Sebastian Brattebø Kronbäck

# Conceptualizations of Sustainable Development among Students in Yogyakarta, Indonesia

Master's thesis in Geography with Teacher Education
Supervisor: Ståle Angen Rye
May 2023

**NTNU**
Norwegian University of
Science and Technology

Sebastian Brattebø Kronbäck

# Conceptualizations of Sustainable Development among Students in Yogyakarta, Indonesia

Master's thesis in Geography with Teacher Education
Supervisor: Ståle Angen Rye
May 2023

Norwegian University of Science and Technology
Faculty of Social and Educational Sciences
Department of Geography

**NTNU**
Norwegian University of
Science and Technology

# Abstract

Universities play a crucial role in educating students with a holistic and balanced conceptualization of sustainable development (SD), as is promoted by UN organizations. Findings from previous studies worldwide show a tendency of environmentally dominated conceptualizations among students, however. Less attention has been given to the effect of potential underlying factors.

This master's thesis explores Indonesian students' conceptualizations of sustainable development with respect to the environmental, social, and economic dimensions. Additionally, various underlying factors related to students' backgrounds, education, and life situation are analyzed for their impact on their conceptualizations. Data was collected through a questionnaire distributed to students in Yogyakarta, Indonesia, using a snowball-sampling method. Statistical analyses including *t*-tests and regression models for three domains: "Knowledge on SD", "SD Dimension emphasis", and "dimension relation to SD".

Students show high knowledge levels on sustainable development. Students emphasize all dimensions as important to achieve SD. Additionally, students perceive all dimensions as very related to the concept. Relative to each other, however, findings support previous studies in which the environmental dimension dominates students' conceptualizations of SD. Influence from aspects in the social dimension is relatively high compared to previous studies. The economic dimension influences students' conceptualizations the least. Still, the students show economic aspects as important and related to the SD concept. Consequently, it is indicated that students in Yogyakarta, Indonesia, do *not* have a holistic and balanced conceptualization of sustainable development.

This study contributes with new insight into what factors impact students' SD conceptualization, with significant relationships regarding age, university attended, funding source for studying, environmental- and economic satisfaction, knowledge on SD, and SDG familiarity. Gender, university, environmental- and economic satisfaction, and students having courses with SD, impact their knowledge. I strongly urge further research to continue investigating these underlying factors.

# Sammendrag

Universiteter spiller en avgjørende rolle i å utdanne studenter med en helhetlig og balansert forståelse av bærekraftig utvikling (BU), på lik linje som det fremmes av FN. Tidligere studier fra omkring hele verden viser likevel en tendens til at studenters forståelse er dominert av miljøaspekter. Mindre oppmerksomhet har blitt gitt til påvirkning fra mulige underliggende faktorer.

Denne masteroppgaven utforsker Indonesiske studenters forståelse av bærekraftig utvikling med hensyn til den miljømessige, sosiale, og økonomiske dimensjonen. I tillegg analyseres ulike underliggende faktorer angående studentenes bakgrunn, utdanning og livssituasjon for påvirkning på studentenes forståelse. Datainnsamling ble utført ved hjelp av et spørreskjema distribuert til studenter i Yogyakarta, Indonesia, ved hjelp av snøball-utvalg. Det ble gjennomført statiske analyser inkludert t-tester og regresjonsmodeller, for å undersøke tre hovedområder: «Kunnskap om BU», «BU dimensjonenes vektlegging», og «dimensjonenes relasjon til BU».

Studentene viser høy kunnskap om bærekraftig utvikling. De vektlegger alle dimensjoner som viktige for å oppnå BU, samt oppfatter alle dimensjoner til å være relatert til BU begrepet. Relativt til hverandre, støtter resultatene tidligere forskning som anser studenters forståelse av BU til å være dominert av den miljømessige dimensjonen. Det er også relativt stor innflytelse fra den sosiale dimensjonen, sammenlignet med tidligere studier. Den økonomiske dimensjonen har svakest innflytelse på studentenes forståelse. Likevel er økonomiske aspekter vist som både viktige for å oppnå BU og til å være relatert til BU begrepet. Det indikeres derfor at studenter i Yogyakarta, Indonesia, ikke har en helhetlig og balansert forståelse av bærekraftig utvikling.

Studien bidrar med ny innsikt på hvilke faktorer som påvirker studenters forståelse av BU, med signifikante sammenhenger knyttet til alder, universitetet en går på, finansiering av studiene, miljø- og økonomisk tilfredshet, kunnskap om BU og kjennskap til bærekraftsmål. Kjønn, universitet, miljø- og økonomisk tilfredshet, om emner med BU, påvirker studenters kunnskap. Videre forskning på disse underliggende faktorene er oppfordret.

# Acknowledgments

# Contents

# Tables and Figures

## List of Boxes

## List of Tables

## List of Figures

# Abbreviations

ASEAN: Association of Southeast Asian Nations

ESD: Education for Sustainable Development

HEIs: Higher Education Institutions

IMF: International Monetary Fund

IPCC: Intergovernmental Panel on Climate Change

MDGs: Millennium Development Goals

SD: Sustainable development

SDGs: Sustainable Development Goals

UGM: Universitas Gadjah Mada

UK: United Kingdom

UN: The United Nations

# 1. Introduction

The global world continues to face environmental, social, and economic challenges. The COVID-19 pandemic, a global health crisis, brought disruptions to the global economy. With drastic negative social and economic impacts, some positive impacts have been identified on the environment (Bhat et al., 2021). Nevertheless, natural disasters are occurring more often and with increased strength, while the IPCC reaffirms climate change as human-caused and the severe impacts on people and ecosystems with continued global warming (IPCC, 2023).

The International Monetary Fund (2022) reports how the COVID-19 pandemic and Russia's war in Ukraine have affected low-income countries, with rapid inflation and major setbacks on sustainable development indicators, including poverty and education, losing years of progress in achieving the Sustainable Development Goals (SDGs).

The SDGs, building on Sustainable Development (SD) concept first introduced in the Brundtland report in 1987, include aspects and goals within an environmental, a social, and an economic dimension, as well as their interlinkages. Conceptualizations of the dimensions' interlinkages and relationships will influence what practices are necessary or which Sustainable Development Goals to prioritize (Nightingale, 2019).

Sustainable Development and the SDGs are becoming commonly known concepts. To continue promoting Sustainable Development in the future, the UN initiative for Education on Sustainable Development (ESD) inaugurated with Agenda 21 in 1992, before gaining more attention through the 2002 World Summits recommendations for a "Decade of education for sustainable development, starting in 2005" (United Nations, 2002, p. 62). The importance of ESD was later reaffirmed in 2015 through the SDGs, with target 4.7 aiming to ensure all learners acquire the knowledge and skills needed to promote a broad understanding of sustainable development (UN Department of Economic and Social Affairs, 2015).

The environmental, social, and economic dimension, formed by different narratives and interests, is intended to be connected with the ESD initiative (Jucker & Mathar, 2015). The connected dimensions reflect views from the term of sustainable development, originating from the Brundtland Commission Report in 1987, which among others, emphasizes the importance of eradicating poverty, basic needs for all, equity, a healthy economy, and a healthy environment and its carrying capacity (WCED, 1987)

Education for sustainable development does, as seen previously, take "all learners" under its umbrella, suggesting it to be a part of the entire educational system, from pre-and/or primary school to Higher Education Institutions (HEIs). HEIs are essential in giving young people/students the necessary knowledge, attitudes and behavior, and opportunity to apply all three dimensions of the sustainable development concept to their lives (Saqib et al., 2020). Although HEIs saw beginnings of systemic changes due to re-orienting towards sustainability in multiple of their activities (Wals, 2014), some can argue that it is still in the early stages concerning education and research on sustainable and inclusive development (Farinha et al., 2018)

Students are key stakeholders within HEIs (Aleixo et al., 2018; Christensen et al., 2009). For developing the ESD approach in HEIs to a further extent, it might be important to study how students, the learners of HEIs, approach the concept of sustainable development. Additionally, what factors affect this approach? The HEIs educate students into future agents of change, decision-makers, problem solvers, and educators by transferring and generating sustainable development knowledge (Barth & Rieckmann, 2012). Hence, exploring their knowledge and conceptualizations of the SD concept is interesting. Considering the holistic views seen from the SD term itself, ESD, and the SDGs, students' conceptualizations of the interlinkages and relationships between the three different SD dimensions are of special interest to this thesis. Additionally, what kind of impact underlying factors related to students' background, education, and life situations have on these conceptualizations is important in this study.

Numerous studies have investigated this or related matters globally and for several countries- or university cases worldwide. Studies show general trends in which the environmental dimension of the SD concept has the highest emphasis and relation to the concept compared to the social and economic dimensions (Azapagic et al., 2005; Björnberg et al., 2020; Kagawa, 2007; Kanapathy et al., 2018; Stir, 2006; Summers et al., 2004; Tollefsen, 2017; Yuan & Zuo, 2013; Zeegers & Francis Clark, 2014). The underlying factors behind conceptualizations of SD, related to the students' backgrounds, education, and current life situation, are shown less attention. Some findings suggest gender differences, often finding females to better understand SD as containing multiple dimensions (Al-Naqbi & Alshannag, 2018; Björnberg et al., 2020; Kanapathy et al., 2018; Titisari et al., 2020). In Indonesian context, results from a conference paper related to the third International Conference on the Future of ASEAN (ICoFA) 2019 interestingly found the environmental aspect lowest of importance, with the economic aspect of the highest importance (Titisari et al., 2020). There is, then, an observed difference in how

students conceptualize SD in Indonesia compared to studies from a range of other countries, including Sweden (Björnberg et al., 2020), Malaysia (Kanapathy et al., 2018), China (Yuan & Zuo, 2013), UAE (Al-Naqbi & Alshannag, 2018), and the UK (Summers et al., 2004). Indonesia is, then, of special interest to studying students' conceptualizations further.

As an extension of the abovementioned topics and existing findings, this thesis aims to investigate the students' conceptualizations further. Better insights into students' SD concept conceptualizations could help form the "how" of future ESD implementation. With Indonesian context and the three SD dimensions in mind, the general goal is to explore how students in Yogyakarta, Indonesia, conceptualize the sustainable development concept. Focusing on the SD concept's environmental, social, and economic dimensions, potential differences in knowledge, the dimensions' emphasis, and their relation to the SD concept are explored. Further, quantitative analyses investigate whether some differences can be explained by underlying factors related to the respondents' background, education, or current situation. These interests cumulate into several research questions of different characters. One general and exploratory question:

- *How do students in Yogyakarta, Indonesia, conceptualize sustainable development with respect to the environmental, social, and economic dimensions?*

And some analytical questions on whether these conceptualizations of sustainable development are significantly affected by underlying factors regarding:

- *Background:*
  - *Gender and age.*
- *Education:*
  - *University, study field, study length, and whether sustainable development has been a part of one or more university courses.*
  - *Whether students have heard of sustainable development, their knowledge of sustainable development, and their familiarity with the sustainable development goals.*
- *Current life situation:*
  - *Funding source for studying, and social class.*
  - *Current environmental, social, and economic situation satisfaction.*

The students' conceptualizations will be investigated and analyzed regarding three areas. First, a "Knowledge on SD" domain, consisting of knowledge of sustainable development and familiarity with the SDGs. Second, an "SD dimension emphasis" domain, investigating students' perspectives on the importance of different SD dimensions (environmental, social, and economic) to achieve sustainable development. Third, a "Dimensions relation to SD" domain, investigating SD dimensions' relation to the sustainable development concept. Although the second and third domains may sound similar, one can, for example, view an economic aspect within the economic dimension as very related to the SD concept as one knows it while simultaneously viewing it as not important for achieving sustainable development.

To answer the research questions, this thesis first presents a chapter covering the background and theoretical framework. This chapter introduces central concepts such as Sustainable Development (SD) and Sustainability, the three dimensions of SD, the SDGs, and some critical approaches to these concepts. Previous research on students' conceptualizations of SD is also provided within this chapter. Further, the methodology chapter explains and reflects upon the data collection and analysis process. Results are then presented and discussed concerning the research questions.

# 2. Background and Theoretical Framework

To investigate students' conceptualizations of sustainable development, some background context is necessary to assess and compare their conceptualizations with the mainstream approach. This chapter provides the origins and meanings of sustainable development and its evolution until the Sustainable Development Goals (SDGs). To do so, sustainability, a closely related concept, is also due for exploration.

## 2.1 Sustainability and Sustainable Development.

The term "Sustainable Development" were brought to the top of global institutions, like the UN, by the Brundtland Commission Report *Our common future* in 1987 (Cole, 2014). The report presented one of the first and still most widely used definitions: "Sustainable Development is development which meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, p. 54). Sustainable development brings the development idea concerning social and economic change together with concerns about the environmental impact of development (Adams, 2020). This interaction of concerns between human development and its impacts on nature can be traced back to ancient times (Lane, 2011). The Greeks attributed environmental degradation to a failure to live in harmony with the landscape, and the Industrial Revolution and merchant capitalism found environmental consequences such as pollution and ecological decline as drawbacks of economic growth and exploitation and natural resources (Nightingale, 2019).

In her book, Andrea J. Nightingale (2019) describes sustainable development as marking a major shift in the sustainability idea. Described as an idea rather than an environmental state that is somehow reachable, the sustainability term refers to relationships and interactions between society and the biophysical environment (Nightingale, 2019). Questions on whether there could be development without damaging the biosphere led to the first UN conference on the environment held in Stockholm in 1972 (Adams, 2020). Making sustainability a global order, the conference framed sustainability as an "economy in balance with basic ecological support systems" (Nightingale, 2019, p. 21). Following the sustainability debate, sustainability should be understood as a spectrum of concepts, as different actors work with different sustainability narratives emphasizing different dimensions of sustainability (Nightingale, 2019). The 1987 Brundtland report opened the sustainability idea to grasp more than the dynamic between economy and environment (Nightingale, 2019), thus marking a shift in the sustainability idea.

A second UN conference on Environment and Development was held in Rio de Janeiro in 1992. Ideas from the Brundtland report were operationalized through the Agenda 21 action plan, emphasizing linkages between society and the environment, no longer viewing development as contradictory to reaching environmental goals (Nightingale, 2019). Particular kinds of development, including economic growth, were perceived to be the pathway toward environmental sustainability, as lack of development drove environmental decline, and poverty was assumed to drive overexploitation (Adams, 2020; Nightingale, 2019). From here, sustainable development could be considered as a set of tools to achieve sustainability, with an inclusion of the idea of social sustainability, while the sustainability concept remained focused on environmental and economic sustainability (Nightingale, 2019).

In the period after Rio 1992, sustainable development was introduced in a wide variety of fields, linking with different agendas with varying conceptualizations depending on the actor and their interests (Adams, 2020; Nightingale, 2019). Expectations created from Rio cooled off, partly because neoliberal economics failed to cause "trickle-down" effects and improvements to economic inequality as promised (Nightingale, 2019), and partly due to a loss of momentum with climate change capturing international attention after the establishment of the Intergovernmental Panel on Climate Change (IPCC) in 1988 (Annan 2002, in Adams, 2020). Whilst economic and environmental issues were questioned, social issues were neglected (Nightingale, 2019)

Launched by the UN in 2000, the Millennium Development Goals (MDGs) introduced concrete targets to better achieve the sustainability views identified in Agenda 21, with a focus on social concerns regarding poverty, hunger, education, and health (Sachs, 2012). The following environmental summits in Johannesburg (2002) and Rio (2012) reaffirmed the interdependence of economic, social, and environmental aspects in development, tracing back to the Brundtland report before being emphasized by the Rio 1992 conference (Nightingale, 2019). The mainstream narrative connecting development and environmental issues is, however, on the verge of change, with alternative approaches such as "planetary boundaries" and "de-growth" (Nightingale, 2019). Planetary boundaries, now often linked with a "safe operating space" for humans with the concern of climate change leading the biosphere to collapse (Nightingale, 2019; Rockström et al., 2009; Steffen et al., 2015), with some arguing to rethink economy (Kosoy et al., 2012). De-growth argues against economic growth as a goal for sustainability and rather argues to find an equilibrium where a stable lifestyle is independent from economic

growth and where people in highly industrialized countries need to live a simpler life – without implying suffering (Nightingale, 2019).

Different sustainability narratives provide different conceptualizations of the concept. Most narratives, as well as the mainstream sustainable development, are anthropocentric, meaning they value human population as superior compared to other species, while on the other hand, ecocentrism gives nature autonomous and intrinsic value, thus valuing ecosystems over the social system in sustainability approach (Nightingale, 2019). The latter perspective questions many sustainable development approaches as they continue to probe neoliberal economy as a solution, suggested to have created the problem in the first place (Nightingale, 2019). Given that the premises of this thesis lies within the more generally accepted vision of sustainability through sustainable development and the SDGs, distinct alternative approaches will not be explored further. Still, it is important to recognize these approaches, with examples on narratives being the already mentioned "de-growth" narrative, the anthropocentric "Development as freedom" - showing little environmental concern, Arne Næss' ecocentric "Deep Ecology", or the "Buen Vivir" understanding of humans as part of nature, embedding societies and environment, in addition to several other narratives (Nightingale, 2019, pp. 47–50).

The sustainability idea refers to a vision in which society prospers simultaneously with long-term environmental, social, cultural, and economic well-being, consisting of multiple narratives which may emphasize different aspects and sometimes present contradictory views. Sustainable development, reflecting a set of possible processes and pathways to achieve sustainability, is also a contested narrative, dependent on political stance and ontological beliefs (Nightingale, 2019). Following an interconnected sustainability idea interconnecting environmental, social, and economic aspects, these aspects may differ in their emphasis: where economists tend to emphasize the maintenance of living standards, ecologists emphasize a concern with biodiversity and resilience, while sociologists prioritize the maintenance of sociological bonds and interrelationships within communities (Cole, 2014, p. 242). Critics argue sustainable development to be a vague concept without meaning (Beckerman, 1992, p. 491, in Cole, 2014), able to represent a major transformation of human society, while at the same time can be perceived as "greenwashing" to keep things operating as usual – both can be legitimized as a way of "sustainable development" (Nightingale, 2019). The former societal transformation, as aspired by several social movements, scientists, and UN bodies such as the World Bank is, in many ways, also a point of departure for this thesis while recognizing critics and questioning

the contradictory in a social transformation whilst continuing present economy systems (Nightingale, 2019). For the following section, the three dimensions of sustainable development are explored, before the Sustainable Development Goals are introduced.

## 2.2 Three Dimensions of Sustainable Development

Since the popularization of sustainable development from the Brundtland report and its following operationalization process during the 1992 Rio Conference, the sustainable development narrative has adopted three main sustainability areas: environmental, social, and economic (Nightingale, 2019). These areas are commonly described as dimensions, alternatively as pillars. Together, these dimension is to beset all necessary elements needed to promote long-term sustainability (Nightingale, 2019). These dimensions have continued to be emphasized, where the outcome document of the 2012 UN Conference on Sustainable Development reaffirming the aim to achieve sustainable development in its three dimensions in a balanced and integrated manner (UNCSD, 2012). The Economic and Social Commission for Asia and the Pacific argue, however, that the "how" of this integrated agenda has not been well defined nor communicated (ESCAP & CSIRO, 2015), while others seek to integrate more dimensions (Pawłowski, 2008), for example technical, legal, and political dimensions. Figure 1 presents how the three dimensions are commonly illustrated.
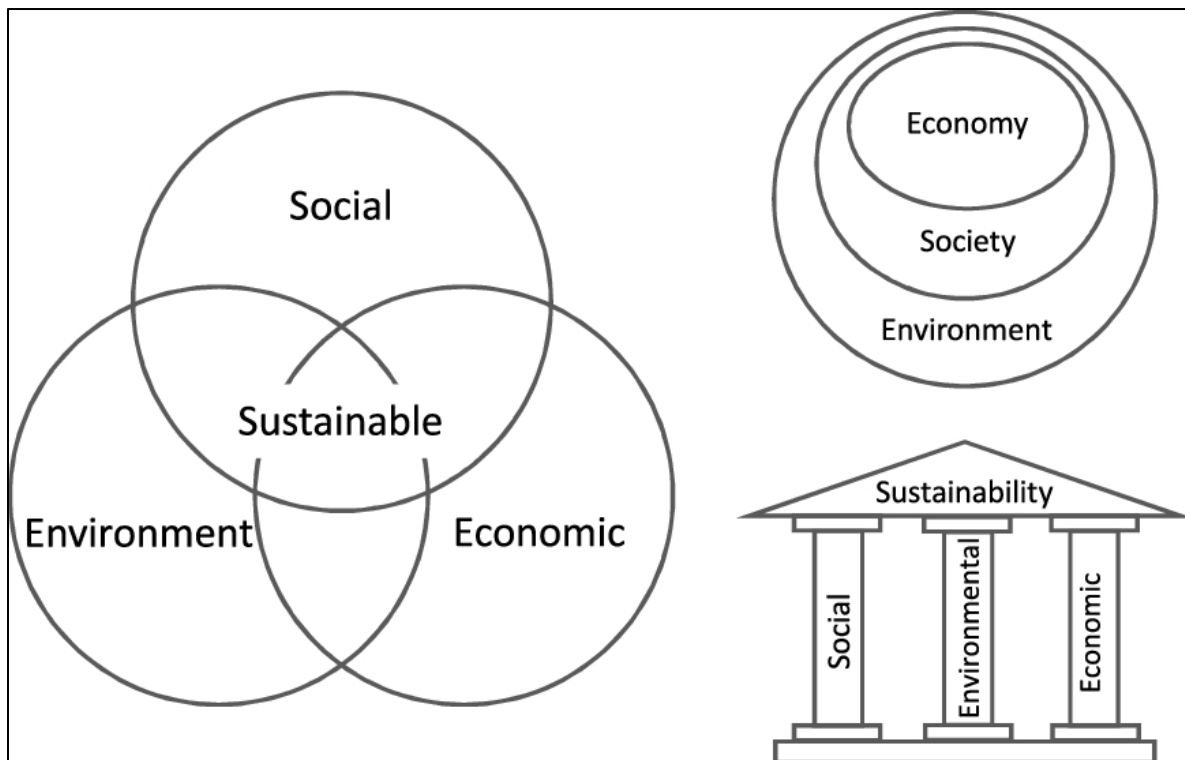
*Figure 1: Left: common illustration of the three dimensions. Right: Alternative illustrations as concentric or pillar approach. Retrieved from (Purvis et al., 2019)*

Common visualizations of sustainable development dimensions, as seen above, are based on an ontological separation between society and the environment – continuing an anthropocentric view to which the environment is here to service humans rather than a synergistic and holistic view (Nightingale, 2019). This separation makes sustainable development so vague it could mean anything (Cole, 2014; Nightingale, 2019), dependent on the actor and their interests. Different actors may have different understandings and emphases for each dimension, making their conceptualizations of sustainable development. Here, what dimension is being most emphasized and how the dimensions relate to each other, Nightingale argues to be of great impact on what practices are needed to achieve sustainable development (Nightingale, 2019). This relationship between the three dimensions of sustainable development and how they are emphasized is the basis for the research questions of this thesis. To better understand these relationships, each dimension is briefly introduced.

The environmental dimension is often assumed to be the most important, and it is within this dimension sustainability concerns had it outspring (Nightingale, 2019). Similar to the sustainability idea as a whole, different approaches to environmental protection and ecology are visible. Again, these can range from a pure ecocentric perspective valuing all species in the ecosystem to an anthropocentric perspective prioritizing human needs.

The economic dimension is often perceived as the way and a requirement to which one can achieve sustainability (Nightingale, 2019). Usually meaning economic growth, as emphasized in Agenda 21. Based on a belief that poverty caused overexploitation (especially in the so-called "developing" countries), an economic improvement would lead to better environmental protection. Others argue that the current capitalist and economic growth-based economy is fundamentally unsustainable, advocating for alternative economic systems, such as "de-growth" (Nightingale, 2019).

A dimension involving social sustainability gained attention in the 1992 conference on Environment in Rio. Concerned with the current development, emphasis was made on areas such as equality, education, and health. Different perspectives in the social dimension are also identified, with some arguing to sustain current lifestyles and maintenance of basic human needs. Others insist on addressing underlying inequalities to achieve social sustainability (Nightingale, 2019).

### 2.3 Sustainable Development Goals (SDGs)

The Sustainable Development Goals (SDGs) are the latest major operationalization and measure of sustainability, based on, as well as continuing the previous MDGs – although adopting a broader vision (Adams, 2020; Liverman, 2018). Put into action in 2015, the SDGs consist of 17 broad and ambitious goals with a total of 169 targets to be achieved by 2030 (Liverman, 2018). The SDGs originate from the 2012 UN Conference on Sustainable Development (Rio+20), a conference functioning as a reboot from lost sustainable development agendas' visionary elements (Adams, 2020).

The SDGs implemented more environmentally focused goals compared to the MDGs whilst also covering every sustainable development aspect since the 1992 Rio Conference, including a need for economic growth (Adams, 2020; Liverman, 2018). The process of forming the SDGs appeared to be more inclusive than with its MDG predecessor, seeing more negotiation with developing countries and a reduction in the division between developed and developing countries, as well as establishing goals that apply to all countries – not just developing ones (Liverman, 2018).

The SDGs have seen a lot of criticism, however (Liverman, 2018). Partly because of complexity, arguing the goals to be too ambitious, universal, and narrow to address the core goal of eliminating poverty (Liverman, 2018). Another part point to contradictions within the

SDGs, questioning how one is to reach growth goals without sacrificing environmental ones, or the assumed need for the World Bank and the International Monetary Fund (IMT) to promote free trade – policies that many claims to previously deepened poverty and caused environmental degradation (Liverman, 2018). Additionally, goals of being "sustainable" is frequently used without a clear definition, despite definitions of sustainability being debated for decades without clear definition (Liverman, 2018).

