Psychological and Behavioural Science

Moving away from fast furniture with Unifiurn

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MOVING AWAY FROM FAST FURNITURE WITH UNIFURN

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Table of Contents

List of Figures 3
1. Background – Defining the Main Problems Associated with Fast Furniture 4
1.1 Stakeholders 5
2. Introduction 6
2.1 Potential of the Furniture Industry in the Circular and Sharing Economies 6
2.2 Target Population 6
3. Stakeholder Analysis 7
3.1 Identifying the Problem Using Multilayer Installation Design 7
3.1.1 Survey 9
3.2 Buying Phase Analysis 9
3.2.1 Lack of Knowledge 9
3.2.2 Time Constraints 10
3.2.3 Convenience 10
3.2.4 Financial Constraints 10
3.3 Disposal Analysis 11
3.3.1 Lack of Support for Repairs 11
3.3.2 Lack of Awareness and Knowledge 12
3.3.3 Transportation Difficulties 12
3.3.4 Lack of Incentive 12
3.3.5 Unsustainable Social Norms 13
3.4 Summary of Pain Points 13
4. Proposed Solution 13
4.1 Rationale and Solution Framework 13
4.2 Platform Operation Explanation 15
4.3 Summary of Solutions in Installation Theory 20
4.4 Marketing and Partnerships 21
5. Conclusion 21
5.1 Limitations 21
References 22
Appendix A – Activity Grids for Buying and Disposal, Based on Lahlou et al. (2022) 28
Appendix B – Survey Results 33
Appendix C – Summary of Pain Points 38
Appendix D – Summary of corresponding features to identified pain points and target layers 40

List of Figures

Figure 1: Traditional trajectory of the student furniture lifecycle 9

Figure 2: Solution framework 15

Figure 3: Redistribution trajectory with circulation platform involved 16

Figure 4: (a, left): Registration page; (b, centre): Home page; (c, right): Recycling information search 18

Figure 5: (a, top left): Search results; (b, top right): Buyer product page; (c, bottom left): Seller profile; (d, bottom right): Delivery options 19

Figure 6: (a, left): Furniture listing page; (b, centre): Popped up handyman service; (c, right): Repairing information page 20

Figure 7: Unifurn community photo wall 21

1. Background – Defining the Main Problems Associated with Fast Furniture

Fast furniture is made from inexpensive materials and not designed to last (Maier, 2021). Furniture manufacturers are now capable of producing furniture more quickly and at a lower cost than ever before (Buch & Trenk, 2021), and, as a result, furniture can be sold at a lower price to consumers. Furniture giant IKEA, for example, produces 20 Billy bookcases per minute (Usborne, 2020). Consequently, consumers can easily replace their furniture more frequently because of convenience and fashion trends (Buch & Trenk, 2021). As Griffith (2017) warned, furniture will follow the same trajectory that fashion has, consumers value low-cost

pieces, with a wide selection, at high speeds. Particularly during the pandemic, the fast furniture issue became exaggerated as many people predominantly spent their time at home and decided to renovate or redecorate (Kamin, 2022).

The primary problems associated with fast furniture are threefold. First, it is made of materials such as laminate and particleboard that are light to ship and cheap to produce (Maier, 2021). Particleboard requires a high amount of energy to manufacture, and the materials involved in its creation can create breathing problems for workers (Maier, 2021). Additionally, particleboard is not durable and is difficult to repaint or re-sand. It splits easily, swells up and rots when wet, which is irreversible, and is not biodegradable. Due to its short lifespan and non-biodegradability, furniture ends up clogging landfills (Kamin, 2022). In 2010, 8.9 million tons of furniture were disposed of in landfills, and this figure rose to 10 million tons by 2018 (Maier, 2021). Between 80-90% of all disposed furniture in the EU ends up in landfill or is burned (Wang et al., 2023). On top of that, the textiles used to produce fast furniture are often very cheap and have a short lifespan, leading to a large volume of textile waste annually (Wang et al., 2023).

The second issue highlighted by Maier (2021), is that cheap furniture production is often outsourced to other countries, meaning that the furniture (or its components) must be shipped over from abroad, which significantly increases the amount of carbon emitted by fast furniture. Additionally, increased overseas deforestation occurs because lumber must be extracted at a higher rate to keep up with the increased consumer demand for furniture (Maier, 2021). In 2020, 55% of world furniture production occurred in low- and middle-income countries and most of it was subsequently exported to high-income countries; this number is still expanding (Oblak et al., 2020).

The final problem, related to the high production speed and low cost, is that consumers discard furniture due to its appearance rather than its functionality or its condition (Hebrok, 2016). When considering how fast furniture is low quality and can easily become damaged, this problem is exacerbated. There is also no motivation, knowledge, or financial gain to repair or reuse old furniture, and it is simply not convenient. As a result, people choose to discard furniture and purchase new items instead.

1.1 Stakeholders

To tackle the obstacles to sustainable furniture adoption, the present intervention will not focus on retailers to solve the issue of fast furniture, as they can perpetuate the consumption cycle. For example, IKEA's '*buy back*' scheme (IKEA, n.d. a), allows customers to swap used pieces of IKEA furniture for store credit, further encouraging consumption through providing vouchers to repurchase new items. Furthermore, 58% of manufactured furniture is household furniture and 39% is corporate furniture (Azimovna et al., 2021), so targeting individual consumers aims to tackle the biggest consumer sector. Thus, the proposed intervention relates to de-growth, which aims to scale down the "capacity to produce and consume and of the role of markets and commercial exchanges" (Sekulova et al., 2013, p. 1). Realistically, the intervention will not stop consumption entirely, but the goal is to shift consumers towards a more circular furniture consumption cycle. The primary focus is on directly changing consumer behaviour, and indirectly changing seller behaviour. An interview with the former Head of Sustainability of IKEA revealed that in order to tackle the fast furniture problem, every party needs to change, including the retailers, the suppliers, and the consumers. The aim with this proposed intervention is to slow down fast furniture demand, not eradicate it altogether. The proposed intervention will not tackle the entire fast furniture problem; however, considering the constraints of the problem and the size of the issue, it is a start to eliciting sustainable behaviour change.

2. Introduction

2.1 Potential of the Furniture Industry in the Circular and Sharing Economies

Both the circular and sharing economies are relevant concepts when tackling the fast furniture problem. The linear economy involves the traditional consumer 'throw-away attitude' of consuming and subsequently disposing. The circular economy, on the other hand, aims to pivot from this perspective by decoupling economic growth from resources through their more efficient usage (Cheng & Chou, 2018). The sharing economy encompasses the peer-to-peer sharing of access to goods or services by giving, for example, or through a transfer of ownership which includes purchasing used goods (Styven & Mariani, 2020).

Compared to other industries such as fashion, furniture has the potential to be useful for the sharing economy, as it is subject to less wear and tear so can be more easily resold. Moreover, furniture is often expensive to purchase new, so purchasing second-hand furniture reduces the price for consumers. In online purchasing, the influence of sustainability increases (Styven & Mariani, 2020). Therefore, to encourage a sharing economy, the sustainability benefits should be made salient. There is high compatibility between the sharing economy and the circular economy (Henry et al., 2021), suggesting that perhaps a sharing economy could help bring about a circular economy.

To better inform the present problem, an interview with the former Head of Sustainability at IKEA revealed that, "Mass consumption companies can make the biggest change but not in an egocentric world; we need to open it to be an ecosystem and build bottom-up." For example, companies like IKEA are already collaborating with municipalities and start-ups to raise awareness of mass consumption; however, they still need complementary capabilities to reach their targets. Refurbishing, reusing, and repairing are already existing resources to encourage a circular economy, but these are not one-size-fitsall solutions.

An ecosystem in the context of this paper can be defined as "mutually dependent systems interconnected by a loose foundation of various ecosystem members such as customers, suppliers, partners, and other stakeholders" (Joo & Shin, 2018). A sustainable ecosystem such as the one this proposed intervention aims to establish, needs both collaboration and coevolution of its members (Joo & Shin, 2018). This definition highlights that all stakeholders are intricately connected, and that cooperation is the key to success, reiterating IKEA's former Head of Sustainability's message.

2.2 Target Population

Young adults are the greatest consumers of fast furniture items from IKEA (Thomas, 2023) and are the most likely demographic to choose irresponsible disposal methods (CruzCárdenas & Arévalo-Chávez, 2018), such as discarding furniture in landfills. The latter may be from a lack of attachment to their possessions, which facilitates mindlessly discarding items (Sorokoumova et al., 2019). The former is in part due to students being a highly mobile population; for example, UK adults aged 18-30 move homes the most (Brycelands Removals, 2017). The consumption pattern of young adults is buy, use, discard or sell, and then buy something new. However, there is growing interest in purchasing others' vintage possessions which are perceived as fashionable (Sorokoumova et al., 2019). These possessions have the benefit of being old in age yet feel new to purchasers.

Furthermore, young adults generate an aligned supply and demand, which is essential to an effective reuse system at the local level (Umashankar, 2022). The prevalence of highereducation institutions provides a stable flow of incoming and outgoing students, with both activities occurring around the same time (August-September) every year. Therefore, this paper targets the buying and disposal behaviour of university students. Focusing on this

narrower demographic allows for a piloted solution before potentially expanding to include other groups.

