | F      | C | G | ΣSocial | ΣFood            | ΣCloth | ΣGen | ΣC-Phase |     |
| Acquisition       | 6                        | 4  | 1 | 11    | 22         | 11 | 19 | 52    | 3      | 2 | 0 | 5       | 31               | 17     | 20   | 68       | 51  |
| Use               | 1                        | 1  | 1 | 3     | 4          | 8  | 30 | 42    | 1      | 0 | 0 | 1       | 6                | 9      | 31   | 46       | 35  |
| Disposal          | 0                        | 0  | 0 | 0     | 5          | 9  | 3  | 17    | 1      | 1 | 0 | 2       | 6                | 10     | 3    | 19       | 14  |
| Σ                 | 7                        | 5  | 2 | 14    | 31         | 28 | 52 | 111   | 5      | 3 | 0 | 8       | 43               | 36     | 54   | 133      | 100 |
| %                 | 16                       | 14 | 4 | 11    | 72         | 78 | 96 | 83    | 12     | 8 | 0 | 6       | 100              | 100    | 100  | 100      |     |

Note. Consumption area: food (F), clothing (C), general (G).

By the distribution displayed in Table 4, the key criteria guiding young adults' realized sustainable consumption behavior—which consequently have the main impact on ecology—become overt.

#### Analyzing the Edges of the Cube

(1) The realized sustainable consumption behavior of young adults was significantly different between the consumption phases ( $\text{Chi-square} = 27.17$ ;  $df = 2$ ;  $p < 0.001$ ) (All statistical calculations are conducted according to Siegel and Castellan [60] and SPSS 25). The results show that most criteria are mentioned with regard to acquisition (consumption phase), less within the phases of usage and disposal. This is the case in both consumption areas of food and textile. Driving force in the acquisition phase for both consumption areas (food and textile) are the ecological criteria of the sustainability dimension.

The young adults mention diverse criteria, which guided their acquisition. In the following, examples are listed which show the variety of arguments:

In the *consumption area* of food:

- 'buying organic products' (cf. 0107BERO; 1408KASC; 0505SABA; 2201INKA),
- 'optimizing own housekeeping by rigor calculation of food really needed, controlling more solidly the days of expiry, buying bigger units, going shopping more frequently, avoiding food spoilage, reducing the claim of having everything at every time absolutely fresh and eating bread from the day before' (0404ADTR, 0508UTRE, 0607NAZY, 2310MAGA),
- 'avoiding plastic packages and using cotton bags for carrying the shopping home' (1802KAKR).

In the *consumption area* of textiles:

- 'buying cloth of higher quality which lasts longer' (1802KAKR, 0607NAZY, 2601LUKU),
- 'disclaiming by just buying things that are needed' (1103ANKR),
- 'avoiding shops with a bad reputation in connection with child labor etc. (1511STST).

In the *consumption phase* of usage young adults report on criteria like:

- 'using the cloth as long as possible' (0107BERO, 0505SABA),
- 'handing on the cloth to other family members' (1103ANKR, 2310MAGA),
- 'being creative in making meals from everything and remaining from the refrigerator' (1804HEWO).

With regard to the *consumption phase* of disposal, they stated criteria such as:

- 'clothing from clearing the closet gets donated (e.g., to the Red Cross)' (1103ANKR, 2310MAGA, 0107BERO),
- 'giving leavings to a food bank' (0607NAZY),
- 'taking part in waste separation concepts' (2310MAGA).

(2) With regard to the cube edge of *sustainability dimension* (economical, ecological, social), there is also a significant difference between the economical, ecological, and social criteria ( $\chi^2 = 150.79$ ;  $p < 0.001$ ;  $df = 2$ ; [60]). The main driving force lies again within the ecological dimension.

(3) There are no significant differences observed for the cube edge of *consumption area* (food, clothing, general).

#### 4.2. Which Barriers Determine Young Adults to Apply Sustainable Consumption Behavior in the Areas of Food and Clothing (RQ2)?

The additional 99 perceived *barriers* that impede young adults to apply sustainable consumption behavior were also structured according to the SCB-Cube model of Geiger, Fischer and Schrader [16]. The results are depicted within Table 5.

The results show a similar pattern: the main *barriers* are mentioned in the *consumption phase* of acquisition and the ecological *sustainability dimension*. The main barriers seen by the young adults are in line with our knowledge from theory. They mention barriers such as the high price for sustainable products, lack of time for housekeeping (planning, running an efficient storage, preparing meals, information gathering), being at food industries' mercy for plastic packages, no alternative packages for hygienic reasons, habits, memories from childhood, lack of the ability to repair cloth, or being not always ready to disclaim from fashionable clothing [5,33,34,36,37].

