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Ergonomic Product Design: An Empirical Study on The Influencing Factors to Use and to Buy

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ABSTRACT

Ergonomic design in various types of products has been introduced in many countries. This study is aimed at observing the intention to use and to buy ergonomic products. A conceptual model of intention to use and to buy ergonomic product design is developed based on the Technology Acceptance Model. Dimensions and construction of the model are developed based on the literature and an experiment. Eight hundred and three respondents were involved by filling out the questionnaire, consisting of 7 dimensions and 23 statements. The result shows that perceived design, perceived comfort, perceived social image, perceived ease of use, and perceived usefulness influence the intention to use ergonomic product design. The intention to use will influence the intention to buy, which finally influences the continuance to use. Implications of the result are discussed.

Keywords: Design, Ergonomic, Intention to Use, Product.

INTRODUCTION

Many countries are familiar with ergonomic product design. Barker (2004) stated that an ergonomic design has different stages of use, including building, using, and maintaining/repairing the product. In addition, several studies developed the objective criteria to assess whether a product is ergonomic or not. Neumann et al. (2014) defined an ergonomic product as an entity with positive characteristics in various aspects, including functionality, usability, convenience, and health, which can be communicated to the customers through the product marketing activity. In other words, it is 'products which demonstrate good ergonomic principles and can be well-delivered to the user'.

The ergonomic products are typically declared to offer benefits for the user, mainly in terms of productivity, comfort, and health. The claim is supported by several findings from prior studies. Smith and Bayeh (2003) found that the use of ergonomic product (fully adjustable chair) in a call center work setting increased the average productivity of the workers by 4.78%. Another study by Cabugawan et al. (2021) suggested that ergonomic workstation may contribute to college students' comfort when studying at home and may as well increase the duration of the study. Ramadhan and Al-Tayyar (2020) reported that their participants who wore an ergonomic backpack felt more comfortable than participants who wore a standard-design backpack.

The term, ergonomic design per se, has been used for consumer products, in particular for marketing purposes (Jindal et al. 2016; Creusen, Veryzer, and Schoormans 2010; Bloch 2011). There has been a lot of talk about the use of the expression "ergonomic product design" in

product marketing claims, not to mention ergonomic shoes, ergonomic tools, ergonomic chairs, etc. (Mansfield et al. 2013).

The good news is that some manufacturers have a personal interest in improving the public's understanding of ergonomic design. Therefore, they were constantly looking out for ergonomics-related claims in the marketplace and they did their best to help customers separate fact from fiction. The consumers can follow a few simple guidelines to determine whether the product they are interested in has ergonomic features that are appropriate for them, besides they find an ergonomic product design by reading labels. In short, ergonomic design labels are often included in product brands and play an important role in the success of a product.

On the other hand, several studies reported a low level of consumer awareness of ergonomic products. The study conducted by Kamaroddin, et al. (2010) involving 60 students in Southeast Asia found that 96.3% of respondents agreed on the importance of applying ergonomic principles to work involving computers (the object of study included chairs, desks, monitors, keyboards, and mice), but only half of them apply these principles, such as using actual ergonomic products. Pratama, Nurfitrisari, & Widyanti (2019) also found an indication that the ergonomic products are still unfamiliar among a group of student and employee consumers. There were only 55% of participants responded that they knew about the ergonomic product existed in the market.

The low awareness of using ergonomic products could be affected by various perceptions of the ergonomic products available in the market. There are those who think that ergonomic products are expensive products and most of them have an unusual shape, there is also a group who thinks that ergonomic products are only intended for active workers (Herbert, 2017). This sort of perceptions should be carefully identified in order to map the real reasons which could encourage consumers to use ergonomic products. The benefits of ergonomic products which have been proven in a number of researches are suspected not to have a significant effect on consumers' intention to use ergonomic products.

For the ergonomic product designer and product manufacturer, as well as the ergonomist, it is particularly important to have proper information about the underlying factors that affect the intention to use an ergonomic product. The identification of the underlying factors has been successful in predicting the intention to use several products and has become a focus of research in various fields such as in using information technology (Yi et al. 2006), use of e-online food delivery (Yeo, Goh, and Rezaei 2017), and Internet-enabled TV (Wagner, Schramm-Klein, and Steinmann 2017). Meanwhile, thereare relatively few studies that investigate the aspects that may influence the intention to use, intention to purchase, and ultimately, the intention to continue using ergonomic products.Therefore, an understanding of these factors is particularly important to ensure that users can effectively use the product, as well as ensure that the ergonomic product design success in the market.

