IDENTIFYING THE CHARACTERISTICS OF SOCIALLY INTEGRATED MOBILE BULLY-VICTIMS USING A MOBILE APPLICATION

By

Nombulelo Virginia Jokazi

Supervised By:

Professor Michael Kyobe

A thesis submitted to the Department of Information Systems, University of Cape Town, in fulfilment of the requirements for the degree of Doctor of Philosophy

December 2023

DECLARATION

I, Nombulelo Virginia Jokazi, hereby declare that the work on which this thesis is based is my original work (except where acknowledgements indicate otherwise) and that neither the whole work nor any part of it has been, is being, or is to be submitted for another degree in this or any other university. I authorise the University to reproduce for the purpose of research either the whole or any portion of the contents in any manner whatsoever.

Signature: Signed by candidate

Date: 07/12/2023

ACKNOWLEDGEMENT

The past few years working on this thesis have been challenging, however, I am grateful that I received a platform and a chance to fulfil my research interests. Throughout this journey, I learned to be curious, more patient and grateful.

I would like to extend my gratitude to Professor Michael Kyobe, who has constantly provided feedback and support throughout this journey. His guidance is highly appreciated. I am also grateful to the University of Cape Town and the Department of Information Systems for providing me with a chance and the necessary support to complete my studies.

This study would not be possible without the Western Cape Province students who availed themselves and participated in this study, thank you. I would like to thank my parents for their support and sacrifices which have given me a chance to reach spaces that seemed impossible for a village child. I would like to thank my only sister and little brother who have always provided comfort and emotional support at all times. Lastly, my friends for the words of encouragement and support.

Abstract

The prevalence of mobile bully-victim behaviour is increasing on popular mobile social networks. Mobile bullying is a sub-type of cyberbullying committed using mobile technology. Mobile bully-victims are individuals who exhibit both bullying and victimisation behaviour. While there are different types of bully-victims, research on bullying has traditionally focused on marginalised bully-victims, rather than on socially integrated bully-victims, who appear to present a greater risk to young people. Socially integrated bully-victims form interpersonal relationships through social interactions, and in the process, are victimised, and bully their peers in retaliation. This bullying is becoming more prevalent, especially among university students in South Africa. This is worrisome as previous studies have linked this behaviour to negative outcomes, such as depression, anxiety, and suicidal tendencies. In addition, studies indicate that identifying socially integrated bully-victims can be challenging. Consequently, this group is not widely known, nor widely catered for by bullying prevention programmes.

The objective of this study was to develop a mobile application that could be used to identify the characteristics of socially integrated bully-victims who use mobile technology. The focus on mobile technology and mobile technology users is important since this technology is utilised more by young people to conduct bullying, compared to other technologies.

To achieve this goal, extensive literature reviews were conducted to identify the characteristics of socially integrated mobile bully-victims, and how these arise. This led to the development of an integrative framework using the five factor theory (FFT), and Bronfenbrenner's socio-ecological model (SEM). The link between these theories is the developmental systems theory (DST), which explains the bi-directional relationship between individual characteristics and environmental influences. A conceptual model was derived from this integrative framework. This then guided the design, development, and assessment of the socially integrated mobile bully-victim (SIMBV) application.

The researcher adopted pragmatism as her philosophical paradigm, and design science (DS) as her research strategy. DS provided the steps needed to develop a useful application. The SIMBV application was tested in two iterations involving undergraduate students at a university in the Western Cape province of South Africa. Forty-two out of 143 participants from the first iteration were found to possess the characteristics of socially integrated bully-victims. These consisted predominantly of females and males between 18 and 19 years of age. The second iteration had 54 respondents, who possessed the characteristics of socially integrated mobile bully-victims.

The findings from the cluster analysis indicate that individual characteristics and environmental factors shape the characteristics of socially integrated mobile bullying victims. The key characteristics of the studied SIMBVs in the South African context are retaliation, low agreeableness, openness, hostility, characteristic adoption, consciousness, popularity, prior victimisation and mobile bully-victim

behaviour. The environmental factors on the other hand include peer norms, coercion by parents, exposure to violence and cultural expectations. In addition, SIMBVs were found to defend friends and others. This finding differs from earlier studies, which tend to report only negative characteristics of bully-victims.

This study contributes to theory by developing a more comprehensive and integrated framework of socially integrated mobile bully-victims characteristics. This integrated framework and the conceptual model can be used to develop useful tools to mitigate bullying committed over mobile phones. Identifying and understanding SIMBVs is made easier for psychologists in higher education with the mobile application. SIMBVs felt free to share the depth of their experience since the mobile application features ensure anonymity, and the psychologist user can know the true characteristics of the SIMBV in real time. The application can enable the development of relevant policies and effective interventions for this group. The mobile app has educational material on mobile bullying that can be utilised by universities and schools to raise awareness about this phenomenon.

Table of Contents

List of Figures

List of Tables

Chapter 1: Introduction

1.1. Background of the study

Globally cyberbullying research within the university context is limited. This is alarming as students in university settings have frequent access to Information Communication Technology (ICT) compared to other youth groups such as school learners (Shaikh et al., 2021). Cyberbullying has been found to have negative impacts such as depression, poor academic performance and sleep disorders. In worse-case scenarios it has resulted in suicide, for example in 2010, *The New York* Times published an incident of cyberbullying that resulted in an undergraduate student at Rutgers University, taking his life. In addition, a study by Martínez-Monteagudo et al (2020) found that cyber-victimisation increased the chances of suicide ideations among Spanish University students. Studies on the phenomenon of cyberbullying have been dominated by North America and Europe, with less research having been conducted in Africa (Smith, 2019). This may be due to Africa's slow adoption of the internet in previous years compared to developed continents. Over the past decade, this view has changed after advances in technology, resulting in the introduction of smartphones, which are mobile devices with access to the internet (Torous & Powell, 2015; Adzobu, Okyere & Banji, 2021). Smartphones have become more affordable and widely available in developing countries in Africa since the end of the 2000s, particularly in Ghana, Kenya, Nigeria, and South Africa (Shim & Shin, 2016; Adzobu, Okyere & Banji, 2021). South Africa had the highest adoption rate relative to other African developing countries as of January 2019, according to the BusinessTech online newsletter (BusinessTech, 2019). This shift in technology has resulted in mobile bullying, i.e., bullying using mobile phone applications such as WhatsApp and Instagram (Kyobe, 2016; Kyobe &Ndyave, 2019).