Attaching all the 99 perceived *barriers* to the cells of the cube, we found the following distribution as displayed in Table 6.

By the distribution displayed in Table 6, we recognize the *key barriers* hindering young adults from sustainable consumption behavior and therefore have negative consequences for ecology.

**Table 5.** Barriers determining young adults' restriction from applying sustainable consumption behavior.

| Consumption Phase | Sustainability Dimension                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                      |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   | Economical                                                                                                                                                                                                                                 | Ecological                                                                                                                                                                                                                                                                                                              | Social                                                                                                                                                                                                                                                                                               |
| Acquisition       | <ul style="list-style-type: none"> <li>price (F/C)</li> <li>laziness to prepare own meals (F)</li> <li>finished products are cheaper and faster (F)</li> <li>portion packs are cheaper and fit better to a single household (F)</li> </ul> | <ul style="list-style-type: none"> <li>some products need a packaging for hygienic reasons (F)</li> <li>products needed are already wrapped in plastic (F)</li> <li>habits and memories from childhood (F)</li> <li>ease to collect necessary information (F/C)</li> <li>just following the own desire (F/C)</li> </ul> | <ul style="list-style-type: none"> <li>no impact on production process (F/C)</li> <li>reputation of the enterprises (C)</li> <li>fair trade is not fashionable (C)</li> <li>fair trade textiles do not fit to my style (C)</li> <li>high intransparency of production and value chain (C)</li> </ul> |
| Use               |                                                                                                                                                                                                                                            | <ul style="list-style-type: none"> <li>difficulty to estimate and to calculate the real need of food (F)</li> <li>belief/conception that products have to be always absolutely fresh (F)</li> </ul>                                                                                                                     |                                                                                                                                                                                                                                                                                                      |
| Disposal          |                                                                                                                                                                                                                                            | <ul style="list-style-type: none"> <li>lack of an efficient and effective food controlling with regard to expiring dates (F)</li> <li>lack of the ability to repair cloth (C)</li> </ul>                                                                                                                                |                                                                                                                                                                                                                                                                                                      |

Note. Consumption area: food (F), clothing (C), general (G).

**Table 6.** Young adults' mentioned barriers for realizing sustainable consumption behavior.

| Consumption Phase | Sustainability Phase |    |   |    |            |    |     |    |        |    |   |    | Consumption area  |                    |                  | Total              | %   |
|-------------------|----------------------|----|---|----|------------|----|-----|----|--------|----|---|----|-------------------|--------------------|------------------|--------------------|-----|
|                   | Economical           |    |   |    | Ecological |    |     |    | Social |    |   |    |                   |                    |                  |                    |     |
|                   | F                    | C  | G | Σ  | F          | C  | G   | Σ  | F      | C  | G | Σ  | Σ <sub>Food</sub> | Σ <sub>Cloth</sub> | Σ <sub>Gen</sub> | Σ <sub>Phase</sub> |     |
| Acquisition       | 12                   | 14 | 0 | 26 | 17         | 12 | 3   | 32 | 0      | 10 | 0 | 10 | 29                | 36                 | 3                | 68                 | 68  |
| Use               | 0                    | 0  | 0 | 0  | 5          | 5  | 7   | 17 | 0      | 0  | 0 | 0  | 5                 | 5                  | 7                | 17                 | 17  |
| Disposal          | 0                    | 0  | 0 | 0  | 8          | 5  | 1   | 14 | 0      | 0  | 0 | 0  | 8                 | 5                  | 1                | 14                 | 14  |
| SUM               | 12                   | 14 | 0 | 26 | 30         | 22 | 11  | 63 | 0      | 10 | 0 | 10 | 42                | 46                 | 11               | 99                 | 100 |
| %                 | 29                   | 30 | 0 | 26 | 71         | 48 | 100 | 64 | 0      | 22 | 0 | 10 | 100               | 100                | 100              | 100                |     |

Note. Consumption area: food (F), clothing (C), general (G).

### Analyzing the Edges of the Cube

(1) Young adults see a different amount of *barriers* between the *consumption phases* for their sustainable consumption behavior ( $\text{Chi-square} = 53.09$ ;  $df = 2$ ;  $p < 0.001$ ). The results show that most barriers are mentioned with regard to acquisition, less within the phases of usage and disposal. This is also the case in both *consumption areas* of food and clothing. Main barriers in acquisition for both *consumption areas* (food and clothing) are the ecological criteria of the *sustainability dimension*.