Researchers have developed various models to observe the underlying factors of acceptance about particular domains. Of the various models, the Technology Acceptance Model (TAM) of Davis (1989), derived from the Theory of Reasoned Action (Fishbein 1980) is the most widely applied. According to Davis, Bagozzi, and Warshaw (1989), behavioral intentions determine particular usage. Two beliefs affect the intention, which are the perceived usefulness (i.e., how far someone believes that the performance of his/her work will improve if he/she uses the system) and the perceived ease of use (i.e., how far someone believes that the effort can be

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reduced if he/she uses the system). Based on TAM, belief or perception would influence the user's preferences and then, both would determine the intentions and acceptance.

The study aims to observe factors that contribute to the intention to use an ergonomic product design. A conceptual model, as well as dimensions and construct, are developed based on a comprehensive literature study and an experiment. To test the model, the respondents fill out a questionnaire which is developed based on the conceptual model and construct.

1. LITERATURE REVIEW

To develop a hypothetical model of intention to use an ergonomic product design, a literature review is conducted to develop the construct of the model. The basic model of this study is TAM, adopting its dimensions (i.e., perceive ease of use and perceive usefulness) and some additions from relevant literature.

An ergonomic product design is related to its design and appearance. According to Yu et al. (2017), the design of a product is a crucial element in winning a globally competitive market. Product appearance will attract the consumer and give important value and perception to the product and ultimately for the user to make a purchasing decision (Hu et al., 2022). Hsiao and Chen (2018), for example, stated that a smartwatch user makes a choice based on the perception of the design.

Ergonomic product design is related to price and luxury. Some research reported this phenomenon such as Khan and Bamber (2008), who underlined that ergonomics is related to luxury. Van Rompay and Pruyn (2011) highlighted visual product features that speak a lot about brand perception and price expectations. Simon and Benedyk (2000) also addressed pleasure in consumer product design through ergonomics.

Ergonomics product design is perceived as comfort. Comfort is the state of a person that involves a sense of subjective well-being as a response to a situation. The ergonomics–comfort relations have been found in some reported products such as in the clothing design (Teyeme et al., 2021; Li, 2005) and the design of seat comfort (Hiemstra-van Mastrigt, 2015).

Ergonomics product design is related to ease of use. An ergonomic product design must fulfil the requirement of how fast the product is accustomed to being used and how well its function is remembered by the user. The ease of use becomes a critical part of usability assessment methods in human-centered design to offer a product as an innovative solution (Tosi, 2020). Alexander, Lynch, and Wang (2008) explained that the intention to use a product decrease when the consumer does not know how to operate or use the product.

An ergonomic product design cannot be separated from the issue of usefulness because an ergonomic product is usually designed based on the need of the user, also known as user-centered design. Han et al. (2000) defined the usefulness of the product in the context of usability, indicating how well the user can understand and interpret the usefulness of a product.

Usage intention is a someone's psychological state to use a particular product or service (Davis, Bagozzi, and Warshaw 1989). Usage intention is crucial in marketing and has been observed in so many studies because this feature will affect product success in the market. Such studies are for example in mobile financial services (Lee et al. 2012), mobile application services (Hur, Lee, and Choo 2017), social software (Hong, Lee, and Suh 2013), and smartwatch (Dehghani 2018). Purchase intention usually follows usage intention. Purchase

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intention can be defined as the extent to which someone sure or might buy a product if the price is affordable (Lowe and Alpert 2015).

For the existing user of an ergonomic product design, the intention to continue using is particularly important because it supports a habit towards an ergonomic habit. According to Bhattacherjee (2001), continuing to use is based on suitability between the products that have been used and the willingness to continue the use of the product. The intention to continue using is also related to user experience, which is an element of ergonomic design. For example, Chou et al. (2022) reported that the interaction between providers and consumers is an important element of user experience to increase consumers' intention to continue using live-streaming products.