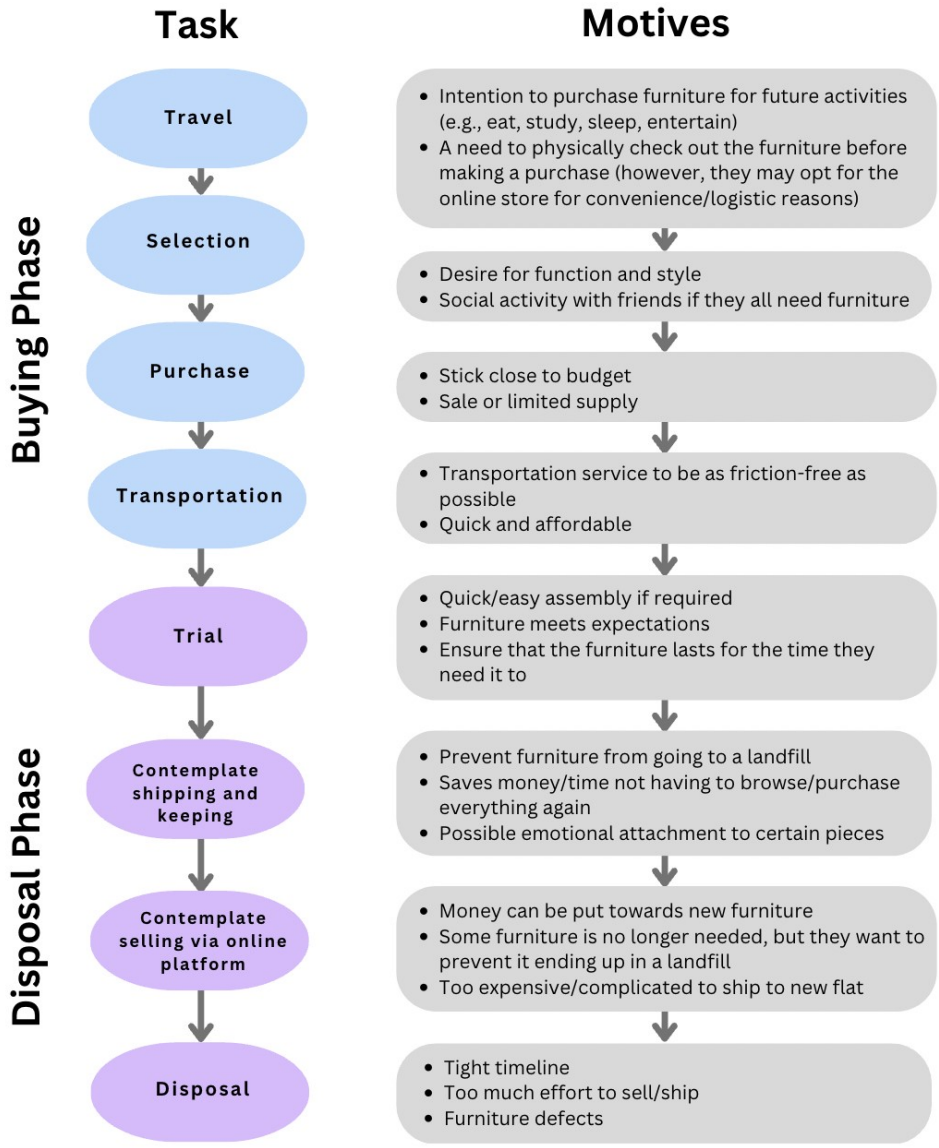
3. Stakeholder Analysis

3.1 Identifying the Problem Using Multilayer Installation Design

To better understand the problem from the student (consumer) perspective, the consumer buying and disposal activities were analysed using Multilayer Installation Design (Lahlou et al., 2022). First, Activity Theory describes the traditional trajectory of the furniture lifecycle (see Figure 1). The first phase (i.e., buying) illustrates a brief overview of the subject's (i.e., the student's) goal, to trial and use the furniture, which they achieve by completing tasks pushed by various motivations. The second phase (i.e., disposal) is shown in a similar manner; however, the goal is to dispose of the furniture, which involves different tasks and motivations.

Figure 1

Traditional trajectory of the student furniture lifecycle.



Next, Installation Theory (Lahlou, 2018) was used to further understand how to channel student behaviour during both activities. Briefly, the first layer, physical affordances, are components of the material environment that are supports or constraints. For example, flatpack furniture affords its transportation from point A to point B (e.g., it is easier for a person to carry themselves, and the shape allows for stacking in the delivery truck). The second layer, embodied competences, is more subject-centric because it relies on skills, knowledge, and experience. Some competences are generally shared among students (e.g., knowing where to purchase furniture or the ability to follow assembly instructions), and there are others that are less common (e.g., experience repairing damaged furniture or selling it online). The final layer, social regulation, relies on social systems and norms to ensure that people behave appropriately and predictably (which is situation dependent). For example, students believe that purchasing furniture from a big chain (e.g., IKEA) should be a straightforward process. An important feature of installation theory is that the layers are redundant, meaning that, should

one layer fail, the remaining layers will still support and allow for the activity to be carried out (Lahlou, 2018).

A further breakdown of activity theory and installation theory into activity grids of buying and disposing furniture (see Appendix A), adapted from Lahlou et al. (2022), were subsequently used to identify the pain points and potential causes to identify the most feasible problems to address.

3.1.1 Survey

Based on the student trajectory and activity grids, a survey was created to identify the buying and disposal elements that were most important to students. The survey was completed exclusively by university students, advertised on social media, and completed on a voluntary basis to help determine the essential features to consider for a student-centric intervention (*n*=65). Findings from previous literature were also incorporated to help create the proposed intervention. However, the survey aimed to obtain a more accurate description of what students wanted through targeting this demographic specifically (for survey results see Appendix B).

3.2 Buying Phase Analysis

The analysis identified several factors in the student consumer journey that could cause consumers to opt for fast furniture over more sustainable furniture options such as second-hand furniture.

3.2.1 Lack of Knowledge

Consumers are alienated from the production process of a commodity because they lack knowledge of what social, environmental, and other factors go into production (Hudson & Hudson, 2003). As a result of this gap, consumers only see the physical characteristics of the product on the shelf, which is known as commodity fetishism (Hudson & Hudson, 2003). Commodity fetishism may be an underlying cause of purchasing unsustainably. For example, in the food sector, a lack of knowledge and awareness was a barrier to purchasing organic food, which slowed down the sector's growth (Aertsens et al., 2010). This barrier also extends to the furniture sector. For instance, in the present survey, students were asked if they agreed with the statement: '*I have good knowledge about the materials of the furniture I've purchased.'* The average score was 3.2, where 1 represented 'strongly disagree' and 7 represented 'strongly agree', depicting that students lack knowledge about the materials in their furniture. This lack of knowledge may prevent students from making fully informed decisions and being aware of sustainable furniture consumption.

Another relevant psychological phenomenon is cognitive dissonance (Festinger, 1962). Cognitive dissonance refers to the psychological discomfort resulting from misalignment between people's beliefs and behaviours (Festinger, 1962). People will try to reduce this dissonance by changing their opinion or behaviour to make them consistent with each other (Festinger, 1962). In the context of furniture, if people hold sustainable beliefs but are simply unaware of where to find sustainable options or that their current furniture is produced unsustainably, they might experience psychological discomfort. People frequently alter their attitudes as a means of minimising dissonance. In other words, they might have a more optimistic outlook on unsustainable consumption that they previously had a negative attitude on (Festinger & Carlsmith,1959). To prevent this shift, it is important to increase their embodied competence of sustainable furniture buying and provide more physical affordances of sustainable consumption (Lahlou, 2018), facilitating dissonance reduction through behaviour change.

The ethical consumption gap is also applicable to the current issue, which is defined as a difference between consumers' intention to consume ethically and their actual actions (Carrington et al., 2016). This gap is partially due to the social desirability bias, in which people state their intentions as the ones they believe are socially acceptable. There appears to be a sustainable consumption gap as well. For example, many consumers claimed they considered sustainability when making choices which were not visible in their actual consumption behaviour because their consumption was predominantly brand and price driven (Viikari, 2021). The present survey supports these findings, as the environmental impact was found to be a key consideration of students when purchasing furniture; however, 79.7% of students in the survey indicated that they still purchased from big chains.

3.2.2 Time Constraints

"Many sustainable actions are viewed as effortful, time-consuming, or difficult to carry out, which can be a barrier to sustainable actions" (White et al., 2019, p. 26) and lead consumers to base their decisions on heuristics (Mancini et al., 2017). For example, brands are one of the main heuristics that people turn to when they are faced with information and choice overload (Chrysocou, 2010), which is identified as the root cause of this pain point. This problem was demonstrated by Mancini et al. (2017), who presented participants with many different brands of the same food and found that participants chose a brand they were already familiar with, or made their judgements based on the packaging. Choice overload occurs when there are many options to choose from, which can lead to less motivation to make a choice or even choice paralysis (Reutskaja et al., 2020). Instead of evaluating all features of a product, consumers view the brand as representative of certain features and quality, whereby they know what to expect making it convenient (Chrysocou, 2010). Information and choice overload may be apparent in the furniture market due to furniture and retailer variety. The proximal cause of the issue is that conducting one's own research is too time-consuming, thus, opting for a furniture chain such as IKEA is the easiest choice. The present survey supports this rationale: 80% of students purchase furniture at big chains when moving and 26% said they never sold second-hand furniture online because it was too timeconsuming. Whilst the question was about selling not buying, it highlights time as a barrier to engaging in sustainable furniture consumption.

3.2.3 Convenience

Certain furniture is extremely bulky, large and impractical to transport (Umashankar, 2022). Flat-pack furniture options offered by companies like IKEA, combat this issue by supplying unassembled furniture in compact, easy-to-move boxes (IKEA, n.d. b). Flat-pack options allow consumers to purchase several items at once and easily transport them due to their size. When comparing flat-pack options versus already assembled second-hand pieces, transportation is easier for flat-pack pieces. Additionally, convenience remains important when consumers must decide whether to reuse their furniture (Umashankar, 2022). Due to the difficulties in transporting furniture, consumers may be motivated to buy cheap, fast furniture that they can leave behind or discard when moving, rather than buying lasting furniture every time they move. Young adults move homes the most (Brycelands Removals, 2017), which is a particularly relevant deterrent for students.

3.2.4 Financial Constraints

The majority of students are enrolled in full-time unpaid education, which is a proximal cause of financial constraints. Therefore, students have less disposable income on average compared to those outside of education. Consequently, it is not surprising that they cannot always choose the product they desire most (Granstrom, 2007). The neoclassical economic theory supports this idea, stating that consumption choices are based on maximising utility under financial constraints (Van den Bergh et al., 2000). Further, in mobile phone purchasing,

four clusters relate to financial constraints: the updater, the budgeter, the environmentalist, and the lifelong user (Bask et al., 2012). The budgeter prioritises price when deciding which phone to buy, which was most prevalent amongst people aged 15-26, which indicates that student-age consumers are more likely to focus on price when considering sustainable options (Bask et al., 2012). The present survey supports the importance of price to students, where 49% identified price as the most important factor and 34% cited it as the second most important factor when deciding which furniture to purchase.

Similar motivations also exist in the furniture sector. For example, some consumers primarily value uniqueness, some prioritise quality and the price less so, and others mainly concern themselves with prices (Viikari, 2021). The consumer group, which was most common amongst those aged 20-29, will predominately be motivated by finding the cheapest option. However, the state of the furniture still matters because they want good value for money, thus second-hand furniture is a viable option for students if they perceive the combination of price and condition to be acceptable (Viikari, 2021). Currently, since fast furniture is the cheapest option, it is the most viable option for students which is the underlying cause of the issue.

3.3 Disposal Analysis

There are many factors in the student consumer journey that could cause them to dispose of furniture rather than choosing a more sustainable redistribution option (e.g., giving it to friends and family, selling their furniture).