Regarding the *barriers*, young adults mention again a variety. Examples are depicted as follows. First, the *consumption phase* of acquisition is addressed.

In the *consumption area* of food:

- 'the prize for sustainable products is too high for young adults' budget' (0107BERO, 0505SABA, 1804HEWO, 1802KAKR),
- 'portion packs fit better to a single household' (2310MAGA),
- 'plastic packages are needed for hygienic reasons' (0107BERO).

In the *consumption area* of clothing:

- 'the prize is too high for sustainable products' (0505SABA, 0607NAZY, 1804HEWO),
- 'being in a shopping inebriation is fun –then sustainable issues are not considered' (1802KAKR, 0404ADTR, 2811EVBE, 2601LUKU).

In the *consumption phase* of usage, the young adults report on barriers just for the ecological *sustainability dimension* like:

- ‘being not able to handle food adequately so that it is spoiling’ (0404ADTR),
- ‘just following own customs’ (0107BERO),
- ‘leaving the comfort zone and change behavior is an effort’ (2811EVBE),

Considering the consumption phase of acquisition, the following could be found:

- ‘refusing to disclaim on fashionable cloth’ (0404ADTR),
- ‘wanting to follow the trendsetter to be accepted in social media communities’ (2310MAGA),
- ‘not ready for disclaiming from fun-factors’ (0107BERO).

With regard to the *consumption phase* of disposal, they mention:

- ‘overhasty littering food, when it does not taste as expected’ (1103ANKR),
- ‘having not jet thought about the disposal of textiles’ (1511STST),
- ‘being not able to repair cloth’ (2811EVBE).

(2) *Barriers* with regard to the *sustainability dimensions* show significant differences between the categories economical, ecological, and social ( $\text{Chi-square} = 44.78$ ;  $p < 0.001$ ;  $df = 2$ ). Most *barriers* are mentioned under ecological perspectives and mainly in the *consumption phases* of acquisition. The mentioned economical *barriers* are likewise raised for the *consumption phase* of acquisition and face the ‘too high prices’ in the *consumption area* of food as well as clothing. *Barriers* in the social dimension are just given for the acquisition of clothing. Here, the main *barriers* persist in the intransparency of production process, trust in given information, not fashionable clothing, supply of fair trade products, or the market is not visible enough.

(3) *Barriers* compared along the cube edge of *consumption areas* (food, clothing, general) show no significant differences.

Contrasting young adults’ *realized sustainable consumption behavior* (RQ1) with their mentioned *barriers* (RQ2) hindering them to behave sustainably, a significant difference occurs between the *sustainability dimensions* of economical, ecological, and social ( $\text{Chi-square} = 12.1$ ;  $p < 0.01$ ;  $df = 2$ ) (see Table 7).

**Table 7.** Young adults’ reported *realized sustainable consumption behavior* contrasted with their mentioned *barriers* for sustainable consumption behavior.

| Sustainability Dimensions | Realized Sustainable Consumption Behavior | Barriers | SUM |
|---------------------------|-------------------------------------------|----------|-----|
| Economical                | 14                                        | 26       | 40  |
| Ecological                | 111                                       | 63       | 174 |
| Social                    | 8                                         | 10       | 18  |
| SUM                       | 133                                       | 99       | 232 |

The values in Table 7 show that young adults state more *barriers* than *realizing criteria* for their *sustainable consumption behavior* in the *sustainability dimensions* of economical and social. The main *barriers* under the economical perspective are price, time, and laziness. *Barriers* under the social perspective are primarily the intransparency of production processes, doubt about given information (trust), own individual’s impact on fair trade production, and fair trade being unfashionable. The given *barriers* from the ecological perspective are ‘all things have to be at any time fresh’, ‘being on mainstream to be socially accepted’, ‘being stylish’, ‘following the desire of fun shopping’, ‘not gathering valid information’, ‘not managing efficiently and effectively the own household’, ‘keeping habits’, and ‘taking industry plastic packages without considerations’. These *barriers* are in line with the literature [5,33,34,36,37].

#### 4.3. How Can Suggestions for Stimulating Teaching–Learning Situations Look Like Fostering Competent Sustainable Consumption Behavior in the Areas of Food and Clothing (RQ3)?

By highlighting “sustainability in education” within the national strategy, learners should not just acquire knowledge about sustainable issues, but also develop a sustainable creative competence. That means that learners are able to think anticipatorily; to participate within sustainable processes by creating innovative ideas, planning, and realizing; to practice empathy, sympathy, and solidarity; to motivate oneself and others for issues of sustainability; and also to reflect on individual and cultural concepts [61,62].