It is important to distinguish between cyberbullying and mobile bullying, because the influence of bullying may differ by the type of technology used (Kyobe &Ndyave, 2019). Cyberbullying is a form of aggression that is exerted towards an individual or a group using a technology device and the internet (Kyobe, Mimbi, Nembandona & Mtshazi, 2018). Mobile bullying is a sub-category of cyberbullying. It differs in that it is channelled through mobile technology such as smartphones, which are easily portable, and have 24/7 internet access. Mobile technology is utilised more frequently to conduct bullying by both pure bullies and bully-victims, compared to other technologies (Ndyave, Kyobe, 2017; Radebe & Kyobe, 2021). This has resulted in an increased prevalence of mobile bullying. In addition, mobile bullying usually takes place on social networks. Studies that have examined social media bullying also highlight the increase in cases involving bully-victims. Bully-victims are individuals who engage in bullying but are also victims of bullying (Kyobe, 2016). This group of bullies was originally studied by

Olweus in 1978 (Rodkin et al., 2015; Liu & Wang, 2021). A study conducted in South Africa in 2009 focusing on youth between the ages of 12-24 years, found that 63% of the sample were mobile bully-victims (Burton & Mutongwizo, 2009). Later, Ndyave and Kyobe (2019) found that 69.8% of high school learners sampled were mobile bully-victims.

The use of mobile technologies like smartphones increases the prevalence of mobile bully-victims. These phones enable users to retaliate by posting videos, photos, comments, and emojis, and replying to messages/posts instantly, sometimes anonymously (Ndyave &Kyobe, 2019). Rodkin et al. (2015) identified two social worlds of bully-victims i.e., those who are socially integrated, and those who are socially marginalised. There has been limited focus on the former.

1.2. Student's welfare and responsible stakeholders

Undergraduate university students spend most of their time on campus, far away from their parents/guardians. Internationally, countries such as The United States of America (USA) and the United Kingdom (UK) law stipulate the university is responsible for the safety of students (Zhen, 2014). This is due to the majority of undergraduate students being below the adult age of 21, as per the country's regulations (Zhen, 2014). South Africa on the other hand is still tackling the issue of inclusiveness and transformation at the university level, to align with the post-apartheid constitution and the Department of Higher Education (Heleta, 2016). Furthermore, the epidemic of Gender Based Violence (GBV) has been escalating in tertiary institutions of South Africa. Therefore, the government introduced the GBV framework in 2020, which makes it an obligation for higher education institutions to raise awareness about GBV and put preventative measures in place to combat it (Von Meullen & Van der Waldt, 2022). It is clear, internationally and in the context of South Africa, that the physical safety of students is the responsibility of higher institutions and there are laws in place to promote this obligation.When it comes to the digital environment, there are scarce initiative direct initiatives that focus on student safety both by the government and tertiary institutions. In the context of South Africa, there is no law that prohibits cyberbullying. In addition, tertiary institutions do not have mobile bullying policies and awareness programs (Cilliers, 2021). Instead, release is placed fractions of existing laws such as the Protection from Harassment Act 17 of 2011 (Smit, 2015). This law only helps mobile victims with protection order against the perpetrator. When it comes to adding cyberbullying educational programmes, international studies have suggested this responsibility is better suited for representatives that are in close proximity to students such as the education systems, parents and psychologists (Moreno et al., 2013; Cilliers, 2021). Given this recommendation, the current study aims to identity the characteristics of Socially Integrated Mobile Bully-Victims (SIMBVs), in order to assist institutions to understand this group better and create policies and treatments for this group.

1.3. Problem statement

Bully-victims in general are said to be at greater risk of adverse outcomes than other bullies. However, research on bullying has traditionally focused on marginalised bully-victims than other types like socially integrated bully-victims. Social integration is a process of forming interpersonal relationships with others and creates a sense of belonging for an individual. The youth form friendships and gain followers through social integration by manipulating social systems (Antiri, 2016). In this form of relational bullying, the victim is marginalised by the bully during social interactions through incidents such as trolling, exclusion, and the spreading of rumours. When victims retaliate, they also become bullies and become socially integrated bully-victims (Kaukiainen et al., 2002). Previous studies have linked socially integrated bully-victim behaviour to negative outcomes such as depression and anxiety (Kennedy, 2021; Lee et al., 2021). Yet other studies have found that identifying this group of bullies can be challenging, and there may be few intervention programmes targeting this group (Hensums et al., 2022). Studies on bully-victims are limited in South Africa in general. This is of great concern, since this group has been associated with suicidal tendencies (Popovac and Leoschut, 2012; Klomek et al., 2009). Suicide is the fastest-growing and second-leading cause of death in 15-19 age groups in South Africa and has been associated with cyber-bullying (Holt, 2015). Since there is limited understanding of socially integrated bully-victims, and a lack of consensus regarding their characteristics, it is imperative to find ways to understand better this group of bullies if appropriate interventions are to be found.

Theories and frameworks that provide a comprehensive view of the factors that influence the roles of bullies, victims, and bully-victims in mobile bullying are lacking. Existing studies have mainly relied on Bronfenbrenner's Socio-Ecological Model (SEM) to explore the environmental factors that influence mobile bullying. In addition, Patel and Quan-Haase (2022) incorporated the digital environment into the modified SEM version. Although there is an updated SEM model that addresses the new age of social media, individual characteristics are often overlooked. Consequently, there are studies that concentrate on demographics and environmental factors, while only a few have delved into individual factors using the Five Factor Model. The drawback of this is the FFM is only focusing on basic tendencies, excluding other elements such as biological bases, characteristic adoption and self-concept included in the enhanced version which is the Five Factory Theory.

1.4. Mobile applications as the potential solution

According to Thun, The and Cheng (2022), adolescents spend most of their time interacting on social media and messaging applications which are embedded in their mobile phones. Mobile applications offer anonymity and ease of use, and they are always within reach for the youth (Kaiser et al., 2021). Recent studies have called for more innovative ways of identifying cyberbullying roles and raising awareness about cyberbullying and its consequences (Radebe & Kyobe, 2021). As a result, there is a growing number of studies from computer science and digital health fields that have created mobile applications to identify cyberbullying and provide emotional support to victims. For example, Thun, The & Cheng (2022) developed a mobile application that identified cyberbullies and victims through analysing social media posts, emojis, and hashtags. Kaiser et al. (2021) also developed a mobile application to assist primary and high school cyber-victims from Norway to cope with cyberbullying. This application provides adolescents with cyberbullying knowledge, coping strategies, and help-seeking mechanisms.