The three dimensions of sustainable development discussed previously are also identified in the SDGs. In fact, the goals themselves "…should address and incorporate in a balanced way all three dimensions of sustainable development and their interlinkages" (UNCSD, 2012, p. 63, para. 246). This reflects the vision of the Rio+20 to integrate economic, social, and environmental aspects as well as their interlinkages in achieving mainstream sustainable development in all dimensions (UNCSD, 2012, p. 1, para. 3). Despite explicitly aiming for a balanced and interlinked approach to the three dimensions with regards to sustainable development, the SDGs arguably maintain an ontological separation of dimensions, visible in Figure 2. When separating environmental domains from social domains, sustainable development is based on trade-offs between dimensions rather than synergies (Nightingale, 2019). This being said, the SDGs are found to create possibilities of both synergies and trade-offs, with Katila and colleagues (2019) finding both a tremendous potential for synergistic interactions and a high potential for trade-offs among the SDGs and their impacts on forests and people.
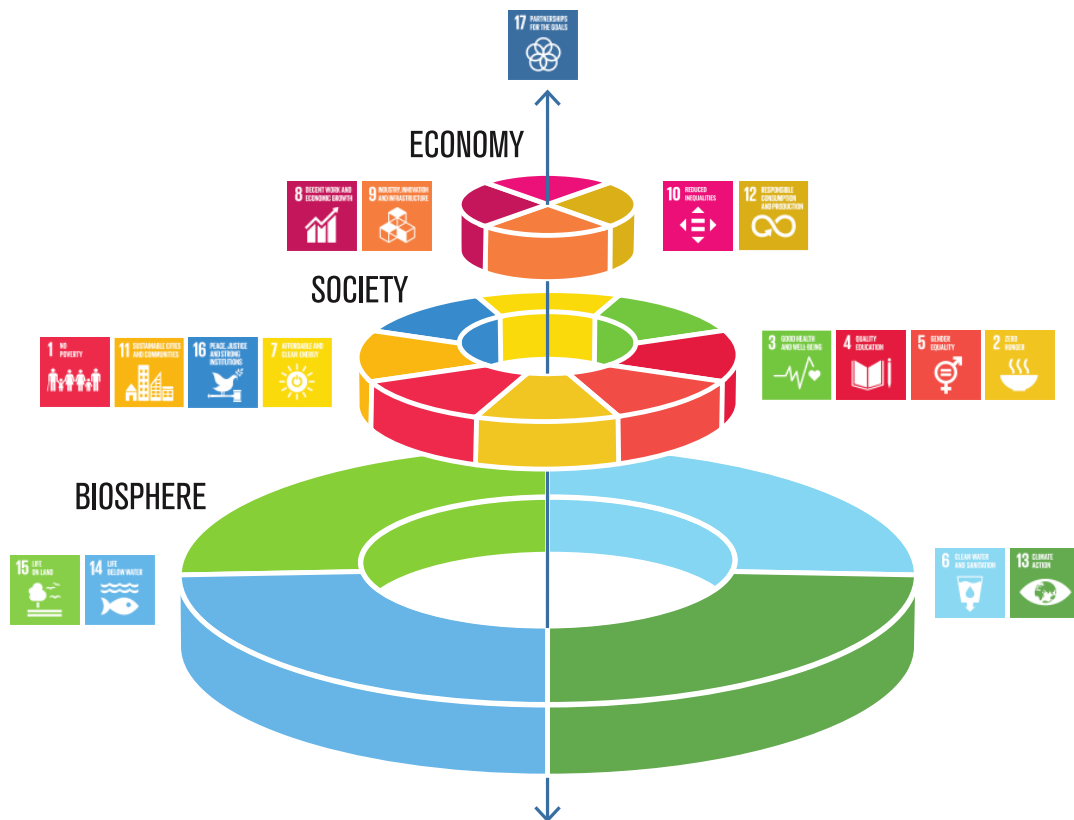
*Figure 2: The SDGs "Wedding cake" showing SDGs classification into the biosphere, society, and economy (credit: Azote for Stockholm Resilience Centre, Stockholm University CC BY-ND 3.0)*

The SDGs play an important role in this thesis, as it works as a way to operationalize and measure sustainable development conceptualizations. The SDGs are based on a mainstream understanding of sustainable development and are recognized globally. Methodologically, the SDGs have been used as a template for questions in the questionnaire and for dimension classification to investigate students' conceptualizations of sustainable development. In the next section, previous studies investigating sustainable development conceptualizations among students are presented.

### 2.4 Previous Studies on Students' Conceptualizations of Sustainable Development.

Students' perceptions and understanding of the SD concept have been investigated in several previous studies from all over the world. With SD and ESD being relatively new concepts, studies on this particular field and related to students are, to the best of my knowledge, absent

before the turn of the millennium in 2000. After an introduction of education as a part of sustainable development in Agenda 21 in 1992, it gained increased recognition ten years later, planning for a "decade of education for sustainable development" from 2005 (United Nations, 2002, p. 62). This new emphasis on ESD opened a need for more research on the subject, including students' perceptions. This section provides insight into previous findings on students' conceptualizations, perceptions, emphasis, and knowledge on sustainable development. There are different ways to present such a review, including categorically or by location – two approaches that could fit. However, a chronological approach is desired for structural reasons. Additionally, a categorical change is identified at the end, as the last two studies on the topic are conducted in Indonesian context.

Studies have been conducted on and within various study fields in many different countries. In ESD context, student teachers' perceptions of the SD concept are an obvious field of interest, being future educators. A 2004 study on conceptions of SD among postgraduate student teachers, specifically geographers and scientists at Oxford University, had a holistic approach including the environmental, social, and economic dimensions as a minimum when conceptualizing SD (Summers et al., 2004). They found that, in general, students were able to identify valid features of sustainable development, with the environmental dimension clearly being the most identified category, followed by the economic and social dimensions, respectively. Also, there seemed to be a greater understanding of the comprehensiveness of the SD concept among the geographers, as they more frequently identified all three dimensions. Additionally, a higher percentage of geographers viewed ESD as something broader than its predecessor, "environmental education", besides reporting to have had SD as a formal part of their formal education and giving higher personal ratings on their understanding of SD as a concept, compared to the scientist (Summers et al., 2004).

A questionnaire on a total of 3134 engineering students worldwide showed that these students had more knowledge of environmental issues regarding sustainable development whilst lacking understanding of the concepts' social and economic dimensions (Azapagic et al., 2005). The questionnaire, notably carried out from October 2000 to June 2002, did not only seek to assess students' knowledge and understanding of sustainable development, but also if and how different variables influence this knowledge. These variables included gender, study length, and study field, where none of these showed statistically significant differences in students' knowledge and understanding of the SD concept (Azapagic et al., 2005). Overall, Azapagic and colleagues (2005) describe the students' knowledge levels on SD as not satisfactory, despite

students reporting sustainable development to be important, rightfully more important for future generations than to their own (Azapagic et al., 2005). What not satisfactory means was not elaborated further.

Some similar tendencies are revealed in the paper of John Stir (2006), looking at restructuring teacher education in Australia. A survey conducted in 2004 saw that the students in teacher education had great concern about environmental issues and felt that "sustainability" should be a part of their preparations to become teachers (Stir, 2006). Despite this, findings also indicated that the student's knowledge for these environmental issues was minimal, and most had scarce understanding of the ESDs' complexity in social, cultural, and economic aspects (Stir, 2006). Yet, the tendency shows emphasis on the environmental dimensions.

Claiming student perceptions of SD have been under-researched, Kagawa (2007) researched perceptions, understandings, and attitudes toward SD for students at the University of Plymouth, UK. Results from the questionnaire issued in 2005 and the following data analysis found a dissonance between the students' perceptions of SD and the concept of SD (Kagawa, 2007). Having limited understanding of the concept, they generally think that sustainable development is a "good thing". However, there was limited understanding among the students of the concept itself. The students' perceptions and understanding of SD were dominated by environmental aspects, whilst understandings of other aspects, including social and economic ones, remained marginal and deficient (Kagawa, 2007).

When asked to write keywords for sustainable development, words related to the environmental dimension received over 45% (n=3857) of the responses, while both the social and economic dimensions had less than 5% of the responses (Kagawa, 2007). Other variables explored found that more men claimed to be very familiar with the SD concept, 40.5% male and 29.3% female, respectively. Respondents under 24 years old reported slightly more often that they were very familiar with the term sustainable development. Related to differences between faculties, the arts, and science faculty reported the lowest percentages of respondents *not at all familiar* with the SD concept, and the health and social work faculty reported the highest percentage, with 40% not being familiar with sustainable development (Kagawa, 2007). About half (48.9%) of the respondents said to have had formal education/courses addressing SD/sustainability, with geography being the superior curriculum area of previous education on the topic. Such previous experience was more reported among males than females, among respondents under 20 years, and among respondents from Social Science and Business faculty (Kagawa, 2007).

A case study from Turkey in 2008 gave, although having a generally more environmental approach, interesting insight into gender and the effect of an environmental course. Here, 74% of the students agreed a statement saying that we first need to consider effects on the environment in dealing with any kind of problem (Tuncer, 2008). Further, girls were, on average found statistically significantly more sensitive towards sustainable development compared to boys. Students enrolled in an environmental course did, however not show any significant mean differences compared to students not enrolled (Tuncer, 2008).

Tarah Wright's research paper from 2010 shows an alternative stakeholder perspective to how SD is perceived within the HEIs when studying Canadian university presidents' conceptualizations on the subject. Her findings provide valuable insights into the comprehensiveness of how HEIs understand sustainable development. All respondents had heard of the concept, and all related it to issues surrounding the environment. The majority also included a non-environmental-focused factor, and 9 out of 17 related it to the balance of economy, environment, and social concerns (Wright, 2010). Afterward, when offered a list of potential concepts related to SD, some new elements were introduced, an example being gender equality issues, which 76.5 percent agreed to have an essential role in SD. Here, all respondents had "integration of environment, social concern, and economics into decision making" as an essential element (Wright, 2010, p. 65), in comparison to 9 out of 17 being able to include the three dimensions in their own conceptualizations. Still, the cohort's conceptualizations on SD tended to be more focused on the environmental aspect than the economic and social aspects (Wright, 2010). For the future, the presidents were dedicated to making the universities more sustainable whilst identifying financial predicaments and "a lack of understanding and awareness on sustainability issues among the university population, and a resistance to change" as main constraints (Wright, 2010, p. 61).

A 2013 study taking a bottom-up approach to assess higher education for sustainable development in China was conducted focusing on the students' perspectives and attitudes towards higher education for SD and its implementations. 1134 students from all divisions at the Shandong University, mostly undergraduates, were invited to participate and asked about their awareness and perceptions. For the former, a high general level of awareness of sustainability issues was found, however, students are not as aware on sustainability issues related to HEIs – but with willingness to learn more on this topic (Yuan & Zuo, 2013). Similar awareness levels were shown between genders, while pure science divisions showed more awareness than other divisions, and 2nd and 3rd year students showed lower awareness than

others (Yuan & Zuo, 2013). With regards to conceptualizations, environmental aspects of sustainability were given the highest priority, given eight of the top ten factors of higher education for sustainable development. Social aspects was given the remaining two spots in the list (Yuan & Zuo, 2013). Additional findings reveals that students showed support for all (53) factors that the authors listed in their questionnaire, with the least important factor being to create a "first-year course for all students to improve environmental literacy and citizenship" (Yuan & Zuo, 2013, p. 111). It is important to note that the economic dimension was not considered in this study, due to public universities in China being non-profit.

With relation to sustainability course, Zeegers and Francis Clark (2014) investigated whether such a course could contribute to balancing out aspects from the social, economic and environmental dimensions. Initial results showed that students initially came with an environmentally focused view on sustainability (Zeegers & Francis Clark, 2014). When finishing the course, students wrote reflective journals of which demonstrated how involvement in their own learning in such a course, can develop more balanced perspectives on sustainability. Despite this, students still reported leaning towards the environment aspects also after the end of course, although being a more moderate drift (Zeegers & Francis Clark, 2014). Results suggest that although having a wanted effect, one course is not sufficient to change the students' strong environmental focused perceptions. They also argue that student engagement, interaction and reflection on learning can be a key pedagogical approach to offering a balances view of sustainability (Zeegers & Francis Clark, 2014).

When investigating students' perceptions of ESD in accounting and business at Delta Business School in New Zealand, Sharma and Kelly (2014) found a general view that ESD is a "good thing". Well over half of the participants reported no knowledge on SD before University, with 14 out of 60 reported to have learnt about the concept previously, meaning the existing introductory education on SD at the university is essential to many students (Sharma & Kelly, 2014). Majority of the 4th year students reported a reasonable knowledge improvement over the years, while 2nd year students reported only a small improvement. The majority also saw sustainable development to be useful in their studies, and that being knowledgeable in sustainability is crucial (Sharma & Kelly, 2014). When asked to rate their holistic understanding of the SD concept, the majority showed reasonable understanding of the concept. No strong differences with regards to gender or year of studies on the understanding of sustainable development (Sharma & Kelly, 2014).

In her master thesis, Irene Tollefsen (2017) investigated what Education for Sustainable Development in Norway is said to entail according official ESD strategies and what views on Sustainable Development that can be found in a then current renewal process. Her findings see a rather holistic approach to ESD, containing perspectives from the environmental, social and economic dimensions both globally and locally, and as one of three interdisciplinary topics (Tollefsen, 2017). However, there seem to be a dominating view that the environmental dimension poses as the main problem, whilst social-and development views is somewhat neglected and economic aspects almost non-existent and missing entirely (Tollefsen, 2017).

Studying students' knowledge, attitudes and behaviors towards ESD in the United Arab Emirates, Al-Naqbi and Alshannag (2018) investigated multiple variables' relation to their initial findings using a quantitative approaches to analyze. They found students to generally have high levels of understanding of SD and ESD, reporting high levels of knowledge towards both the social and economic dimension, in addition to the environmental (Al-Naqbi & Alshannag, 2018). On gender differences, they found females to be significantly more knowledgeable of SD compared to males. National students showed a significant higher level of knowledge compared to non-national students, while students from the Education college reported the highest mean level of knowledge, with College of Information Technology students reported the lowest levels. No significant differences were found related to academic level (Al-Naqbi & Alshannag, 2018). Regarding attitudes, students is described to generally have a positive attitudes and concerns towards sustainability challenges, although only 32.4 percent reporting to disagree that "As long as resources are available, using more than we need now does not threaten the health and welfare of future generations" and 79.2 percent disagreed that "Understanding the problems of climate change is not important" (Al-Naqbi & Alshannag, 2018, p. 576). No significant differences on gender, nationality, and academic level on attitudes of SD and ESD. However, students from the Engineering college was found to have significantly higher attitudes to SD compared to students from the Law college (Al-Naqbi & Alshannag, 2018).

A similar investigation was done in Malaysia, focusing on chemistry learners' knowledge, attitudes, and behaviors. Of the chemistry learners asked, only 34.8 percent had heard of sustainability or sustainable development, and only 5.3 percent had heard of the SDGs (Kanapathy et al., 2018), minding they was released only three years prior to the publishing of the paper. Still, the authors suggest that chemistry learners have low basic understanding about sustainability and sustainable development concepts (Kanapathy et al., 2018). When setting

their understanding in relation to the environmental, social, and economic dimension, the environmental dimension was strongly recognized by the learners, while the social and economic dimension remained of less importance. The study also finds significant differences in terms of gender, as females score higher on all measures, knowledge, attitudes, and behavior (Kanapathy et al., 2018). Interesting findings was made in the intersections between these measures. A strong and significant relationship was found between the knowledge and attitudes of the learners, while weaker relationships were found between behavior and attitudes, as well as between behavior and knowledge. This suggests that their knowledge and attitude does not necessarily positively affect sustainable development behavior, in addition to having an environmentally focused perspective (Kanapathy et al., 2018).

In Swedish university context, a study examining students' understandings of SD, including different aspects' interest and differences in terms of gender or the professional role as an engineer or teacher. A rather typical perspective on SD was discovered, with environmental aspects being showed most interest and knowledge. Still, authors report higher understanding on the social aspects compared to other studies (Björnberg et al., 2020). Engineers also perceived these aspects to be of most importance, while teachers rated social aspects highest. Gender-wise, females showed higher interest in 19 of 21 aspects, where three social aspects, one environmental and one economic showed significant differences between genders (Björnberg et al., 2020). Results suggest gender differences is higher in the social dimension than the others. Additionally, four of the five lowest ratings (<4) on SD aspects different interest, was male respondents – the last one not including any gender information (Björnberg et al., 2020). No significant differences were found in mean values on responsibility to contribute to SD between being a teacher, engineer or as a private citizen. For both an engineer and teacher role, the environmental area ranked highest, however engineers ranked economic areas secondary, while teachers had the social aspects almost leveled with environmental ones (Björnberg et al., 2020). Lastly, the study found a "confidence gap" between interest and confidence, engineers showing low confidence in the social and economic dimensions, and teacher showing low confidence the economic dimension (Björnberg et al., 2020).

Although continuing the chronological approach, a geographical shift is made, as later studies are found the be for the specific country of interest for this thesis - Indonesia. As a part of the Proceedings of the 3rd International Conference on the Future of ASEAN (ICoFA) 2019, insight from Indonesia was presented on the topic of students' perceptions regarding SD and ESD. A total of 99 respondents from "Universitas Islam Riau" answered a questionnaire, with 43 and

56 males and females respectively (Titisari et al., 2020). Developed from the social, environmental, and economic aspects of sustainable development, differences between these were investigated based on gender. A general perception about ESD was found to be in the "very good" category. Results from each dimension of the SD concept, suggest that there is a "good" understanding in all dimensions (Titisari et al., 2020). Individually, the economic dimension scored the highest among the three, with the social dimension ranked second. Surprisingly, and in contrast other studies presented, the environmental dimension was ranked lowest, although still being categorized within the "good" category of understanding (Titisari et al., 2020). Gender differences see females having a higher understanding of economic aspects compared their male counterpart. On the other hand, men received higher averages in the environmental and social dimension, thus given a higher total average across all three dimensions (Titisari et al., 2020). This stands in contrast to some of the previous findings presented earlier (Björnberg et al., 2020; Kanapathy et al., 2018; Tuncer, 2008).

Despite not investigating the different dimension of sustainable development directly, there has been interesting findings in general levels of awareness, knowledge, and perception about the SDGs among students in Indonesia. A study conducted at a public university in Indonesia revealed approximately 3 out of 4 students having good knowledge of the SDGs, with almost as many showing a positive perception about the goals. Only a little over half of the students was categorized as "aware" of the SDGs (Novieastari et al., 2022). Analysis on different variables' association on knowledge, perception and awareness was conducted. The discipline cluster and income-level was variables associated with knowledge-levels on the SDGs (Novieastari et al., 2022). Additionally, perception, here related to a person's opinions of the SDGs, found to be associated with age, program degree and income level. At last, awareness, which is related to the respondent's personal relevance to SDG information, saw that only age and program degree could be associated with awareness-levels (Novieastari et al., 2022).

## 2.5 Sustainable Development and ESD in Indonesian Context

In later time, Indonesia have taken up steps to approach sustainable development, with committing to UN's sustainable development goals and signing on the Paris Agreement on Climate Change, as reported by the "Ministry of Environment and Forestry" (Kementerian Lingkungan Hidup dan Kehutanan PPID / Biro Hubungan Masyarakat, 2016; United Nations Indonesia, 2023). This chapter briefly examines the current Sustainable Development and ESD

status in Indonesia, as continuation of the student insights given at the end of the previous chapter.

The students showed positive perceptions on ESD in general, and as a way to reach the fourth SDG on quality education (Titisari et al., 2020). There were also found that a majority of students had good knowledge of the SDGs (Novieastari et al., 2022). Efforts have been made to improve Indonesia's education system, and the recognition of quality education for sustainable development is increasing (Yuliani & Hartono, 2020) including a program to ensure basic education for all that was implemented in. Still, access to education in some regions and a lack of quality teachers poses main challenges for providing quality education in the country (Yuliani & Hartono, 2020). For higher education institutions, several Indonesian universities are incorporated in to the centre for implementing the SDGs in Indonesia (Voluntary National Reviews, 2019, in Titisari et al., 2020, pp. 193–194), whilst others, including the two Yogyakarta-based universities Universitas Islam Negeri Sunan Kalijaga Yogyakarta and Universitas Gadjah Mada (UGM), have made explanations on their roles "…in achieving the SDGs, starting from village community service programs to conducting research on the development of development models for a sustainable city" (International NGO Forum on Indonesia Development (INFID), 2016, in Titisari et al., 2020, p. 194). UGM is currently ranked as the second best university in Indonesia, thus being one of the most acknowledged in the country (Topuniversities.com, 2023).

This shows that there have been made progress in terms of providing education on sustainable development, however there are needs for further efforts to be made (Yuliani & Hartono, 2020). The United Nations Indonesia reports on to which goals funds are allocated, seeing SDG 4 given a total of 2.4% of total allocations over a period from 2021-2025. Thus, a total of 10 goals is given higher funding percentages than SDG 4 (United Nations Indonesia, 2023). Interestingly, the five SDGs receiving the highest allocations are all related to the social dimension of sustainable development, here including SDG 1 on "No Poverty" (United Nations Indonesia, 2023).

With regards to status on sustainable development, or rather sustainability, one can identify both economic growth and environmental degradation (Kurniawan & Managi, 2018). Despite seeing high levels of economic growth over the past decades, this growth can be perceived as unsustainable due to reliance and exploitation of natural resources and failure to invest in public services such as infrastructure and education (Kurniawan & Managi, 2018). A high increase in population can be of explanation to why investments in public services providing social

progress has failed to keep up with the economic growth, with the environment being at expense (Kurniawan & Managi, 2018). The high population growth also outpaced wealth growth, making growth per capita to decrease. In general, Indonesia was considered to be extracting more natural capital than it was investing in infrastructure and human capital (Kurniawan & Managi, 2018).

High economic growth has seen environmental degradation together with a lack of investment in public services (Kurniawan & Managi, 2018). Simultaneously, students showed highest understanding for the economic dimension in Titisari and colleagues' (2020) study, while the majority of similar studies from other countries have the environmental dimension ranked highest. The current status of sustainability in Indonesia (Kurniawan & Managi, 2018), together with the students insights given at the end of the last section (Novieastari et al., 2022; Titisari et al., 2020) makes Indonesia a particular interesting case to study. Next, an analytical approach to investigate Indonesian students' conceptualizations further, are introduced.

## 2.6 Analytical Approach

With reference to the research question and theoretical backgrounds, this thesis aims to explore how students in Yogyakarta, Indonesia, conceptualize sustainable development. However, this chapter have investigated how the sustainable development concept, in addition to sustainability, can vary in their conceptualizations. Therefore, a premise for this study is to investigate the sustainable development concept considering its well-known dimensions. Of special interest is the dimensions' relation to the sustainable development concept, in addition to how different dimensions are emphasized by students. It is important to understand what is meant by dimension emphasis and dimension relation for this thesis. This might be confusing, the following text box aims to clear this up, and can be used as a reference point for the remaining readings.

**SD dimensions' emphasis:**

Refers to how a sustainable development dimension is weighted to achieve sustainable development. It represents a view of prioritization for the achievement of SD.

Example 1: *A student emphasize the environmental dimension the most compared to the other dimensions*. This would mean that the students view the environmental dimension as most important (more important than the social and economic) dimension in achieving SD – he would prioritize this dimension over the others.

**Dimensions' relation to SD:**

Refers to how related a sustainable development dimension is to the SD concept, as one knows it. It represents a person's view of what aspects belong within sustainable development.

Example 2: *The same student relate the environmental dimension as "somewhat" related to the SD concept.* This would mean that the student does not perceive environmental aspects to be big a part of the mainstream SD concept. Still, the student may view environmental aspects as very important to achieve SD.

Students' views on the dimensions' emphasis and relation to the SD concept may be affected by their knowledge on sustainable development and other underlying factors. These underlying factors include background factors such as age and gender, education factors such as study field, university, knowledge on SD and whether SD has been a part of university courses. Additionally, some factors regarding current environmental, social, and economic life situation are investigated. An analytical model shown in Figure 3 is created to visualize the analytical process to study students' conceptualizations.

The theoretical introductions given on sustainability, sustainable development, SDGs, and ESD, is not explicitly visible from the analytical model. Still, these concepts provide the foundation for the areas of interest, at will be important insights when the results will be discussed, helping to interpret the results.
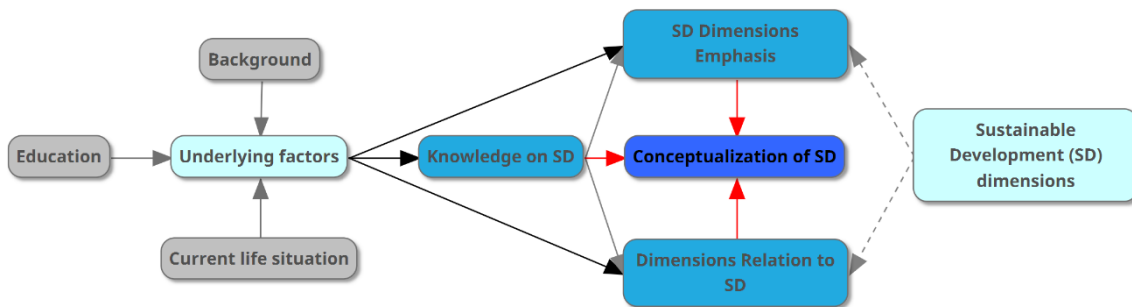
*Figure 3: Analytical model investigating students' conceptualizations on sustainable development. The conceptualizations are based on knowledge, dimension emphasis, and dimensions relation to sustainable development.*

To perform the analyses, a data collection process was required. The next chapter covers the collection process and methodological decision made. Getting relevant data is an essential step for the research project, enabling analyses to be made based on the results found from the data collection.

# 3. Methodology

The goal of this master's thesis is to explore the conceptualizations of sustainable development among students in Yogyakarta, Indonesia. Additionally, this thesis aims to get an understanding of how a set of factors affect the conceptualizations found among the students. To be able to investigate this, a research design had to be conducted. With several considerations, a quantitative approach with a questionnaire was preferred for this study.