By our results, we got insights into situational challenges and affordances for sustainable behavior (e.g., calculating necessary amounts of food to avoid that it is going badly) and correspondingly required competence facets for mastering successfully sustainable behavior (e.g., to apply planning and implementation knowledge; here: for sustainable housekeeping). By matching these results with our developed competence model on sustainable creative competence [30], we are able to make domain-specific suggestions for stimulating teaching–learning situations fostering sustainable consumption behavior in the sense of the national sustainability strategy for young adults in VET. In Table 8, we give some suggestions for stimulating teaching–learning situations.

**Table 8.** Suggestions for stimulating teaching–learning situations.

| Consumption Phase  | Sustainability Dimension                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | Economical                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Ecological                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Social                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Acquisition</b> | <ul style="list-style-type: none"> <li>Running comparisons and analyses of prices for main products of young adults’ life to verify the argument of ‘too high prices’ (SYST) (F/C)</li> <li>Introducing product checks on their quality to get information about their ingredients (INST) (F/C)</li> <li>Exploring recipes to prepare good, plain, easy and fast sustainable meals (INST) (F)</li> <li><i>Encouraging to acquire clothing via sharing platforms (BELI) (C)</i></li> </ul> | <ul style="list-style-type: none"> <li>Informing about the ‘bring your own packages’ system (INST) (F)</li> <li>Engaging in communication and negotiation with sales persons by taking a proactive and responsible role (COMM) (F/C)</li> <li>Reconsidering habits (REFL) (F/C)</li> <li>Linking childhood memories to sustainable issues and stimulate change (REFL, BELI) (F/C)</li> <li>Showing how and where to collect necessary information (P&amp;EVAL) (F/C)</li> <li>Engaging for awareness and responsibility when following the own desire (REFL, VALU) (F/C)</li> </ul> | <ul style="list-style-type: none"> <li>Visualizing the impact of consumers on industrial production, social issues, and environment (SYST) (F/C)</li> <li>Reading commonly eco-reports (GRI-reports) of firms to get information about their sustainable activities and reputation (INST) (F/C)</li> <li>Gather information about young adults’ main products as fair trade and estimating them with regard to fashion (INST, BELI, VALU) (C)</li> <li>Identifying role models wearing fair trade fashion (INST) (C)</li> </ul> |
| <b>Use</b>         | <ul style="list-style-type: none"> <li>Encouraging in participating in returnable packages (BELI) (F)</li> <li>Exploring on how to exploit all leavings from the fridge (INT, BELI) (F)</li> </ul>                                                                                                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>Teaching how to manage one’s own housekeeping (MANA) (F)</li> <li>Reconsidering beliefs and conception of ‘fresh’ (REFL, BELI) (F)</li> <li>Informing how to handle food to avoid going badly (coping with expiring dates, ways of checking food quality) (INST) (F)</li> </ul>                                                                                                                                                                                                                                                              | <ul style="list-style-type: none"> <li><i>Tasting fair trade products (BELI) (C)</i></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Disposal</b>    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <ul style="list-style-type: none"> <li>Informing and showing strategies of how to ascribe ‘disposal’ back into the value chain (INST, SYST) (F/C)</li> <li>Teaching basic abilities to repair clothing and things and (INST) (C)</li> <li>Teaching how to handle recycle food leavings (INST) (F)</li> <li><i>Teaching how to disassemble products into their central elements for waste separation and recycling processes (INST) (C)</i></li> </ul>                                                                                                                               | <ul style="list-style-type: none"> <li>Analyzing how food banks and donations work (INST, SYST) (F/C)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                |

*Note.* Consumption area: food (F), clothing (C), general (G); the normal written measures pick the young adults up where they are with their consideration about sustainable consumption behavior; the italic marked measures may take them further in their development of sustainable behavior.



By the impact-oriented cube model, we could identify relevant behavior components to young adults that have already been realized and should be assured, and also the behavior components where young adults have their barriers that should be removed. By that, tailor-made stimulating teaching–learning situations can be constructed to foster sustainable consumption behavior.