Hall et al. (2021) recommended mobile applications include mental health indicators, in addition to identifying whether an adolescent is a cyber-bully/cyber-victim. This can be done by ensuring the design of the mobile application is informed by psychology to provide mental health professionals with actionable insights. Balakrishnan et al. (2019) reported an improvement in cyberbullying detection after incorporating individual traits by using psychological models (the Big Five and Dark Triad, respectively). Since mobile phones have this potential, and are widely used by young people to bully others and also to seek intervention, the present study aims to develop a mobile application that can be used to identify the characteristics of socially integrated mobile bully-victims. As indicated above, the research focuses specifically on those socially integrated bully-victims using mobile technology.

1.5. Research Question

The main research question for this study is: *How can a mobile application be developed and used to identify socially integrated mobile bully-victim characteristics?* To answer this question, the following sub-questions were formulated:

- What are the characteristics of socially integrated mobile bully-victims?
- How do the characteristics of socially integrated mobile bully-victims lead to social integration and mobile bully-victim behaviour?
- What features should a mobile application have in order to identify the characteristics of socially integrated mobile bully-victims better?

1.6. Research Objectives

In line with the research questions, the objectives of this study are as follows:

- To develop a mobile application that can be used to identify the characteristics of mobile social integrated bully-victims.
- To determine the characteristics of social integrated mobile bully-victims.

1.7. Philosophical stance of the study

The main purpose of this study was to develop a mobile application that can be used to identify the characteristics of socially integrated mobile bully-victims. Relevant literature on socially integrated mobile bully-victims was reviewed. The five-factor theory, Bronfenbrenner's socio-ecological model, and the developmental systems theory (DST) were adopted in order to develop a conceptual model of the potential characteristics of SIMBV. The researcher adopted the pragmatism ontology and epistemology paradigms, as this, together with the conceptual model, would effectively guide the development and testing of the mobile application. Furthermore, mixed methods were used to collect and analyse the data.

1.8. Research contribution

This research contributes to the cyberbullying body of knowledge by identifying and highlighting socially integrated mobile bully-victims (SIMBV) as a group that has been rarely studied. Furthermore, this study provides guidance on how the characteristics of this role can be identified. The study makes theoretical, methodological, and practical contributions to the information systems (IS) field, as outlined below:

a) Theoretical contribution

This study finds that socially integrated mobile bully-victims possess complex characteristics and to comprehend these characteristics, one must be guided by various theoretical frameworks. The researcher therefore built an integrated framework drawing from various theories. With this, she then successfully developed the mobile application. The development systems theory (DST) was adopted, and to unpack its components, the five-factor theory (FFT) and Bronfenbrenner's socio-ecological model (SEM) were also adopted. FFT was used to identify and examine the individual characteristics of SIMBVs, whereas the SEM was used to explore the environmental factors influencing the characteristics of SIMBVs. This study examined all five components of the FFT, unlike previous studies, which focused only on basic tendencies such as extroversion,

consciousness, agreeableness, neuroticism, and openness. The cluster analysis results confirmed the significance of most of the components of the FTT (i.e. low agreeableness, openness, hostility, and consciousness), as well as self-concept (popularity), objective biography (prior victimisation) and characteristic adoption (learnt aggressive behaviour). The researcher therefore concludes that to understand SIMBV characteristics, it is important to examine many individual characteristics and their interaction with influencing environmental factors.

The SEM enabled an understanding of how the immediate and distal environments influence the behaviour and characteristics of an individual. The qualitative findings revealed how individual characteristics influence the physical and digital environments, while cluster analysis enabled the measuring of this bi-directional relationship between individual characteristics and environmental factors. The cluster analysis technique also assisted the researcher to test the conceptual model. This conceptual model can enable psychologists and policymakers to understand SIMBVs better and develop appropriate interventions for this bullying role.

b) Methodological contribution

This study demonstrates the effectiveness of using the pragmatist paradigm and design science as a research approach. The nature of the current study demanded the adoption of a paradigm that recognises the interconnectedness between experience, knowing and acting, and a research approach that could enable the development of knowledge those fighting bullying can use to develop appropriate interventions. With these approaches, it was possible for the researcher to generalise data, validate the instrument and develop a holistic analysis of the interactions between SIMBV characteristics and the influencing environmental factors.

There is currently limited knowledge on how to fully integrate both qualitative and quantitative data in mixed methods research. The present study demonstrates how one can use the quantitisation technique to obtain a deeper analysis of qualitative findings. The researcher also showed the effectiveness of the cluster analysis technique in measuring complex bi-directional relationships between constructs. This non-parametric technique has not been used widely by researchers in the field of cyberbullying. Previous studies have studied environmental factors and individual characteristics in isolation, yet these interplay, as explained in Chapter 2.

c) Practical contribution

The conceptual model of this study can be used as a guide by the counselling services departments of universities for pre-counselling assessments, and to develop the appropriate interventions. Screening of characteristics by psychologists has been recommended by previous cyberbullying studies as it helps to understand the students before providing treatment (Myers & Cowie, 2017). The mobile application also consists of information that explains mobile bullying, and it also provides helplines. These features can be used to raise mobile bullying awareness at these universities. In addition, the Department of Higher Education, legal practitioners, and university policymakers can use the findings of this study and the conceptual model to inform policy on combatting mobile bullying. Lastly, throughout the design and development process of the mobile application, this study offers practical knowledge on the use of agile tools to deliver a technology solution end-to-end. Overall, this study also illustrates the practical use of the Design Science (DS) approach in creating and evaluating a technological artefact.

Chapter 2: Literature Review

2.1. Literature Review Approach

In search of existing literature on Google Scholar, keywords were used. As this study aims to identify the characteristics of socially integrated mobile bully-victims, keywords included characteristics, bully-victims, social integration, and mobile bully-victims. Cyberbullying was also included as a keyword, as some studies would include mobile bullying under cyberbullying. During the search, it was noted that few papers from the Journal of Emotional and Behavioral Disorders, Journal of Violence, Journal of Interpersonal Violence and ScienceDirect focused explicitly on the characteristics of bully-victims and socially integrated mobile bully-victims. One paper specifically outlined the different types of bully-victims, while the second identified the similarities and differences between cyberbullies and cyberbully-victim (Kennedy, 2018; Schenk, Fremouw & Keelan, 2013). Few other papers concerned mobile bully-victim behaviour (Kyobe, 2016; Kyobe, Oosterwyk & Kabiawu, 2016; Nomane & Kyobe, 2017).

Most of the studies from EBSCOHost compared traditional bully-victims and cyberbully-victims with pure bullies and pure victims in terms of their characteristics, risks exposure and prevalence. In addition to gathering literature on socially integrated bully-victims, theories and frameworks that explain bullying on mobile devices and how the behaviour of bully-victims emerges were identified. The theoretical frameworks have been adapted to guide the review of the characteristics of socially integrated mobile bully-victims. Furthermore, the theories helped to describe and understand the factors that influence students to become socially integrated bully-victims online.