Based on the dimensions of TAM and the literature identified above, construct variables are defined to measure the dimensions. The definitions process of each construct variable is conducted through the literature review as well, as can be seen in Table 1. The validity of the construct in the model is tested using construct validation, by asking two ergonomics experts separately, both have more than five years of research experience in the field of ergonomics, to review the model and the construct. Feedback from both reviewers were collected and given back to them iteratively until consensus was achieved.

Table 1. The construct variables of the proposed conceptual model of intention to use and to buy an ergonomic product

Dimensions	Definition	References
Perceived design	The use of design elements to create a pleasing appearance of a product	Hwang (2014), Yu et al. (2015)
Perceived comfort	A pleasant state of physiological, psychological and physical harmony between a human being and their environment	De Looze et al. (2003), Pijls et al. (2017), Li (2005), Hiemstra-van Mastrigt (2015), Mueller and Hassenzhal (2016)
Perceived social image	The extent to which users may derive respect and admiration from peers in their social network as a result of their product usage	Lin & Bhattacherjee (2010), Yu et al. (2015), Khan and Bamber (2008), Van Rompay and Pruyn (2011) , Simon and Benedyk (2003)
Perceived ease of use (negative value of Perceived Complexity)*	The difficulty of understanding how to use the product, and therefore negatively affects the level of usability. We also expect that products which are high on complexity are likely to be products which are low on perceived functionality.	Lowe and Alpert (2015)
Perceived usefulness	The degree that a technology increases consumer's job performance	Davis et al. (1989) & Shin (2007)
Usage intention	The psychological level of a person's general thinking to use a particular system or service	Davis et al. (1989), Bower and Landreth (2001)
Purchase Intention	How likely, certain, and probable they were to purchase the product if the price seemed reasonable to them	Lowe and Alpert (2015)
Continuance to Use	Continuance was based on the congruence between one's continued product usage decisions and consumers' repeat purchase decisions	Bhattacherjee (2001), Hong, et al. (2016)

2.METHODS

2.1.Experiment

An experiment was conducted to observe people's perceptions of ergonomic product design. Five pairs of ergonomic – non-ergonomic consumer products were used as the experimental object, which are keyboard, mouse, chair, scissors, and pencil. The ergonomic design product had an ergonomic label on it and three ergonomics expert who has more than five years of experience in ergonomics application ensure that the product represented the implementation of good ergonomics principle. The ethical Committee of Industrial

Engineering Department of Institut Teknologi Bandung, Indonesia (approval number KE-ITB-05-2018) approves this study.

One hundred Industrial Engineering students of Institut Teknologi Bandung (ITB), who have taken an ergonomics class (mean age = 21.3 years, SD = 1.5 years, 15 females) were involved in the experiment. The respondents were recruited based on convenience sampling. They were instructed to use pairs of ergonomic and non-ergonomic products for about five minutes each or as long as they wanted. After the products' trial, a short set of questionnaires was given. The respondents should choose which product from the pair is the actual ergonomic product and state their reasons for choosing the ergonomic product based on their perception by giving 3-5 keywords. The result of the paired comparison of ergonomic and non-ergonomic products shows the correct answers of more than 65% for all paired products, indicating proper knowledge of the respondents about ergonomic products.

Table 2. The number of appearances of the keywords

Keywords	Keywords' appearance					Total
	Mouse	Keyboard	Office chair	Scissor	Pencil	#Appearance
Follows body shape	229	495	567	0	0	796
Comfortable	231	176	194	44	46	691
Makes work easier	168	71	9	16	13	277
Interesting design	87	84	61	15	13	260
Proud/feel different when use it	121	38	20	2	1	182
Efficient	54	14	14	17	13	112
Useful	18	23	12	28	23	104
Simple design	11	31	33	14	12	101
Adjustable	0	0	11	0	0	11
Safe/not hurt/reduce discomfort	0	3	1	1	3	8
Easy to find in the market	4	2	0	0	0	6
Functional	0	0	5	0	0	5
Faster in completing the task	0	1	0	1	1	3
The size suit the body	1	1	0	0	0	2

Three ergonomics experts with experience more than five years in ergonomics field were requested to categorize the keywords into clusters of variables based on the context of the keywords (i.e., similarity of the meaning of the words). Later, a language expert checked the keywords clustering to ensure the semantic similarity among the keywords. Table 3 shows the judgment of the three ergonomic experts.