3.3.1 Lack of Support for Repairs

One reason for premature furniture disposal is furniture being damaged. As previously discussed, young adults consume fast furniture products the most (Thomas, 2023), which can rapidly degrade and become damaged. Consequently, students likely face the problem of choosing what to do when their items require repair or refurbishment. For example, people often perceive damaged, low-quality products as useless to others and these items are consequently disposed of (Bianchi & Birtwistle, 2010), which stands true for furniture (Hebrok, 2016). The present survey results also revealed that 54.7% of respondents would not choose to repair a damaged item of furniture. This ‘throw-away culture’ means that many items are simply discarded without consumers considering repair opportunities (McCollough, 2009). However, repairing is integral to a circular economy as it contributes to increased product lifespans and consequently uses fewer resources (Laitala et al., 2021).

Two primary furniture repair options exist: ‘Do it yourself’ (DIY) or hire a professional. Research shows that those aged 16-24 are the least likely to DIY ("Share of Adult Population Doing DIY," 2020), with the top barrier being a lack of appropriate skills (Ibbetson, 2019). Accordingly, the results of the present survey indicate that 43.8% of respondents did not know how to repair furniture, and a further 51.6% said their repair abilities depended on the degree of damage. In line with the survey results, it is true that even if individuals can carry out minor repairs, certain types of damage may be more difficult to repair at home.

In recent decades, the availability of repair services has declined alongside the demand for such services (Fachbach et al., 2022). Therefore, even when repair support is desired, it may be difficult to find a suitable professional. Additionally, consumers are not willing to pay a large price for repairs, showing a preference to not pay over 20% of the cost of replacement to repair an item (McCollough, 2007). Whilst there has been a continuous increase in repair prices, the options to access cheap furniture have also increased. Therefore, the ever-increasing repair prices coupled with the ever-decreasing replacement prices mean consumers often opt for the cost-effective option of replacement (McCollough, 2009). Hence, damaged furniture is frequently disposed of.

3.3.2 Lack of Awareness and Knowledge

A lack of awareness of the environmental impacts of different disposal versus redistribution methods may contribute to irresponsible behaviours. As with the production process, consumers are similarly detached from the process of what happens to their furniture after they get rid of it. This detachment is evident in the survey results; 89.1% of respondents reported not knowing about the furniture recycling practice in their borough. Therefore, individuals may lack an understanding of how to correctly dispose of furniture, leading to irresponsible disposal methods (i.e., landfill versus recycling) being chosen by accident. Further, individuals lack the motivation to act sustainably if they are unaware of the issue, do not understand the environmental consequences of their behaviours, and are unaware of alternative sustainable actions (Gifford & Nilsson, 2014).

The dominant sustainability movement has been against fast fashion (Stallard, 2022); however, fast furniture sustainability concerns have only recently emerged across popular media channels (Kamin, 2022). Therefore, due to a lack of awareness of the issue, students may not know the environmental impact of different disposal methods. Critically, research shows that providing information alone is typically not enough to motivate long-term proenvironmental behaviour change (Abrahamse et al., 2005). Therefore, effective sustainable solutions often require providing consumers with information coupled with other tactics (White et al., 2019).

3.3.3 Transportation Difficulties

Considering that most UK universities are within urban areas ("Where Do HE Students Study", 2023) and car ownership is significantly lower in urban versus rural areas ("Distribution of Household Car or Van Ownership", 2015), it is likely that many UK students do not own a vehicle which they could use to transport furniture. Even with access to a vehicle, many items may be too large to fit into cars and may require a larger vehicle (e.g., a van), which is often costly. For example, the price of hiring a small van, for 1 hour, to move 2 items of furniture is a minimum of £71 in central London (via *Compare the Man & Van*). This financial barrier can hold true even when students want to keep their furniture, and thus consumers feel pushed towards opting for the easiest disposal method.

3.3.4 Lack of Incentive

Moving is reported as being one of the most stressful life events ("Moving House Stress Signals", n.d.). Additionally, individuals often choose to discard the item when they have limited time (Jacoby et al., 1977). Consequently, during a busy moving period, even when individuals have knowledge of negative sustainable impact of irresponsible disposal methods, convenience may trump concern. However, one way to encourage sustainable behaviour is providing an incentive for pro-environmental behaviour. Sustainable actions, which occur less frequently (versus habitual behaviours), are best encouraged using monetary incentives (White et al., 2019). As the need to get purge furniture typically only occurs around 1-2 times per year (i.e., at the time of a move), a financial incentive to encourage sustainable disposal of furniture is likely useful.

Gaining monetary incentives through reselling furniture could provide motivations to individuals to sustainably redistribute their furniture rather than dispose of it. Several online platforms for selling furniture already exist within the UK (e.g., *Gumtree*, *eBay*, and *Facebook Marketplace*); however, most of these platforms rarely offer delivery. Unsurprisingly, most respondents (68.8%) in the present survey identified the availability of a delivery service as the most important factor in encouraging future use of a furniture redistribution platform. Therefore, students may resist furniture redistribution through existing reselling options due to

transportation concerns, so including delivery as an incentive may necessarily be part of the solution.

3.3.5 Unsustainable Social Norms

Social norms are a powerful predictor of pro-environmental behaviours. If individuals see others acting sustainably or if they feel others expect them to act sustainably, they will be more likely to take sustainable action (Culiberg & Elgaaied-Gambier, 2016). Additionally, the magnitude of the social influence on behaviour depends on the social identity of an individual whereby consumers are more likely to act sustainably if other ingroup members are doing so (White et al., 2019). High transportation costs may result in students leaving furniture outside their flat or 'fly-tipping', rather than giving or selling their furniture to someone else. Fly-tipping is not only unsustainable, but also economically costly with local authorities in England spending £11.6 million to clear this waste ("Fly-Tipping Statistics for England", 2023). Concerningly, fly-tipping is a common practice within student areas (French, 2018), with several respondents in the present survey admitting to leaving furniture on the side of the road. Frequently seeing furniture left on the side of the road by other students acts as an influential visual cue indicating that such behaviour is a student norm and encourages others to follow suit. Therefore, any sustainable solutions must address shifting disposal social norms within student populations.

3.4 Summary of Pain Points

Appendix C summarises the pain points that arose from the student consumer behavioural analysis. From the analysis, the main problem that emerged was the lack of a circular solution for students that connected both buying and disposal activities. Thus, the present intervention focuses on prolonging the longevity of purchased furniture through a redistribution platform. This platform aims to create a convenient channel for students to settle their furniture (as already mentioned, moving can be a stressful process), and increase the number of students circulating furniture (from our survey, while many students purchase second-hand furniture, a much smaller number of them sell their furniture online).

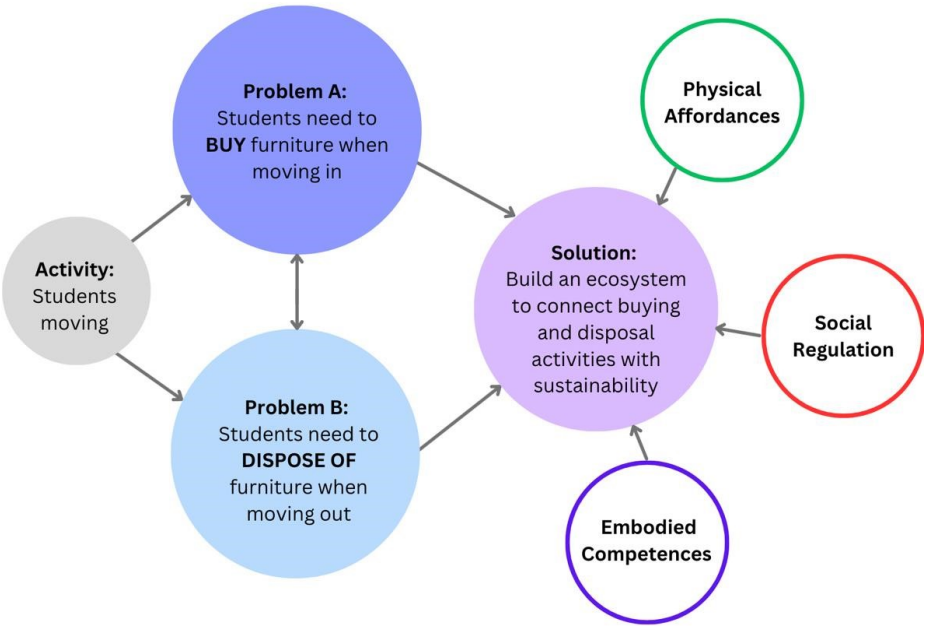
4. Proposed Solution

4.1 Rationale and Solution Framework

As the former Head of Sustainability at IKEA emphasised, tackling the unsustainable trends in fast furniture requires an ecosystem approach in which every stage of students' furniture consumption should be coordinated and interconnected in a sustainable way. The present intervention proposes creating a communal furniture circulation mobile platform for students called *Unifurn*. The meaning of the name Unifurn is threefold: first, it is a platform for university students to buy their furniture. Secondly, 'uni' is derived from Latin meaning 'having only one' (Online Etymology Dictionary, n.d.), to suggest that there is one way to furnish your house, namely, in a sustainable manner. Lastly, it is a play on the word uniform since the platform targets university students. The word uniform is a nod to the fact that they are all enrolled in education, helping to foster group identity and cohesion. Unifurn aims to address the identified pain points throughout the whole furniture consumption circle from the three layers (physical affordances, embodied competences, and social regulation) of installation theory (Lahlou, 2018) (Figure 2).

Figure 2

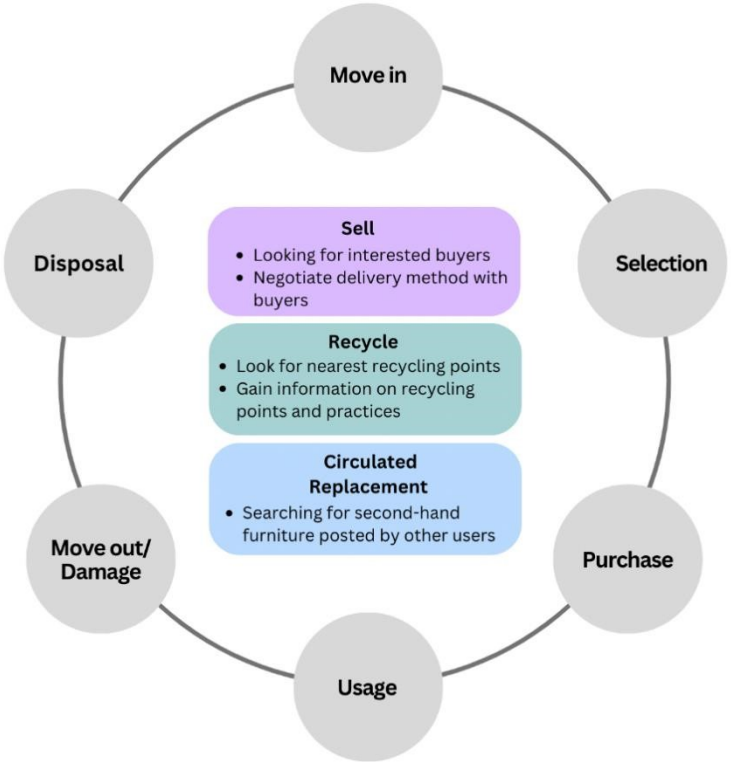
Solution framework.