## 3.1 Research Design

A quantitative approach through a questionnaire, give the researcher the possibility to use an existing data set or collect data material that can be analyzed and potentially generalized (McLafferty, 2003). With limited existing research and data material available for my specific research questions, primary data collection was necessary, this is, when the researcher need to generate or collect their own data (Kitchin & Tate, 1999). Given my study's aspirations to generalize differences in conceptualizations based on background, education and current situation, the use of a questionnaire became the preferred method. Sara L. McLafferty (2003) describes that acquiring these kinds of information is the goal for research through questionnaire. Gathering information about the life of individuals, in terms of attitudes, behavior, or perceptions on a specific topic can give the researcher useful insight that not necessarily is publicly published or available (McLafferty, 2003). A limitation is apparent, with Indonesia being a largely populated and diverse country, requiring a way more extensive study to be able to generalize and investigate students' conceptualizations for the whole country. Although generalization on the target population, students in Yogyakarta, Indonesia, was an aspiration, there are other reasons to why a quantitative approach was preferred. First, insight in to the attitudes and perceptions on a specific topic, as described by McLafferty (2003), was seen to fit with the research questions, whilst being able to gather such information from a larger set of individuals. Using a quantitative approach, were also seen to be more precise, especially when investigating how factors related to background, education, and education affect students' conceptualizations – using statistical analyses.

When collecting primary data through a questionnaire, its design is important and operates as the heart of the research (McLafferty, 2003). The structure, length and appearance of the questionnaire, as well as the questions enunciation and order is just some of the elements contributing to the quality and response-rate of the respondents (Bryman, 2016; Kitchin & Tate,

1999; McLafferty, 2003). Before getting to this actual construction of the questionnaire, one has to mind "how the survey is undertaken" (Kitchin & Tate, 1999 p. 48).

For this data collection, it is already decided that the data will be generated through a questionnaire. However, how it is undertaken refers the medium for distribution and response. Examples are face-to-face, telephone, postal and e-mail. The last two is described as having variable response rate (Kitchin & Tate, 1999). In 2004, a study showed that web based survey had comparable response rates as the traditional postal mail (Kaplowitz et al., 2004). 10 years later, De Bruijne & Wijnant had results suggesting that if the respondent is answering the survey on their smartphone, a text-message approach lead to faster initial respond time and higher completion rates (De Bruijne & Wijnant, 2014). This may indicate a shift with time where the "typical respondent" prefers to answer a web-based questionnaire. Nevertheless, a 2017 article is based on a decreasing response rate in all kinds of surveys, but especially for web-based ones, seeing that a lottery incentive is necessary for achieving higher response rates (Zhang et al., 2017). A prenotification, reminders and the design is also ways to improve the response rate (Sammut et al., 2021).

 Web-based surveys/questionnaires have the advantage of being cost-efficient because they target large and broad sample sizes with relatively low cost and in a less time-consuming way (Rød, 2017; Sammut et al., 2021). The relation the respondent feel towards the researcher is often more formal giving a more anonymous feel, resulting in a more genuine response (Rød, 2017). The main disadvantage is that misunderstandings could occur, where that the researcher is not able to correct or further explain during the time of response.

Based on these advantages and the practical difficulties for other methods (such as telephone or face-to-face) mainly due to the language barriers of collecting data in a foreign country, a questionnaire approach was chosen. Further, a web-based design was preferred because of both convenience and practical reasons. The population of my study being students, I assumed it to be of high probability that many of the respondents would receive the invitation to the survey through a mobile device. Having a web-based questionnaire with invitations through text-message ("WhatsApp" being the most common in Indonesia) would in theory generate the best results in terms of response rate and initial response time from invitation for my specific case (De Bruijne & Wijnant, 2014). This approach gave me sufficient time to prepare questions and translations with the least possible errors coming from language and cultural differences, as well as the opportunity to do testing in advance of publishing the invitations. Although the

questionnaire approach opens up for misunderstandings and errors in translations (Rød, 2017), I felt that this was the approach giving the least amount of errors.

## 3.2 Questionnaire Design

The high importance of the questionnaire design is emphasized and widely recognized in the relevant literature (Bryman, 2016; De Bruijne & Wijnant, 2014; Kitchin & Tate, 1999; McLafferty, 2003; Pasek & Krosnick, 2010). In the process of designing the questionnaire, Pasek & Krosnicks (2010) provided a particularly useful insight into some of the psychological aspects of the design approach. The ambition is to minimize the number of respondents to "satisfice", reducing the risk of invalid data. This is, when respondents give answers with minor or no relation to the question or answer with as little thinking as possible. The explanation to this being either an objective or subjective view that the question is difficult for the respondents, or that they are not motivated (Pasek & Krosnick, 2010). The ambition of low "satisfying" by respondents can be pursued with techniques to the questionnaire design.

### 3.2.1   Questionnaire Structure

De Bruijne & Wijants (2014) studied the effects of different aspect of the layout and structure of the questionnaire, finding that a scrolling (a long page) layout gave faster completion time. Realizing that my questionnaire would become relatively long, I decided to add paging (loading new page with question) for every "theme" change, as I did not want to make the respondent unmotivated – potentially leading them to "satisfice". Presenting a new theme or form of questions on each page, I felt more convinced that the respondents would be aware of the change, not just answering with the basis as the previous page.

 Rød (2017) describes three different parts of a questionnaire. First one being the introduction, where there is some information about the study as well as some general background-questions, followed by a substance section. Here the essential questions are asked. At last, there is a categorization section, typically consisting of questions about the respondent's life, for example their socio-economic situation (Rød, 2017). When constructing the questionnaire for this study, the first draft was following this formula. This however, changed after a pilot testing of the questionnaire, so that the categorization section was included as an extension of the introduction based on feedback that it be a better fit. The main drawback for this change, may be that respondents is more likely to "satisfice" towards the end of the survey (Pasek & Krosnick, 2010), which is a part of the substance section. Although this effect also existed before the

change, it may be harder to "satisfice" on questions about your life situation as you most likely have the "correct" answers or that they are given more on "auto-pilot" than other types of questions. Consequently, one could argue that the consequence of this question order effects may have impacted the results more than necessary. Nonetheless, a potential question order effect is impossible to avoid (Pasek & Krosnick, 2010). A three-section structure of my questionnaire ended up being: 1) Introduction with information and assent form, 2) categorization with mapping of the respondent's background, and last 3) substance section consisting of questions regarding their conceptualizations of sustainable development. The substance section also included an open-ended question, asking for the respondent's "first thought" when hearing sustainable development.

### 3.2.2   Closed-ended Questions.

Having a quantitative approach with both descriptive and analytical purposes, closed-ended questions (where the respondent select amongst given options, unable to insert an answer unique to them) was to a far extent preferred when designing the questionnaire. Although having both administrative and analytical advantages, it may not always generate the best data. In the attempt to discourage "satisfying", open-ended questions (where the respondent may enter an answer unique to them) could be preferred, as it does not guide the respondent in any way, but rather requires more thought and consideration (Pasek & Krosnick, 2010). Close-ended question is, however, preferred if offering every possible option is achievable and practical (Pasek & Krosnick, 2010). Longing for data that can be statistically described or analyzed, this kind of close-ended questions was desired, as open-ended question quickly would require a lot of work in terms of de- or re-coding the answers (which nor is unproblematic). The majority of the questions in the categorization section were designed to be close-ended. In general, these provided every possible option, as is preferred if minimizing "satisfying" (Pasek & Krosnick, 2010). Some had the "other" alternative, but without the extended opportunity to specify, as respondents tend to rather select among other presented alternatives if the "other" option asks them to specify (Pasek & Krosnick, 2010). I made the decision that the "other" category could be excluded from the analysis, and rather pursuit response options that nearly every respondent could place themselves within.

### 3.2.3   Rating Questions

In the later substance section of the survey, I faced other challenges related to question design. In this section I was longing for information on the respondent's conceptualizations, including

emphasis and relation on different aspects of the sustainable development term. Wanting to maintain production of descriptive and analytical statistics, I continued to seek for alternatives for the open-ended question design. Still, found the classic close-ended question design unsuitable for investigating conceptualizations of sustainable development. Consequently, a "rating scale" approach became preferred. This is based on the arguments that it is both suitable for analytical purposes, and are commonly used in surveys – making it recognizable and easy to understand for the audience (Pasek & Krosnick, 2010). Whilst being time-efficient for the respondent, which reduces "time to answer" which again is positive for the response rate (Bryman, 2016; Kitchin & Tate, 1999; McLafferty, 2003), it may also lead to some respondents choosing to "satisfice"(Pasek & Krosnick, 2010). This is often a result of "non-differentiating", where (some) respondents chooses the same alternative on the scale for each rating question. Pasek & Krosnick (2010) argues that if this kind of identical ratings is appropriate, ratings scales is preferred over a ranking-order approach, the latter not being used in my questionnaire. I argue that identical rating indeed is appropriate, as respondents may very well feel that different aspects of the sustainable development term have corresponding emphasis, value, or importance, hence advocating for the rating approach. Further, questions with "unipolar dimensions" are suggested having five-points alternatives, for example "not related" to "extremely related" as in the last question of my questionnaire. Seven-points alternatives is suggested for "bipolar dimension", for example "strongly agree" to "strongly disagree" (Pasek & Krosnick, 2010). Both is used in my approach. Lastly, the suggestion to text-label all alternatives (Pasek & Krosnick, 2010), was difficult to fulfil because of the restrictions on the survey-software "Nettskjema".

For the five-point unipolar dimension questions, I chose to not include an option for "don't know" or related answers, as all the answers are rated in one dimension, for example "not related" to "extremely rated". Whilst for the bipolar dimension questions, I chose to include a "don't know/no opinion" option. Being bipolar, this option seemed more natural as it could distinguish the two dimensions, from "strongly agree" to "strongly disagree". Pasek & Krosnick (2010) highlight that the literature has arguments both discouraging and advising to include such a category, in addition to the aspect that attitudes and/or opinion strength may vary.

### 3.2.4 Acquiescence Response Bias

Dealing with questions providing answers of bipolar dimensions, the use of "Likert-scale" is apparent. Although being familiar and appreciated for both the researcher and the respondent,

it can initiate the "acquiescence response bias" phenomenon (Pasek & Krosnick, 2010). This refers a tendency towards agreement, originating from either 1) politeness and agreeableness in conservational communication, 2) a tend to agree with people of higher authority, for example the researcher, or 3) a willingness to "satisfice" which strengthens the probability of agreement. The acquiescence response bias effect is problematic as it is difficult to measure and hard to minimize (Pasek & Krosnick, 2010).

For the overall purpose of keeping the questionnaire within reasonable length, the agree-disagree approach was preferred. Being familiar for most, I estimated that it would be less "time-consuming" and less "cognitively fatiguing", giving a higher response rate and a lower chance of respondents to "satisfice". A popular alternative suggests other variations of response scales, often called "construct-specific" (Lelkes & Weiss, 2015; Pasek & Krosnick, 2010). However, this is not necessarily a better option, as research on this topic found agree-disagree questions as valid and reliable as the construct-specific ones. Further suggesting that either the former does not negatively affect the data (implying that the acquiescence bias effect is exaggerated) , or that the construct-specific approach is not a cure for the tendency towards agreement (Lelkes & Weiss, 2015).

### 3.3 Population and Sample Strategy

Related to the research questions, as well as the available possibilities and capabilities, the target population were selected to be students in the Yogyakarta, Indonesia. This city was chosen for availability reasons, as I had an exchange semester at this location. A more extensive study covering larger areas of Indonesia would of course be preferred, although being out of reach for this thesis, both in terms of time and resources.

With regards to sampling of the targeted population, principles of probability sampling should be used in order to be able to generalize. Most often, this require a sampling frame, consisting of all the possible "units" in the total population from which the sample is selected. The selection of the sample is then done in a way that ensure randomness, often with a mechanism that includes that all different sub-groups (Bryman, 2016). This is often referred to as a "stratified random sample", generating a sample that is randomly chosen and representative for the population, suitable for generalizing (Bryman, 2016; Kitchin & Tate, 1999).

I did *not* follow these guidelines, as it was judged unachievable for several reasons leading to a misbelief in getting a sufficient number of respondents. This is, despite it being more important

how the sample method is carried out rather than the sample size (Bryman, 2016; Kitchin & Tate, 1999), there is a challenge in getting enough respondents. This is based on indications that response rates to academic surveys is decreasing, both among private persons and inquires at the organization level (Baruch & Holtom, 2008; Bryman, 2016; De Leeuw, 2005). I was unable to access a sampling frame, and creating or accessing one was assessed as too time- and cost-consuming, thus becoming a limitation for the study project.  For such a situation, it may be more appropriate to use other sampling methods which do not require a sampling frame (Kitchin & Tate, 1999). Despite the initial ambition of a result compatible for generalizing, the sample selection cannot be defined as randomized, consequently being invalid for generalization.

My strategy for the data collection was based on snowball sampling, generally classified as a non-probability method. Based on convenience sampling, another form of non-probability sampling where the sample is available to the researcher, the snowball method for quantitative data is based on an initial contact of a group, similar to the more popular qualitative approach. However, this group is urged to provide other possible respondents that they think would fit the population (and survey) requirements (Bryman, 2016; Kitchin & Tate, 1999). The method was executed through a relatively small initial contact group, consisting of students, former students, employees and/or administrators at the university within my network. They distributed the survey to potential respondents, with an urge of further distribution. In meetings with larger student groups, I also promoted the survey, probing them to respond.

The indications of lower response rates in recent years (Baruch & Holtom, 2008; Bryman, 2016; De Leeuw, 2005), seemed to strengthen. I experienced slow and low response rates in the start, but after some while the response rates increased. I found that several continuous reminders worked quite well. In this part of the data collection there is probably other approaches that could have worked better, for example Sammut and colleagues' (2021) findings of an "Email prenotification, email invitation, 2 reminders, simple 10 min design and lottery incentives" to improve response rates (Sammut et al., 2021). For future research it is suggested that a probability sampling method is used to enhance the data collection process, enabling generalization to the population.

### 3.4 Data Analysis

Statistical data collected from the questionnaire has seen managed and prepared for several types of statistical analysis. Data was retrieved from the software used for the questionnaire,

"Nettskjema", before the free statistical computing software "R" and "RStudio" was used to manage the dataset, make representations, and do statistical analyses. A lot of time was needed to "clean" the dataset, including recoding names and values of most variables to prepare it for further analysis. No serious changes were made on the respondents' answers to the questions in the survey. However, some new composite scores were created originating from the values given by respondents, which will be discussed later. Prior to that, some reflections on the use of descriptive statistics are discussed, with more advanced statistical analysis methods including regressions and t-test are discussed latter to the composite scores.

### 3.4.1 Descriptive Statistics

As a first step to the data analysis, descriptive statistics is presented to better understand the data received from the questionnaire. Although some minor modifications have been made to better present the data, the descriptive statistics describes the distributions of values in the dataset. There are several measures to provide such insight to the dataset, including graphs, charts, measures of central tendency and measures of variability (Schacht, 2005; Sirkin, 1999). These are different measures to summarize, organize and represent the characteristics of the respondents in the dataset in understandable ways.

Measures of central tendency includes mean, median, and mode. The mean, or arithmetic mean is the average value of a variable in the dataset, whilst the median is the value in the middle of the dataset with equal number of values on each side. The mode is the value which is most frequently found in the dataset (Schacht, 2005; Sirkin, 1999). Thus, all calculate "a" centrality of the data set values, but with different strategies. In contrast, measures of variability are used to examine the variability of the data. Range is often displayed through a minimum and maximum value, with the range being the difference between them. Standard deviation is based around the mean, measuring the typical variation there is from the mean (Schacht, 2005; Sirkin, 1999). Then, visualizations of these measures can be presented through a variety of methods, here with bar charts and density plots. For the density plots, the highest point represents the mode, and a mean value is also added.

### 3.4.2 Composite Scores

Aiming to explore complex concepts such as different dimensions within sustainable development, several questions was formulated. Thus, composite scores were constructed to help represent responses related to these concepts. A composite score, or a composite variable

can be defined as a "… variable made up of two or more variables or measures that are highly related to one another conceptually or statistically" (Ley, 1972, in Song et al., 2013, p. 1). Although the use of composite scores are common in social sciences, one should be aware the potential consequences (Bobko et al., 2007; Song et al., 2013). These can include loss of information from the individual variables or challenges in interpreting the composite variable and its relationship to other variables (Song et al., 2013). Still, the approach taken here is based on the view that simply asking questions such as "How important is the overall social dimension of sustainable development" or similar, are insufficient. Composite scores lower the number of analyses needed, making it easier to analyze, interpret and present. As previously seen, composite scores should be made up of variables strongly related to each other. To check the relationship between the variables expected to be related, the Cronbach's alpha (>0.70) reliability test was run to justify the inclusion of variables prior the establishment of the composite scores. Table 1 shows all the created composite scores, with included variables and their Cronbach's alpha values. Values of 0.7 or higher are usually seen as acceptable.

| Category | Composite score | Included variables | Cronbach's Alpha |
|---|---|---|---|
| Current life situation | Environmental | 1, 10, 11, 12 | 0.748 |
| | Social | 1, 2, 3, 4, 5, 6, 10 | 0.834 |
| | Economic | 1, 7, 8, 9, 10 | 0.742 |
| Dimension Emphasis | Environmental | 19, 20, 21, 22, 23 | 0.944 |
| | Social | 13, 16, 17, 18, 20, 23 | 0.927 |
| | Economic | 14, 15, 20, 23 | 0.816 |
| Dimension Relation | Environmental | 30, 31, 32, 33 | 0.882 |
| | Social | 24, 27, 28, 29, 31 | 0.797 |
| | Economic | 24, 25, 26, 27, 31 | 0.746 |

*Table 1: Composite scores within different categories, with variables included and their Cronbach's alpha values. See table 2, 3, and 4 for explanations on the included variables.*

## Current life situation, variable explanation

| From 1-5, how satisfied are you with your current situation regarding... | Variable number |
|---|:---:|
| Overall living standard | 1 |
| Food security | 2 |
| Gender equality | 3 |
| Physical health | 4 |
| Well-being/mental health | 5 |
| Access to quality education | 6 |
| Access to decent work | 7 |
| Not having over-consumption on goods an food | 8 |
| Access to good infrastructure | 9 |
| Access to affordable and renewable energy | 10 |
| Access to recycling | 11 |
| Incentives to preserve nature | 12 |

*Table 2: Variable explanation and numbering of current life situation.*

## Dimension Emphasis, variable explanation

| From 1-7, you think ... should be a priority for achieving sustainable a development | Variable number |
|---|:---:|
| Fighting poverty and hunger | 13 |
| Supporting innovation and aiming for economic growth | 14 |
| Having responsible production and consumption of goods | 15 |
| Aiming for peace, justice and equality in our society | 16 |
| Aiming for quality education and good physical/mental health for everyone | 17 |
| Developing sustainable cities and communities | 18 |
| Preserving nature and life in the sea and on land | 19 |
| Providing clean and affordable energy for everyone | 20 |
| Providing clean water en sufficient sanitation for everyone | 21 |
| Combating climate change | 22 |
| In general, sustainable development | 23 |

*Table 3: Variable explanation and numbering on emphasis.*

## Dimension relation, variable explanation

| From 1-5, How related do you think each statement is to a sustainable development | Variable number |
|---|:---:|
| Fighting poverty and hunger | 24 |
| Supporting innovation and aiming for economic growth | 25 |
| Having responsible production and consumption of goods | 26 |
| Having peace, justice and equality in our society | 27 |
| Quality education and good physical/mental health for everyone | 28 |
| Developing sustainable cities and communities | 29 |
| Preserving nature and life in the sea and on land | 30 |
| Providing clean and affordable energy for everyone | 31 |
| Providing clean water en sufficient sanitation for everyone | 32 |
| Combating climate change | 33 |

*Table 4: Variable explanation and numbering on conceptualizations*

There are several ways to create composite variables. Here, the most common, "simple averaging" is used. Using simple averaging, the composite values are created by taking the averaging values from all included variables (Song et al., 2013).

### 3.4.3   T-test

As a part of the study and to answer the research questions, analyses of the mean scores between groups have been conducted. The method used is the two-sampled *t* test. The *t*-test compares two groups, calculating their means and standard deviation on a variable, creating a *p* value indicating whether there are significant differences on the means or not (Sirkin, 1999). It is common to the set the *p* value limit to 0.05, meaning that a value below this indicates a significant difference in means (Schacht, 2005; Sirkin, 1999). The two-tailed *t* test "only" investigates whether there are "some" significant differences, not identifying whether the directional differences seen in the means are significant (Sirkin, 1999).

*T* tests have mainly been conducted on the grounds to investigate differences on the means of groups in different categories, for example females and males, or related to study field or university.

### 3.4.4   Regression Analyses

Several regression analyses have also been conducted as part of the data analysis for this thesis. Regression analysis is used to study the relationship between a dependent variable and one or multiple independent variables, where the independent variable bring change to the dependent variable (Schacht, 2005; Sirkin, 1999). Although not explaining causality, regression enables one to make qualified predictions based the variables included.

With linear regression investigating the relationship between one (independent) variable for each dependent variable, this is often insufficient in terms of measuring factors with a possible effect (Schacht, 2005; Sirkin, 1999). Multiple regression analysis then, uses multiple independent variables to analyze the relationship with a dependent variable (Schacht, 2005; Sirkin, 1999). Multiple regression analysis enables investigation of how several background factors, for example age and gender, explain to the specific variable being researched. Additionally, the regression assesses the strength of the relationships, so one can identify whether the relationship is significant or not (Schacht, 2005; Sirkin, 1999). Similarly with the *t*-test, a *p* value lower than 0.05 can be considered statistically significant.

## 3.5 Reliability and Validity

Reliability and validity are important to assess with any data collection, and it says something about how accurate and trustworthy the results found can be (Sirkin, 1999). Validity refers to a relationship between what one want to measure and how one in reality measure it, while reliability refers to the trustworthiness of the data collected (Sirkin, 1999). As presented earlier, an indirect approach was preferred when asking respondents questions related to specific concepts of interest, such as dimensions of sustainable development. This in itself would raise questions on the validity, as one could argue that one does not measure the exact topic of interest. This is however done with caution, using the sustainable development goals and their dimensions identified by Stockholm Resilience Group (see Figure 2) as frameworks for both creating questions and creating composite scores. In this way, I argue that the question does investigate the topic and concepts of interest. However, I do not exclude a chance that the composite goals include additional information besides the topic of interest.

With the use of the more indirect approach, one may expect respondents to better be able to answer the questions truthfully and to the best of their ability, justifying the indirect approach. In contrast, a direct approach would have increased risk of the question being misunderstood or non-relatable for the respondents, producing lower reliability. Unfortunately, there was no time and resources to thoroughly check whether the data kept its consistency and stability over time, for example doing repeated measures, which would increase the reliability of the data (Sirkin, 1999). For the composite scores, reliability tests were conducted using Cronbach's alpha to test whether the included variables were related.

Other elements that can be discussed related to reliability and validity. For instance, may several questions within the questionnaire be perceived as leading, potentially influencing respondents to choose what they think of "correct" or morally "right". However, it is difficult to measure what people actually think if they are affected by leading questions or even how leading a question might or might not be. In a similar vein, reported responses are hard to examine whether are correct or not. Even if possible, it is often practically impossible accomplish.

The sampling method have been discussed previously. This does also affect the validity of the data, and because one cannot generalize to the target population, the external validity of the data is generally weakened.

## 3.6 Ethical Considerations

The questionnaire was designed to be completely anonymous, hence no gathering of sensitive information such as email address, name nor very specific information on age, location, or occupation. None of responses can be traced back to the respondent. To ensure the anonymity, guidelines given by the Norwegian Centre for Research Data AS (NSD), now Norwegian Agency for Shared Services in Education and Research (SIKT), were followed. An application to NSD for the data collection was approved. As a part of the introduction of the questionnaire, respondents were informed about their anonymity in participating.

## 3.7 Conclusions

This chapter has presented the methodological background and reasoning for the data collection and data analysis being part of this thesis. The research design and following construction, implementation and distribution of a web survey were carefully chosen and reflected literature on the relevant topics, including insight from psychology (Pasek & Krosnick, 2010).

Reflections on the selection of methods give insights into the complexity of methodology approaches, observing that it is not always possible to realize all aspects in the desired way. This is also demonstrated within my approach. Although the data collected, thus also the results produced, may be questionable in terms of reliability and validity, for example in the use of an indirect approach when asking questions about complex concepts, the sampling poses as the major liability for this data collection process.

Mainly due to practical reasons within timeframe for the data collection process, a sampling approach based on probability sampling was determined unachievable. Thus, a non-probability sampling method basing on snowball sampling got implemented. Therefore, the ability to generalize findings out to the overall target population, gets deserted. However, other initial aspirations, including precise measures and analyses of how factors related to background, education, and current life situation for a larger set of individuals, were accomplished. Despite a non-probability sampling, findings given from the results and following discussion can provide interesting insights on the sample-population studied. Findings may also function as indications on the topics of the research questions, despite there being a lack of ability to generalize. For future research on similar topics, the ability to generalize should continue to be pursued.

# 4. Results

This chapter will present the findings from the questionnaire and the following statistical analyses. First, some general respondent characteristics is presented with descriptive statistics.