2.2. Traditional bullying and mobile bullying

2.2.1. Emergence of traditional bullying and cyberbullying

Bullying refers to when an individual is subjected to direct or indirect negative actions such as verbal insults, beatings, and offending comments, repeatedly over time by another person or a group (Olweus, 1994). Bullying became the focus of academic researchers in the late 1970s in Northern Europe (Salmivalli & Peets, 2009). Nowadays, the amount of research into this phenomenon has increased, along with its relative complexity. According to Hinduja and Patchin (2010), bullying starts when the perpetrator sees another student as either physically or socially weak. The perpetrator is usually an individual or group of students who possess more power than the targeted student. The

victim is subjected to abuse such as beatings, exclusion from a group, insults, and offensive comments.

Over the last decade, in addition to traditional bullying, cyberbullying has also emerged (Slonje & Smith, 2008). This is due to advances in technology that allow physical relationships and interactions to occur digitally. For many researchers, cyberbullying is an evolutionary process of traditional bullying, and therefore, would possess some similar characteristics (Donegan, 2012). Cyberbullying involves bullying, embarrassment, and mistreatment of an individual or group using the internet and technological devices such as a mobile phone and a computer (Jaiswal, 2021). This type of bullying may take many different forms and has been defined differently in some cases. However, what is common in most of the definitions is that the aggression is committed online. According to Hornor (2018), there are six main ways in which young adults bully others online, namely, flaming, harassment, outing and trickery, exclusion, impersonation, and cyberstalking. Flaming refers to outbursts of rude behaviour (cyber verbal attacks) by others on a social network platform. Flaming includes several elements, such as hostility, slander, disseminating false information about another person, and personal attacks (Lee & Jin, 2019). This phenomenon tends to have negative consequences for healthy growth and living in social spaces. According to the United Kingdom's Protection from Harassment Act, cyberaggression includes monitoring via the internet (cyberstalking), distributing sensitive information about someone, and identity theft (Millman, Winder & Griffiths, 2019). This is consistent with views expressed by Burke Winkelman et al. (2015), which link cyber harassment to cyberstalking, identity theft, incessant text messaging, and inappropriate messaging. Outing and trickery are defined as obtaining an individual's trust through deception, and later publicly exposing their private information, such as secrets, videos, and photos (Peebles, 2014). Exclusion refers to the intentional exclusion of an individual from an online group (Menesini et al., 2012), while identity theft refers to the theft and use of another person's name, or online account (Nocentini et al., 2010).

The phenomenon of cyberbullying became popular in the United States at the end of the 1990s, when the second generation of digital phones emerged. This is because teenagers began at this time to have access to this technology, contrary to previous telephone models that were rare, not portable, and most popular among adults. International studies on cyberbullying began to be published in the late 1990s and early 2000s in databases such as Google Scholar, EBSCOHost, and ScienceDirect. The majority were intended to compare the seriousness of traditional bullying with cyberbullying, or to report popular cases of cyberbullying that led to suicide. At this point, studies focused primarily on adolescents, bullying through websites, and chatrooms (Hinduja and Patchin, 1998; Paulson, 2003).

By 2006, there were studies that focused on prevalence and gender differences. The prevalence of cyberbullying varied from 6.5% to 30% (Patchin & Hinduja, 2006; Ybarra, 2004). A greater number of males were cyberbullies than females. Furthermore, when it comes to gender, there were certain inconsistencies. Some studies argued that males were more likely to become cyberbullies compared to females, whilst others noted no differences in this regard (Li, 2006; Hinduju & Patchin, 2008). Recently, studies have started identifying the prevalence of various cyberbullying roles, such as cyberbullies, cyber-victims, and cyberbully-victims amongst adolescents. Furthermore, the psychological characteristics and the environmental factors that impact these roles have also been examined separately by various studies.

2.2.2. Emergence of mobile bullying

The technological advancement and innovation of online communication platforms have given rise to the need to categorise cyberbullying based on the media used to conduct such acts (Scheithauer et al., 2021). Earlier studies classified cyberbullying based on channels such as emails, SMSes, chatrooms, phone calls, and websites. However, this has now changed as most of this functionality is embedded and accessible via smartphones (Scheithauer et al., 2021). One profound finding by Kyobe et al. (2016) is that cyberbullying may differ by the type of technology used, and that the impact of mobile technology bullying may be greater on the victim than that of other technologies. Kyobe et al. (2016) therefore argue for a clear distinction between cyberbullying and bullying committed using mobile phones, placing focus on this type of bullying, defined as mobile bullying, and the behaviours resulting from this as 'mobile bullying behaviour'. Kyobe et al. define mobile bullying as a sub-category of cyberbullying conducted on instant messaging applications and social networks using a mobile device. Mobile bullying can be perpetrated directly in the form of sending offensive text and voice messages, and indirectly, by spreading rumours, gossiping, and social exclusion. The perpetrator of indirect bullying may or may not see the reaction of victims.

Studies have also linked the 'always-on' connectivity provided by mobile phones to an increase in the prevalence of bullying online, as the majority of young adults access social networks via mobile phones (O'Neill & Dinh, 2015; Chughtai, 2021). Moreover, it has now become more challenging to differentiate between bullies and victims due to overlapping roles, as recent digital platforms have eliminated the power imbalance (O'Neill & Dinh, 2015; Chughtai, 2021). Furthermore, the use of mobile phone features like Emojis, as well as posts on social media make it possible to observe instantly the feelings and anger of victims, the support the victims and perpetrators they may get, and those who may possess both the characteristics of bullies and victims, viz. *bully-victims* (Ndyave & Kyobe, 2019). Mobile bully-victim behaviour has been linked to adverse outcomes, such as depression, anxiety, and suicidal tendencies. This is of concern as not much is known about this group and studies about mobile bullying,

its severity, and the characteristics of the associated roles are scarce (Radebe & Kyobe, 2021). Therefore, the present study will focus on mobile bully-victim.