The traditional trajectory of the student furniture cycle typically begins at the start of the new academic year when substantial amounts of accommodation settlement take place amongst the student population. The cycle then terminates either towards the end of the study period when students must move out from their current accommodation or after damage occurs. Unifurn aims to replace furniture disposal as the consecutive step after moving out or damages with various alternatives, including reselling, recycling, and exchange, reconnecting the trajectory with the start of the life cycle (Figure 3).

Figure 3

Redistribution trajectory with circulation platform involved.



Internet literacy is highly related to the amount of online purchasing (Choudhury & Dey, 2014). Since students tend to be very internet literate, they often use e-commerce to buy

products (Choudhury & Dey, 2014), which was apparent in the survey results; 57.8% of students indicated that they had used online platforms to buy second-hand furniture. Thus, because many students are already experienced platform users, they already possess some embodied competencies required to use Unifurn. Furthermore, students tend to be early adopters of new platforms and products, which are essential for triggering others to join (Lee, 2014). Additionally, students are also amongst the most susceptible to social norms and are likely to behave in a way that conforms to their friends' behaviour (Lee, 2014). Thus, if a couple of students start using Unifurn and have a positive perception of the platform, it could create a ripple effect to attract more users.

Previous research also found that online shopping has greater perceived convenience and financial advantages for consumers (Clausen et al., 2010). Compared to organising second-hand furniture markets or offline events, Unifurn is an informational, interactive, and easy-to-use online platform that may be more effective in facilitating long-term and timely sustainable consumption. The following subsections will introduce Unifurn's sustainabilityoriented operation system, which differs from typical second-hand e-commerce channels, and will explain how Unifurn resolves the pain points of students' furniture consumption through the lens of Lahlou's (2018) installation theory. Lastly, marketing and partnership opportunities for Unifurn will be proposed to leverage beneficiaries' coverage.

4.2 Platform Operation Explanation

Like typical e-commerce mobile applications, new users will go through account registration to use Unifurn (Figure 4a). However, since the aim of the present intervention is to create an ecosystem amongst students, a new page prompts users to select their institution, which directs them to an identity verification page. Research shows that social networks are a powerful microenvironmental force to motivate product flow from original owners to new owners in the sharing economy model (Krush et al., 2015). Therefore, the membership based Unifurn community, coupled with a shared student identity, will become a frame of reference shaping platform users' furniture consumption (Merton & Rossi, 1949).

After registration, users can navigate the home page as shown in Figure 4b. Unlike typical e-commerce mobile platforms, the homepage design contains three key elements to channel sustainable furniture consumption. First, the top of the homepage includes a recycling encouragement prompt. The quote '*Paper, Plastic, Metal.... What's Next? Tap here to learn more about recycling in your area*.' aims to integrate furniture into the user's embodied competence of typical recycling knowledge. Clicking the prompt allows users to access a map to help them locate their nearest recycling facility and corresponding service details (Figure 4c). A map view of the facility helps users visualise the convenience of furniture recycling and evaluate the compatibility of different facilities. As the survey results revealed, students choose irresponsible disposal methods by accident due to a lack of understanding. Therefore, from the recycling prompts to recycling facilities' information, Unifurn aims to channel platform users to more sustainable disposal choices through chained physical affordances, following the idea of unfolding different affordances when individuals proceed with the installation (Lahlou, 2018).

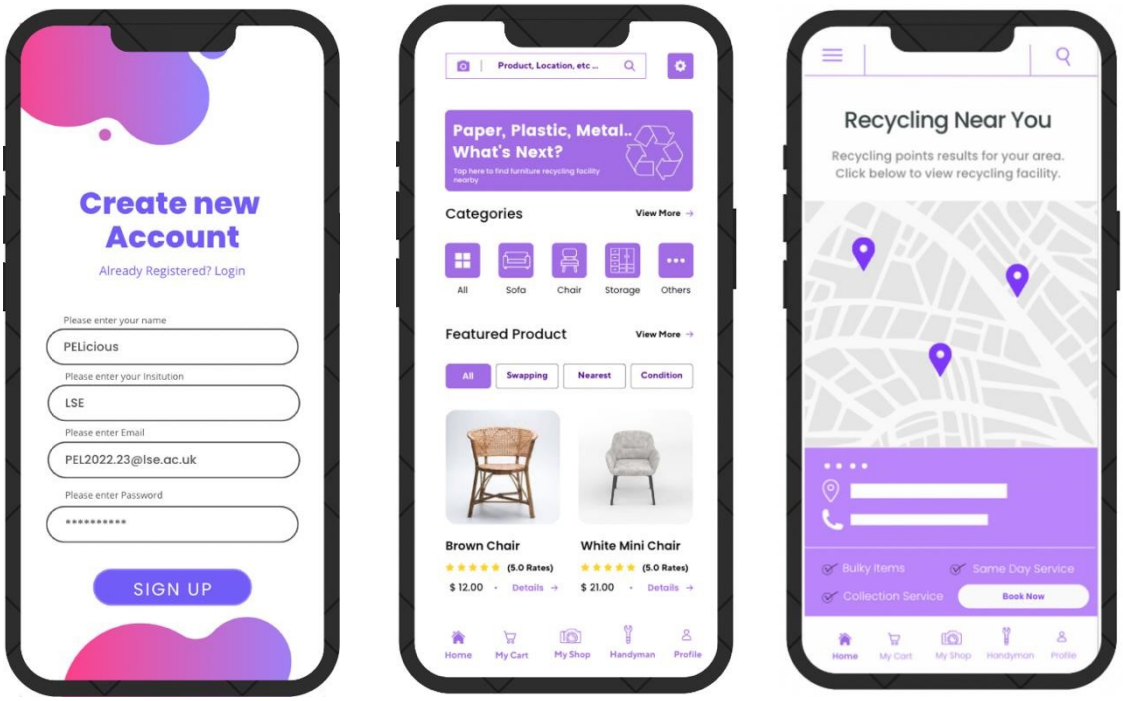
Second, the selection filters under 'Featured Product' differ from typical commercial factors (e.g., *'Newest*,' *'Popular*,' or '*Sales*'), alternatively utilising sustainable substitutions like '*Swapping*' (to increase second-hand furniture adoption), '*Nearest*' (distance concern) and '*Condition*.' Such small adjustments could effectively ease users' concerns about convenience and price which traditionally promotes fast furniture consumption. Additionally, hygiene-related filters such as '*Pet-free*' and '*Smoke-free*' are also available. The student population in the survey did not express great concern about hygiene when stating their reasons for not purchasing second-hand furniture, however, other research shows that consumers consider hygiene when purchasing second-hand furniture products (Pierce & Paulos, 2011). Therefore,

a hygiene filter aims to help consumers feel more at ease with purchasing a range of secondhand furniture items.

Third, the bottom bar of the home page (see '*Handyman*' wrench icon) facilitates access to resell and repair options. Overall, four sustainable furniture consumption alternatives are provided together as physical affordances for users on the first screen after login. Since affordances have a signalling effect on the individual at the turning points of action (Lahlou, 2018), obvious and different physical affordances would be most effective in channelling individuals towards sustainable alternatives. Moreover, users' exposure to available sustainable alternatives will also be increased each time they navigate on the platform, thus gradually developing a new embodied competence of suitable furniture consumption practices (Lahlou, 2018).

Figure 4

(a, left): Registration page; (b, centre): Home page; (c, right): Recycling information search.

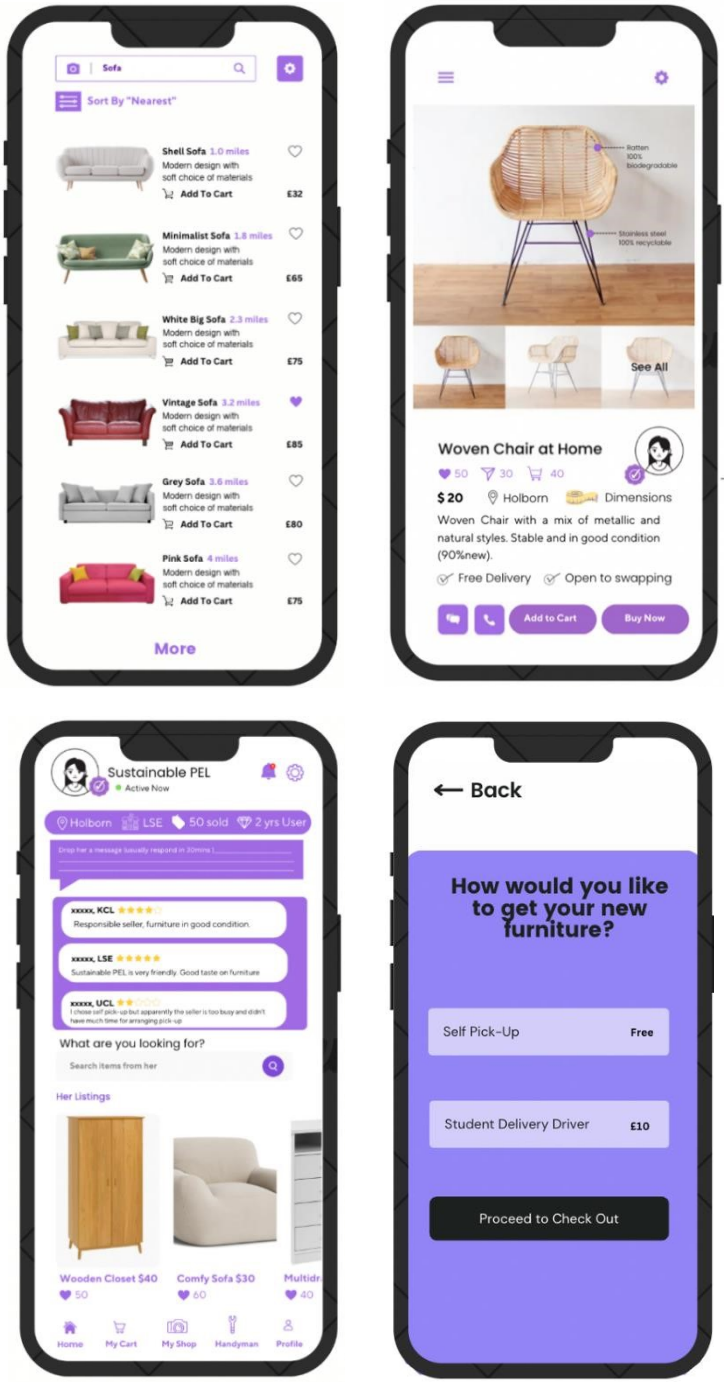


Moving to the selection stage (Figure 5a), apart from typical product information (e.g., basic descriptions, images, dimensions, and reviews), Unifurn additionally includes sustainability specifications on product images (Figure 5b). As previously mentioned, sustainable action requires individuals' knowledge and awareness of the impact and consequences of unstainable practices (Gifford & Nilsson, 2014). The platform indicates the corresponding materials' eco-friendliness, which expands users' embodied knowledge (Lahlou, 2018) of furniture to include sustainability. Consequently, this feature nurtures young consumers to consider environmental impact alongside price and design in their decisionmaking process. The product page also includes a verified seller icon so users can access the seller's profile (Figure 5c) to view their affiliated institutions, number of previous sales, and buyer reviews and ratings. Customer reviews were used specifically due to their importance in consumer decision making, with the presence of reviews increasing customer propensity to purchase (Askalidis & Malthouse, 2016). Transparent sellers' profiles enhance the reliability and trustworthiness of the platform, as well as prevent irresponsible listings through social regulation.