Table 3. Results of the clustering process from three ergonomic experts

Expert 1		Expert 2		Expert 3	
Keywords	Cluster	Keywords	Cluster	Keywords	Cluster
Follows body shape	1	Interesting design	1	Interesting design	1
Interesting design		Simple design		Simple design	
Simple design		Follows body shape	2	Comfortable	2
The size suit the body		The size suit the body		Follows body shape	
Adjustable		Comfortable	3	Adjustable	
Comfortable	2	Safe/not hurt		Safe/not hurt	
Safe/not hurt		Adjustable		The size suit the body	
Proud/fell different	3	Proud/fell different	4	Proud/fell different	3
Efficient	4	Efficient	5	Efficient	4

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Expert 1		Expert 2		Expert 3	
Keywords	Cluster	Keywords	Cluster	Keywords	Cluster
Makes work easier		Faster in completing the task		Makes work easier	
Faster in completing the task		Makes work easier		Faster in completing the task	
Functional	5	Functional	6	Functional	5
Useful		Useful		Useful	
Easy to find in the market	6	Easy to find in the market	7	Easy to find in the market	6

The three ergonomic experts showed different clustering decision. The three ergonomic experts and the language expert conducted a focused group discussion to further specify the construct title of the keywords. Final conclusion determined six titles of the construct namely, design, comfort, product' image, efficient, usefulness, and familiarity.

2.2.The Conceptual Model

Mapping the result of the literature study and the experiment, the constructs which have been used in the conceptual model are: perceived design (i.e., equal with design in the experiment), perceived comfort (i.e., equal with comfort), perceived social image (i.e., equal with product image), perceived ease of use (i.e., equal with efficient, the negative value of perceived complexity), and perceived usefulness (i.e., equal with usefulness). Construct of familiarity resulted from the experiment is excluded from the model due to the small number of appearances in the listed keywords. Figure 1 shows the conceptual model of intention to use and to buy an ergonomic product design.

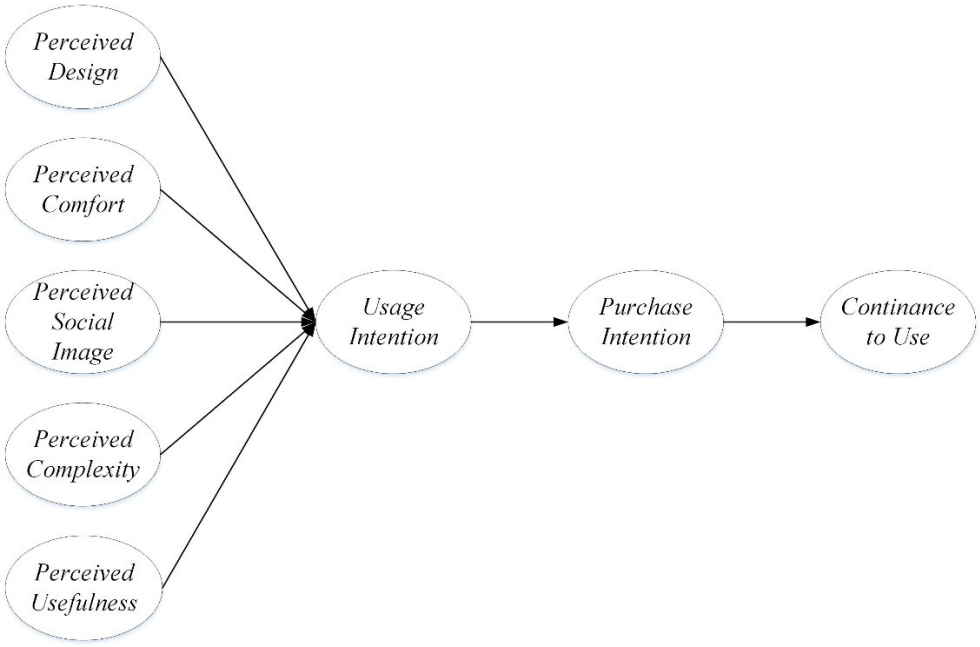

Figure 1. The conceptual model of intention to use and to buy an ergonomic product

2.3.Questionnaire

A questionnaire was developed based on representative (manifest) variables from the constructs that can be directly measured or observed. The original statements or questions in English were adopted into Indonesian following the back-translation procedure. For the question responses, there was a seven-point Likert scale from 1 (strongly agree) to 7 (strongly disagree).