## 5. Discussion

Within our study, we tried to shed light on the already *realized sustainable consumption behavior* (RQ1) of young adults and their perceived *barriers* (RQ2) for applying sustainable consumption behavior. We, therefore, applied the impact-based SCB-Cube model of Geiger, Fischer and Schrader [16], which supports us to identify relevant components of sustainable consumption behavior (such like *consumption phases, sustainability dimensions, consumption areas*) with a great impact on ecology. Regarding the *consumption phase*, it becomes obvious that young adults primarily consider the acquisition and bear less in mind the phases of use and disposal during their realized sustainable consumption behavior. Furthermore, they concentrate mainly on the ecological *sustainability dimension*. In more detail, young adults' realized sustainable consumption behavior is driven by acceptance of higher prices for sustainable products, relying on seals/labels, avoiding superfluous packages, as well as optimizing housekeeping or exploiting leavings. It is a striking point that throw-outs are given to younger relatives or donated to people in need. This disposal strategy seems to be one-way as they very seldom mentioned that they acquire their items secondhand or get those things from older relatives. The perceived barriers are primarily similarly located in the categories of acquisition (*consumption phase*) and ecology (*sustainability dimension*). In particular, young adults see the high prices out of their current financial possibilities or cannot accept it. Some distrust the used seals/labels for sustainable products. Another big issue is the lack of more reliable and valid information about products and value chains, or not taking the time to gather such information. Also, housekeeping is a big thing as young adults do not want to spend that much time on preparing meals, they have a lack of knowledge and abilities to handle and manage food, or they are not ready to disclaim from fashion, tastes, or habits and beliefs. It is obstructive that young adults perceive themselves being at the food industries' mercy for plastic packages. In sum, the reported criteria and barriers for sustainable consumption behavior are in line with existing studies (cf., [5]).

By these analyses using the impact-based cube model, we could get concrete information on domain-specific situational challenges and corresponding necessary ability to realize sustainable consumption behavior. Linking these hints with our model on *sustainable creative competence*, additional information on concrete competence facets become overt that would enable young adults to apply a sustainable consumption behavior.

Based on that, stimulating *teaching–learning situations* (RQ3) can be constructed, here, especially to broaden the view on all three *consumption phases*. That means to have issues of usage and disposal already in mind when acquiring something. Strategies of already realized behavior can be assured. Therefore, but also with regard to removing barriers, more knowledge on products and productions processes is necessary, as well as how to prepare sustainable meals fast and how to handle food. Simultaneously, it seems to be important to become a proactive communicating consumer who perceives, gathers, and evaluates information to raise transparency, who do not perceive themselves at the industries' mercy, and whose consumption behavior has an impact. Additionally, non-cognitive issues such as changing habits, beliefs, values, desires for example on fashion, myth on fair trade products, taste should be considered. For stimulating such learning processes, didactical methods like lectures (e.g., on production chains, on eco-reports (Global Reporting Initiative (GRI)-standards) on sharing platforms, hands-on activities by showing how to do something (e.g., quick meal preparation in a sustainable way, searching for relevant information, refusing something politely), and authentic experiences (e.g., excursions to agricultural enterprises, food and textile industry, but also showcases of cradle-to-cradle-projects) can be made.

On the theoretical level, we validated the SCB-Cube model [16]. Furthermore, the impact-oriented cube model directs the focus to relevant behavior components that can be assured and others that have to be educated and trained. An additional value can be seen in the linkage with the model of sustainable creative competence as it specifies the dispositions respective to the competence facets to be stimulated and developed. By our assumption, the SCB-Cube and our competence model fit together as both are focusing on the output by simultaneously considering the input-factors.

Although we adjusted our sample within a broader peer group, limitations can be seen with regard to the relatively small interview sample. In this first approach, the intention was not to generalize, but rather to collect information about sustainable behavior and barriers for creating stimulating teaching–learning situations for the group of young adults in VET. At a number of 14 interviewees, the arguments for that group were similar, so we assume a saturation at this point [63]. Additionally, we do not have any information on whether the young adults live in their own household or still with their parents. That should make a difference regarding their consumption behavior, which is why we call for future research to address this issue. In general, in further study we should also observe in more detail young adults’ living conditions and try to figure out differentiations according to the various contexts and check whether there are differences in their behavior to be able to construct more tailored teaching–learning situations. Furthermore, we agree with other findings [5]: as consumption is part of a highly volatile behavior environment, our findings should be updated and complemented on a regular basis. Another point is the limited access to information on consumption behavior. Future research could also use diaries, housekeeping documentations, and interviews with peers as friends or family on realized consumption behaviors to triangulate the interview data by various sources. Through this, an information bias could be prevented. Nevertheless, as a first step we took an explorative view to obtain hints for constructing domain-specific tailored teaching–learning situations for young adults.

With regard to further research, the identified and outlined stimulating teaching–learning situations have to be worked out in more detail. Thereby, new and additional strategies for applying sustainable consumption behavior have to be created. Furthermore, these new didactical measures have to be implemented and empirically tested whether they improve realized sustainable consumption behavior and remove the mentioned barriers.

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