## 4.1 Descriptive Statistics and Respondent Characteristics

The figure below shows the gender distribution of the respondent sample.
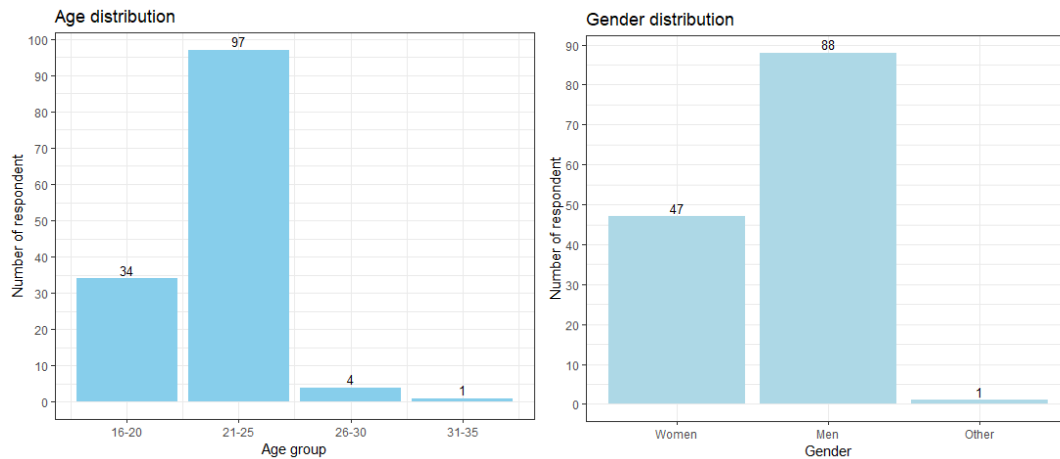


*Figure 4: (left) Age distribution (n=136)*

*Figure 5: (right) Gender distribution (n=136)*

The distributions shown above (Figure 4 and

Figure 5) present the gender and age distributions of the respondents, identifying an overweight of men compared to women, and that most student is under 26 years of age, most being within the range of 21-25.
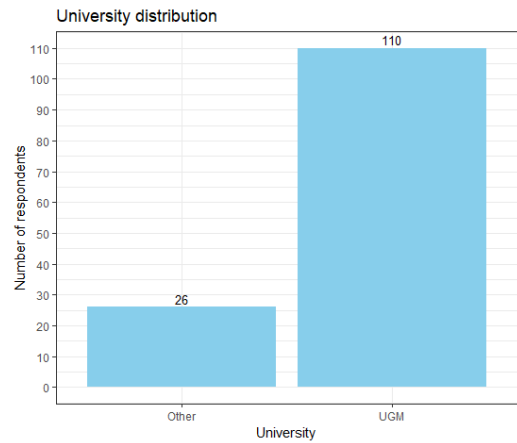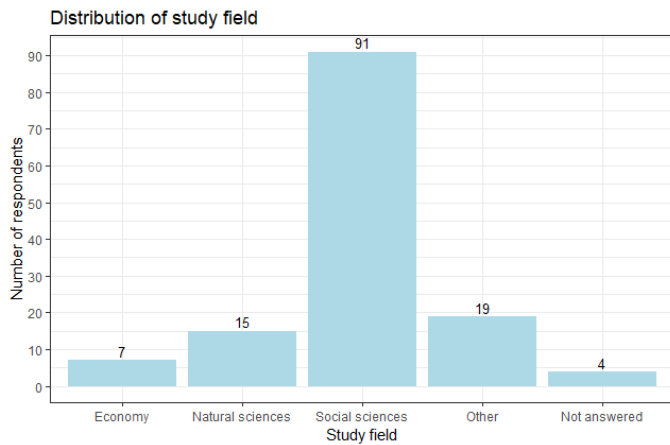
*Figure 6: (left) Distribution of students' field of study (n=136).*

*Figure 7: (right) University distribution among students (n=136).*

Figure 6 and Figure 7 show students' field of study and university attended respectively. The field of study is categorized into economy, natural sciences, and social sciences, in addition to a "other" category. Most of the respondents report to study within social sciences. For the university distribution, most respondents attend University of Gadjah Mada (UGM), with 110 of 136 students reporting UGM to be their university.
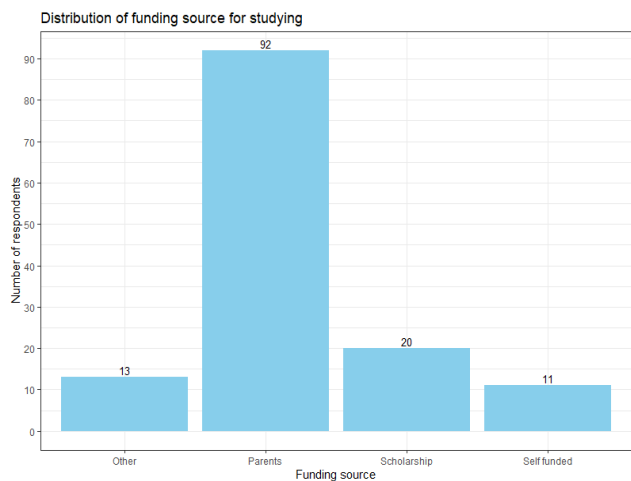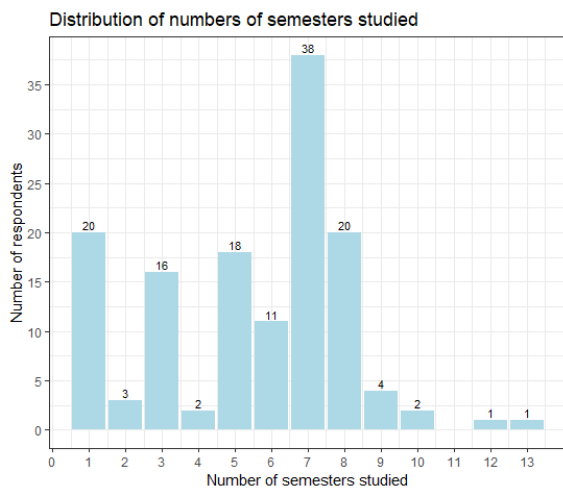


*Figure 8: (left) Number of semesters studied (n=136).*

*Figure 9: (right) Funding source for studying (n=136).*

Figure 8 provides an overview of the total semesters studied among the students. Very few students had studied for over 8 semesters when responding to the questionnaire. Most were found to have studied 1, 3, 5, 7 and 8 semesters. Most students (92 of 136) fund their studies

with help from their parents or family, as seen in Figure 9. However, some is self-funded, have scholarship or report other forms of funding.
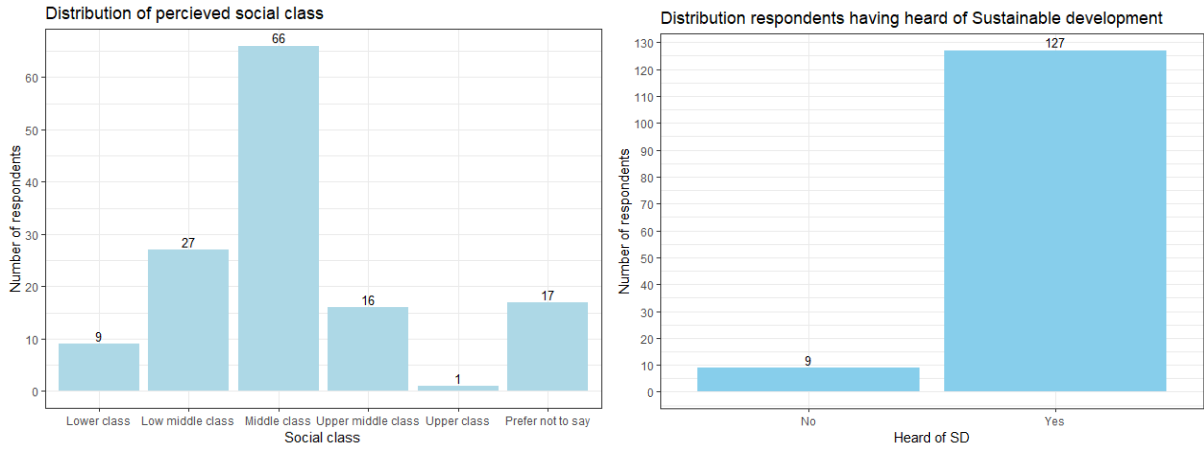


*Figure 10: (left) Perceived social class (n=136).*

*Figure 11: (right) Heard of Sustainable Development (n=136).*

When asked which social class they perceived to be coming from, related to family, nearly half (66 of 136, 48.5%) reported to fit within a "middle class" category. "Lower middle class" and "lower class" were reported by 27 and 9 respondents respectively. 16 considered themselves as coming from an "upper middle class", while only 1 in the "upper class". 17 respondents preferred not to report information on this topic (see Figure 10). Nearly all (>93%) students had heard of Sustainable Development, with 9 out of 136 reporting to not having heard of it.
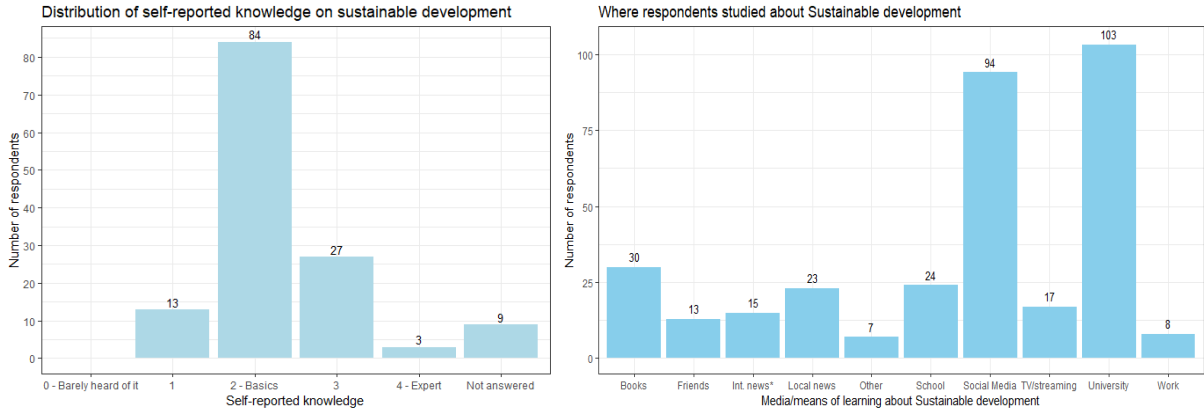


*Figure 12: (left) Self-reported knowledge on SD (n=136).*

*Figure 13: (right) Where students learn about SD (n=334).*

Students having heard of Sustainable Development (SD), mainly reported basic or above knowledge of the concept. The 9 students not having heard of SD, did not receive this question.

84 students reported to know the basics of SD, while three reported knowledge on "expert" levels. See the distribution in Figure 12. Figure 13 show where (the medium) students report to have learned about SD, they could check a maximum of three alternatives. Social media and University stand out as the main mediums for learning about SD, reporting 94 and 103 responses respectively. Books, Local news, and School (before university) were other alternatives receiving over 20 responses.
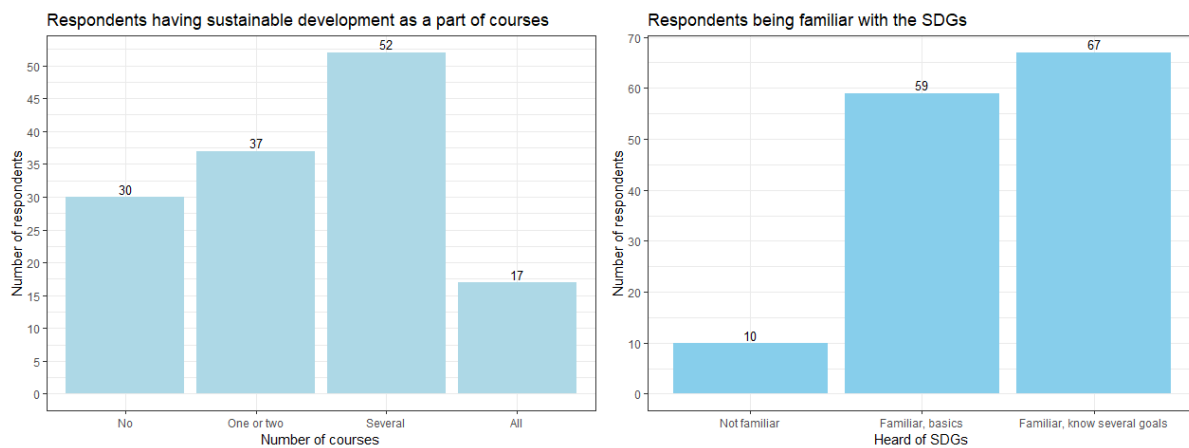


*Figure 14: (left) SD as part of university course (n=136).*

*Figure 15: (right) Students' familiarity to SDGs (n=136).*

In Figure 14, one can see that 30 students report that Sustainable Development has not been a part of any of their courses. Thus, a majority report that SD have been a part of one or more courses, with 17 reporting it to be a part of all courses and 52 reporting SD to be a part of several courses. For the Sustainable Development Goals (SDGs), 10 of 136 students report to not be familiar with the SDGs. One student reported to be familiar with the SDGs despite not having heard of SD. Many students (67) report to know several of the goals, while 59 students report to be familiar with the basics of the SDGs.
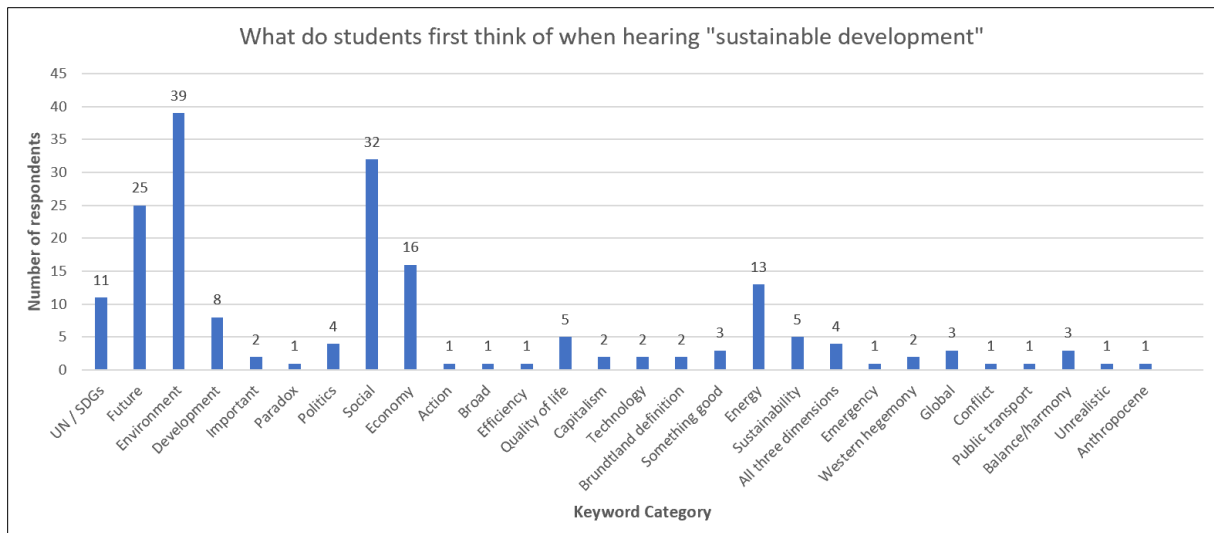
*Figure 16: Students' first thought of Sustainable Development.*

Students were asked to write their first thought about Sustainable Development, and their answers were recoded into categories seen in Figure 16. Here, responses may count in several categories. Being an open-ended question, a lot of different responses were acquired. Environmental aspects were found most often, being in 39 of the responses. Aspects falling into the social dimension were seen in 32 of the responses while 16 responses felt within the economic dimension. Many (25) mentioned that SD has to do with the future. 11 mentioned the UN or SDGs when first thinking of the concept, while others saw connections to energy. Four responses mentioned all three dimensions of SD (environmental, social, and economic), while five mentioned the "sustainability" concept, and three mentioning balance/harmony between society and nature. Four respondents first thought of politics, three saw SD as something at a global scale, while two mentioned it as a "western hegemony".
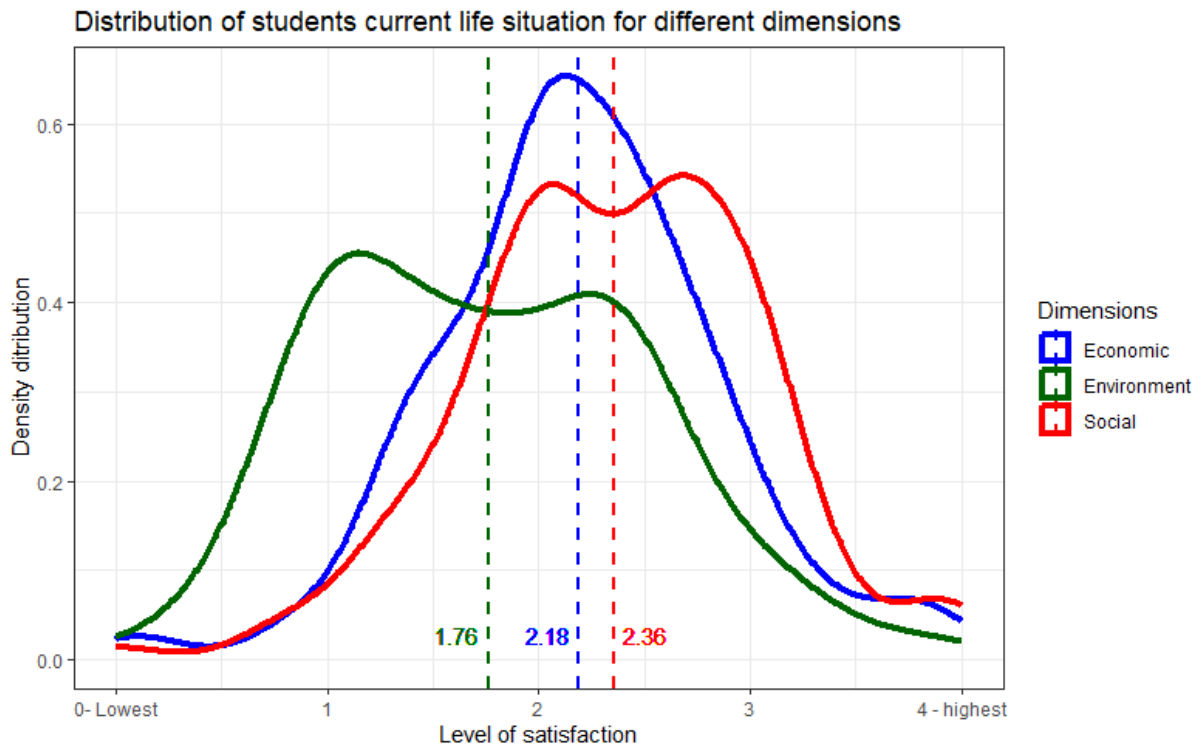
*Figure 17: Density distribution of current life situation for different dimensions. Environmental mean: 1.76. Economic mean: 2.18. Social mean: 2.46.*

Figure 17 show a density distribution of how satisfied students are with their current life situation categorized into the economic, environmental, and social dimension. These dimension variables are created as composite goals based on a set of questions, which can be studied in further detail in Table 1 and Table 2 (page 34).

For the environmental dimension, students are generally placing their "satisfaction score" towards the low-mid levels – level 1 and 2. Number of students start to decrease from about 2.5 and moving higher on the "level of satisfaction" axis. The mean of the environmental dimension is 1.76. The economic dimension on the other hand, has a mean of 2.18. Here, most students placed themselves in the mid-level of satisfaction around level 2, with relatively few students placed in outsider-levels 0, 1, 3, and 4. At last, the social dimension averages on 2.36, the highest of the three dimensions.

Most students had a level of satisfaction somewhere around level 2 and 3, with less students placing on other levels of satisfaction. As shown in the figure, some differences are shown between the density distributions of the three dimensions. The environmental dimension has a distribution which is more tilted to lower levels of satisfaction compared to the economic and social dimensions. While being distributed at higher levels of satisfaction, the economic

dimension is close to normally distributed with one density top, while the social dimension is more spread out with two smaller tops. The distributions, as well as the means, may indicate that the environmental dimension rank lowest among the three, with the social dimension ranking highest.
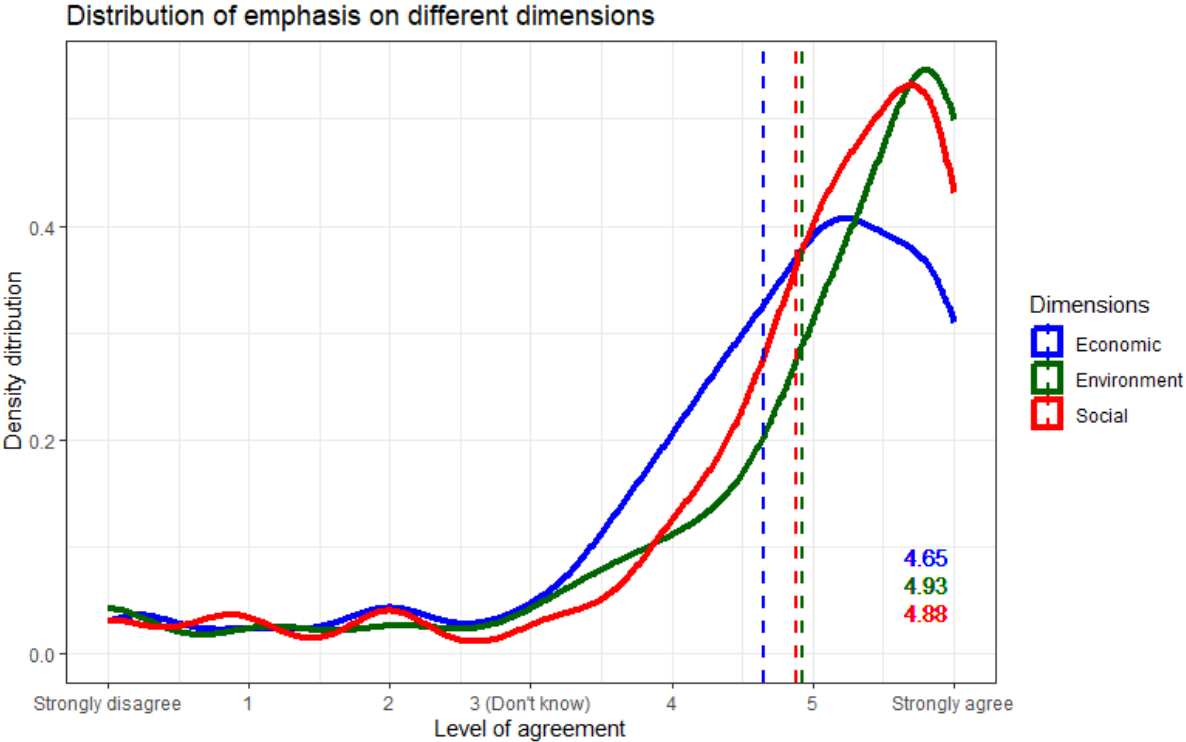


*Figure 18: Density distribution of emphasis on different dimensions of sustainable development. Environmental mean: 4.93. Economic mean: 4.65. Social mean: 4.88.*

Composite scores on dimensions emphasis were created based on another set of questions, seen in Table 1 and Table 3 (page 34). Responses were given in the form of agreement levels. Results of density distributions of these composite scores is presented in Figure 18.

In general, students believed aspects coming from all three dimension to be of importance. Being a bipolar measure, the level 3 functioned as a "don't know/no opinion" option. Values to the left, less than 3, saw few students placed in the "disagree" tendency part of the distribution. One can identify that most students tended to agree on all aspects to every dimension as being important to sustainable development.

All three density distributions follow a pattern of an increase in responses placed on level 4 and level 5, before dropping at the highest agreement level. Still, some differences are identified, with especially the economic dimension having higher density on an around level 4, but reaching its peak density, and dropping off in density earlier than the environmental and social

dimensions. The means may represent this, with the economic dimension averaging on 4.65, lower than both the environmental and social dimensions on 4.93 and 4.88 respectively.
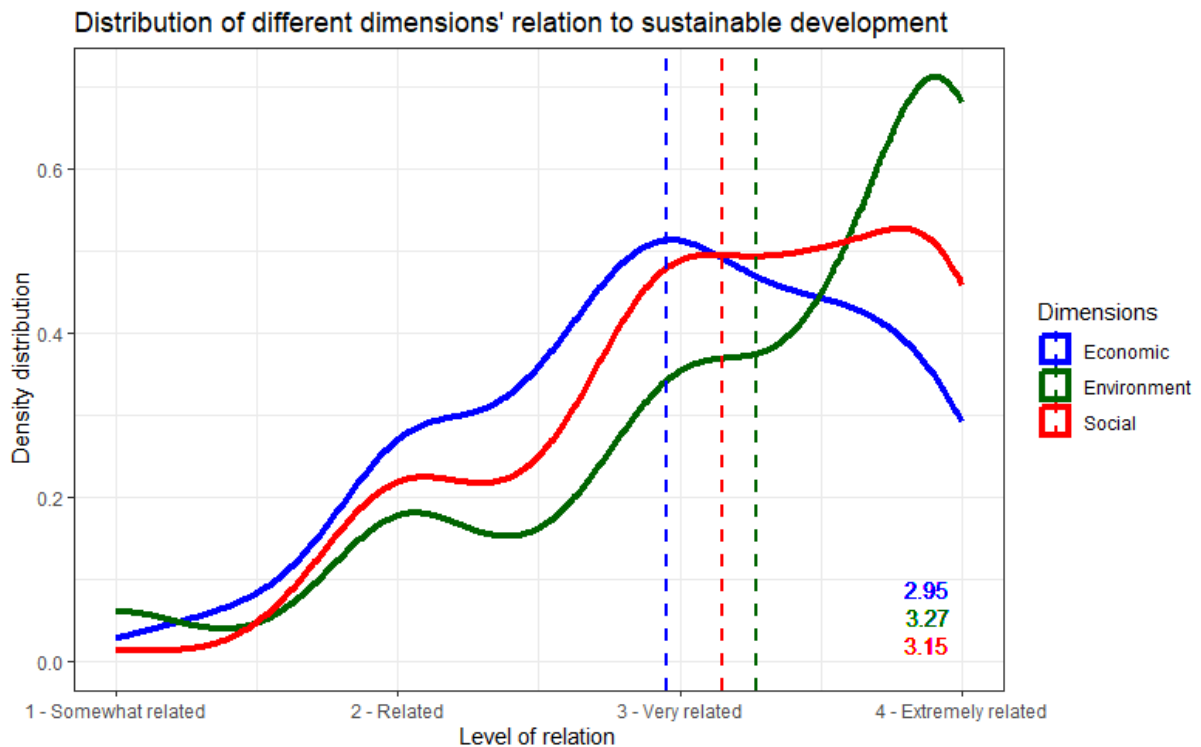


*Figure 19: Different dimensions relation to sustainable development. Environmental mean: 3.27. Economic mean: 2.95. Social mean: 3.15.*

To get insight in how students conceptualize the sustainable development concept, a last set of composite scores was created (see Table 1 and Table 4, page 34). Students were asked to set a "level of relation" to several statements fitting within one or more dimensions. Figure 19 show the density distribution from these composite scores. Note that a "0 – not related" category received no respondents and is therefore not shown in the figure.