2.4.Participants

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Eight hundred and three respondents (mean age = 27.13 years old, SD = 9.20 years old, 385 female) from four large cities in Indonesia (i.e., Jakarta, Bandung, Jogjakarta, Solo) participated voluntarily in this study. A method of convenience sampling was used to choose the sample. The respondents, that represents user and non-user of ergonomic product design, were instructed to answer a question set in the context of a paper and pencil questionnaire.

3.RESULTS

Socio-demographic characteristics of the questionnaire respondents as well as their awareness of ergonomic products are shown in Table 4. In this study, there were 323 university students and 480 employees (from various work places) involved and most of them (70.98%) had received knowledge of ergonomics prior to this research. It is interesting that 43.34% of the respondents admitted that they do not know about ergonomic product. It was found that employment/student status and prior knowledge of human factors/ergonomics had significant effect on consumer awareness of ergonomic products. So, it can be concluded that consumers who are students will have a higher level of awareness of ergonomic products than consumers who are not students. Likewise, consumers who have knowledge of human factors/ergonomics will have a higher level of awareness of ergonomic products than consumers who do not have knowledge of human factors/ergonomics.

Table 4. Socio-Demographic and Ergonomic Product Awareness Data

Demographic Element	All (N = 803)
Age (*mean, SD*)	27.13 (9.20)
Gender	
Male	386 (48.07%)
Female	417 (51.93%)
Student/employment status	
Student	323 (40.22%)
Employee	480 (59.78%)
Having knowledge of ergonomics (Yes)	570 (70.98%)
Consumer awareness of ergonomic brands (Percentage of people know about ergonomic product)	455 (56.66%)

Validity and reliability tests were conducted on all dimensions and items of the construct. The result can be seen in Table 5. All items are proven to be reliable (loading factors > 0.6) and valid ($\alpha > 0.7$).

Table 5. Validity and reliability of the dimensions used in the model

No.	Dimensions	Items	Factor loading	α
1	Perceived Design	1. The appearance of an ergonomic product is aesthetically appealing to me.	0.895	0.789
		2. The design of an ergonomic product are aesthetically appealing to me.	0.919	
		3. The overall style of an ergonomic product is appealing to me.	0.842	
2	Perceived Comfort	1. I think I will feel at ease using an ergonomic product	0.900	0.779
		2. I think I will feel comfortable using an ergonomic product	0.928	
		3. I think I will feel relaxed using an ergonomic product.	0.890	
3	Perceived Social Image	1. Using an ergonomic product makes a good impression on other people	0.818	0.819
		2. I expect that using an ergonomic product will add to my personal uniqueness	0.874	
4	Perceived Complexibility	1. It will require a long time before I fully understand the advantages of an ergonomic product	0.900	0.881
		2. The concept behind an ergonomic product is difficult for me to understand	0.902	
5	Perceived Usefulness	1. The ergonomic product is very useful to my life in general	0.775	0.766

No.	Dimensions	Items	Factor loading	α
		2. Using an ergonomic product improve the quality of the work I do	0.913	
		3. Using an ergonomic product increase my productivity	0.926	
		4. Using an ergonomic product enhances my effectiveness on the job	0.909	
6	Usage Intention	1. I intend to try an ergonomic product	0.874	0.759
		2. Assuming I have access to an ergonomic product, I intend to use them.	0.899	
		3. Given that I have access an ergonomic product, I predict that I would use them.	0.888	
7	Purchase Intention	1. How willing would you be to buy an ergonomic product if the price were reasonable to you?	0.941	0.783
		2. How probable is it that you would purchase an ergonomic product if the price were reasonable to you?	0.940	
8	Continuance Intention to Use	1. I will frequently use the ergonomic product in the future	0.858	0.747
		2. I will strongly recommend others to use the ergonomic product.	0.886	
		3. I intend to continue buying new generation of the ergonomic products in the future	0.868	
		4. I intend to continue using the ergonomic products rather than discontinue its use	0.869	

Structural Equation Modeling, a method of variance-based analysis, is applied to observe relations among factors. All the requirements for the SEM analysis have been tested including sample requirement, outlier evaluation, data normality, multicollinearity. Figure 2 shows the model of factors that affect the intention to use and to buy an ergonomic product.