To ease students' transportation concerns, Unifurn includes the seller's location and two delivery packages (Figure 5d) as physical affordances to facilitate convenient furniture transportation (Lahlou, 2018). Since Unifurn targets university students, they can shop based on their institution where they may find more sellers who live in surrounding areas. Students can opt for free self-pick-up upon agreement with the seller or the student delivery service provided by registered Unifurn student drivers. From a practical perspective, Unifurn will employ student drivers who will be trained specifically in transporting furniture. The involvement of student drivers completes the ecosystem of furniture circulation in the student community, with the delivery cost being perceived with a reciprocal communal helping mentality knowing their peers receive the fee. Hopefully, this 'for students, by students' approach emphasises the sense of community across the platform.

Figure 5

(a, top left): Search results; (b, top right): Buyer product page; (c, bottom left): Seller profile; (d, bottom right): Delivery options.



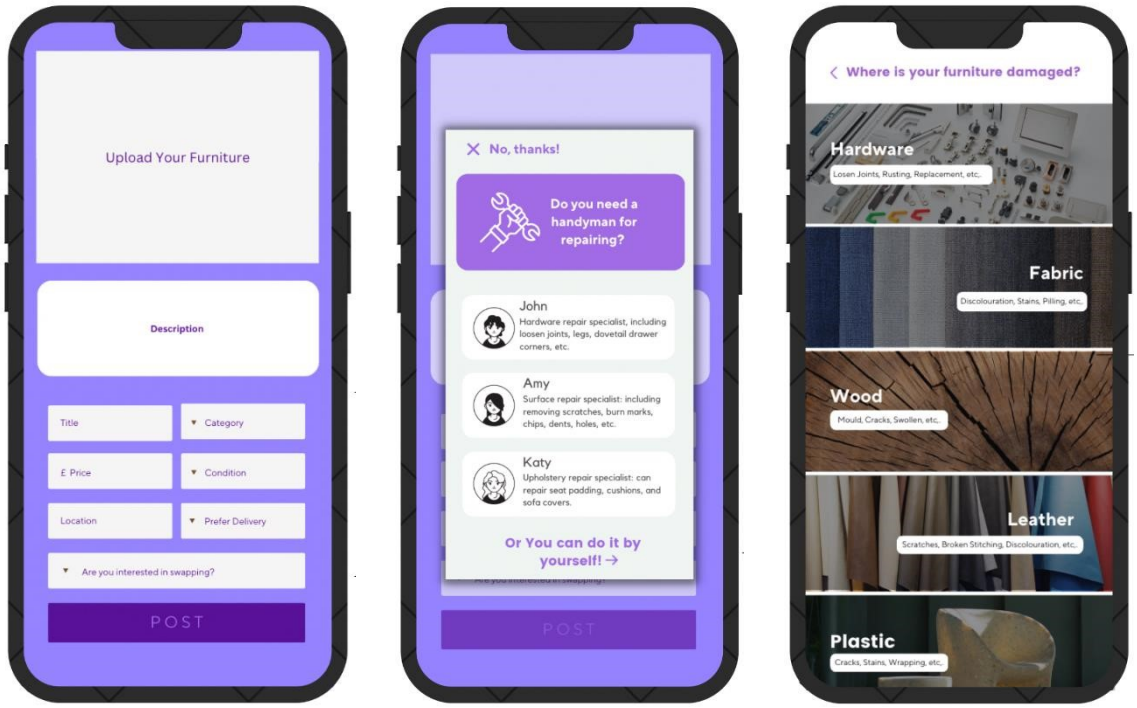
For users who want to discard their furniture, Unifurn provides a straightforward way to list unwanted items without prior sales experience. The survey results indicate that students seldom sell their furniture online due to the perceived stressfulness of the selling process. To enhance the seller's physical affordances, Unifurn features the '*My Shop*' button on the homepage to direct users to the furniture listing page, where specific boxes indicate which information is required (Figure 6a).

Furthermore, one common obstacle to purchasing second-hand furniture is a lack of confidence in its quality (Cheng & Chou, 2018). To address this problem, a handyman service pops up when the seller indicates any damage in the '*Condition*' box (Figure 6b). As previously mentioned, many students have little knowledge of repairing furniture, therefore, students who perform repairs as part of their field of study (e.g., carpenters), have sufficient industry experience in furniture repair, or show a strong interest in and experience with DIY will be recruited. Unifurn also provides students with a hands-on option. The '*You can do it by yourself*' feature attempts to boost students' self-efficacy when considering DIY, encouraging them to

engage in self-repair. Users will be directed to a repairing information page where YouTube videos, repairing guidelines, and tool recommendations based on materials categories are present and physically affordable (Figure 6c). As previously mentioned, lack of knowledge is a major obstacle for young adults choosing DIY (Ibbetson, 2019), therefore, accessible repair guidance would enhance students' willingness to repair furniture and install a set of embodied competences, preventing similar premature disposal in the future.

Figure 6

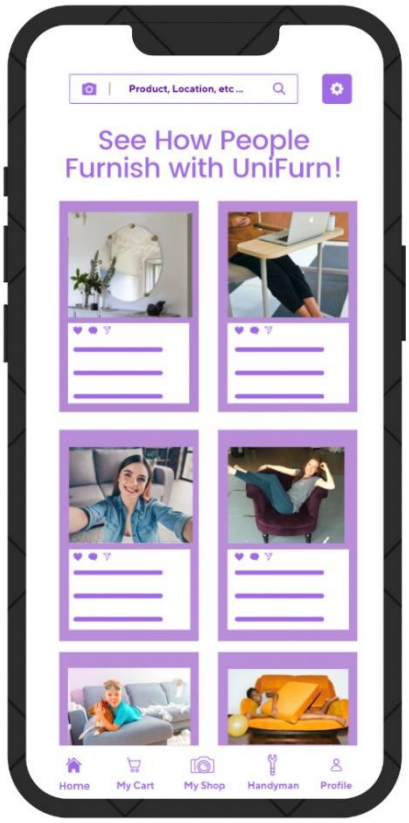
(a, left): Furniture listing page; (b, centre): Popped up handyman service; (c, right): Repairing information page.



The last function is the Unifurn Community Photo Wall *(*Figure 7). Users can post pictures of their newly furnished living area with furniture purchased from Unifurn, as well as browse other students' sharing and give comments and likes. The photo wall aims to shift unsustainable social norms (e.g., fly-tipping) within the student community by depicting users acting sustainably. The photo wall acts as both a social regulation of sustainable furniture consumption and a reference to users of the expected results of Unifurn service.

Figure 7

Unifurn community photo wall.



4.3 Summary of Solutions in Installation Theory

The Unifurn platform is an installation for sustainable furniture consumption, combining three layers of behavioural components as summarised below (see Appendix D for how the installation theory components match the relevant platform features to address the aforementioned pain points).

Physical Affordances: The swapping options, nearby recycling information, DIY guidance, and handymen services are embedded in the platform environment as three sustainable alternatives: Recycle, Reuse, and Repair. Pre-set product info box is designed for lowering the hurdle of furniture reselling, leveraging the affordance of sustainable alternatives. In the terms of installation theory, these affordances are designed purposefully to trigger 'Stigmergy' (Lahlou, 2018, p. 93) and to support the behaviour change by signalling appropriate furniture consumption practices (Lahlou, 2018). Unifurn implants the affordances in students' furniture consumption practises so more sustainable options are chosen rather than continuously using fast furniture or irresponsible disposal.

Embodied Competencies: Unifurn attempts to equip users with a set of soft skills for sustainable furniture consumption by including informational features, including the recycling info page, furniture's sustainability specifications, pre-set product info boxes, and selfrepairing guidance. The experience and knowledge of sustainable furniture consumption gained by using Unifurn services would thus turn into an essential mental capacity for longterm sustainable practises, such as where, what, and how is sustainable furniture consumption (Lahlou, 2018).

Social Regulation: Successful sustainable behaviours predominately require collective rather than individual action (White, Habib & Hardisty, 2019). Alongside building an effective functional environment, Unifurn also strives to boost the trust and community spirit on the platform. With verified institution identity, transparent seller's profile, and Unifurn Photo Wall, the regulatory role of social identity generates unspoken rules (Lahlou, 2018) to control users'

furniture consumption by imposing both descriptive and injunctive norms (Goldstein & Cialdini, 2009).

4.4 Marketing and Partnerships

As advised by the former Head of Sustainability at IKEA, it is important to consider that all parts of the ecosystem are interconnected. Each part of the ecosystem must operate with the help of others and not in isolation. Therefore, several marketing and partnership strategies are proposed to rapidly acquire users on Unifurn and make the intervention as successful as possible. Firstly, partnering with a fast furniture giant such as IKEA allows Unifurn to reach a wider audience and access more resources. For example, access to their inventory of spare parts to aid repairs via a handyman or through DIY. This partnership is a great opportunity for IKEA to demonstrate their continued efforts towards their recent sustainability commitments (IKEA, 2023). Secondly, partnering with universities allows Unifurn to verify student identification through university records to ensure higher user safety. Additionally, universities have a large reach with students, thus, to rapidly acquire users, Unifurn could be advertised in student fairs, welcome packs, and across social media. Unifurn is an attractive partnership for universities as it helps build a more connected and sustainable student community, as well as helping showcase universities' engagement in promoting sustainability. Thirdly, as the analysis demonstrated, most of the issues arise during times of moving. Therefore, partnering with property companies (e.g., *Rightmove* and *SpareRoom*) will help attract users during critical moving periods where Unifurn is most useful. In return, a proportion of sales generated via these platforms will be awarded to the property businesses.