From the figure, one can identify that only a few students thought aspects from every dimension were "somewhat related" to SD. More students see aspects from each dimension to be "related" to SD, while another increase is shown to the "very related" category. Here, fewer students feel environmental aspects are "very related", compared to economic and social aspects. However, the environmental aspects are shown to be "extremely related" by more students compared to the other dimensions, with the economic dimension seeing the lowest density among all three dimensions.

For the means, the environmental dimension has the highest mean value of 3.27, while the social and economic dimension has a mean value of 3.15 and 2.95 respectively. These results

may indicate that the environmental dimensions are most related to students' conceptualization of sustainable development, compared to the social and economic dimensions.

## 4.2 T-tests

In preparation for the *t* tests, variables were recoded and placed in to two categories, thus enabling *t* tests to be run. *T* tests were run to investigates topics related to the research questions, with reported knowledge, dimension emphasis and dimension relation being the main areas of investigations for this part of the analysis. In total, eight sets of *t* tests were run, where two aimed to investigate knowledge, three aimed to investigate dimension emphasis, and three aimed to investigate dimension relations and conceptualizations to sustainable development.

All eight sets were tested on several variables, with age, gender, study field, university, number of semesters, funding, perceived social class, current climate satisfaction, current social satisfaction, current economic situation, and SD as part of a course, were included on all sets of tests. A variable on familiarity on the SDGs was included on all sets of tests, except on the set of tests investigating exactly this variable – being a part of the knowledge area. Additionally, variables on whether students had heard of SD, and their reported knowledge on SD was included on all sets of tests, except on the set investigating the latter (reported knowledge on SD) – being a part of the knowledge area.

Thus, the variables being tested for the knowledge area are 1) reported knowledge on SD, and 2) familiarity with the SDGs. For investigating dimension emphasis, all variables were tested on 1) emphasis on the environmental dimension, 2) emphasis on the social dimension, and 3) emphasis on the economic dimension. These represent composite scores, presented in Table 1 and Table 3 (page 34). To investigate dimension relation of sustainable development (SD), variables were tested on 1) environmental relation to SD, 2) social relation to SD, and 3) economic relation to SD. These represent composite scores, presented in Table 1 and Table 4 (page 34).

Some of the variables included in the sets of *t* tests needed to be recoded for the tests to investigate differences in mean values for two samples. For the "Age" variable, respondents were split into under 21 years old and 21 years or older. For "Gender", respondents were categorized into male and female. "Study field" is recoded into those who study social sciences and those who studies within anything else. For "University", the two categories were UGM and others, similar to Figure 7. "Number of semesters" are split into those having studied for

less than six semesters, and those having studied for six or more semesters. For "study funding", respondents are split into those who get help from family, and those who have any other financial method. For "Perceived social class", those perceived in the lower class or lower middle class were placed in one category, and any social class above in another – with those not preferring to say being recoded to "NA" and therefore not included. For current environmental, social, and economic satisfaction, respondents were split into those being placed lower than satisfaction level 2, and those at level 2 or above. Whether students have had sustainable development as part of one or several courses, where categories into yes and no, where no represents students report that SD has not been a part of any course. "Familiarity with SDGs" placed those not familiar in one category, on those knowing the basics or more into another category. For "reported knowledge on SD", those reporting any level above basics were given one category, while reported knowledge levels at basics or below were given the other. Results from all sets of *t*-test are shown in Table 5, Table 6, and Table 7

### 4.2.1 Knowledge on Sustainable Development and the SDGs

**Knowledge Domain**

| Variable | Age | Gender | University | Study field | Number of semesters | Funding source | Perceived social class | Current environmental satisfaction | Current social satisfaction | Current economic satisfaction | SD part of course | Heard of SD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group1 | Under 21 years | Females | Other | Not social sciences | 6 or more semesters | No help from parents/familiy | Middle class or above | Satisfaction lever 2 or higher | Satisfaction lever 2 or higher | Satisfaction lever 2 or higher | Yes | Yes |
| Group2 | 21 yars or older | Males | UGM | Social sciences | Under 6 semesters | Help from parents/family | Low middle, and lower class | Under satisfaction level 2 | Under satisfaction level 2 | Under satisfaction level 2 | No | No |
| **Reported Knowledge on SD** | | | | | | | | | | | | |
| Mean (group 1) | 2.22 | 2.24 | 1.72 | 2.18 | 2.11 | 2.29 | 2.16 | 2.28 | 2.19 | 2.22 | 2.24 | |
| Mean (group 2) | 2.13 | 2.13 | 2.22 | 2.16 | 2.22 | 2.09 | 2.18 | 2.07 | 2.06 | 2.00 | 1.79 | |
| Difference | 0.09 | 0.11 | -0.50 | 0.02 | -0.11 | 0.20 | -0.02 | 0.21 | 0.13 | 0.22 | 0.45 | |
| t | 0.67 | 0.99 | -3.44 | 0.16 | -0.93 | 1.73 | -0.13 | 1.91 | 1.08 | 2.03 | 3.75 | |
| df | 53.90 | 89.55 | 23.62 | 54.55 | 98.22 | 81.62 | 54.30 | 117.72 | 64.27 | 83.33 | 40.43 | |
| p-value | 0.51 | 0.327 | **0.002*** | 0.88 | 0.356 | 0.09 | 0.90 | 0.059 | 0.283 | **0.045*** | **0.001*** | |
| | | | | | | | | | | | | |
| **Reported Familiarity with SDGs** | | | | | | | | | | | | |
| Mean (group 1) | 1.36 | 1.57 | 0.88 | 1.37 | 1.40 | 1.55 | 1.48 | 1.53 | 1.44 | 1.48 | 1.56 | 1.50 |
| Mean (group 2) | 1.44 | 1.34 | 1.55 | 1.47 | 1.44 | 1.36 | 1.33 | 1.34 | 1.36 | 1.26 | 0.93 | 0.33 |
| Difference | -0.08 | 0.23 | -0.67 | -0.10 | -0.04 | 0.19 | 0.15 | 0.19 | 0.08 | 0.22 | 0.63 | 1.17 |
| t | -0.68 | 2.15 | -4.18 | -0.92 | -0.35 | 1.68 | 1.19 | 1.78 | 0.60 | 1.99 | 5.19 | -6.68 |
| df | 65.00 | 102.51 | 30.63 | 74.94 | 120.98 | 91.39 | 64.67 | 132.20 | 56.67 | 74.18 | 45.89 | 9.49 |
| p-value | 0.50 | **0.034*** | **0.00*** | 0.36 | 0.73 | 0.96 | 0.24 | 0.078 | 0.55 | 0.0503 | **0.00*** | **0.00*** |

*Table 5: T-test results from the "reported knowledge on SD" and "reported familiarity with SDGs" variables in the knowledge domain. Significant results were found in terms of Gender, University, Current economic satisfaction, SD as part of course, and whether students had heard of SD.*

For the investigation of the knowledge domain, two sets of tests were run – one set focused on how different groups reported their knowledge-levels on sustainable development, the other on their reported familiarity with the sustainable development goals (SDGs). Both results are presented in Table 5. The former has responses in the range from 0-4, where 0 is "barely heard of it", 2 is "Basics", and 4 is "expert" level. The total mean is 2.16 for all 127 respondents. 9 respondents reported not to have heard of sustainable development and were not asked this question. Results from the *t*-tests suggest that no significant difference in means is found between females and males, nor between those under 21 years and those 21 years or above for age. However, a difference in means between other universities (M=1.72) and UGM (M=2.22) was found to be significant: t(23.62) = -3.44, p = .002. Thus, there are a very low probability that the differences seen in knowledge means between those studying at UGM and those that do not is a coincidence. The result suggests higher knowledge levels among those studying at UGM. No significant results were found from t-tests investigating groups related to study field, number of semesters, funding, perceived social class, current environmental or social satisfaction. For current economic satisfaction, however, significance in the mean difference between the group in level 2 or higher (M=2.22) and the group below level 2 (M=2.00); t(83.33) = 2.03, p = .045 was found, showing a higher mean in reported knowledge among those more satisfied with their economic situation. In addition, significant differences in means were shown between those who have had sustainable development as part of one or more courses (M=2.24) and those who did not (M=1,79); t(40.43) = 3.75, p = .001, meaning those that had SD in one or more courses reported higher knowledge levels on the concept.

Investigating reported familiarity with the SDGs, responses had the range of 0-2, where 0 represents "no familiarity", 1 represents "familiar with the basics", and 2 represents "Knowing several of the SDGs". Results suggest no differences in means between those under 21 years and those 21 years or older. Females (M=1.57) and Males (M=1.34) had a significant t(102.51) = 2.15, p = 0.034 difference in their reported familiarity with the SDGs, in favor of the females. Similar to reported knowledge, a significant difference in means were identified based on university, between non-UGM students (M=0.88) and UGM students (M=1.55); t(30.63) = -4.18, p = 0.00, suggesting UGM students to be more familiar with the SDGs. No significant differences in means between groups of study fields, number of semesters, financial methods, perceived social class, nor current environmental, social, and economic satisfaction were identified. Between those having SD as a part of one or more courses (M=1.56) and those that did not (M=0.93), there were significant results for the means t(45.89) = 5.19, p = 0.00. Students

having heard of SD (M=1.5) and students not having heard of SD (M=0.33) were also significant on the means; t(9.49) = -6.68, p = 0.00. These results suggest that those having had SD as part of one or more course, or those having heard SD, reports significantly higher means on familiarity with the SDGs compared to those not having SD in a course or having heard of SD.

### 4.2.2 Emphasis on Different Dimensions of Sustainable Development

**Emphasis**

| Variable | Age | Gender | University | Study field | Number of semesters | Funding source | Perceived social class | Current environmental satisfaction | Current social satisfaction | Current economic satisfaction | SD part of course | Heard of SD | SDG familiarity | Reported knowledge on SD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group1 | Under 21 years | Females | Other | Not social sciences | 6 or more semesters | No help from parents/family | Middle class or above | Satisfaction lever 2 or higher | Satisfaction lever 2 or higher | Satisfaction lever 2 or higher | Yes | Yes | Yes | Basic level or below |
| Group2 | 21 yars or older | Males | UGM | Social sciences | Under 6 semesters | Help from parents/family | Low middle, and lower | Under satisfaction level 2 | Under satisfaction level 2 | Under satisfaction level 2 | No | No | No | More than basics |
| **Emphasis on environmental** | | | | | | | | | | | | | | |
| Mean (group 1) | 4.70 | 4.96 | 4.55 | 4.62 | 5.07 | 4.92 | 4.88 | 4.64 | 4.87 | 4.87 | 4.96 | 4.95 | 4.95 | 4.91 |
| Mean (group 2) | 5.02 | 4.90 | 5.02 | 5.10 | 4.75 | 4.93 | 5.15 | 5.15 | 5.10 | 5.08 | 4.81 | 4.67 | 4.64 | 5.06 |
| Difference | -0.32 | 0.06 | -0.47 | -0.48 | 0.32 | -0.01 | -0.27 | -0.51 | -0.23 | -0.21 | 0.15 | 0.28 | 0.31 | -0.15 |
| t | -1.05 | 0.25 | -1.37 | -1.65 | 1.20 | -0.06 | -1.02 | -1.95 | -1.05 | -0.83 | 0.54 | -0.66 | 0.76 | -0.43 |
| df | 57.43 | 82.62 | 34.73 | 61.07 | 92.16 | 83.60 | 84.53 | 100.23 | 91.25 | 81.76 | 49.00 | 9.75 | 11.10 | 41.45 |
| p-value | 0.30 | 0.80 | 0.18 | 0.10 | 0.23 | 0.95 | 0.31 | 0.05 | 0.30 | 0.41 | 0.59 | 0.52 | 0.47 | 0.67 |
| **Emphasis on social** | | | | | | | | | | | | | | |
| Mean (group 1) | 4.65 | 4.88 | 4.46 | 4.55 | 4.98 | 4.83 | 4.82 | 4.63 | 4.80 | 4.80 | 4.94 | 4.90 | 4.90 | 4.88 |
| Mean (group 2) | 4.97 | 4.87 | 4.98 | 5.06 | 4.65 | 4.91 | 5.14 | 5.07 | 5.14 | 5.11 | 4.68 | 4.69 | 4.63 | 4.96 |
| Difference | -0.32 | 0.01 | -0.52 | -0.51 | 0.33 | -0.08 | -0.32 | -0.44 | -0.34 | -0.31 | 0.26 | 0.21 | 0.27 | -0.08 |
| t | -1.12 | 0.05 | -1.58 | -1.88 | 0.92 | -0.34 | -1.33 | -1.82 | -1.66 | -1.35 | 0.92 | -0.51 | 0.70 | -0.26 |
| df | 56.01 | 83.80 | 33.37 | 58.39 | 91.35 | 83.55 | 87.91 | 96.11 | 95.43 | 81.41 | 46.84 | 9.55 | 11.10 | 40.91 |
| p-value | 0.27 | 0.96 | 0.12 | 0.065 | 0.36 | 0.74 | 0.19 | 0.07 | 0.10 | 0.18 | 0.36 | 0.62 | 0.50 | 0.79 |
| **Emphasis on economic** | | | | | | | | | | | | | | |
| Mean (group 1) | 4.56 | 4.63 | 4.40 | 4.43 | 4.75 | 4.67 | 4.62 | 4.49 | 4.62 | 4.64 | 4.67 | 4.66 | 4.68 | 4.62 |
| Mean (group 2) | 4.69 | 4.65 | 4.71 | 4.78 | 5.53 | 4.64 | 4.75 | 4.78 | 4.77 | 4.67 | 4.59 | 4.50 | 4.35 | 4.79 |
| Difference | -0.13 | -0.02 | -0.31 | -0.35 | -0.78 | 0.03 | -0.13 | -0.29 | -0.15 | -0.03 | 0.08 | 0.16 | 0.33 | -0.17 |
| t | -0.47 | -0.09 | -0.93 | -1.29 | 0.92 | 0.11 | -0.51 | -1.19 | -0.67 | -0.12 | 0.29 | -0.45 | 0.83 | -0.55 |
| df | 56.92 | 82.40 | 33.27 | 60.72 | 93.59 | 83.80 | 73.82 | 105.33 | 79.84 | 79.37 | 47.63 | 10.07 | 10.95 | 43.45 |
| p-value | 0.64 | 0.93 | 0.36 | 0.20 | 0.36 | 0.91 | 0.61 | 0.24 | 0.50 | 0.91 | 0.78 | 0.66 | 0.42 | 0.59 |

*Table 6: T-test results from the environmental, social, and economic emphasis to sustainable development. No significant results were found between the means of two different groups across all variables.*

Table 6 shows sets of *t*-tests conducted to investigate mean differences on emphasis on different dimensions of the sustainable development concept. All included variables were tested for each dimension. There were found no significant results from the conducted *t*-tests across all three dimensions. In other words, no significant differences in means between two groups for every variable were found. These results suggest that the existing differences in means observed for groups in all variables - could be a coincidence.

Thus, students under 21 years and 21 years or older, do not significantly differ in their emphasis on any dimension of sustainable development between them in terms of mean values. Likewise,

females do not differ from males, UGM students do not differ with students from other universities, and their study field or number of semesters studied do not provide significant differences for the mean values. Students being helped by family or students perceived to come from lower social classes, do not significantly differ from those not being helped by family or those coming from medium or higher social classes, respectively. Whether students are placed lower than level 2 or in level 2 and above for current environmental, social, and economic satisfaction, do not significantly differ for emphasis means. Similarly, no significant differences in mean were found between students reporting having had SD as a part of one or more courses and students that did not, students having heard of SD and students that had not, nor between students being familiar with the SDGs those not being familiar, across all dimensions. In addition, no significant differences were seen between students reporting basic or below knowledge level on SD compared to those reporting a higher knowledge level. The results may suggest very similar dimension emphasis across all groups for every dimension, as well as finding all dimension to be important for achieving sustainable development.

### 4.2.3  Dimensions' Relation to Sustainable Development

**Dimensions' relation to SD**

| Variable | Age | Gender | University | Study field | Number of semesters | Funding source | Perceived social class | Current environmental satisfaction | Current social satisfaction | Current economic satisfaction | SD part of course | Heard of SD | SDG familiarity | Reported knowledge on SD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group1 | Under 21 years | Females | Other | Not social sciences | 6 or more semesters | No help from parents/family | Middle class or above | Satisfaction lever 2 or higher | Satisfaction lever 2 or higher | Satisfaction lever 2 or higher | Yes | Yes | Yes | Basic level or below |
| Group2 | 21 yars or older | Males | UGM | Social sciences | Under 6 semesters | Help from parents/family | Low middle, and lower class | Under satisfaction level 2 | Under satisfaction level 2 | Under satisfaction level 2 | No | No | No | More than basics |
| **Environmental relation** | | | | | | | | | | | | | | |
| Mean (group 1) | 3.03 | 3.42 | 3.12 | 3.09 | 3.31 | 3.51 | 3.34 | 3.28 | 3.35 | 3.32 | 2.37 | 3.28 | 3.28 | 3.19 |
| Mean (group 2) | 3.37 | 3.19 | 3.31 | 3.34 | 3.23 | 3.16 | 3.25 | 3.27 | 3.02 | 3.15 | 3.29 | 3.25 | 3.18 | 3.54 |
| Difference | -0.34 | 0.23 | -0.19 | -0.25 | 0.08 | 0.35 | 0.09 | 0.01 | 0.33 | 0.17 | -0.92 | 0.03 | 0.10 | -0.35 |
| $t$ | -2.07 | 1.69 | -1.13 | -1.51 | 0.51 | 2.78 | 0.49 | 0.02 | 2.00 | 1.04 | -0.14 | -0.13 | 0.42 | -2.33 |
| df | 57.12 | 113.03 | 38.42 | 64.09 | 121.17 | 121.19 | 53.55 | 130.87 | 51.23 | 56.89 | 48.31 | 10.50 | 10.65 | 61.12 |
| p-value | **0.043*** | 0.09 | 0.27 | 0.14 | 0.61 | **0.006*** | 0.63 | 0.98 | 0.0501 | 0.30 | 0.89 | 0.90 | 0.68 | **0.02*** |
| **Social relation** | | | | | | | | | | | | | | |
| Mean (group 1) | 2.96 | 3.20 | 2.83 | 3.00 | 3.12 | 3.26 | 3.20 | 3.19 | 3.16 | 3.12 | 3.17 | 3.17 | 3.19 | 3.10 |
| Mean (group 2) | 3.23 | 3.13 | 3.23 | 3.22 | 3.20 | 3.10 | 3.18 | 3.13 | 3.13 | 3.25 | 3.08 | 2.98 | 2.68 | 3.36 |
| Difference | -0.27 | 0.07 | -0.40 | -0.22 | -0.08 | 0.16 | 0.02 | 0.06 | 0.03 | -0.13 | 0.09 | 0.19 | 0.51 | -0.26 |
| $t$ | -1.90 | 0.55 | -2.39 | -1.57 | -0.59 | 1.30 | 0.19 | 0.49 | 0.25 | -0.99 | 0.72 | -0.98 | 2.41 | -1.87 |
| df | 57.68 | 86.37 | 33.33 | 62.94 | 114.80 | 95.45 | 69.22 | 124.73 | 55.72 | 69.80 | 54.30 | 9.99 | 10.69 | 53.36 |
| p-value | 0.06 | 0.59 | **0.02*** | 0.12 | 0.56 | 0.20 | 0.85 | 0.62 | 0.80 | 0.32 | 0.47 | 0.45 | **0.03*** | 0.07 |
| **Economic relation** | | | | | | | | | | | | | | |
| Mean (group 1) | 2.85 | 3.02 | 2.65 | 2.84 | 2.90 | 3.07 | 3.02 | 3.05 | 2.97 | 2.95 | 2.98 | 2.96 | 3.00 | 2.88 |
| Mean (group 2) | 3.00 | 2.92 | 3.03 | 3.00 | 3.03 | 2.90 | 2.92 | 2.88 | 3.90 | 2.96 | 2.87 | 2.82 | 2.44 | 3.23 |
| Difference | -0.15 | 0.10 | -0.38 | -0.16 | -0.13 | 0.17 | 0.10 | 0.17 | -0.93 | -0.01 | 0.11 | 0.14 | 0.56 | -0.35 |
| $t$ | -1.05 | 0.78 | -2.29 | -1.06 | -1.03 | 1.38 | 0.67 | 1.45 | 0.51 | -0.05 | 0.74 | -0.65 | 2.60 | -2.46 |
| df | 60.25 | 92.83 | 34.24 | 62.13 | 117.04 | 99.37 | 64.85 | 127.05 | 59.71 | 68.15 | 49.26 | 9.57 | 10.75 | 49.92 |
| p-value | 0.30 | 0.43 | **0.028*** | 0.29 | 0.303 | 0.17 | 0.51 | 0.148 | 0.62 | 0.96 | 0.47 | 0.53 | **0.0249*** | **0.017*** |

*Table 7:  T-test results from the environmental, social, and economic dimensions' relation to the sustainable development concept. There were significant results for Age, University, Financial method for studying, SDG familiarity, and Reported Knowledge on SD.*

*Environmental relation to sustainable development*

The last sets of *t*-tests investigate how students conceptualize the sustainable development concept by studying the environmental, social, and economic dimension's relation to the concept. One set of tests was run for each dimension, testing groups for all selected variables. A mean difference for age, comparing students under 21 years (M=3.03) and students 21 years or older (M=3.37) was found significant; $t(57.12) = -2.07$, $p = 0.043$, suggesting that the older group interpret the environmental dimension to be more related to sustainable development compared to the younger group. Additionally, there was found significant differences in the means between students funding their studies without help from family (M=3.51), compared to the groups being helped by family (M=3.16); $t(121.19) = 2.78$, $p = 0.006$. This result suggests that students receiving financial help from their families, interpret the environmental dimension to be significantly less related to sustainable development compared to their counterparts. The last significant results for the environmental dimension were found for mean differences in students' reported knowledge on the SD concept, between the group reporting basic levels or below (M=3.19) and the group reporting above basic levels (M=3.54); $t(61.12) = -2.33$, $p = 0.02$. Suggesting the group reporting higher knowledge levels to have environmental aspects more related to sustainable development than the group reporting lower knowledge levels.

No significant differences in means were found between groups for the variables gender, university, study field, number of semesters, perceived social class, nor for variables on current environment-, social-, or economic satisfaction. Whether SD had been a part of one or more courses, whether students had heard of SD, nor whether students were familiar with the SDGs or not, did not produce significant results.

*Social relation to sustainable development*

For the social dimension, significant differences were found between students not attending UGM (M=2.83) and the groups attending UGM (M=2.32); $t(33.33) = -2.39$, $p = 0.02$. Thus, UGM students interpret social dimension as more related to sustainable development compared to non-UGM students. The *t*-tests did also find significant differences in means between the group being familiar with the SDGs (M=3.19) and the group not being familiar (M=2.68); $t(10.69) = 2.41$, $p = 0.03$, suggesting the group being familiar with the SDGs to interpret social aspects more related to sustainable development compared to those not familiar with the SDGs.

No significant differences in means were found between groups for the variables age, gender, study field, number of semesters studied, financial method for studying, perceived social class, nor for current environmental-, social-, or economic satisfaction. Whether SD had been part of

one or more courses or not, whether students had heard of SD or not, as well as their reported knowledge on the concept, did not produce any significant results.

*Economic relation to sustainable development*

Similar to the social dimension, significant differences in means were found between non-UGM students (M=3.65) and UGM students (M=3.03) for the economic dimension; $t(34.24) = -2.29$, $p = 0.028$. Here, the result suggests UGM students to have economic aspects less related to SD compared to non-UGM students. Difference in mean values between students being familiar with the SDGs (M=3.00) and those not familiar (M=2.44), as well as students reporting basic or lower (2.88) and those reporting above basic (M=3.23) knowledge levels, were both found significant; $t(10.75) = 2.60$, $p = 0.0249$, and $t(49.92) = -2.46$, $p = 0.017$, respectively. These results suggest students being familiar with the SDGs and the group reporting higher knowledge levels, to interpret economic aspects more related to sustainable development compared with their counterparts.

No significant differences in means were found between groups for the variables age, gender, study field, number of semesters studied, financial method for studying, perceived social class, nor for current environmental-, social, - or economic satisfaction. Whether SD had been a part of one or more courses or not, as well as whether students had heard of SD or not, did not produce significant results.

## 4.3 Regression Analyses

For further investigations on the impacts to knowledge, emphasis and relation to SD and its dimensions, several regression analyses were conducted. As with the *t*-tests, eight variables were tested across all three areas of knowledge, emphasis, and relation. In the regression analyses, these eight variables are described as the *dependent variable*. For the knowledge area, reported knowledge and familiarity with the SDGs (SDG familiarity) were dependent variables. For the dimensions' emphasis and relation areas, dependent variables investigated were environmental, social, and economic emphasis and relation, respectively.