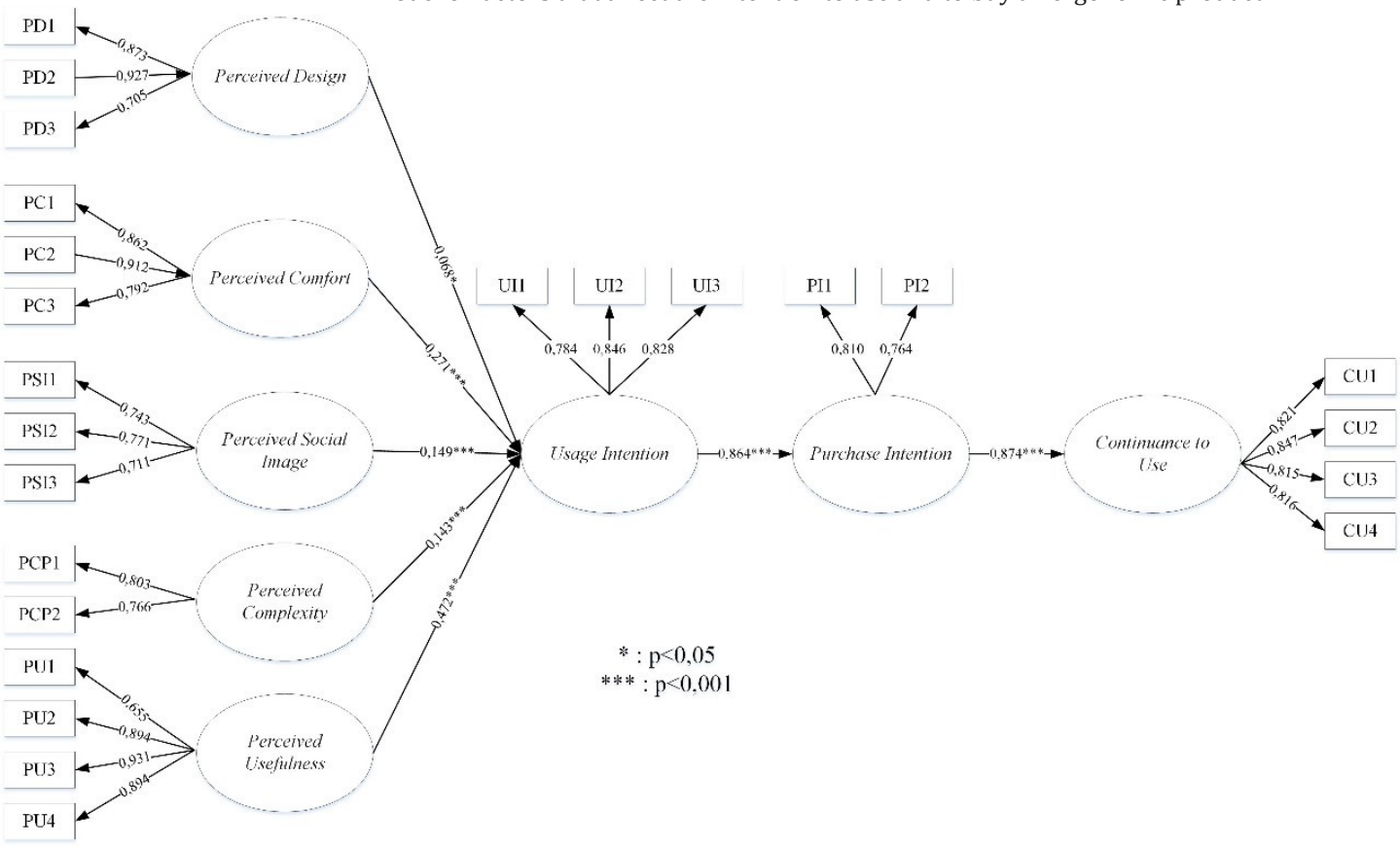

Figure 2. Model of intention to use and to buy an ergonomic product (values represent the loading factors for each item)