2.2.3 Bully-victim role

It is crucial to note that past international studies on cyberbullying primarily focused on victims and bullies. The dual role of being a victim and a bully was not examined until 2008. According to Campfield (2008), the prevalence of cyberbully-victims at that time was about 35% among young people in primary and secondary schools. Campfield (2008) states further that cyberbully-victims showed distinct characteristics compared to traditional bully-victims. Although this is the case, the literature related to this group was still limited at that time (Mishna et al., 2012). When it comes to African literature, studies on cyberbullying and mobile bullying have been limited for some time. A study by the Centre of Justice and Crime Prevention in South Africa (Burton & Mutongwizo, 2009), found at that time that about 12.2% of cyberbullying was taking place through MXIT, an instant messaging application that is available on smartphones. About 63% of the victims of bullying on instant messaging platforms retaliated. It was not clear whether this was a form of revenge against a bully, or whether these individuals were initially perpetrators that had themselves been bullied. Recent studies suggest that the prevalence of bullying victims in South Africa has since increased. Ndyave and Kyobe (2019) reported 69.8% of mobile bully-victims among high school students. The authors attribute this high prevalence to the homogeneous nature of this group (Ndyave & Kyobe, 2019). Earlier studies by Giang and Graham (2008) and Ettekal and Ladd (2017), found two types of bully-victims i.e., highly victimised bully-victims and highly aggressive bully-victims.

There are also marginalised bully-victims who tend to display high levels of physical and verbal aggression, but are also victimised through verbal aggression (Giang & Graham, 2008). This group tends to be rejected in social systems. Marginalised bully-victims are reported to face emotional challenges, such as anxiety and depression. This may be attributed to loneliness (Kennedy, 2021). Socially integrated bully-victims, on the other hand, tend to manipulate social systems and exclude others instead of engaging directly in physical aggression. This group is characterised by social integration and according to both traditional bullying and cyberbullying studies, it belongs to friendships, and may be protective. Socially integrated bully-victims are found to be prevalent during their late teenage years. This has been attributed to the fact that as teenagers grow up, they transition from highly victimised bully-victims to relational aggressive victims (Ettekal & Ladd, 2017). Furthermore, unlike highly victimised bully-victims, relational aggressive bully-victims are more likely to inflict pain on their victims, since they are not easy to identify and appear to possess power (Kennedy, 2021). This is a major

concern, as these socially integrated bully-victims are also least researched, and more prevalent among young people (O'Brien, 2019) and in schools (Ettekal & Ladd, 2017).

2.3. The characteristics of socially integrated mobile bully-victims

Socially integrated mobile bully-victims are individuals that partake in bullying on mobile platforms by swinging between being a bully and a victim, and they are characterised by high levels of aggression and quality friendship groups. This subtype of bully-victims is rarely understood, as previous studies have mainly focused on marginalised bully-victims. The researcher sees value in exploring this group, as Skilbred-Fjeld et al. (2020) have called for more research in the cyberbullying field to explore characteristics of bully-victims, in order to enable earlier and better detection of this group. In addition, previous studies recommend characteristics of each subtype of bully-victim to be identified to enable the development of tailored interventions suitable for each bully-victim group as there are variations in engaging in bullying or being victimised (Chung & Lee, 2020; Skilbred-Fjeld et al., 2020, Kennedy 2021). This makes the psychological impact different for each subtype of bully-victim (Chung & Lee, 2020).

According to bullying and cyberbullying researchers, bullying is the result of the interaction between an individual and socio-ecological factors (O'Brien, 2019; Shaikh et al., 2020). This has resulted in both traditional bullying and cyberbullying studies adopting Bronfenbrenner's socio-ecological model (1979) to identify and explain those factors that influence bullying both online and offline (Patel & Quan-Haase, 2023). The present study also adopted Bronfenbrenner's socio-ecological model (1979) to identify the environmental and social factors that influence the characteristics of socially integrated mobile bully-victims. Therefore, the researcher argues the behaviour of socially integrated mobile bully-victims (SIMBVs) to be a consequence of the interactions between individual characteristics and socio-ecological factors. This position is consistent with developmental systems theory (DST), which posits that behaviour is not the result of individual characteristics ~~factors~~ alone, but also the result of interactions between an individual, their inherent environment, and the social contexts.

It is crucial to note however, that while Bronfenbrenner's socio-ecological model (SEM) provides a comprehensive view of the socio-ecological factors that influence bullying both online and offline, with an individual at the centre of each environmental context, the model does not explain which individual characteristics to consider when examining personal attributes. Therefore, bullying and cyberbullying researchers like Alonso & Romero (2017) and Balakrishna et al. (2019) have resorted to the five-factor model (FFM) to explore the individual characteristics of bullying and cyberbullying roles. Hence, the

current study has adapted the updated version of the five-factor theory (FFT) to determine the individual characteristics of socially integrated mobile bully-victims.

2.3.1. Individual-level characteristics of socially integrated mobile bully-victims

The five-factor theory (FFT) is a framework from the personality psychology discipline, which provides details of how the characteristics of an individual develop (McCrae & Sutin, 2018). Figure 2.3.1 depicts the FFT as made up of five components, namely: biological bases, basic tendencies, objective biography, characteristic adoption, self-concept, and external influence.

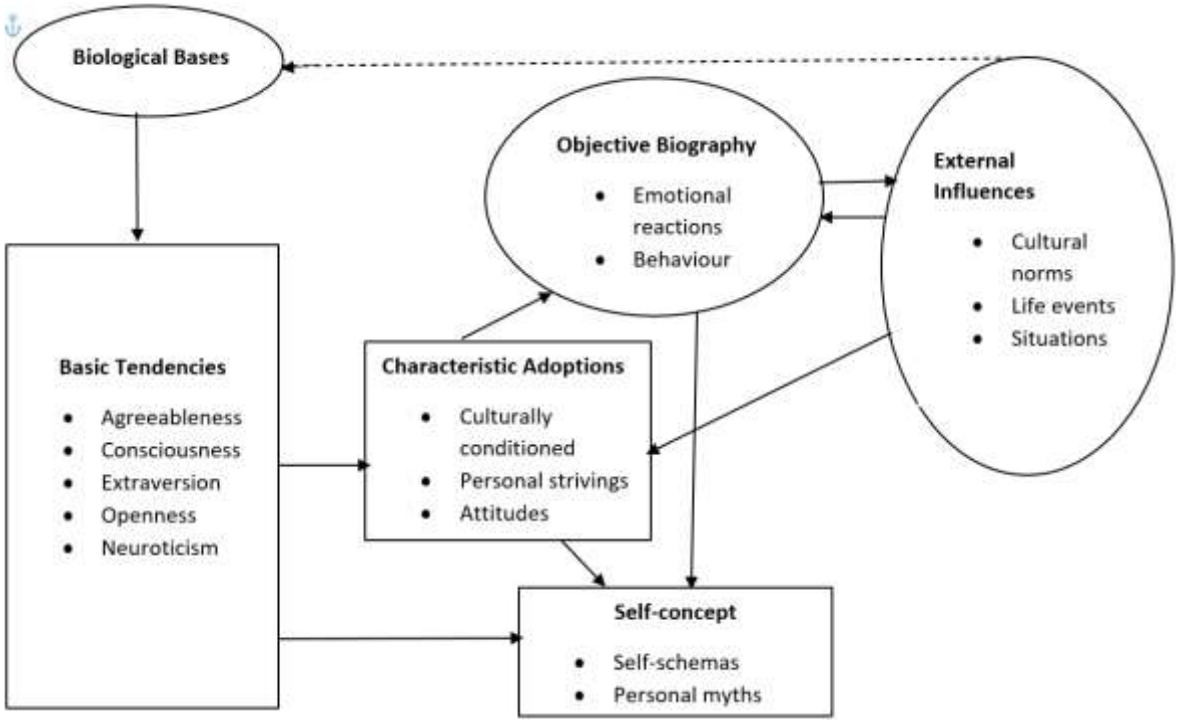


Figure 2.1: Five-Factor Theory (Costa & Paul, 1996)