5. Conclusion

To conclude, an intervention was proposed which aims to slow down fast furniture consumption within the student population. Unifurn offers a sustainable solution to the unsustainable trends in fast furniture consumption amongst university students. Through building a more sustainable ecosystem, the platform addresses pain points throughout the furniture consumption circle by reconnecting the trajectory with the start of the life-cycle. A mobile platform solution was chosen because it aligns with students' internet literacy and their tendency to be early adopters of new platforms and products. Using the tools offered by multilayer installation design (Lahlou et al., 2022), which combines activity theory and installation theory, a comprehensive understanding of the student (consumer) behaviour in the context of buying and disposing of furniture was gained. Through this approach, the various tasks, motivations, and competencies involved in these activities and the role of physical affordances, embodied competences, and social regulation in shaping student behaviour were identified. The Unifurn community, coupled with a shared student identity, aims to become a frame of reference to shape platform users' furniture consumption. The platform promotes sustainable furniture consumption through informational, interactive, and easy-to-use features, such as providing a recycling encouragement prompt, offering delivery options, selection filters that include distance, swapping options and condition information. The platform also facilitates access to resell and repair options, encouraging responsible and sustainable consumption of furniture. The proposed marketing and partnership strategy aims to create a ripple effect to build an ecosystem, which aims to extend furniture lifespan and prevent landfill waste. Overall, the Unifurn platform presents an innovative and sustainable solution to slowing down fast furniture consumption amongst university students.

5.1 Limitations

One limitation of the present intervention is that Unifurn is exclusive to university students. In the early stages of launching Unifurn, a student consumer base will be used to test and assess the success of the concept. As they are within the demographic of fast furniture companies' biggest consumers (Thomas, 2023) and those who move most frequently (Brycelands Removals, 2017), they were selected as the most pressing population to target

first. However, by focusing exclusively on university students it is understood that the present intervention excludes most individuals. Notably, other young adults who face similar barriers to sustainable furniture consumption, yet do not study at university, are exempt from the intervention. However, following Unifurn's initial success, it is hoped that the platform would be extended to other groups starting with young adults who are not in education.

Furthermore, it is predicted a large proportion of the furniture sold through Unifurn will likely be from fast furniture companies. As identified in the analysis section, student consumers will be drawn to fast furniture brands due to their convenient, low-cost options. Therefore, it is expected that the circulated furniture will have a shorter lifespan or be prone to damage. Although the platform can ultimately not prevent furniture from becoming too damaged to use, Unifurn's primary aim is to extend furniture lifespan by encouraging redistribution and refurbishment. Additionally, Unifurn's information section informs consumers on the issue of fast furniture at the point of purchase and disposal to better educate consumers to make more sustainable furniture purchases in the future. In the meantime, excessive furniture waste will unfortunately be inevitable whilst fast furniture production dominates.

Lastly, this intervention does not address the rapid production of fast furniture brands directly. However, Unifurn hopes to drive change from the bottom-up. Spreading awareness of this issue may lead to a fast furniture sustainability movement, which has similarly been seen in the fashion industry. Therefore, increased consumer awareness and a decrease in demand may shift fast furniture companies to consider sustainable innovations to keep up with changing consumer attitudes. It is hoped this could have a knock-on effect on fast furniture businesses, ultimately addressing over-production.

Future interventions should primarily focus on how to combat the rapid production of fast furniture, targeting the fast furniture manufactures directly. If such interventions are successful then it is hoped that all aspects of the furniture ecosystem will be improved to eventually create a new, more sustainable furniture ecosystem.

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Appendix A – Activity Grids for Buying and Disposal, Based on Lahlou et al. (2022)

Activity – Buying

Task	Actor's Motives & Goals	Contributions from Actor	Actor's Rewards	Installation: Affordances	Installation: Competences	Installation: Regulation
Travel to store	Intention to furnish flat so the student has somewhere to eat, study, sleep, entertain. If the store is too far away or it's inconvenient for the student, they may opt for the online store.	Being physically present will help the student get a better idea of how the furniture would look in their flat (IKEA models). They can also ask for assistance from the IKEA workers.	Satisfaction of picking something out (whereas one can become easily distracted while browsing the website)	Larger stores located a bit farther away (but still along a motorway for easy access), smaller stores likely to be located in the city	Evaluating which stores to shop at (IKEA easily comes to mind), knowing the route to get there	Advertisements encouraging/ people to exercise (5000 steps to IKEA) Buying from IKEA is well known and practiced among young people
Picking out furniture	Desire for both function and style (Possibly wanting social time with friends, they are all shopping for furniture together)	Selects furniture that fits within defined parameters (e.g., material, colour, price) The student may also enlist the help of a friend and they can help each other choose what they want	Student gets the items that they want and can now furnish their flat Shopping with a friend reinforces a social connection between the two people.	Large carts for instore shopping, which are conveniently located and easy to maneuver. Layout is straightforward (follow the arrows to each section) Online shopping website is easy to navigate (e.g., categories, filter	Students know where to buy fast furniture (IKEA, Wayfair etc.) Previous knowledge about furniture materials and fabrics (e.g., interior design magazines)	Peer influence. Even if the student shops alone, they are likely to ask for others' opinion, or may get inspiration from their friends' furniture.

				options) and gives customers the option to hold items in a virtual basket		
Payment considerations	Students are often on a budget so they need furniture prices that will align with that	Planning when to make their purchases (e.g., back to school sale)	Satisfaction of finding furniture for a fair price or something on sale	Supermarket-like checkout facilitates the transaction. Shopping online only takes a few clicks	Students know that sales happen during the same time every year (e.g., from peers, or company emails) so they will choose to buy during that time (either from necessity or fear of missing out)	There are social norms around the fact that furniture should be cheap and easy to get
Logistics of getting furniture to flat	The desire for transportation/delivery to be as friction-free as possible. May not make sense to transport it on their own so delivery is the best option	The student makes the decision as to whether to get the furniture shipped or to pick it up themselves	In the case of delivery, the student saves time and energy from store collection. Excitement from package being delivered	IKEA furniture is flat-packed, making it easier to transport (stack) All parts are clearly labelled and separately packed to facilitate assembly	Instructions are usually straightforward for the builder to follow	Free shipping is expected above a spending minimum, which makes it too convenient to not select that option

Trial period	Students want to be able to use and enjoy their furniture for as long as possible (at	Using the furniture, getting the opinions of guests	The IKEA effect (people place more value on things they built themselves)	Using the space in the flat to see where the furniture fits best	Testing the furniture oneself to see if it meets expectations, leading to the decision to keep	Belief that the furniture will maintain itself and serve its purpose for as long as possible.
	least until they move again)				it or return it/dispose of it	

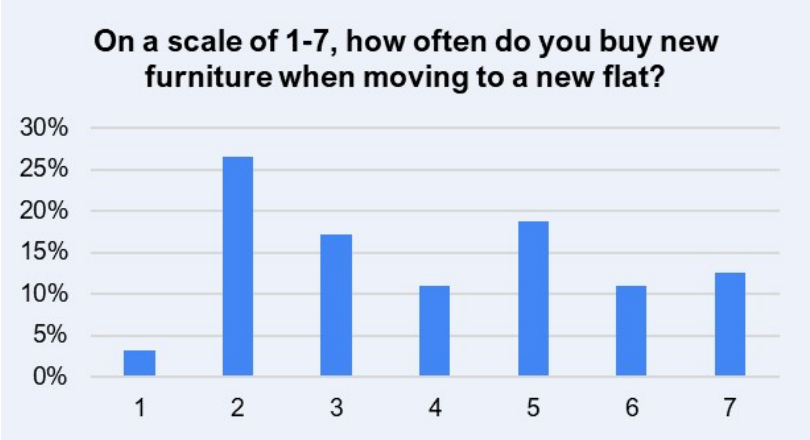
Activity – Selling

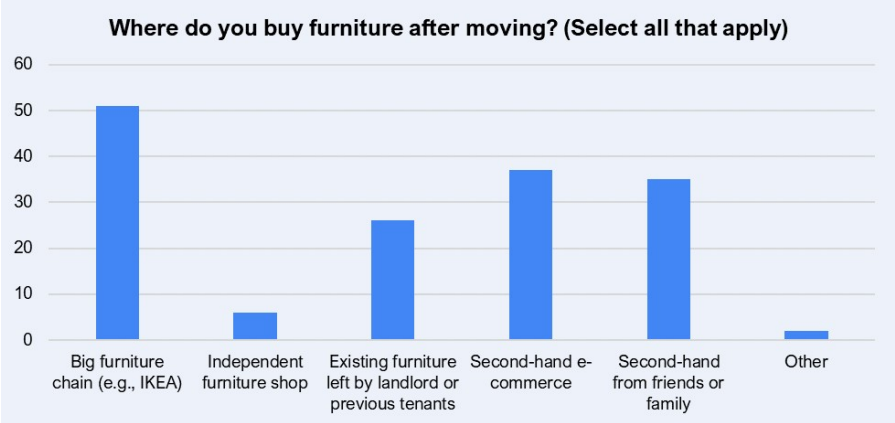
Task	Actor's Motives & Goals	Contributions from Actor	Actor's Rewards	Installation: Affordances	Installation: Competences	Installation: Regulation
Shipping the furniture to the next destination	Not wanting the furniture to end up in the landfill. If the furniture is in good condition, the student would save a lot of time/money not having to repurchase everything	Involved in disassembling and repackaging of the furniture. Have to figure out who will collect the furniture (if renting a vehicle is not possible), how much shipping will cost, and how long it will take to arrive at the new destination	Lots of money/time saved. Feel good about continuing to use their own furniture (as opposed to the old models no longer being available and then having to go through the whole process of choosing furniture)	Shipping material, such as boxes, protective wrap, and packing tape. Tools/instructions to disassemble furniture properly/safely Internet-enabled device to purchase and print shipping labels	Knowledge about how to properly pack furniture so it doesn't get broken in transit. Knowledge of how to ship large items (logistics of moving the furniture, different pricing depending on size/weight, timing)	If renting a flat, leaving all furniture there for the next tenant may not be allowed