Figure 2 shows that the hypothetical model is valid. Perceived design, perceived comfort, perceived social image, perceived ease of use, and perceived usefulness influenced usage intention of an ergonomic product. Usage intention will influence purchase intention, which finally influences continuance to use the ergonomic product. The model is assessed through several parameters including *Chi-Square, Comparative Fit Index (CFI), Tucker Lewis Index (TLI), Standardized Root Mean Residual (SRMR), and Root Mean Square Error of Approximation*

(RMSEA), as can be seen in Table 6. Table 6 shows that all parameters of the model fall in the categories of a good fit, except for *chi-square and its p-value*.

Table 6. The goodness of fit (GOF) of the proposed model

GOF Index	Cut off Value	Real value	Goodnes of Fit
Chi-Square	Small value approaching 0	1107.923	Lack of fit
p-value	> 0.05	<0.001	Lack of fit
CFI	> 0.92	0.933	Good fit
TLI	> 0.92	0.921	Good fit
SRMR	< 0.08	0.078	Good fit
RMSEA	< 0.07	0.068	Good fit

4.DISCUSSION

This study aims to observe factors that affect the intention to use and buy ergonomic product. The result shows that perceived design, perceived comfort, perceived social image, perceived ease of use, and perceived usefulness tend to influence intentions to use an ergonomic product. The intention to use may influence the intention to buy, which in the end influences the continuation to use the ergonomic product. These results strengthen the finding of the preliminary study which indicated positive appeal from ergonomic product for its consumer in term of its design, comfortability, social image, and usefulness (Pratama, Nurfitrisari, & Widyanti, 2019).

Perceived design that influences the intention to use an ergonomic product is in line with Hsiao and Chen (2018). Enhancing product appearance and looks had been reported as a factor that makes the difference in a consumer product's success (Jeannet et al., 2021)Cho, Cheng, and Lai (2009) also found that design plays an important role in the intention to use e-learning tools. Thus, someone who is concerned and interested in the design of a product tend to have the intention to use the product.

The fact that perceived comfort directly influences the intention to use an ergonomic product design is as expected. Reducing discomfort for the targeted users is one of the first steps towards successful product development and making a basis for ergonomic design (Mansfield et al., 2020). For example, Fu and Luximon (2022) showed that product size based on anthropometric data significantly influenced perceived comfort and fit for a physical product. In addition, Cupar et al. (2021) reported that the comfort of a service product is one of the greatest impact to the intention to use.

Perceived ease of use, the antithesis of perceived complexity, is generally found to affect the intention to use an ergonomic product. Raza, Umer, and Shah (2017) describe the relationship between the perceived ease of use and intention to use with resistance as an additional intervening variable. Higher perceived complexity or low perceived ease of use was related to resistance, and the outcome of the resistance is a reluctance to use.

Perceived usefulness directly influenced the intention to use an ergonomic product. This result is in line with the result of Hsiao and Chen (2018) who explained that perceived usefulness of a product, in this case, a smartwatch, has significant influence on the intention to use the product. Similar results have been found in different contexts such as e-commerce (Hajli 2015), smart agriculture technology (Caffaro et al., 2020), and government e-service (Tahar et al., 2020). These results are not surprising because, as stated by Davis (1989), perceived

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usefulness is the belief about using the technology that would bring benefits to the user. Thus, this belief certainly will influence the intention to use an ergonomic product.

The fact that perceived social image influenced the intention to use an ergonomic product is in line with a study in the context of using luxury cosmetic brands (Ajitha and Sivakumar 2017). In addition, perceived social influence makes a success story in increasing the intention to use smartphone chatbot (Kasilingam, 2020), online food delivery system (Gunden et al., 2020), and e-learning (Park 2009).

Intention to use has a potential to influence the intention to buy an ergonomic product. This result is similar to the result of previous studies. For instance, the intention to use of product affects the intention to buy a smart watch (Hsiao and Chen 2018) and the green products (Choi and Johnson, 2019).