Not all *independent variables* visible in the *t*-test were included to the regression analyses. What university one attends, study field, funding for studying, social class, and whether one have heard of sustainable development, were all variables not included for the regressions. This is mainly reasoned with the variables being categorical data, which is difficult or impossible to rank in a reasonable order. For example, if someone studies social sciences, natural sciences,

or economics, cannot be put in order. The variable related to social class was excluded because a total of 17 respondents preferred not to answer on this matter. Including social class would create poorer regression models because of the number of observations would decrease. Independent variables included are age, gender, number of semesters, current environmental-, social-, and economic satisfaction, whether SD have been a part of course. Familiarity with SDG and reported knowledge on SD were also included for the dimensions' emphasis and relation areas.

Two regression models were created for each of the eight dependent variables. One including all independent variables as mentioned. The second attempting to create a better overall model, including only independent variables found to be of significance in single regression analyses. All regressions including the independent variable gender, have one less observation, because one respondent neither identified as male nor female.

### 4.3.1 Regression Results: Knowledge on Sustainable Development

| | Knowledge domain | |
|---|---|---|
| | Knowledge | SDG familiarity |
| | (1) | (2) |
| Age | 0.107 | 0.055 |
| | (0.120) | (0.098) |
| Gender | −0.165 | −0.151 |
| | (0.128) | (0.105) |
| Num. Semesters | −0.034 | −0.010 |
| | (0.023) | (0.019) |
| Environmental satisfaction | −0.266* | −0.156 |
| | (0.122) | (0.099) |
| Social satisfaction | 0.014 | −0.089 |
| | (0.164) | (0.134) |
| Economic satisfaction | 0.305 | 0.322* |
| | (0.198) | (0.162) |
| SD as part of course | 0.399** | 0.258** |
| | (0.064) | (0.052) |
| Constant | 1.439** | 0.952** |
| | (0.290) | (0.237) |
| Observations | 135 | 135 |
| $R^2$ | 0.302 | 0.236 |
| Adjusted $R^2$ | 0.263 | 0.194 |
| Residual Std. Error (df = 127) | 0.691 | 0.564 |
| F Statistic (df = 7; 127) | 7.845** | 5.597** |
| Note: | | *$p<0.05$; **$p<0.01$; ***$p<[0.***]$ |

| | Improved, Knowledge domain | |
|---|---|---|
| | Knowledge | SDG familiarity |
| | (1) | (2) |
| Gender | | −0.163 |
| | | (0.104) |
| Economic satisfaction | 0.111 | 0.107 |
| | (0.092) | (0.075) |
| SD as part of course | 0.389** | 0.254** |
| | (0.064) | (0.051) |
| Constant | 1.224** | 0.938** |
| | (0.214) | (0.198) |
| Observations | 136 | 135 |
| $R^2$ | 0.243 | 0.214 |
| Adjusted $R^2$ | 0.231 | 0.196 |
| Residual Std. Error | 0.708 (df = 133) | 0.564 (df = 131) |
| F Statistic | 21.314** (df = 2; 133) | 11.865** (df = 3; 131) |
| Note: | | *$p<0.05$; **$p<0.01$; ***$p<[0.***]$ |

*Table 8:(left) Regression table on knowledge, all independent variables included.*

*Table 9: (right) Regression table on knowledge, improved model.*

Results from the initial regressions on the knowledge domain is presented in Table 8, including all independent variables. For the first analysis, focusing on knowledge, significant

relationships were found for both "environmental satisfaction" and "SD as part of course". Both have p-values less than 0.05, which is the threshold for this thesis. The negative beta coefficient ($\beta$) for the environmental satisfaction (-0.266) indicates that the knowledge level decreases when the environmental satisfaction increase. In addition, a significant positive relationship is identified for the "SD as part of course" variable ($\beta=0.399$), indicating increasing knowledge-levels when there is an increase in attended courses having sustainable development as part of it. No significant relationships to the knowledge-level were found from age, gender, number of semesters, nor social or economic satisfaction. Investigating SDG familiarity, a significant positive relationship was found regarding economic satisfaction ($\beta=0.322$), suggesting SDG familiarity to increase along with increased economic satisfaction. "SD as part of course" ($\beta=0.258$) was also found significant, where an increase suggests higher SDG familiarity.

Improved models based on whether the included variables were significant when running single linear regressions is presented in Table 9. Focusing on knowledge, only "SD as part of course" ($\beta=389$) was found significant. However, the adjusted $R^2$, indicating the overall explanation proportion for the model adjusted for the number of variables, is lower in the improved model (adjusted $R^2= 0.231$) compared to the initial model (adjusted $R^2= 0.263$). This suggests that the initial model better explains "Knowledge", with the independent variables a total of 26.3% of the knowledge variable. For SDG familiarity, "SD as part of course" ($\beta=0.254$) did also stand out as the only significant variable, again with a positive relationship. Based on adjusted $R^2$, the improved model was slightly better for SDG familiarity. Neither of the models found significant relations for other variables, suggesting "SD as part of course" to be the superior explanatory factor.

## 4.3.2 Regression Results: Dimensions' Emphasis on Sustainable Development

| | Emphasis on different dimensions | | |
|---|---|---|---|
| | Environment | Social | Economic |
| | (1) | (2) | (3) |
| Age | 0.279 | 0.253 | 0.186 |
| | (0.248) | (0.229) | (0.231) |
| Gender | −0.068 | −0.012 | 0.084 |
| | (0.267) | (0.246) | (0.248) |
| Num. Semesters | 0.029 | 0.028 | 0.013 |
| | (0.049) | (0.045) | (0.045) |
| Environmental satisfaction | −0.653* | −0.593* | −0.541* |
| | (0.256) | (0.236) | (0.238) |
| Social satisfaction | 0.130 | 0.050 | −0.076 |
| | (0.340) | (0.314) | (0.317) |
| Economic satisfaction | 0.207 | 0.192 | 0.474 |
| | (0.415) | (0.383) | (0.386) |
| SD as part of course | −0.012 | −0.026 | −0.070 |
| | (0.151) | (0.140) | (0.141) |
| Knowledge | 0.080 | 0.027 | 0.099 |
| | (0.222) | (0.205) | (0.207) |
| SDG familiarity | 0.192 | 0.278 | 0.195 |
| | (0.272) | (0.251) | (0.253) |
| Constant | 4.555** | 4.617** | 4.088** |
| | (0.659) | (0.608) | (0.613) |
| Observations | 135 | 135 | 135 |
| $R^2$ | 0.098 | 0.106 | 0.075 |
| Adjusted $R^2$ | 0.033 | 0.041 | 0.008 |
| Residual Std. Error (df = 125) | 1.426 | 1.316 | 1.327 |
| F Statistic (df = 9; 125) | 1.507 | 1.641 | 1.125 |
| Note: | | | $^*p<0.05$; $^{**}p<0.01$; $^{***}p<[0.^{***}]$ |

| | Improved, Emphasis on different dimension | | |
|---|---|---|---|
| | Environment | Social | Economic |
| | (1) | (2) | (3) |
| Environmental satisfaction | −0.416** | −0.418** | −0.270 |
| | (0.157) | (0.145) | (0.147) |
| Constant | 5.663** | 5.619** | 5.129** |
| | (0.303) | (0.279) | (0.282) |
| Observations | 136 | 136 | 136 |
| $R^2$ | 0.050 | 0.058 | 0.025 |
| Adjusted $R^2$ | 0.043 | 0.051 | 0.017 |
| Residual Std. Error (df = 134) | 1.416 | 1.307 | 1.321 |
| F Statistic (df = 1; 134) | 7.005** | 8.301** | 3.401 |
| Note: | | | $^*p<0.05$; $^{**}p<0.01$; $^{***}p<[0.^{***}]$ |

*Table 10: (left) Regression table on SD dimension emphasis, all independent variables included.*

*Table 11: (right) Regression table on SD dimension emphasis, improved model.*

Analysis SD dimensions' emphasis with all included variables is presented in Table 10. Related to all dimensions (environmental, social, and economic), the only significant relationship was found with the environment satisfaction variable, (β=-0.653), (β=-0.593), and (β=-0.541) for the environment, social, and economic dimension respectively. The results suggest that the emphasis for all dimensions (environmental, social, and economic) decreases when the environmental satisfaction increases. No other independent variables were found significant.

Improved models seen in Table 11, with slightly improved adjusted $R^2$ only found significant relationships with the environmental satisfaction for the emphasis on the environmental and the social dimension, (β=-0.416), (β=-0.418), respectively. The improved model did not provide a

significant relationship result for the economic dimension, as for the initial model. However, both the initial and the improved models report relatively weak adjusted $R^2$ values. Thus, most explaining factors is not covered by the models.

### 4.3.3 Regression Results: Dimensions' Relation to Sustainable Development

| | Dimension relation to SD | | |
| --- | --- | --- | --- |
| | Environment | Social | Economic |
| | (1) | (2) | (3) |
| Age | 0.130 (0.135) | 0.147 (0.118) | 0.103 (0.118) |
| Gender | −0.123 (0.146) | 0.036 (0.127) | 0.038 (0.127) |
| Num. Semesters | 0.001 (0.027) | −0.002 (0.023) | −0.008 (0.023) |
| Environmental satisfaction | −0.091 (0.140) | −0.057 (0.121) | −0.053 (0.122) |
| Social satisfaction | 0.289 (0.186) | 0.009 (0.161) | −0.102 (0.162) |
| Economic satisfaction | 0.097 (0.227) | 0.217 (0.197) | 0.420* (0.197) |
| SD as part of course | −0.067 (0.083) | −0.014 (0.072) | −0.028 (0.072) |
| Knowledge | 0.030 (0.121) | 0.051 (0.105) | 0.141 (0.106) |
| SDG familiarity | 0.234 (0.149) | 0.202 (0.129) | 0.081 (0.129) |
| Constant | 2.209** (0.360) | 2.258** (0.313) | 1.947** (0.314) |
| Observations | 135 | 135 | 135 |
| $R^2$ | 0.138 | 0.109 | 0.146 |
| Adjusted $R^2$ | 0.076 | 0.044 | 0.085 |
| Residual Std. Error (df = 125) | 0.779 | 0.676 | 0.679 |
| F Statistic (df = 9; 125) | 2.217* | 1.692 | 2.378* |
| Note: | | | *p<0.05; **p<0.01; ***p<[0.***] |

| | Improved, Dimension relation to SD | | |
| --- | --- | --- | --- |
| | Environment | Social | Economic |
| | (1) | (2) | (3) |
| Environmental satisfaction | | | −0.059 (0.117) |
| Social satisfaction | 0.263 (0.181) | | −0.110 (0.158) |
| Economic satisfaction | 0.046 (0.189) | 0.169 (0.087) | 0.426* (0.193) |
| Knowledge | | 0.043 (0.096) | 0.125 (0.097) |
| SDG familiarity | 0.235* (0.109) | 0.200 (0.125) | 0.072 (0.126) |
| Constant | 2.222** (0.267) | 2.412** (0.226) | 2.032** (0.242) |
| Observations | 136 | 136 | 136 |
| $R^2$ | 0.112 | 0.091 | 0.136 |
| Adjusted $R^2$ | 0.092 | 0.070 | 0.103 |
| Residual Std. Error | 0.770 (df = 132) | 0.666 (df = 132) | 0.670 (df = 130) |
| F Statistic | 5.557** (df = 3; 132) | 4.403** (df = 3; 132) | 4.107** (df = 5; 130) |
| Note: | | | *p<0.05; **p<0.01; ***p<[0.***] |

Table 12: (left) Regression table on dimension relation to SD, all independent variables included.

Table 13: (right) Regression table on dimension relation to SD, improved model.

Investigating how elements from the environmental, social, economic dimension are related to the sustainable development concept, initial regression models are presented in Table 12. Across all dimensions and all independent variables, only one significant relationship was found. A positive relationship between economic satisfaction and the economic dimension's relation to SD (β=0.420). This result suggests that when one's economic satisfaction increases, one perceive aspects from the economic dimension as more related to sustainable development.

The improved models in Table 13, all having marginally better adjusted R compared to their initial model counterpart, includes independent variables which appeared as significant in single linear regression analyses. For the environmental dimension's relation to sustainable development in the improved model, SDG familiarity shows a significant positive relationship

(β=0.235), suggesting that increased SDG familiarity among students, increase their environmental dimension's relation to sustainable development. None of the variables included for investigating the social dimension were found significant. For the economic dimension's relation, economic satisfaction remains a significant positive relationship (β=0.426).

# 5. Discussion

This chapter discusses the results presented in the previous chapter in light of the background and theoretical frameworks outlined in Chapter 2. Following the analytical model (Figure 3), the chapter starts with discussions on the results seen from the different domains: "Knowledge on SD", "SD dimensions emphasis", and "Dimensions relation to SD". For each domain, affects from underlying factors are compared with findings from previous studies and given tentative explanations. Later, results and discussions from these domains form further discussions on students' conceptualizations of SD regarding previous studies, the mainstream SD approach its criticism.

## 5.1 Analytical Approach

To approach students' overall conceptualizations of SD, discussed in the next section (Chapter 5.2), three domains are investigated prior to this. First, "Knowledge on SD", before "SD dimensions emphasis", and "Dimensions relation to SD" at last. Discussions on the results and underlying factors are provided.

### 5.1.1 Knowledge on SD

Based on the results, students are found to have good knowledge levels, showing both good knowledge of the SD concept and high familiarity with the SDGs, with knowledge showing a preponderance of basic-or-above levels and most students know several of the SDGs. The results are arguably improvements from Azapagic and colleagues (2005) descriptions of students' knowledge levels on SD as "not satisfactory" worldwide, despite not elaborating what "not satisfactory" mean. Limited understandings was also seen in UK (Kagawa, 2007). In 2013, Yuan and Zuo (2013) found high awareness of sustainability issues in China, where one could argue that awareness of sustainability builds on knowledge on sustainable development. A later study show that students in the UAE having high levels of understanding on both SD and ESD (Al-Naqbi & Alshannag, 2018).

Same year, a Malaysian study on chemistry learners saw relatively low percentages in students having heard of sustainable development at 34.8 percent, and only 5.3 percent having heard of the SDGs (Kanapathy et al., 2018). In my sample, over 94.4 percent had heard of SD, while 92.6 percent reported familiarity with the SDGs, thus reporting far better knowledge compared to the Malaysian study. Previous studies in Indonesia, report "good" understandings of the SD

concept and the SDGs (Novieastari et al., 2022; Titisari et al., 2020), both being relative similar results as the ones produced from this thesis.

One can identify increased SD knowledge and SDG familiarity over time from these studies, with the Malaysian study as an exception. Such a trend is not surprising, as the "Decade of Education for Sustainable Development" were to start in 2005 (United Nations, 2002, p. 62), giving the 2005 and 2007 studies little time to adjust thus finding limited understandings (Azapagic et al., 2005; Kagawa, 2007). Towards the end of this ESD decade and after being reaffirmed with the SDGs (UN Department of Economic and Social Affairs, 2015), higher understandings of the SD concept was found (Al-Naqbi & Alshannag, 2018; Novieastari et al., 2022; Titisari et al., 2020; Yuan & Zuo, 2013).

*T*-tests found significant mean differences between groups for several of the independent variables within the knowledge domain. Students attending Universitas Gadjah Mada (UGM) showed higher SD knowledge and SDG familiarity compared to students at other universities. This might suggest UGM to be more successful in their ESD implementation, which could relate to UGM being one of the universities explicitly explaining their role in achieving the SDGs (Titisari et al., 2020), and being one of the best universities in Indonesia (Topuniversities.com, 2023). The latter may influence the results by attracting the best students.

Another significant difference was found between groups with higher and lower current economic satisfaction, where the more satisfied group reported higher SD knowledge. Higher economic satisfaction may suggest better economic conditions, perhaps giving more access to knowledge on SD, more time to study, or better access to assistance and support. However, there were found no significant differences between lower and medium-high social classes, nor between students funding their studies with help from family compared to those who do not. The initial regression analysis model conducted for SDG familiarity showed similar tendencies as with SD knowledge, but it was not supported in the improved model.

Females were shown to have significantly higher familiarity with the SDGs, despite no gender differences were identified for SD knowledge. These indications are consistent with some previous findings suggesting females to have higher interest and knowledge of sustainable development (Al-Naqbi & Alshannag, 2018; Kanapathy et al., 2018). This might relate to findings suggesting females to both have higher interest in SD aspects (Björnberg et al., 2020), and being more sensitive towards sustainable development (Tuncer, 2008). Affects from gender is not one-directional, with several findings suggesting no significant relationship

(Azapagic et al., 2005; Sharma & Kelly, 2014; Yuan & Zuo, 2013), and other suggesting males to have higher knowledge-levels (Kagawa, 2007).

Unsurprisingly, students having heard of SD had higher SDG familiarity. Moreover, students having had SD included in one or more of their university courses reported higher levels of both SD knowledge and SDG familiarity. Results from regression analyses, did also prove that students attending courses with SD, report higher SD knowledge and SDG familiarity – suggesting SD related courses to be a major explanatory factor for students' knowledge of sustainable development. Perhaps being expected results, it shows that ESD implementation increase knowledge levels of SD, as is promoted by the 4.7 target of the SDGs (UN Department of Economic and Social Affairs, 2015)

In an initial model, a significant negative relationship was found between environmental satisfaction and knowledge of SD, suggesting lower knowledge as the environmental satisfaction increase. These results are difficult to interpret but may suggest students with higher knowledge of SD to be more aware of environmental challenges, thus rating their environmental satisfaction lower.

### 5.1.2  SD Dimensions Emphasis

From the results (see Figure 18), all the SD dimensions are highly emphasized among the students, thus suggesting students to perceive environmental, social, and economic aspects as important to achieve SD. This might suggest that students have, at least to some degree, obtained a broad understanding of sustainable development, as the SDG target 4.7 sets to ensure to all learners (UN Department of Economic and Social Affairs, 2015) In between them, some differences were identified. The economic dimension is found with the lowest mean value (mean=4.65), with less students strongly agreeing economic aspects to be a priority, compared to the environmental (mean=4.93) and the social (mean=4.88) dimensions, having relatively similar means and density distributions.

Extensive statistical analyses were conducted to investigate mean differences between groups, as well as relationships from regression models. No mean differences were found between groups form the *t*-tests, while one variable was found to have a significant effect on how students emphasize different dimensions in the regressions. The result suggests the higher a student view their current environmental satisfaction; the lower emphasis is shown in all SD dimensions for the initial models. For the improved model, this tendency is kept for the

environmental and social dimension. An interpretation can involve that students being satisfied with their environmental situation, for example regarding access to recycling, emphasize certain aspects of SD, or the SD as a whole, to be less important compared to students less satisfied with their environmental situation, perhaps viewing it as less stressing challenges. This finding is, however, difficult to interpret with numerous possible explanations which is beyond the scope for this thesis.

The results on how students emphasize SD dimensions, appear to be affected by underlying factors regarding background, educational, and current life situation to a small extent. Arguably then, dimensions emphasis is defined by a broad spectrum of students, suggesting students to emphasize different SD dimensions fairly similar regardless of their background, education, and current life situation – with the exception of current environmental satisfaction.

### 5.1.3   Dimensions Relation to SD

From the results and Figure 19, the environmental dimension is found to be the dimension most related to the SD concept, compared to the other dimensions. Most students place the environmental dimension in the "extremely related" category. Following, about equal amounts of students perceive the social dimension as very related, and extremely related to the SD concept. The economic dimension is the least related to the SD concept compared to other dimensions, with most students perceiving this dimension as very related, and fewer students perceiving it as extremely related to the SD concept. For the mean values, all dimension means are closest with the very related category, however with the environmental dimension ranked first, the social dimension ranked second, and the economic dimension ranked lowest. These results then reflect the order observed from the emphasis domain.

In Figure 16, a distribution of what students first think about when hearing "sustainable development" has been categorized. In this figure, keywords within the environmental aspects are most commonly seen, with social keywords following right behind. Keywords regarding economy are rarer compared to the other two dimensions. Kagawa (2007) did also find environmental keywords dominant when studying students understandings of SD. These results reaffirm environmental aspects as dominant in how students relate dimensions to the SD concept.

Statistical analyses from *t*-tests and regression models found several significant mean differences and relationships. An older group of students related the environmental dimension

more to SD compared to the younger group. This might suggest that the relationships between the dimensions are changing, and older students are "stuck behind" in a view conceptualizing environment as the main dimension related to the SD concept. Alternatively, older students have been exposed more to environmental media attention and perhaps experienced more changes to the environment in their lifetime, or simply having higher knowledge levels.

In fact, students reporting above average knowledge-levels, tend to relate the environmental support. This tendency was also shown for the economic dimension. Additionally, students reporting higher SDG familiarity, relate social and economic dimension more to the SD concept, compared to those not being familiar with the SDGs. The social and economic dimensions are also related higher by UGM students compared to non-UGM students. These two results may suggest that the explicit role to reaching the SDGs taken by UGM (Titisari et al., 2020), have led to higher acknowledgement of these dimensions, given that they, together with the environmental dimension, are represented by the SDGs. An interpretation of all these results, may suggest that students are moving towards a more holistic view with more balance between the dimensions, where UGM, a university acknowledging their role to meet the SDGs, goes in front. However, with the environmental dimension still being the dimension most related to the SD concept.

Both the initial and the improved regression models found students more satisfied with their current economic situation to relate the economic dimension more to the SD concept. This is an interesting mechanism, perhaps explained with students being more satisfied with their economic situation, have greater access to education and information, learning more about the economic aspects of SD. However, no other underlying factors regarding economy, for example funding source and social class, were seen to have significant differences. Another explanation could involve that students with higher economic satisfaction, generally are more economic-minded. Perhaps more engaged in a neoliberal economy aiming for economic growth – thus believing economic aspects, as economic growth, belongs within the SD concept. Alternatives to the "economic growth" approach are seen through alternative sustainability approaches such as the "de-growth", seeing the capitalist growth-based economy as unsustainable (Nightingale, 2019), views perhaps more embraced among those less satisfied with their economic situation. Such an explanation may be strengthened by the fact that an increased economic satisfaction only affects the economic dimension's relation to SD, with the "access to education and information" explanation, potentially increasing the environmental and social dimensions simultaneously.

For the improved model, the environmental dimensions' relation to SD is improved together with improved SDG familiarity. This could then suggest that knowledge and awareness for the SDGs corresponds positively with how much students relate the environmental dimension to the SD concept. Such an assumption strengthens knowing the SDGs are more environmentally focused compared to its MDGs predecessor (Adams, 2020; Liverman, 2018), meaning students less familiar with the SDGs might conceptualize sustainable development as more related to aspects outside the environmental dimension, originating from pre-SDG era.

### 5.1.4   Non-explaining Factors

A focus has been made on interpreting the results from the factors showing as statistically significant because they suggest somewhat explain an investigated area. It is, however, important to discuss the factors appearing to not explain the variables. Here, discussions are provided on factors found to not explain any of dependent variables explored.

No significant differences are shown between students in social sciences and other study fields. This is similar to Azapagic and colleagues' (2005) findings of no significant differences for the study field (Azapagic et al., 2005). On the other hand, several studies identify some differences regarding study field. Summers (2004) found geographers to have greater understandings of the SD concept compared to scientists. Of faculties in a UK study, the arts and science faculty had the highest amounts of students being familiar with the SDGs (Kagawa, 2007). In China, pure science divisions showed more awareness compared to other divisions (Yuan & Zuo, 2013). In the UAE, highest knowledge-levels were found from the Education college, and lowest levels from the college of Information Technology (Al-Naqbi & Alshannag, 2018).

One might have expected some differences in the study field classification, for example students in social sciences to emphasize the social dimension more, compared to students not in social sciences. Cole (2014) describes economists tend to emphasize maintenance of living standards, ecologists concerned with biodiversity and resilience, while sociologists prioritize sociological bonds and interrelationships within communities. This is, however, not the case for this study. The lack of differences between the study fields, may be explained by students learning about sustainable development regardless of their study field, as sustainability and sustainable development have been implemented in a wide variety of fields since the 1992 Rio Conference (Nightingale, 2019). Additionally, it may suggest students' education of SD is balanced and holistic regardless of the study field they attend – possibly also making the students' conceptualizations of similar characteristics.

The statistical analyses did only provide one result suggesting a relationship for age, and none for number of semesters. This could be perceived to be surprising results, as one may think older and more experienced students would report higher levels of knowledge and SDG familiarity having taken more courses. Explanations to these findings may include a shift in the educational approach, for example if sustainable development have been more integrated into universities in later years, suggesting more experienced students to not necessarily know more about sustainable development. For example, UGM have explained their role on achieving the SDGs (Titisari et al., 2020), however, the SDGs are still relatively new and with some delay in the system, students at the end of their program may have relatively similar conceptualizations.

A contradictory possibility, could suggest more experienced students to view the concept as more comprehensive, thus acknowledging more of what they don't know despite higher knowledge-levels. Some previous studies have investigated a relationship involving number of semesters or similar factors. In a worldwide study for engineering students, no significant differences to students' knowledge and understanding of SD were showed for study length (Azapagic et al., 2005). Yuan and Zuo (2013) found 2nd and 3rd year student to show lower awareness of sustainability issues compared to others, while no significant differences were found between academic levels in the UAE (Al-Naqbi & Alshannag, 2018).

No differences were shown between students in the middle- and above social class compared to students in lower classes. Previous studies investigating this relationship are scarce or non-existing. Given the identified results within this study however, the lack of differences for this factor may come as a surprise. Differences between UGM students and non-UGM students for both the knowledge domain and the relation domain, and higher knowledge among those more satisfied with their economic situation, are identified from the *t*-test (Table 5 and Table 7). From the regressions, increased economic satisfaction is positively related with SDG familiarity in the initial model, while increased economic satisfaction is positively related with the economic dimension's relation to the SD concept for both the initial and the improved model. One could assume that most students attending UGM, rated as one of the best universities in Indonesia (Topuniversities.com, 2023), and students more satisfied with their economic situation – to be in the middle or higher social classes. Hence, it is perhaps surprising that no significant differences were shown between the two groups.