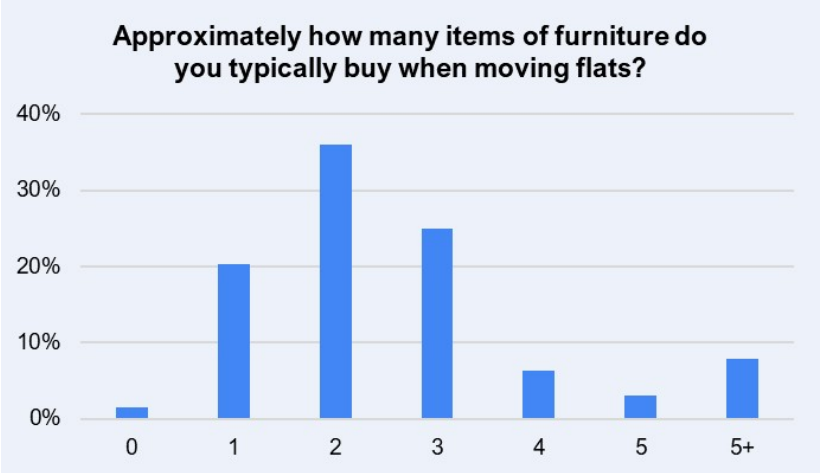
Selling the furniture using an online platform	Start out by trying to sell furniture so the money can be put towards buying new furniture at the next flat.	Involved in putting the furniture up for sale. Coordinating the logistics of the exchange with the buyer	They don't have to deal with furniture disposal. Monetary reward to repurchase the furniture at the next flat.	Possible disassembling to facilitate transportation for the buyer. Instructions for the buyer on how to reassemble the furniture	Knowledge about how to post the sale of the furniture using an online platform (e.g., good quality photos,	If using an online platform to sell the furniture, it is expected that the company will get something in return (e.g., a percentage of the
	Then, try to give away remaining furniture if there is time pressure and the student doesn't want the furniture to go to waste		Don't have to deal with the logistics and cost of shipping the furniture to their next flat		dimensions, material) Knowledge of how much the furniture would be worth second hand	selling price, a fee for posting) Both the buyer and the seller will behave as expected (e.g., the buyer will pay what they said they would, and the seller will have the furniture in the condition they said it would be in)

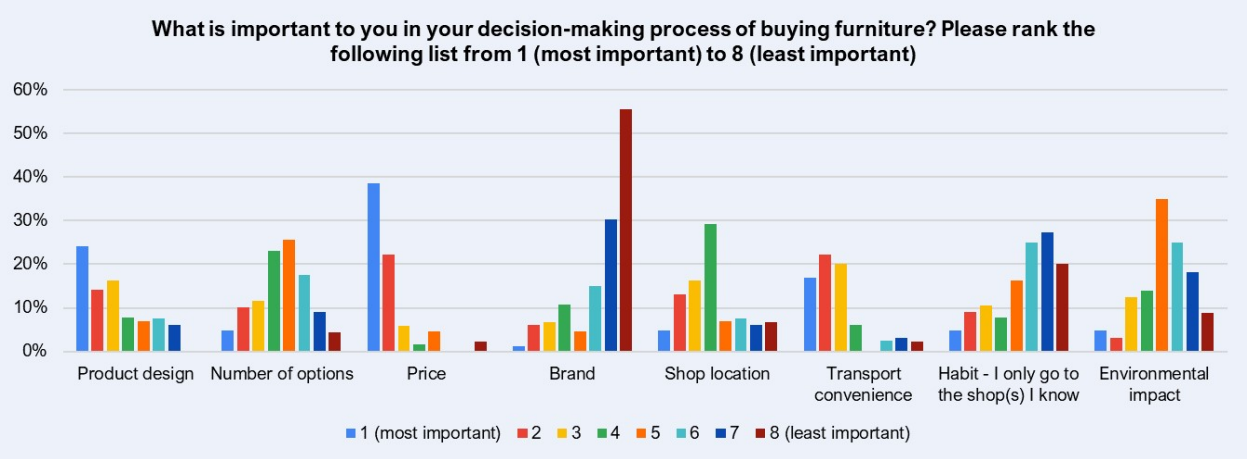
Disposing of the unwanted furniture	If on a tight timeline, the student may just want to get rid of the furniture (it may be too much effort to figure out how to ship it or sell it online) Furniture may have too many defects, so the best option is to dispose of it	Collecting the unwanted furniture and prepare it for collection	It's the easiest "solution" because they don't have to worry about shipping or selling	Putting the furniture on the road (if allowed) so the people collecting emptying the bins can see it	Knowledge of the collection days and what can be collected (e.g., some materials should be brought to specific disposal centres) Belief that the furniture will be properly disposed of or that some of the material is salvageable/recyclable	It is societally acceptable to dispose of furniture for the sake of convenience or if it's perceived to have too many defects It is common for students to frequently (every year) change where they live, so the concept of disposing and repurchasing furniture is not frowned upon

Appendix B – Survey Results

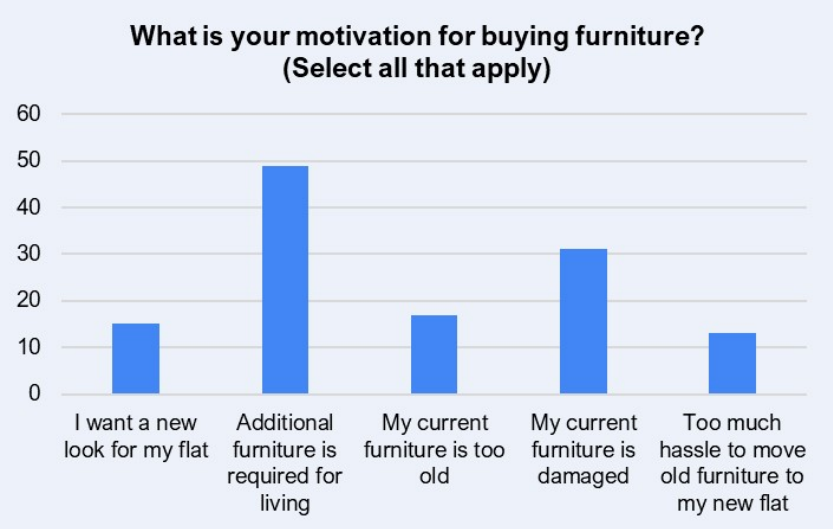


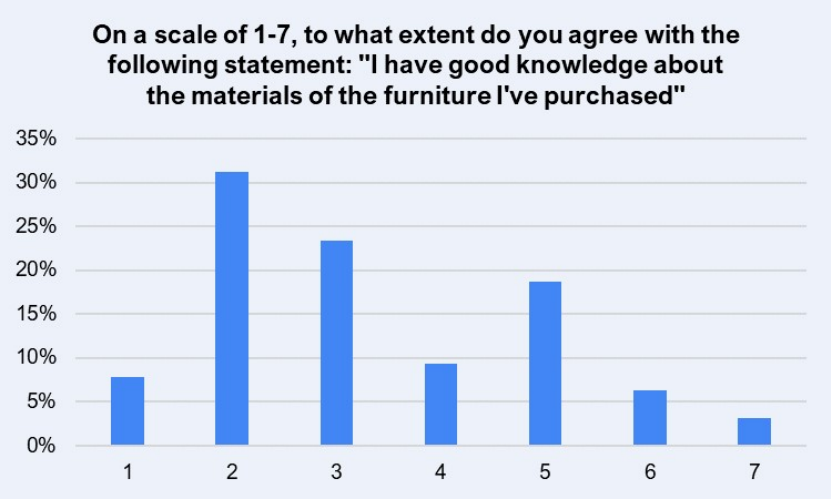




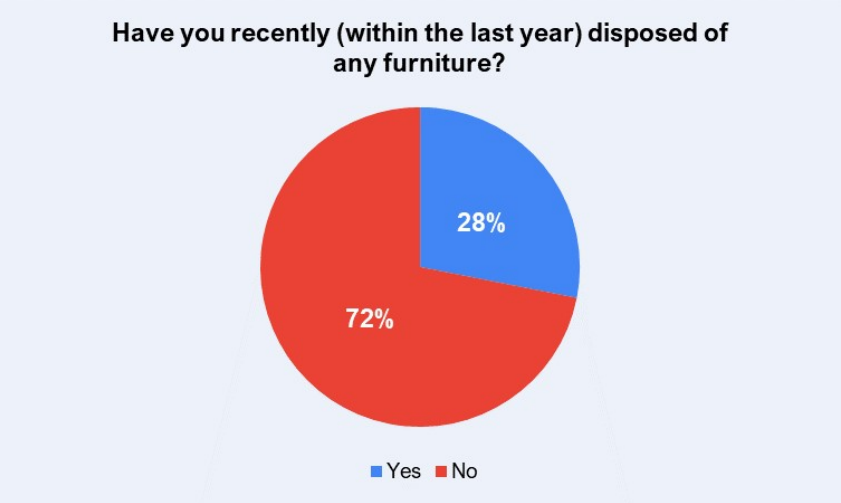

What is important to you in your decision-making process of buying furniture? Please rank the following list from 1 (most important) to 8 (least important)
60%
50%
40%
30%
20%
10%
0%
Product design
Number of options
Price
Brand
Shop location
Transport convenience
Habit - I only go to the shop(s) I know
Environmental impact
1 (most important)
2
3
4
5
6
7
8 (least important)

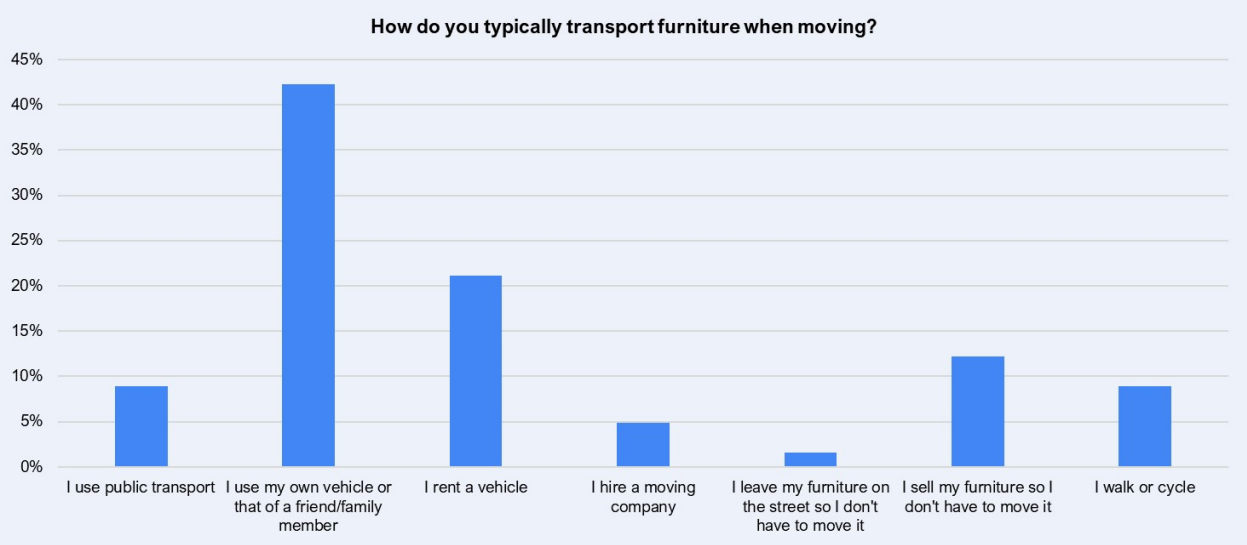

On a scale of 1-7, to what extent do you agree with the following statement: "I have good knowledge about the lifespan of my furniture"
30%
25%
20%
15%
10%
5%
0%
1
2
3
4
5
6
7