The result of the model shows that the intention to buy directly influences the continuation to use the product. The outcome is surprising because previous research shows that perceived usefulness (Nascimento, Oliveira, and Tam 2018; and attitude toward a product (Sun, Gan, and Song 2017; Al-Maghrabi, Dennis, Halliday, and BinAli 2011) were the factors which mostly affect continuation to use. This might be because ergonomic product design is related to high price. Once the consumers intend to buy the product, they also plan to use it for a long-term period. In accordance with this behavior, it is also worth investigating whether the consumers are willing to upgrade their ergonomic product after a certain period of usage once an updated version of the product is available in the market.

In the context of the analysis used in this study, covariance-based SEM (CB-SEM) is used, rather than partial least squares SEM (PLS-SEM) for several reasons. First, this present study is a confirmatory study based on a conceptual model and literature study, therefore, a theoretically specified causal model must test all possible relationships . Second, CB-SEM estimates model parameters so that can minimize the difference between the empirical covariance matrix and the covariance matrix determined by the theoretical model. In addition, as stated by Jannoo et al. (2014), CB-SEM path estimates are more precise than PLS-SEM under both normal and non-normal conditions when the sample size is sufficient.

Concerning the goodness of fit (GOF) of the model, all evaluation indicators (CFI, TLI, SRMR, and RMSEA) fulfil the criteria of a good model except the chi-square value which did not show a significant difference in means. However, the chi-square statistic is very sensitive to sample size, so it is no longer relied upon as a basis for acceptance or rejection (Schermelleh-Engel, Moosbrugger, and Müller 2003). As a result, to provide a more holistic view of GOF, the use of multiple fit indexes has developed, considering not only sample size but also the complexity of the model and other relevant issues of the study.

The sample of this study (N=803) is considered appropriate for model development. According to Hair et al. (2010), the minimum sample needed to test a model with more than seven factors using SEM is 500. Whereas, according to Harris (2017), the number of respondents needed is 10 times the number of indicators/manifest variables. Because the number of manifest variables used in this study is 24, 240 respondents is the minimum number to test the model according to Harris (2017).

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5.CONCLUSION

This research aimed to investigate factors that contribute to the intention to use an ergonomic product. A conceptual model, as well as dimensions and construct, were developed based on a comprehensive literature study and an experiment. This study showed that there is a number of people who are not aware of the ergonomic-labelled products have existed in the market. Based on the evaluation of the demographic data, student status and prior knowledge of human factors/ergonomics have a significant effect on the level of consumer awareness of ergonomic products. This can be a consideration for ergonomic product manufacturers in determining market segments for their products. As explained by Dul and Neumann (2006), an ergonomic product marketing strategy will be successful if producers are able to convey it appropriately to the right consumers. The right consumers are those who are aware of the existence as well as the advantages that an ergonomic product can provide. Thus, they are willing to purchase and use the ergonomic product for their benefit.

Based on SEM evaluation in this study, the factors which significantly influence the intention to use ergonomic products were found. These factors are perceived design, perceived comfort, perceived social images, perceived complexity, and perceived usefulness. Thus, consumers expect ergonomic products to be attractive in design, comfortable to use, enhance a good social image for users, are easy to understand, and are useful in helping them do their work. Among all, the factor which has the greatest influence on the intention to use is perceived usefulness. Thus, the more an ergonomic product is proven to increase the productivity and effectiveness of the user's work, the higher the user's intention to use it. This is also discussed in the research of Davis, et al. (1989) who stated that consumers do not accept useless system, even though it takes only a little effort to operate it.

This research makes a significant and valuable contribution to ergonomics development. It can be seen as a first step in the body of literature about the understanding of the intention to use and to buy an ergonomic product, considering the fact that ergonomic design attracts not only ergonomists but also marketers. Considering the importance of understanding the factors that affect the effectiveness and the success of the ergonomic product design in the global market, cultural aspects would be important to consider in future studies.

This study has several limitations worth noting. First, the sample of respondents is restricted to Indonesians only. Further research with different nationalities might enrich the analysis as well. Second, although ergonomics frequently relates to safety, perceived safety is not considered in this study because the respondents are given examples and knowledge about ergonomic products that is limited to office use. Further research considering the perceived safety of ergonomic product design might enrich the result as well. Third, the product price is not included as a consideration in this study. Although some can argue that price is something important about an ergonomic product design, we decided not to include the price because we control this variable to avoid a biased response from different social statuses of the respondents. Further research including this variable is worth conducting to observe the influence of the price.

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