According to the five-factor theory, *biological bases,* which refer to the natural features of a living organism (e.g. a human being), such as genes, brains, and gender, influence the hypothetical psychological traits called *basic tendencies,* (see Figure 2.1) (McCrae & Costa, 2008; McCrae & Gaines, 2013). According to Costa and McCrae (2008), basic tendencies influence the way in which different individuals think, feel and act, and are reported to manifest during interactions that take place within the social environment (McCrae & Gaines, 2013). Over a period of time, the way an individual thinks and acts is influenced by environmental factors (*external influences*) such as culture, resulting in an

individual acquiring certain features and relationships. This is called *characteristic adoption* (McCrae & Sutin, 2018). On the other hand, objective biography is based on the experiences of an individual, which are functions of characteristic adoptions induced during specific situations (McCrae & Gaines, 2008). Lastly, self-concept is defined as a function of basic tendencies, experiences (objective biography) and acquired features (characteristic adoption), resulting in an individual forming certain beliefs about themselves. Overall, the FFT framework indicates the way in which an individual acquires experiences and behaviour. This framework was adapted in the present study to identify the individual characteristics of socially integrated mobile bully-victim and how they emerge. In the sections below, the author defines and discusses the elements of the framework and how these are represented among bullies and bully-victims.

Previous research has applied the five-factor theory (FFT) to identify the characteristics of traditional bully-victims and cyber bully-victims, such as that of De Bolle and Tackett (2013); Mitsopoulou and Giovazolias (2015); as well as Alonso and Romero (2017). However, these studies only focused on the basic tendencies, and not the other components of the FFT. This is perhaps due to the use of an earlier version of the FFT called the Five Factor Model, which consisted of the basic tendencies only. The basic tendencies include five dimensions, namely, extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience. Extraversion is defined as the sociable and positive effect that an individual displays during interactions with others (Mooradian & Swan, 2006). Agreeableness refers to a behavioural tendency to display empathy and politeness towards others (Hirsh & Peterson, 2009). Conscientiousness refers to the tendency to be self-disciplined and organised (Liao & Lee, 2009). Neuroticism is defined as a trait disposition to experience adverse emotions such as depression, anxiety, and hostility (Alonso & Romero, 2017; Widiger & Oltmanns, 2017). Lastly, openness refers to being curious and having an imaginative mind (Balakrishnan et al., 2019). The current study goes beyond the basic tendencies by examining how the other components of FFT such as biological bases, objective biography, characteristic adoption, and external influences reveal social integration characteristics that contribute to bullying at the individual level. Consideration of all the key elements of the FFT framework provides a broader view of an individual's identity via social interactions.

According to Balakrishnan et al. (2019), bully-victimisation is a cycle that turns victims into bullies and vice-versa. Since mobile bullying is a subset of cyberbullying, and some of the individual characteristics of cyberbully-victims are like those of cyberbullies, cyber victims and mobile bully-victims (Skilbred-Fjeld, Reme & Mossige,2020; Kyobe et al., 2016), the author proposes that socially integrated mobile bully-victims will share some individual characteristics with the above groups. Therefore, the present

study considered past studies on cyberbully-victims, cyberbullies and mobile bully-victims to arrive at the characteristics of socially integrated mobile bully-victims used here.

2.3.1.1. Basic tendencies

Based on the assessment of the basic tendencies of bully-victims, previous studies found that bully-victims and cyberbully-victims are characterised by hostile behaviour, low conscientiousness, low openness, and low agreeableness (De Bolle & Tackett, 2013; Alonso & Romero, 2017). However, a recent study by Escortell (2020) found that cyberbully-victims have high levels of openness and agreeableness. Openness is defined as a tendency to be curious, imaginative, and willing to experience new things (Guo, Liu & Wang, 2021, Giumetti & Kowalski, 2022). Guo et al. (2021) found that cyberbully-victims are characterised by openness when driven by anger and curiosity (Zhong et al., 2021; Giumetti & Kowalski, 2022). Agreeableness, however, has also been reported as a protective trait, which prevents individuals from engaging in cyberbullying due to their caring nature (Balakrishnan et al., 2019). Based on the findings from these studies, the current researcher proposes that socially integrated mobile bully-victims may have high levels of openness to explore various ways to bully or retaliate on mobile platforms.

Various cyberbullying and mobile bullying studies have linked cyberbullying roles to negative emotional challenges, such as neuroticism. These negative emotions include depression, hostility and anxiety. Lee at al. (2021), found that, individuals end up being cyberbully-victims due to low self-control. Balakrishnan et al. (2019) linked extraversion to cyberbullying perpetration on popular platforms such as Twitter. Balakrishnan et al. (2019) claim that cyberbullies engage in bullying to increase their social status. This echoes earlier findings by Jokazi and Kyobe (2017), that social integration is a significant variable that caused individuals to bully/retaliate on mobile platforms, thereby resulting in mobile bully-victim behaviour. Previous studies have also highlighted that the personality traits of individuals do not only determine bullying roles, but also affect social integration (Lodi-Smith & Roberts, 2007; Egan & Beadman, 2011). For example, individuals with a low level of agreeableness and consciousness are more likely to look for peers who are like them, which provides them with social integration and memberships to delinquent groups (Kim et al., 2020). Holt and Espelage (2007) also report that bully-victims are likely to report moderate to high levels of social integration. Ndyave and Kyobe (2019) echo the same findings. They reported that some of the mobile bully-victims tend to have implicit power and many followers, which made them socially integrated online.