What is your motivation for buying furniture? (Select all that apply)
60
50
40
30
20
10
0
I want a new look for my flat
Additional furniture is required for living
My current furniture is too old
My current furniture is damaged
Too much hassle to move old furniture to my new flat


On a scale of 1-7, to what extent do you agree with the following statement: "I have good knowledge about the materials of the furniture I've purchased"
35%
30%
25%
20%
15%
10%
5%
0%
1
2
3
4
5
6
7


Have you ever purchased second-hand furniture?
11%
89%
Yes
No

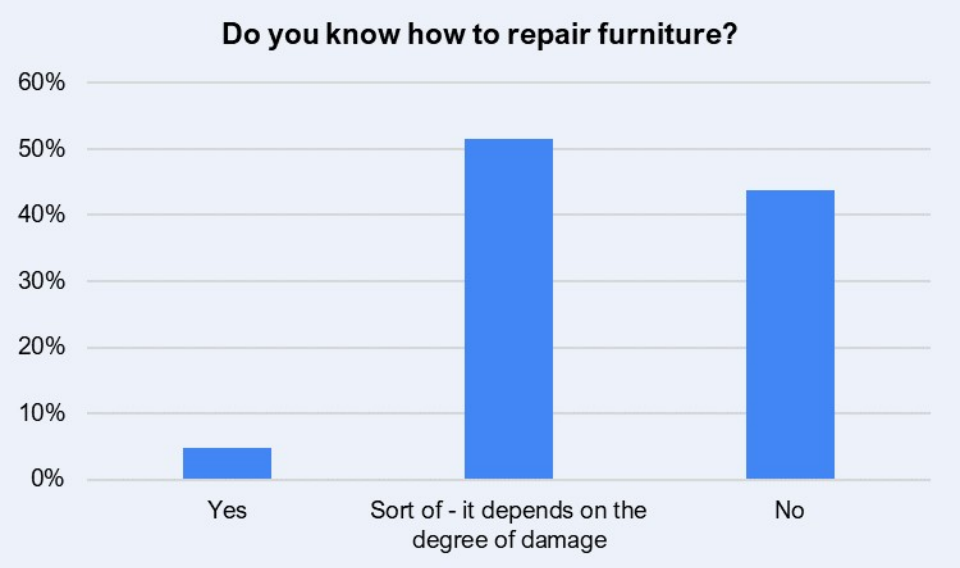

Have you recently (within the last year) disposed of any furniture?
28%
72%
Yes
No

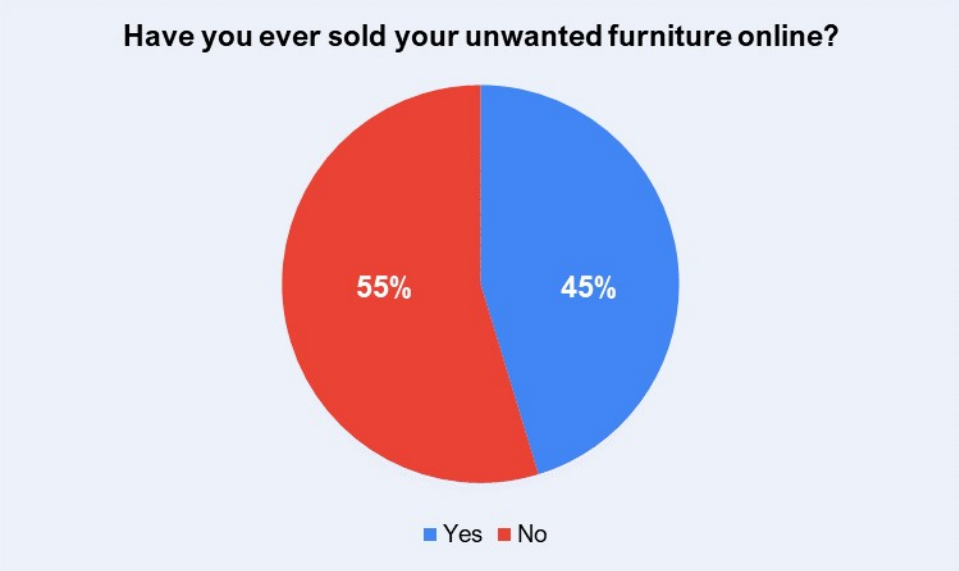

How do you typically transport furniture when moving?
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
I use public transport
I use my own vehicle or that of a friend/family member
I rent a vehicle
I hire a moving company
I leave my furniture on the street so I don't have to move it
I sell my furniture so I don't have to move it
I walk or cycle

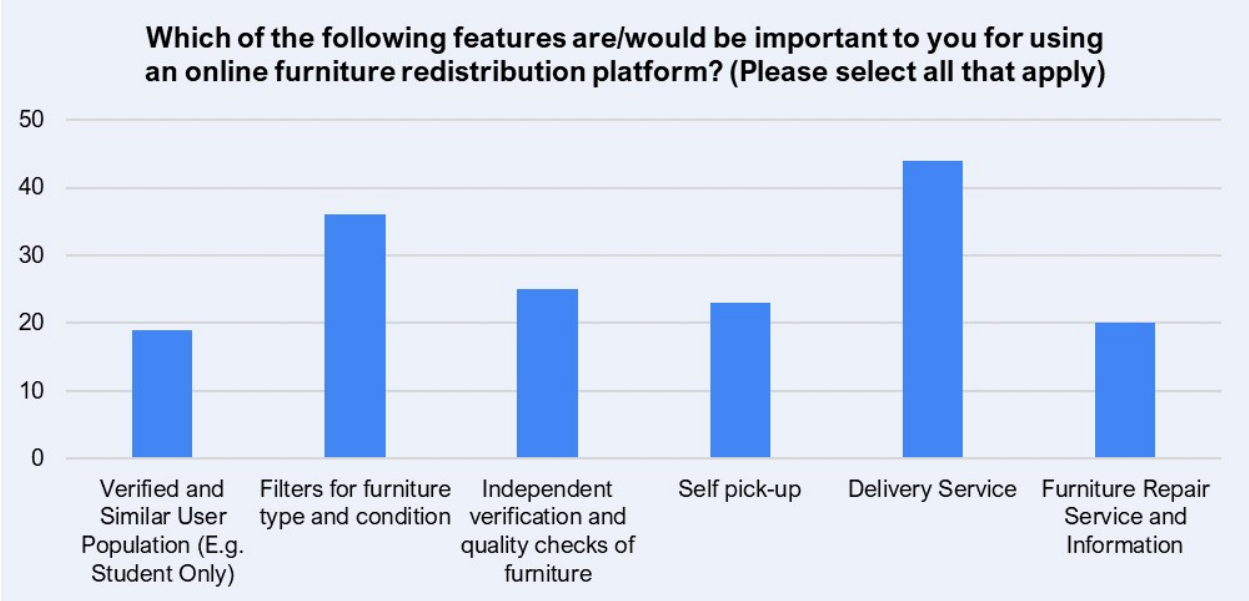

How would you handle your furniture when you need to move out of your current accommodation?
35%
30%
25%
20%
15%
10%
5%
0%
Leave the furniture on the street for collection
Transport furniture to a recycling/disposal facility
Leave the furniture in the flat
Give/sell the furniture to friends or family
Sell the furniture online
Bring the furniture with me


What are you most likely to do when your furniture is damaged?
50%
40%
30%
20%
10%
0%
Throw it away
Repair
Leave it alone
Give it to someone else


Do you know the furniture recycling practice in your borough?
11%
89%
Yes
No


Do you know how to repair furniture?
60%
50%
40%
30%
20%
10%
0%
Yes
Sort of - it depends on the degree of damage
No





Appendix C – Summary of Pain Points

Pain Point	Proximal (Direct) Cause	Root (Underlying) Cause

Financial constraints		• Students are at school most of the day and are unemployed (restricted disposable income)	• New furniture is expensive, therefore convenience and price of fast furniture trump other considerations
Subjective Convenience	Selection fatigue	• Students don't have enough time to go through all furniture shops and evaluate the product information per piece	• Limited organised furniture shopping channel • Brand-oriented selection due to the choice overload
	Transportation concern	• Many students do not own a vehicle to move all their furniture	• Expectation that furniture should be cheap and easy to obtain, with relatively little effort • Students move frequently and when/where they will settle long term is still uncertain
Lack of knowledge and support	Purchase	• Sustainability specifications not in a convenient format, or unavailable (e.g., listing lifespan, repair options)	• Cheap prices and simple aesthetic are the most salient selling features
	Repairing	• Spare parts are usually included in the original package, but no maintenance kit and repair manual	• Specific repair instructions when purchasing furniture may not exist because it wasn't designed to be maintained
	Disposal	• Unsure of selling logistics using third-party platform (e.g., value, professionallooking photos) • Preference to keep furniture until the moving day	• Moving is a stressful process, so often the easiest thing to do is put the furniture on the street for collection
	Furniture circulation	• There are already-existing platforms for buying and selling furniture, but they are not exclusive	• Lack of advertising buyback schemes • Lack of planning for disposal during buying phase • Convenience of disposing furniture on the street
Unsustainable Social Norms		• Visible fly-tipping occurs frequently within student areas	• Missing social pressure on responsible disposal practice • Convenience and reduced dissonance by following others

Appendix D – Summary of corresponding features to identified pain points and target layers

Pain Point		Relevant Features	Target Layers
Financial constraints		Second-hand product nature, Swapping Opportunity	Physical Affordances
Subjective Convenience	Selection fatigue	Sustainability, Distance, and Condition Filters	Physical Affordances, Embodied Competences
	Transportation Concern Time constraints	Neighbourhood user population, Two Delivery Options	Physical Affordances
Lack of knowledge and support	Purchase	Furniture Sustainability Specifications	Embodied Competences
	Repairing	Handyman service and prompts, Self-repairing information page	Embodied Competences
	Disposal	Recycling Facility Page	Physical Affordances, Embodied Competences
	Furniture circulation	Pre-set product info boxes	Physical Affordances, Embodied Competences
Unsustainable Social Norms		Verified university population, Unifurn Community Photo Wall, Seller Profile	Social Regulation