Furthermore, the factor of current social satisfaction did not explain any results from the knowledge, emphasis, nor relation domains. One might expect students' social satisfaction to affect their emphasis on the social dimension to achieve SD, or how they relate the dimension

to the concept. For example, one could expect student feeling lower satisfaction on social aspects such as food security, gender equality, health, and education, to emphasize these aspects within the social dimension more, compared to students more satisfied with such social aspects. Explanations to why this appears to not be the case, could involve students being satisfied with their social situation, are aware of social challenges, thus reporting similar emphasis-levels and relation to the SD concept for the social dimension. The social dimension's emphasis and relation to SD could then, be more similarly acknowledged by a collective society, rather than personal situations.

### 5.1.5 Summary of Underlying Factors

So far, we have found students' knowledge to be significantly affected by gender, the university they attend, whether they have had SD in one or more course, satisfaction on their current economic situation, and satisfaction on their current environmental situation. Furthermore, students' knowledge proved to have significant impact on dimensions relation to SD.

The only significant underlying factor found for SD dimension emphasis, with the more satisfied a student was on their current environment situation, dimension emphasis decreased for all dimensions. Significant underlying factors affecting SD dimensions relation to the SD concept among students, include age, funding for studying, knowledge, university attending, SDG familiarity, and satisfaction on current economic situation.

In this first segment, there have been a focus on investigating how and what kinds of underlying factors that impact the three main domains from the analytical model (Figure 3): "Knowledge on SD", "SD dimensions emphasis", and "Dimensions relation to SD". In the next segment, these domains are used as a point of departure to discuss students' conceptualizations of SD more directly, thus entering the destination point of the analytical model.

## 5.2 Students' Conceptualizations of Sustainable Development

Based on the findings and discussions provided in the last segment (see 5.1), this segment aims at identifying how students conceptualize SD with respect to the three dimensions. Further, this is put into context with previous studies and discussed in light of the theoretical framework.

Based on the findings identified from the "Knowledge on SD", "SD dimensions emphasis", and "dimensions relation to SD" domain, one can identify some general conceptualizations of the sustainable development concept among students in Indonesia. Students show good knowledge on the SD concept, together with high familiarity with the SDGs. Additionally, the environmental, social, and economic dimension are all highly emphasized dimensions to achieve SD, and they are all perceived as "very related" to the SD concept. All dimensions proving to be emphasized and very related to the SD concept, might be an argument to say that the students have an holistic conceptualization of SD and its dimensions, as it is promoted through SD since the Brundtland report, through several UN conference, ESD and up to today's SDGs (Jucker & Mathar, 2015; Nightingale, 2019; UNCSD, 2012; United Nations, 2002; WCED, 1987). Discussions on whether a holistic conceptualization are found among students, is brought up towards the end of the chapter.

There are distinct differences between how dimensions are emphasized and related to the SD concept, which might challenge the argument of a holistic conceptualization. Arguably, students' conceptualizations are primarily influenced by the environmental dimension, as this dimension both is highest emphasized and perceived as most related to the SD concept among the students. The social dimension is almost as highly emphasized as the environmental dimension, however with less students perceiving this dimension to as highly related to the SD concept as seen with the environmental dimension. The social dimension is then, second of influence on students' SD conceptualizations. Consequently, the economic dimension influence students' SD conceptualizations the least. The economic dimension saw lower emphasis to achieve SD, together with being perceived as less related to the SD concept – although most still perceive the dimension to be in the "very related" category.

### 5.2.1  Environmental Influence

Many studies have explored how students conceptualize sustainable development previously, as presented in chapter 2.3. Most find the environmental dimension to dominate the students' conceptualizations (Azapagic et al., 2005; Björnberg et al., 2020; Kagawa, 2007; Kanapathy et al., 2018; Stir, 2006; Summers et al., 2004; Tuncer, 2008; Yuan & Zuo, 2013; Zeegers & Francis

Clark, 2014). This thesis supports these findings, as the environmental dimension is the dimension influencing students' conceptualizations the most.

In 2004, environmental features were clearly being the most identified category when student teachers tried to identify valid SD features, followed by economic and social features, respectively (Summers et al., 2004). Azapagic and colleagues' (2005) worldwide study on engineering students, showed students to have more knowledge on environmental issues, while lacking understanding on the social and economic dimensions. Similarly, Stir (2006) saw great concern on environmental issues among students in teacher education. Despite knowledge on these environmental issues being minimal, they were higher than for the social and economic aspects. Kagawa (2007) found students' understandings to be dominated by environmental aspects, while social and economic ones remained marginal. In Tuncers (2008) study, 74 percent of the students agreed that environmental effects should be considered first in dealing with any kind of problem, suggesting a strong prioritization and emphasis towards the environmental dimension.

In China, environmental aspects were given also the highest priority over the social dimension (Yuan & Zuo, 2013). Notably, the economic dimension was not included in the Chinese study. Zeegers and Francis Clark (2014) found students to have a strong focus on the environmental dimensions, both before and after a course aiming to balance their perspectives. In Malaysia, the environmental dimension was strongly recognized among chemistry learners suggested to have a low basic understanding on the SD concept, with the social and economic dimension shown less importance (Kanapathy et al., 2018). At last, a Swedish study found environmental aspects as given most interest and knowledge, although reporting higher understandings of social aspects compared to other studies (Björnberg et al., 2020)

A clear trend is showing, where the environmental dimension is dominant in students' conceptualizations of SD. The findings from previous studies and in this thesis, corresponds with Nightingale's (2019) suggesting that the environmental dimensions are often assumed to be most important. Perhaps, it is related to the sustainability idea having its outspring from this dimension, or the excessive amounts of attention and media coverage environmental aspects, especially climate change, have gotten since the IPCC establishment (Annan 2002, in Adams, 2020). The environmental aspects are shown attention today as well, with IPCC recently reaffirming climate change to be human-caused (IPCC, 2023). When the SDGs were introduced, building from the previous SDGs, an increased number of environmentally focused goals was implemented (Liverman, 2018) – again raising attention to these aspects.

The historical foundation behind the environmental dimension, as well as continuous media coverage and public attention, may also cause policymakers, political organizations, educational institutions, and their leaders to be environmentally focused in the conceptualizations. Some studies may show such a tendency; in Canada, university presidents are more focused on environmental aspects compared to social and economic aspects (Wright, 2010), while environmental aspects are presented as the main problem within sustainable development in the educational curriculum, neglecting social and economic aspects (Tollefsen, 2017).

### 5.2.2   Social Influence

Despite having the environmental dimension dominate students' conceptualizations, the social dimension follows right behind. With the social dimension being nearly as highly emphasized as the environmental and being the dimension second most related to the SD concept, students' conceptualizations are largely affected by social aspects. A scarcity of previous findings reports the social dimension as high influence and effect to students' conceptualizations. A Swedish study however, found surprisingly high understandings of social aspects (Björnberg et al., 2020), thus showing tendencies similar with this thesis.

Aspects within the social dimension originally gained attention in the 1992 conference on Environment in Rio (Nightingale, 2019), concerned about current development regarding areas such as equality, education, and health. Here, an emphasis was made on linking society and environment to view development as more integrated (Nightingale, 2019). The Agenda 21 action plan from 1992, operationalized the sustainable development ideas from the previous Brundtland report (Nightingale, 2019; United Nations Conference on Environment & Development, 1992; WCED, 1987), in which sustainable development included the social sustainability idea, in contrast to "sustainability" which continued an economic and environmental concern (Nightingale, 2019).

In addition, concerns related to the social dimension were emphasized in the Millennium Development Goals in 2000, before social aspects as a part of the sustainable development were reaffirmed with the SDGs in 2015 (Sachs, 2012). Social issues keep being of interest and getting attention with population growth, poverty, hunger, and inequality continuing to be prevailing problems. In an overview from the United Nations Indonesia, the five SDGs allocated the most funds, are all related to the social dimension – when "No poverty" is included among these

(United Nations Indonesia, 2023). This might suggest that social issues are highly recognized and given much attention in Indonesia, impacting the high emphasis shown for the dimension.

### 5.2.3 Economic Influence

Interestingly, differences found in this thesis between dimensions influence in students' conceptualizations, stand in direct contrast to the only known study investigating dimension differences among Indonesian students. The Indonesian study find the environmental dimension to rank lowest, with the economic dimension highest ranked (Titisari et al., 2020). Titisari and colleagues (2020) have more focus on students' knowledge, however, investigating their understandings and perceptions. Although potentially explaining the differences between the studies, one can assume knowledge, understandings, and perceptions to be interconnected with their conceptualizations. The economic dimension is often viewed to be the way to achieve a sustainable development (Nightingale, 2019). Often meaning a desire for economic growth, which have being emphasized both in Agenda 21 from 1992 and from the SDGs as requirements for sustainable development (Liverman, 2018; Nightingale, 2019; UN Department of Economic and Social Affairs, 2015). These economic solutions are however, met with some skepticism, as one can argue them to be contradictory to reach environmental goals (Liverman, 2018).

Economic aspects have for a long time been involved in the sustainability idea together with the environmental dimension - the industrial revolution and merchant capitalism saw environmental drawbacks from economic growth and natural resource exploitation (Nightingale, 2019). In the period after Agenda 21 in 1992, questions linked to economic and environmental sustainability were being asked, seeing neoliberal economy bring few improvements to economic inequality and failing to cause the "trickle down" effects promised (Nightingale, 2019). Economic growth goals within the SDGs are criticized, partly for being contradictory (Katila et al., 2019; Liverman, 2018), as it is making environmental goals unachievable, together with a need for policies such as free trade – claimed to previously have caused environmental degradation and increased poverty (Liverman, 2018).

With alternative economic systems, or development approaches such as "de-growth", claiming economic growth as unsustainable and to rather find an equilibrium with a stable and simpler lifestyle independent from economic growth (Nightingale, 2019), the economic dimension meets more resistance compared to other dimensions. This kind of resistance can be part of the explanation to why the economic dimension to a less extent is part of students' conceptualizations. Results from Figure 16, showing students' first thought of sustainable

development, might indicate some skepticism towards these economic aspects – as two students' first though are "capitalism" and two others are "western hegemony", in addition to the lower mean values seen for both the economic dimension's emphasis and relation (Figure 18 and Figure 19).

In later years, we can identify that SDG progress in low-income countries is largely dependent on the economy, which is easily affected by unforeseen factors way beyond their control, for example The COVID-19 pandemic or Russia's war in Ukraine, causing inflation and major setbacks on SDG achievements (International Monetary Fund, 2022). One may then question if the current economic system is required to achieve SD. In that case, it would be a contrast to the narrative promoted as the pathway to sustainable development since the 1992 Agenda 21 (Adams, 2020; Nightingale, 2019). Multiple alternative approaches, from ecocentric views, to "planetary boundaries" and "de-growth" believe such change in the economy is necessary (Kosoy et al., 2012; Nightingale, 2019; Rockström et al., 2009; Steffen et al., 2015).

### 5.2.4   A Holistic Conceptualization?

Through the historical advancement of sustainable development-related concepts and operationalizations, a holistic approach balancing environmental, social, and economic dimensions has been incorporated. The three dimension reflect the views of the sustainable development concept, introduced in the Brundtland report (WCED, 1987). Since then, the interconnectedness and balanced importance of these three dimensions have been reaffirmed. Education for Sustainable Development, have reflected the holistic approach since being initiated in the UN Conference on Environment and Development in Rio in 1992, connecting narratives and interests from each dimension (Jucker & Mathar, 2015). The Rio conference emphasized linking the society and environment in a more integrated way (Nightingale, 2019), and in the years after, sustainable development got implemented in a variety of fields. Later UN conferences in Johannesburg (2002) and Rio (2012) reaffirmed an interdependence between the environmental, social, and economic dimensions (Nightingale, 2019). The SDGs put into action from 2015, reflected visions from the Rio (2012) conference to integrate economic, social, and environmental aspects as well as their interlinkages (UNCSD, 2012). Additionally, the goals themselves are often placed in different dimension in visual representations, as seen in Figure 2.

Given that Education for Sustainable Development have taken up this holistic approach similar to the sustainable development, educational curriculums and institutions would be expected to

have similar approaches when introducing sustainable development, ESD or the SDGs to their agenda. Higher Education Institutions (HEIs) would be expected to ensure all learners to acquire the knowledge and skills needed to promote a broad understanding of sustainable development, as described in target 4.7 of the SDGs (UN Department of Economic and Social Affairs, 2015), and as ESD and SD have a holistic approach including all three dimensions (Jucker & Mathar, 2015), HEIs have an important role in giving young people the necessary education to apply all three dimensions of sustainable development to their lives (Saqib et al., 2020).

So far, arguments have been seen both for and against students having a holistic conceptualization of sustainable development. In one end, students emphasize all dimensions strongly, suggesting all dimension to be important to achieve sustainable development. In addition, all dimensions are perceived to be very related with the SD concept, suggesting students to acknowledge the environmental, social, and economic dimensions, a similar approach as seen from ESD and SDG initiatives.

In the other end, there are still differences on *how much* each dimension is emphasized or related to the SD concept. An environmental domination, followed by the social dimension have been identified for students' conceptualizations, with the economic dimension being ranked the lowest. As an example, in Figure 19, most students had the environmental dimension as "extremely related" to sustainable development, while most students had the economic dimension as "very related", suggesting approximately a whole point difference in a 1-5 scale. Based in later arguments, this thesis suggests that students in Yogyakarta, do *not* have a holistic and balanced conceptualization of sustainable development with respect to the environmental, social, and economic dimensions, as is promoted by mainstream approaches within SD, ESD, and SDGs.

Discussion can, however, be held on such holistic and balanced conceptualizations of sustainable development among students is realistic, or even possible to achieve by HEIs. There are claims that HEIs generally still is in very early stages of education and research on sustainable and inclusive development (Farinha et al., 2018), while Wals (2014) have started to see systematic changes within HEIs to re-orient sustainability. This might suggest that HEIs are on the way to facilitate towards a holistic ESD. Views from Nightingale (2019) spotlight fundamental issues for how the dimensions are ontologically separated from each other, with sustainability within each dimension depending on trade-offs from other dimensions. If trade-offs are required, prioritization are always needed, suggesting differences in dimension

emphasis. In Indonesia, one might identify these kinds of trade-offs. High levels of economic growth have been seen over the last decades, however with the drawback environmental degradation natural resources exploitation (Kurniawan & Managi, 2018), thus suggesting a trade-off between the economic and environmental dimension. In addition, investments in social service failed to keep up with the economic growth, while population growth have outpaced wealth growth, making growth per capita to decrease (Kurniawan & Managi, 2018). In this example, economic growth is unsustainable.

Despite an integrated and balances SD approach is promoted explicitly (UNCSD, 2012, p. 1, para. 3), there is a lack of communication on "how" to adopt this integrated agenda (ESCAP & CSIRO, 2015).Critics are also seen on the SDGs, viewing some of the goals to be contradictory (Katila et al., 2019; Liverman, 2018), having to choose which one to sacrifice. This being said, there are also found potential for synergies between the SDGs (Katila et al., 2019). The separation between dimension, perhaps especially separating the environmental dimension from the social and economic dimension, is rooted in an understanding that humans somehow affect their environments (Nightingale, 2019). Alternative approaches, as the "Buen Vivir" view society and environment as more integrated (Nightingale, 2019). The dimensions of sustainable development can also be said to have a generally anthropocentric perspective, having two dimensions human-related and one dimension related to the environment (Nightingale, 2019). Anthropocentrism values humans as superior to other species, with alternative "ecocentric" perspectives, for example "Deep Ecology" are more environmentally minded. Alternative approaches criticizing the anthropocentric approach or the ontological separation between the dimensions, do influence conceptualizations of sustainability idea. With the critics and alternative approaches in mind, in addition to taking a step back from the mainstream sustainable development approach, it might not be realistic, perhaps not even possible, to achieve conceptualizations of sustainable development in a holistic and balanced way, with current ontologically separated and anthropocentric dimensions of sustainable development.

### 5.2.5 *Different People, Different Conceptualizations*

Introductions to sustainability and sustainable development provided by Nightingale (2019) have given insight into how conceptualizations of these and related concepts are constantly being changed. Different actors implement sustainability and sustainable development ideas with different conceptualizations depending on their field and interests (Adams, 2020;

Nightingale, 2019). The same can be said for people – people implement conceptualizations on sustainable development based on their background and interests. For this study, students are arguably a relative homogenous groups compared a whole population. Still, differences among students have been identified during this study. Students' conceptualizations of SD are, as discussed previously, affected by satisfaction on current environmental and economic situation, age, university, funding method, and knowledge on sustainable development and SDG familiarity. Farther, the knowledge domain is affected by gender, university, economic situation satisfaction, whether students have had SD in one or more course, and whether they have heard of SD. We then see that within a group of students, there are different conceptualizations which is dependent on factors related to their background, education, and current life situations.

## 5.3 Methodological Discussion

Previous discussions of the results have to a small degree discussed methodological effects. It is, however, important to consider potential methodological impacts, although its exact impacts remain unknown. As presented in the methodological chapter, the sampling method perhaps stands as the major liability for the methodological approach. The use of snowball sampling, being a non-probability sampling method, gives potential for the study to have reached out to groups of students with similar backgrounds, interests, meanings, and knowledge, because an initial contact group is urged to provide additional respondents that would fit within the target population and survey requirements (Bryman, 2016; Kitchin & Tate, 1999).

For the final sample for this study, some indications on similarities are found from descriptive statistics section of the results chapter, a section included to give an overview of respondents' characteristics. For example, there are a majority of men within sample, a majority of students study in social sciences, and the majority study at UGM. These characteristics may suggest that many students are "similar" in terms of common backgrounds and interests. One could assume students with higher interest and knowledge of sustainable development to be overly represented in the sample, making findings knowledge, dimension emphasis, dimension relation, and general conceptualizations of SD to be unrealistic.

These impacts are, however, difficult to measure, and I would argue that similar issues would apply with a probability sampling method, given that students interested in the topic, would be over-represented due to non-responses among uninterested students. Regardless of the sampling method, research findings should be approach with caution, minding effects of potential

unrepresentative samples. Besides, it is important to remember that the results and discussions is of interest to the sample population, at a bare minimum.

# 6. Conclusions

Multiple aims were outlined for this thesis through its research questions. One exploratory question sought to investigate how students in Yogyakarta, Indonesia, conceptualize sustainable development with respect to the environmental, social, and economic dimensions. Students' conceptualizations were analyzed following an analytical model outlined in Figure 3 regarding three main domains: "knowledge on SD", "SD dimension emphasis", and "dimension relation to SD". Additionally, analyses on whether these domains are significantly affected by underlying factors regarding background, education, and current life situation, were conducted.

Regarding knowledge, students are found to have good knowledge levels, showing good knowledge of the sustainable development concept and high familiarity with the SDGs. Students' knowledge was significantly affected by gender, the university they attended, whether they have had SD in one or more course, satisfaction on their current economic situation, and satisfaction on their current environmental situation. Furthermore, students' knowledge proved to have significant impact on dimensions relation to SD.

Analyses conducted with regards to knowledge, SD dimensions emphasis, and dimension relation to SD, suggests students to have an environmentally dominated conceptualization of the sustainable development concept. The environmental dimension is emphasized the most compared to other dimensions, suggesting environmental aspects to be most important to achieve sustainable development. Additionally, students perceive the environmental dimension to be most related to the concept of sustainable development. Hence, environmental aspects are viewed to be extremely related to the SD concept, while also viewed to be most important to achieve sustainable development.

Underlying factors affecting the environmental dimension's influence on students' conceptualizations are identified. Environmental influences are found to be higher among older students compared to younger students. Students funding their studies with the help of their family, relate the environment dimension less to the SD concept. Students with higher knowledge levels or those more familiar with the SDGs, are more influenced by the environmental dimension in their conceptualizations. Students more satisfied with their environmental situation is less influenced by the environmental aspects.

Secondly, students' conceptualizations of SD were influenced by the social dimension. This dimension was almost equally as highly emphasized as the environment dimension – suggesting students to perceive social aspects to be of high importance to achieve SD. Additionally, about equal number of students perceived the social dimension to be either very related or extremely related to the SD concept. Students conceptualize social aspects then, as less related to SD concept when compared with the environmental dimension, despite being almost as highly emphasized.

For underlying factors affecting the social dimension's influence on students' SD conceptualizations, students attending UGM and students more familiar with the SDGs value social aspects higher in their conceptualizations of SD. Additionally, students more satisfied with their environmental situation, is less influenced by social aspects.

Students SD conceptualizations are found to be least influenced by the economic dimension. Although being categorized as important, the economic dimension is less emphasized compared to the other dimensions, suggesting economic aspects to be of less importance in reaching SD. Additionally, less students perceive the economic dimension as extremely related to the SD concept compared to other dimensions, showing a lower mean value. Still, most students perceive the economic dimensions to be very related to the SD concept.

The economic dimension's influence on students SD conceptualizations is found positively related with students attending UGM, students more familiar with the SDGs, students with more knowledge on SD, and students more satisfied with their economic situation. Additionally, students more satisfied with their environmental situation, is less influenced by economic aspects.

Overall, the students' conceptualizations of SD do not represent the holistic and balanced approach the mainstream sustainable development narrative has embraced since the Brundtland report, through several UN conferences, a decade of ESD, and up to the later SDGs. The economic dimension is shown as least influential, which may be the case of a growing misbelief in today's economic growth based economy and alternative approaches such as de-growth changing the sustainability narrative (Nightingale, 2019).

Students' conceptualizations of sustainable development with respect to the environmental, social, and economic dimension have been investigated, and there have been found significant relationships for several underlying factors related to the students' background, education, and current life situation. An environmentally focused conceptualization of sustainable

development among students supports the majority of findings from previous research on the topic (Azapagic et al., 2005; Björnberg et al., 2020; Kagawa, 2007; Kanapathy et al., 2018; Stir, 2006; Summers et al., 2004; Tollefsen, 2017; Yuan & Zuo, 2013; Zeegers & Francis Clark, 2014). This is, however, new insight in Indonesian context, where students previously have shown highest understandings for the economic dimension (Titisari et al., 2020). The relatively high influence from the social dimensions, also contribute to the field, as a scarcity of studies have found the social dimension at nearly similar levels as the environmental dimension, the exception being a Swedish study (Björnberg et al., 2020). In addition, the analyses regarding the effects from underlying factors related to students' background, education, and current life situation, extend the horizon to understanding more of the factors affecting students' conceptualizations.

For further investigation on relative relationships between sustainable development dimensions and conceptualizations, investigating knowledge levels more thoroughly for each dimension is suggested to provide more insight into how knowledge affects the conceptualizations. Further, some speculative suggestions on explanations behind relationships between underlying factors and students' conceptualizations are provided in the discussion – however, more comprehensive studies explaining these relationships are hereby promoted. At last, for future research on similar topics, an extensive sampling approach ensuring a representative sample of respondents is urged.

# References

Adams, B. (2020). *Green development: Environment and sustainability in a developing world* (Fourth). Routledge.

Aleixo, A. M., Leal, S., & Azeiteiro, U. M. (2018). Conceptualization of sustainable higher education institutions, roles, barriers, and challenges for sustainability: An exploratory study in Portugal. *Journal of Cleaner Production*, *172*, 1664–1673. https://doi.org/10.1016/j.jclepro.2016.11.010

Al-Naqbi, A. K., & Alshannag, Q. (2018). The status of education for sustainable development and sustainability knowledge, attitudes, and behaviors of UAE University students. *International Journal of Sustainability in Higher Education*, *19*(3), 566–588. https://doi.org/10.1108/IJSHE-06-2017-0091

Azapagic, A., Perdan, S., & Shallcross, D. (2005). How much do engineering students know about sustainable development? The findings of an international survey and possible implications for the engineering curriculum. *European Journal of Engineering Education*, *30*(1), 1–19. https://doi.org/10.1080/03043790512331313804

Barth, M., & Rieckmann, M. (2012). Academic staff development as a catalyst for curriculum change towards education for sustainable development: An output perspective. *Journal of Cleaner Production*, *26*, 28–36. https://doi.org/10.1016/j.jclepro.2011.12.011

Baruch, Y., & Holtom, B. C. (2008). Survey response rate levels and trends in organizational research. *Human Relations*, *61*(8), 1139–1160. https://doi.org/10.1177/0018726708094863

Bhat, S. A., Bashir, O., Bilal, M., Ishaq, A., Dar, M. U. D., Kumar, R., Bhat, R. A., & Sher, F. (2021). Impact of COVID-related lockdowns on environmental and climate change scenarios. *Environmental Research*, *195*, 110839. https://doi.org/10.1016/j.envres.2021.110839

Björnberg, K. E., Skogh, I.-B., & Gumaelius, L. (2020). Student Perceptions of Engineers' Versus Teachers' Roles and Responsibilities in Contributing to Sustainable Development. In E. Sengupta, P. Blessinger, & T. Subhi Yamin (Eds.), *Teaching and Learning Strategies for Sustainable Development* (Vol. 19, pp. 177–195). Emerald Publishing Limited. https://doi.org/10.1108/S2055-364120200000019015

Bobko, P., Roth, P. L., & Buster, M. A. (2007). The Usefulness of Unit Weights in Creating Composite Scores: A Literature Review, Application to Content Validity, and Meta-

Analysis. *Organizational Research Methods*, *10*(4), 689–709.
https://doi.org/10.1177/1094428106294734

Bryman, A. (2016). *Social Research Methods*. Oxford University Press.

Christensen, P., Thrane, M., Herreborg Jørgensen, T., & Lehmann, M. (2009). Sustainable
development: Assessing the gap between preaching and practice at Aalborg
University. *International Journal of Sustainability in Higher Education*, *10*(1), 4–20.
https://doi.org/10.1108/14676370910925217

Cole, M. A. (2014). Economic growth and the environment. In *Handbook of sustainable
development* (pp. 240–253). Edward Elgar Publishing.