2.3.1.2. Characteristic Adoption

According to Ball et al. (2008), bully-victims are characterised by having to grow up in harsh home environments, both witnessing and experiencing aggression. This makes bully-victims grow up to become aggressive individuals. It is important to note that, even though bully-victims are characterised by aggression, they may not necessarily be born with it, but learn it (Bandura, 1978). According to the theory of social learning by Bandura, learning that is due to actual experiences occurs through two means, namely, the observation of other actions, and the consequences that arise from their actions (Bandura & McClelland, 1977). Furthermore, emotional responses to situations can develop through observation by watching how others handle both pleasurable as well as bad experiences. In addition, one's cognitive capacity also governs the impact of the experiences in their behaviour. The other important element is self-regulation, which deals with managing the behaviour in a given situation. In social systems, learning a specific behaviour takes place through both observations and experiences. Adopting behaviour or actions from the experiences and observations is determined by the rewards and punishment associated with a specific behaviour, referred to as differential reinforcement. In this way, youth develop informative feedback and hypothesis on behaviour that is likely to bring reward or punishment.

When it comes to mobile bullying on social networks, students who are friends with bullies and bully-victims learn to engage in bully-victim behaviours through observation. Imitating the learned behaviour is easier, due to the availability of mobile social networks, which have features such as being able to create several fake accounts, and the availability of emoji features to express support/anger (Ndyave & Kyobe, 2019; Shadmanfaat et al., 2020). The researcher argues that SIMBVs are likely to possess similar characteristics. Student motives for imitating bullying behaviour online include using bullying as a coping mechanism or to gain resources (Barlett et al., 2017; Myers & Cowie, 2020). The most common anticipated gains from bully-victim behaviour in an online environment include revenge, obtaining resources such as social power, and social status (Konig, Gollwitzer & Steffgen, 2010; Barlett et al, 2017; Myers & Cowie, 2020).

2.3.1.3. Self-Concept

Negative self-concept has been linked to bully-victim behaviour via social integration (Kaukiainen et al., 2002). Social integration provided by others via support has been found to have a positive impact on self-views, and on the perception of others. For bully-victims, this is different (Jenkins & Demaray, 2012). Marginalised bully-victims usually have less social support, whilst socially integrated bully-victims have more support. Social integrated bully-victims receive social support from their peers and online communities through posts being reshared and liked, increasing their self-concept especially when it comes to socially integrated bully-victim behaviour (Cho & Yoo, 2017). This is why socially integrated bully-victims are characterised by delinquent friends (Kennedy, 2021). Socially integrated

bully-victims start seeing their behaviour as favoured and those they bully are perceived as less likeable; hence they continue bullying others, even though they receive retaliation at times.

2.3.1.4. Objective Biography

Objective biography consists of previous experiences, which change as a person grows older. According to Costa and McCrae (2013), these experiences shape a person's behaviour. When it comes to bully-victims behaviour online, bully-victims start as pure victims of bullying. The victimisation experience traumatises them, and they later develop aggression towards others, becoming bullies (Çokluk, 2019). Lacking family support also adds to bully-victim behaviour. These bully-victims are not necessarily liked by others, however, they are perceived as popular, and they occupy high leadership positions within their peer groups (Lozano-Blasco, Cortés-Pascual & Latorre-Martínez, 2020).

2.3.1.5. Biological bases

A cyberbullying study based on university students in South Africa found that the majority of the bullying was based on physical appearance (Rachoene & Oyedemi, 2015). According to previous studies, bully-victims are characterised by distinct physical features, so they attempt to retain their social power by bullying those who pick on them in social spaces, because of how they look (Macklem, 2003; Wilton & Campbell, 2011). Furthermore, biological differences through gender chromosomes have been found to influence the way in which bully-victims behave during social interaction with others (Britt & Rocque, 2016). As a result of the differences in gender chromosomes for females and males, researchers have found that in social spaces, males are more likely to bully others and be bullied than females. This is because males tend to be impulsive and more aggressive compared to females. Various cyberbullying studies have examined gender differences, however, the results are inconsistent. For example, according to Baldry, Farrington and Sorrentino (2017) as well as Fahy et al. (2016), males are more likely to engage in cyberbully-victim behaviour than females, whilst Lozano-Blasco, Cortés-Pascual and Latorre-Martínez (2020), did not report any gender differences. The variations in study findings when looking at gender as a biological factor are concerning, and this calls for researchers to examine other factors, such as serotonin. Serotonin is a brain element that is crucial for communication among human cells. Limited levels of this substance have been linked to anti-social behaviour, such as bullying and delinquency (Anderson, 2019). According to Swearer and Hymel (2015), the youth who engage in bully-victim behaviour with low levels of serotonin are usually characterised by emotional problems and depression.

2.3.1.6. External Influences

According to the FFT model, the personal characteristics of a bully-victim are also influenced by ***external influences such as culture.*** According to Singelis and Brown (1995), culture can be defined as patterns that are implicit or explicit, and that consist of traditional ideas which guide the behaviour of individuals within a group; these patterns are transmitted through symbols. According to Oishi (2004), no matter how independent an individual can be, the personality that they portray when interacting with others in social spaces can be influenced by culture. Hence, it is proposed that personality be understood as a product of negotiations between culture and predisposition. In the context of this study, the researcher argues that culture will influence the behaviours of bully-victims. According to Morcillo et al. (2015), culture does influence bullying behaviour. Figure 2.1 shows an individual's basic tendencies, such as lack of agreeableness and biological bases, which can influence how a socially integrated mobile bully-victim feels and behaves during social interactions, and have an impact of the characteristics that an individual adopts. However, this predisposition can be controlled or magnified by socio-cultural factors such as culture (Morcillo et al., 2015).

Summary of the individual level

The individual characteristics discussed above are summarised as per Table 1.1 below:

Table 2.1: Individual characteristics of socially integrated mobile bully-victims

FFT Component	**Characteristics of SIMBVs**
Basic tendencies	Neuroticism, low conscientiousness, high openness, extraversion and low agreeableness
Characteristic adoption	Learned aggression
Self-concept	Befriending delinquent friends
Objective biography	Prior victimisation experience
Biological bases	Possession of emotional issues e.g., depression and anxiety, and gender

2.3.2. Socio-ecological factors influencing the individual characteristics of socially integrated mobile bully-victims

Bronfenbrenner's socio-ecological model (SEM) has been used by bullying and cyberbullying studies to explain how children develop bullying tendencies online and offline (Espelage et al., 2012). According to Bronfenbrenner (1979), the development of human behaviour requires the examination of multi-person systems of interaction not limited to a single setting and must take into account beyond the immediate environment containing the subject. Bronfenbrenner developed a framework to depict the nested structures, which consists of the immediate and distal environments as shown in Figure 2.2.