De Bruijne, M., & Wijnant, A. (2014). Improving Response Rates and Questionnaire Design
for Mobile Web Surveys. *Public Opinion Quarterly*, *78*(4), 951–962.
https://doi.org/10.1093/poq/nfu046

De Leeuw, D. (2005). To Mix or Not to Mix Data Collection Modes in Surveys. *Journal of
Official Statistics*, *21*(2), 233.

ESCAP, U., & CSIRO. (2015). *Integrating the three dimensions of sustainable development:
A framework and tools*.

Farinha, C. S., Azeiteiro, U., & Caeiro, S. S. (2018). Education for sustainable development in
Portuguese universities: The key actors' opinions. *International Journal of
Sustainability in Higher Education*, *19*(5), 912–941. https://doi.org/10.1108/IJSHE-
09-2017-0168

International Monetary Fund. (2022). *Macroeconomic Developments and Prospects in Low-
Income Countries*. https://www.imf.org/en/Publications/Policy-
Papers/Issues/2022/12/07/Macroeconomic-Developments-and-Prospects-in-Low-
Income-Countries-2022-526738

IPCC. (2023). *Climate Change 2023: Synthesis report of the IPCC 6th Assessment Report
(AR6)*. https://www.ipcc.ch/report/ar6/syr/

Jucker, R., & Mathar, R. (Eds.). (2015). *Schooling for Sustainable Development in Europe:
Concepts, Policies and Educational Experiences at the End of the UN Decade of
Education for Sustainable Development*. Springer International Publishing.
https://doi.org/10.1007/978-3-319-09549-3

Kagawa, F. (2007). Dissonance in students' perceptions of sustainable development and
sustainability: Implications for curriculum change. *International Journal of
Sustainability in Higher Education*, *8*(3), 317–338.
https://doi.org/10.1108/14676370710817174

Kanapathy, S., Lee, K. E., Sivapalan, S., Mokhtar, M., Syed Zakaria, S. Z., & Mohd Zahidi, A. (2018). Sustainable development concept in the chemistry curriculum: An exploration of foundation students' perspective. *International Journal of Sustainability in Higher Education*, *20*(1), 2–22. https://doi.org/10.1108/IJSHE-04-2018-0069

Kaplowitz, M. D., Hadlock, T. D., & Levine, R. (2004). A Comparison of Web and Mail Survey Response Rates. *Public Opinion Quarterly*, *68*(1), 94–101. https://doi.org/10.1093/poq/nfh006

Katila, P., Pierce Colfer, C. J., de Jong, W., Galloway, G., Pacheco, P., & Winkel, G. (Eds.). (2019). *Sustainable Development Goals: Their Impacts on Forests and People*. Cambridge University Press. https://doi.org/10.1017/9781108765015

Kementerian Lingkungan Hidup dan Kehutanan PPID / Biro Hubungan Masyarakat. (2016, April 23). *Indonesia Signs Paris Agreement On Climate Change*. http://ppid.menlhk.go.id/siaran_pers/browse/299

Kitchin, R., & Tate, N. (1999). *Conducting Research in Human Geography: Theory, Methodology and Practice*. Taylor & Francis Group.

Kosoy, N., Brown, P. G., Bosselmann, K., Duraiappah, A., Mackey, B., Martinez-Alier, J., Rogers, D., & Thomson, R. (2012). Pillars for a flourishing Earth: Planetary boundaries, economic growth delusion and green economy. *Current Opinion in Environmental Sustainability*, *4*(1), 74–79. https://doi.org/10.1016/j.cosust.2012.02.002

Kurniawan, R., & Managi, S. (2018). Economic Growth and Sustainable Development in Indonesia: An Assessment. *Bulletin of Indonesian Economic Studies*, *54*(3), 339–361. https://doi.org/10.1080/00074918.2018.1450962

Lane, M. (2011). *Eco-Republic: What the Ancients Can Teach Us about Ethics, Virtue, and Sustainable Living*. Princeton University Press.

Lelkes, Y., & Weiss, R. (2015). Much ado about acquiescence: The relative validity and reliability of construct-specific and agree–disagree questions. *Research & Politics*, *2*(3), 2053168015604173. https://doi.org/10.1177/2053168015604173

Liverman, D. M. (2018). Geographic perspectives on development goals: Constructive engagements and critical perspectives on the MDGs and the SDGs. *Dialogues in Human Geography*, *8*(2), 168–185. https://doi.org/10.1177/2043820618780787

McLafferty, S. L. (2003). Conducting questionnaire surveys. *Key Methods in Geography*, *1*(2), 87–100.

Nightingale, A. J. (2019). *Environment and sustainability in a globalizing world*. Routledge.

Novieastari, E., Pujasari, H., Abdul Rahman, L. O., Ganefianty, A., & Rerung, M. P. (2022). Knowledge, perception, and awareness about Sustainable Development Goals (SDGs) among students of a public university in Indonesia. *International Journal of Health Promotion and Education*, *60*(4), 195–203. https://doi.org/10.1080/14635240.2022.2066557

Pasek, J., & Krosnick, J. A. (2010). Optimizing survey questionnaire design in political science: Insights from psychology. *Oxford Handbook of American Elections and Political Behavior*, 27–50.

Pawłowski, A. (2008). How many dimensions does sustainable development have? *Sustainable Development*, *16*(2), 81–90. https://doi.org/10.1002/sd.339

Purvis, B., Mao, Y., & Robinson, D. (2019). Three pillars of sustainability: In search of conceptual origins. *Sustainability Science*, *14*(3), 681–695. https://doi.org/10.1007/s11625-018-0627-5

Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin, F. S., Lambin, E. F., Lenton, T. M., Scheffer, M., Folke, C., Schellnhuber, H. J., Nykvist, B., de Wit, C. A., Hughes, T., van der Leeuw, S., Rodhe, H., Sörlin, S., Snyder, P. K., Costanza, R., Svedin, U., … Foley, J. A. (2009). A safe operating space for humanity. *Nature*, *461*(7263), Article 7263. https://doi.org/10.1038/461472a

Rød, J. K. (2017). *Innføring i GIS og statistikk: Verktøy for å beskrive verden* (2. utg.). Fagbokforl.

Sachs, J. D. (2012). From Millennium Development Goals to Sustainable Development Goals. *The Lancet*, *379*(9832), 2206–2211. https://doi.org/10.1016/S0140-6736(12)60685-0

Sammut, R., Griscti, O., & Norman, I. J. (2021). Strategies to improve response rates to web surveys: A literature review. *International Journal of Nursing Studies*, *123*, 104058. https://doi.org/10.1016/j.ijnurstu.2021.104058

Saqib, Z. A., Zhang, Q., Ou, J., Saqib, K. A., Majeed, S., & Razzaq, A. (2020). Education for sustainable development in Pakistani higher education institutions: An exploratory study of students' and teachers' perceptions. *International Journal of Sustainability in Higher Education*, *21*(6), 1249–1267. https://doi.org/10.1108/IJSHE-01-2020-0036

Schacht, S. (2005). *Social and behavioral statistics: A user-friendly approach* (2nd ed.). Westview.

Sharma, U., & Kelly, M. (2014). Students' perceptions of education for sustainable development in the accounting and business curriculum at a business school in New

Zealand. *Meditari Accountancy Research*, *22*(2), 130–148.
https://doi.org/10.1108/MEDAR-12-2012-0042

Sirkin, R. M. (1999). *Statistics for the social sciences* (2nd ed.). Sage Publications.

Song, M.-K., Lin, F.-C., Ward, S. E., & Fine, J. P. (2013). Composite Variables. *Nursing Research*, *62*(1), 45–49. https://doi.org/10.1097/NNR.0b013e3182741948

Steffen, W., Richardson, K., Rockström, J., Cornell, S. E., Fetzer, I., Bennett, E. M., Biggs, R., Carpenter, S. R., de Vries, W., de Wit, C. A., Folke, C., Gerten, D., Heinke, J., Mace, G. M., Persson, L. M., Ramanathan, V., Reyers, B., & Sörlin, S. (2015). Planetary boundaries: Guiding human development on a changing planet. *Science*, *347*(6223), 1259855. https://doi.org/10.1126/science.1259855

Stir, J. (2006). Restructuring teacher education for sustainability: Student involvement through a "strengths model". *Journal of Cleaner Production*, *14*(9), 830–836. https://doi.org/10.1016/j.jclepro.2005.11.051

Summers, M., Corney, G., & Childs, A. (2004). Student teachers' conceptions of sustainable development: The starting-points of geographers and scientists. *Educational Research*, *46*(2), 163–182. https://doi.org/10.1080/0013188042000222449

Titisari, P. W., Elfis, Zen, I. S., Hendrayani, Y., Chahyana, I., Khairani, Janna, N., Suharni, N., & Sari, T. P. (2020). Students' Perceptions of Education for Sustainable Development (ESD) to Achieve SDG 4 in Indonesia: A Case Study of Universitas Islam Riau. In N. Kaur & M. Ahmad (Eds.), *Charting a Sustainable Future of ASEAN in Business and Social Sciences* (pp. 191–202). Springer. https://doi.org/10.1007/978-981-15-3859-9_18

Tollefsen, I. (2017). *What is missing in the interdisciplinary approach to sustainable development in Norwegian education?* [Master thesis, Høgskulen på Vestlandet]. https://hvlopen.brage.unit.no/hvlopen-xmlui/handle/11250/2559008

Topuniversities.com. (2023, May 14). *QS Asia University Rankings 2023: South-Eastern Asia*. https://www.topuniversities.com/university-rankings/asia-university-rankings/south-eastern-asia/2023

Tuncer, G. (2008). University Students' Perception on Sustainable Development: A Case Study from Turkey. *International Research in Geographical and Environmental Education*, *17*(3), 212–226. https://doi.org/10.1080/10382040802168297

UN Department of Economic and Social Affairs. (2015). *Transforming our world: The 2030 Agenda for Sustainable Development*. Sustainable Development Knowledge Platform: 2030 Agenda. https://sdgs.un.org/2030agenda

UNCSD. (2012). *The Future We Want, Outcome document of the United Nations Conference on Sustainable Development*. UN Conference on Sustainable Development. https://sustainabledevelopment.un.org/content/documents/733FutureWeWant.pdf

United Nations. (2002). *Report of the World Summit on Sustainable Development: Johannesburg, South Africa, 26 August-4 September 2002*. World Summit on Sustainable Development, New York. United Nations.

United Nations Conference on Environment & Development. (1992). *Agenda 21*. UNCED. https://sdgs.un.org/sites/default/files/publications/Agenda21.pdf

United Nations Indonesia. (2023, April 13). *Our Work on the Sustainable Development Goals in Indonesia*. https://indonesia.un.org/en/sdgs

Wals, A. E. J. (2014). Sustainability in higher education in the context of the UN DESD: A review of learning and institutionalization processes. *Journal of Cleaner Production*, *62*, 8–15. https://doi.org/10.1016/j.jclepro.2013.06.007

WCED, S. W. S. (1987). World commission on environment and development. *Our Common Future*, *17*(1), 1–91.

Wright, T. (2010). University presidents' conceptualizations of sustainability in higher education. *International Journal of Sustainability in Higher Education*, *11*(1), 61–73. https://doi.org/10.1108/14676371011010057

Yuan, X., & Zuo, J. (2013). A critical assessment of the Higher Education For Sustainable Development from students' perspectives – a Chinese study. *Journal of Cleaner Production*, *48*, 108–115. https://doi.org/10.1016/j.jclepro.2012.10.041

Yuliani, S., & Hartono, D. (2020). Quality Education for Sustainable Development in Indonesia. In N. Kaur & M. Ahmad (Eds.), *Charting a Sustainable Future of ASEAN in Business and Social Sciences* (pp. 145–155). Springer. https://doi.org/10.1007/978-981-15-3859-9_14

Zeegers, Y., & Francis Clark, I. (2014). Students' perceptions of education for sustainable development. *International Journal of Sustainability in Higher Education*, *15*(2), 242–253. https://doi.org/10.1108/IJSHE-09-2012-0079

Zhang, C., Lonn, S., & Teasley, S. D. (2017). Understanding the Impact of Lottery Incentives on Web Survey Participation and Response Quality: A Leverage-salience Theory Perspective. *Field Methods*, *29*(1), 42–60. https://doi.org/10.1177/1525822X16647932

# Appendix

Here the information letter and assent form, as well as the questionnaire, are provided.

Please note that these are edited.

## Information Letter and Assent Form

Students' conceptualizations of sustainable development

Thank you for opening this survey. We are interested in your approach and perceptions regarding sustainable development. We would really appreciate if you took the time to answer this survey. Your answers matter!

This survey is issued and distributed as a part of CITRES.EDU (Citizen Engagement and Natural Resource Governance Education), a collaborative research-based educational project between

Department of Politics and Government Universitas Gadjah Mada and Norwegian University of Science and Technology. The project is in collaboration with POLGOV, a research institution under the

Department of Politics and Government. The findings from the survey will be used in the master thesis of a student from NTNU, Sebastian B. Kronbäck, as a part of the CITRES.EDU project.

Under you can read information on the project and give necessary assent on the next page. The survey takes an estimated time of 10-15 minutes to complete.

**\*Terjemahan bahasa Indonesia ada di bawah\***

Are you interested in taking part in the research project
"Students' conceptualizations of sustainable development"?

Purpose of the project

You are invited to participate in a research project where the main purpose is to map out how students in Indonesia, specifically in Yogyakarta, approach and conceptualize different dimensions of sustainable development.

The project will, among other things, look into whether there are some general trends within the student communities, based on information such as study program, age, gender, and place of origin.

Which institution is responsible for the research project?
Department of Geography, at NT NU (Norwegian University of Science and Technology), Norway is responsible for the project.

Data is collected through the Norwegian survey system called "Nettskjema". This is a system developed by the University of Oslo, to collect data from different research projects in a secure

and reliable way. The data that is collected, will only be accessible for a small number of individuals directly involved in the project.

Why are you being asked to participate?
You are being asked to participate in this project, because you may be a part of the population that fits my selection criteria. This is a project trying to reach as many students in Yogyakarta as possible, so you have most probably received this inquiry because of your participation in a social media channel, registery, or through other forms of contact.

What does participation involve for you?
Your participation in this survey involves answering questions in a questionnaire to the best of your ability. The survey is done electronically and your answers will be recorded electronically. The survey take an estimated time of 15 minutes to complete.

The survey will ask for information about your age, gender, nationality, study program and personal opinion on multiple matters related to sustainable development.

Participation is voluntary
Participation in the project is voluntary. If you chose to participate, you can withdraw your consent at any time without giving a reason. All information about you will then be made anonymous. There will be no negative consequences for you if you chose not to participate or later decide to withdraw.

This only applies if your answers is still possible to find. If it already have been successfully anonymized, it is not possible to find back to what data is yours.

Your personal privacy — how we will store and use your personal data
We will only use your personal data for the purpose(s) specified here and we will process your personal data in accordance with data protection legislation (the GDPR).

Only the individual that is responsible for the collection and anonymization of the data, will have access to any personal data (un-anonymized) . After the anonymization, others (for example a supervisor) would potentially have access to the data.

All of the data will be collected in Indonesia, as well as some of the analysis of the data material. Participants will NOT be recognizable in any publication, as the aim of the study is focusing on general trends.

What will happen to your personal data at the end of the research project?

The planned end date of the project is 15. May 2023. At the end of the project, all personal data will be permanently deleted. Data already analysed and/or generalized, will be archived

for potential future research or follow-up studies. This data will not contain any personal data that can recognize you as a individual.

Your rights
As long as you can be identified in the collected data, you have the right to:
   access the personal data that is being processed about you request that your personal data is deleted request that incorrect personal data about you is corrected/rectified receive a copy of your personal data (data portability), and send a complaint to the Norwegian Data Protection Authority regarding the processing of your personal data

What gives us the right to process your personal data?
We will process your personal data based on your consent.

Based on an agreement with Department of Geography at NTNU, Data Protection Services has assessed that the processing of personal data in this project meets requirements in data protection legislation.

Where can I find out more?
If you have questions about the project, or want to exercise your rights, contact:
   CITRES.EDU via
      ○ Tadzkia Nurshafira (project manager), citres.fisipol@ugm.ac.id, Whatsapp: +62 857-14430001
   Department of Geography at NTNU via
      ○ Sebastian B. Kronbäck (student), Sebastian.b.kronback@ntnu.no, Whatsapp: +62 821-2371-
         9856
      ○ Ståle Angen Rye (supervisor), Stale.anqen.rve@ntnu.no

If you have questions about how data protection has been assessed in this project, contact:
   Data Protection Services, by email: (personverntienester@sikt.no) or by telephone: +47 53 21 15
   00.

Thank you for your attention.

Assent form

Do you confirm that you:
  have received and understood information about the project "Perceptions of Sustainable Development" and got the contact information needed to ask questions.
  Accept that it is impossible to remove/correct information after data has been anonymized. Give consent:
    ○ To participate in the survey.
    ○ For CITRES.EDU to use the information about me for the project purposes.

  Yes (and proceed to survey) No

You have chosen not to give assent to the survey and may quit the survey as I am unable to use any information from you.

**Questionnaire**

How old are you?

    Under 16
    16-20
    21-25
    26-30
    31-35
    36-40
    41 or above

PLEASE QUIT THE SURVEY, AS I CAN ONLY COLLECT DATA FROM PEOPLE OVER 16 YEARS OLD

What gender do you identify as?

    Woman / Female
    Man / Male
    Other / Will not specify

Do you currently study in Yogyakarta?

    Yes
    No

Do you study in any of these universities?
Please select your university
    Universitas Gadjah Mada (UGM)
    Universitas Negeri Yogyakarta (UNY)
    Ahmad Dahlan University
    University Islam Indonesia
    Universitas Atma Jaya
    Universitas Pembangunan Negeri Yogyakarta
    Universitas Sanata Dharma
    Other

Which of the following would you place your study program under?
This element is only shown when the option 'Yes' is selected in the question 'Do you currently study in Yogyakarta?'
    Social sciences
    Natural sciences
    Economy

Other

For how many semesters have you studied?
Including your current semester and potential semesters from outside Yogya

1

2

3

4

5

6

7

8

9

10

1 1

12

13 or more

How do you finance your studies?
Enter your main source for financing your studies.

Self-funded
scolarship
Help                from
parents/family Other

You consider yourself as coming from a family in the...

Lower class
Low middle class
Middle class
Upper middle class
Upper class
Prefer not to say

On a scale from 1-5, how satisfied are you with your current situation regarding...
From your own point of view.

Overall living standard
1 (Lowest level of satisfaction)
2
3
4
5 (Highest level of satisfaction)
Food security
1 (Lowest level of satisfaction)
2

3

4

5 (Highest level of satisfaction)

Gender equality

 1 (Lowest level of satisfaction)

 2

 3

 4

 5 (Highest level of satisfaction)

Physical health

 1 (Lowest level of satisfaction)

 2

 3

 4

 5 (Highest level of satisfaction)

Well-being/MentaI  health

 1 (Lowest level of
 satisfaction)

 2

 3

 4

 5 (Highest level of satisfaction)

Access to quality education

 1 (Lowest level of satisfaction)

 2

 3

 4

 5 (Highest level of satisfaction)

Access to decent work (after
 study) 1 (Lowest level of
 satisfaction)

 2

 3

 4

 5 (Highest level of satisfaction)

Not having over-consumption on goods and food

 1 (Lowest level of satisfaction)

 2

 3

 4

 5 (Highest level of satisfaction)

Access to good
 infrastructure  1

(Lowest    level    of
satisfaction)
2
3
4
5 (Highest level of satisfaction)

Access to affordable and renewable energy
1 (Lowest level of satisfaction)
2
3
4
5 (Highest level of satisfaction)

Access to recycling
1 (Lowest level of satisfaction)
2
3
4
5 (Highest level of satisfaction)

Incentives    to    preserve
nature 1 (Lowest level
of satisfaction)
2
3
4
5 (Highest level of satisfaction)

Have you heard of Sustainable Development?
Yes
No

How well would you say you know sustainable development
This element is only shown when the option 'Yes' is selected in the question 'Have you heard
of Sustainable Development?'
From your own perpective, how well do you know the term sustainbable development and what
it includes.
(on the scale below)


Where have you learned most about sustainable development?
Please check maximum three alternatives for which sources you have learned most about
sustainbable development.
University
School (before university)
Social media (Facebook, YouTube, Instagram etc.)
TV or streaming (Including Netflix, Disney&#43; etc.)
Reading books (not related to school)

Local and National News
International and Worldwide News
Friends and Family
Through work (It is a part of your
job) Other

Have sustainable development been a part of any courses that you have taken?
During your studies (at university), have Sustainable Development been a part of (in any sense, for example discussion) one or several of the courses you have attended?

Yes, all

Yes, several

Yes, one or two
No, not really

What is your first thoughts when hearing "Sustainable Development"?
Please answer with keywords (for example: keyword 1 , keyword2, keyword3 etc.)

Are you familiar with the Sustainable Development Goals (SDGs)?

In the following section you are asked to place your opinion on different statements related to achieving Sustainable Development. You can both agree and disagree to the statements, with different strength. Please read the statements carefully, to be able to provide the most accurate answer. Your opinions matter, so ble consider your selection and be honest.

1 = Strongly Agree
2 = Agree
3 = Agree a little bit
4 = I don't know (or no opinion)
5 = Disagree a little bit
6 = Disagree
7 = Strongly Disagree

"I think Fighting Poverty and Hunger, SHOULD NOT be a priority for achieving Sustainable Development"
Please place your opinion on the scale below

"I think Supporting Innovation and Aiming for Economic Growth, SHOULD NOT be a priority for achieving Sustainable Development" Please place your opinion on the scale below

"I think Having Responsible Production and Consumption of Goods, SHOULD NOT be a priority for achieving Sustainable Development" Please place your opinion on the scale below

"I think Aiming for and Having Peace, Justice and Equality in our Society, SHOULD NOT be a priority for achieving Sustainable Development" Please place your opinion on the scale below

"I think Aiming for High Quality Education and Good Physical and Mental Health for

Everyone, SHOULD NOT be a priority for achieving Sustainable Development"
Please place your opinion on the scale below

"I think Developing Sustainable Cities and Communities, SHOULD NOT be a priority for achieving Sustainable Development" Please place your opinion on the scale below

"I think Preserving Nature and Life in the Sea and on Land, SHOULD NOT be a priority for achieving Sustainable Development" Please place your opinion on the scale below

"I think Providing Clean and Affordable Energy for Everyone, SHOULD NOT be a priority for achieving Sustainable Development" Please place your opinion on the scale below

"I think Providing Clean Water and Sufficient Sanitation for Everyone, SHOULD NOT be a priority for achieving Sustainable Development" Please place your opinion on the scale below

"I think Combating against Climate Change, SHOULD NOT be a priority for achieving Sustainable Development" Please place your opinion on the scale below

I think that in general, Sustainable Development SHOULD NOT be a priority in future development
Please place your opinion on the scale below

Relations to Sustainable development
On a scale from 1-5, please rate how much YOU THINK each of the statements below is related to achieving a sustainable development.
Fighting poverty and hunger
    1: Not related
    2: Somewhat related
    3: Related
    4: Very related
    5: Extremely related

Supporting Innovation and economic growth
    1: Not related
    2: Somewhat related
    3: Related
    4: Very related
    5: Extremely related

Having Responsible Production and Consumption og Goods
    1: Not related
    2: Somewhat related
    3: Related
    4: Very related
    5: Extremely related

Having Peace, Justice and Equality in our Society
    1: Not related
    2: Somewhat related
    3: Related
    4: Very related
    5: Extremely related

Quality Education and Good Physical and Mental Health for Everyone
    1: Not related
    2: Somewhat related
    3: Related
    4: Very related
    5: Extremely related

Developing Sustainable Cities and Communities
    1: Not related
    2: Somewhat related
    3: Related
    4: Very related
    5: Extremely related

Preserving Nature and Life in the Sea and on Land
    1: Not related
    2: Somewhat related
    3: Related
    4: Very related
    5: Extremely related

Providing Clean and Affordable Energy for Everyone
    1: Not related
    2: Somewhat related
    3: Related
    4: Very related
    5: Extremely related

Providing Clean Water and Sufficient Sanitation for Everyone
    1: Not related
    2: Somewhat related
    3: Related
    4: very related
    5: Extremely related

Combating against Climate Change
    1: Not related
    2: Somewhat related
    3: Related
    4: Very related
    5: Extremely related

The survey is finished, please remember to click "send" down below.

Thank you so much for contributing with your opinions for our survey. .
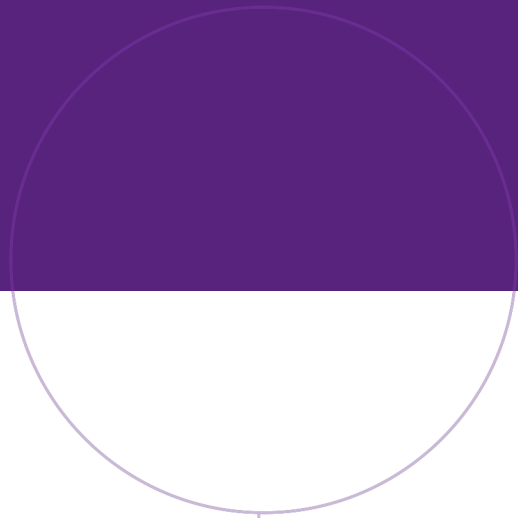
If you have any further questions, feel free to contact us through:
   POLGOV
 ⊙ Tadzkia Nurshafira (project manager), citres.fisipol@ugm.ac.id, Whatsapp: +62 857-1443-
0001

   Department of Geography at NTNU via
      ⊙ Sebastian B. Kronbäck (student), Sebastian.b.kronback@ntnu.no, Whatsapp: +62 821
      2371-9856