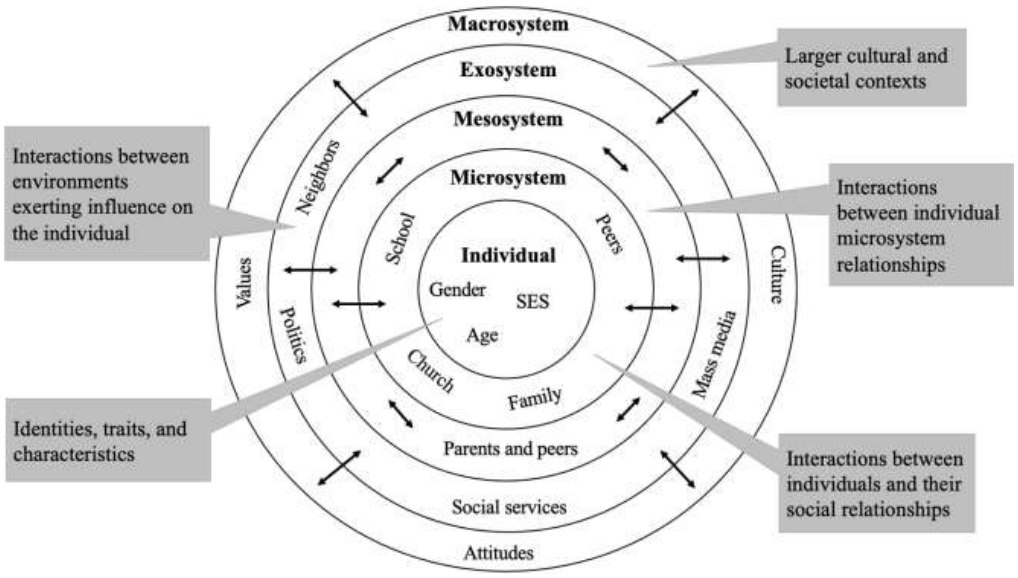


Figure 2.2: Bronfenbrenner's Socio-Ecological Model **(Bronfenbrenner, 1979*;* Patel & Quan-Haase, 2022)**

Patel and Quan-Haase (2022) enhanced Bronfenbrenner's socio-ecological model (SEM) by including attitudes towards cyberbullying, peer norms, cyberbullying regulations, and features of mobile social networks to respective system levels of the framework as digital factors that influence cyberbullying, as shown in Figure 2.3 below. Bronfenbrenner's socio-ecological model (1979) combined with the digital components of cyberbullying provide a view of both the physical and digital context. Therefore, the author has embedded the digital factors as part of the discussion of each system within the SEM.

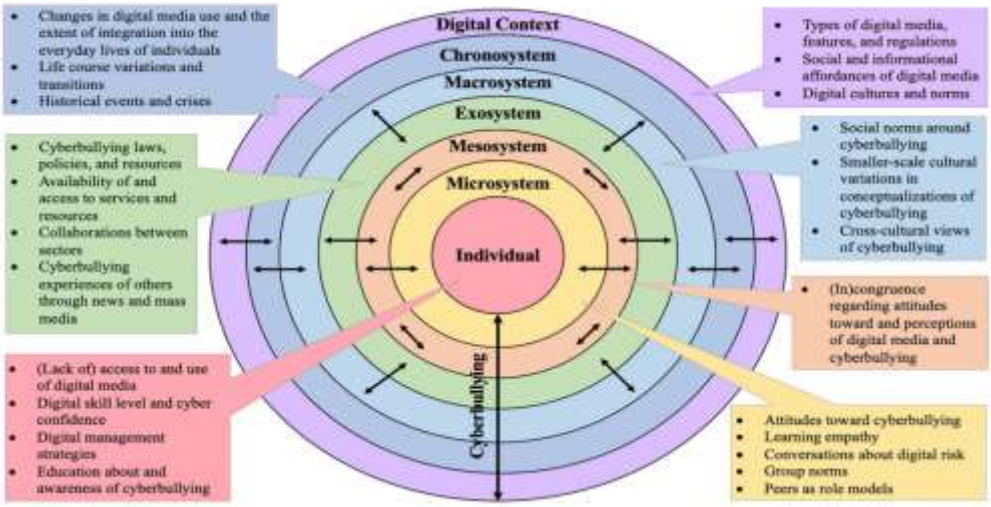


Figure 2.3. Socio-ecological model of cyberbullying **(Patel & Quan-Haase, 2022)**

2.3.2.1. Immediate settings

Microsystem: Is the closest environment to children in which they experience direct relations (Krishnan, 2010). Examples of these relations include parent-child relations and the child-peers' interactions (Myers & Cowie, 2019). The interactions that the child has with their parents, siblings and peers are key factors that have an impact on the child's early development. That is, their first point of developing certain characteristics and behavioural tendencies. Hence, previous studies have examined parent-child interactions in relation to antisocial and delinquent behaviour. According to the coercion theory, negative parenting has an influence on the child's characteristics and the selection choice of peers, which then results in delinquent and aggressive behaviour (Voss, 1999). According to this theory, coercion is described as the most proximal factor that has an influence on hostile and delinquent behaviour (Patterson,2016). This phenomenon is characterised by undesirable effects on those over whom it comes to bear, with those inflicting it believing aggression is an acceptable approach for handling differences with others (Bayles, 2017). The harsh disciplinary methods by parents have been found to predict the adolescent's likelihood of selecting delinquent friends and engaging in cyberbullying (Chu & Xie, 2023). Kennedy (2021) found socially integrated bully-victims to be characterised by high levels of aggression and affiliations delinquent peers.

At the late adolescent stage, young adults value friendships at times more than they do their relationships with their own parents (Lee et al., 2021). This becomes an additional microsystem, where interactions and relationships are formed with fellow students (Bronfenbrenner, 1979). Previous studies have found that peer groups have the potential to exert a considerable influence on group members (Nesdale &

Scarlett, 2004). Social integration between individuals and their peers occurs through attachment and regulation. Regulation includes norms that are formed with peers at a microsystem level. To maintain these relationships, norms are important, and they should be maintained. According to the social norms theory, human behaviour is influenced by perceptions of how peers and associates act and think (Perkins & Berkowitz, 1986). This is evident from a cyberbullying perspective, as students tend not to report bullying incidents where they may anticipate the consequences of disputing status quo, such as exclusion from a friendship group or retaliation (O'Brien, 2019). On the other hand, Alrajeh et al. (2020) suggest that students may view cyberbullying as part of the digital life hence, they do not classify of the behaviour they witness online as bullying. This is especially the case with university students (Myers & Cowie, 2019; Alrajeh et al., 2020).

2.3.2.2. Distal settings

Exosystem: Is made up of a link between two or more environments, whereby one distal system has a direct influence on an immediate environment involving an individual (Härkönen, 2001). For example, parent's work dynamics, such as work hours and pay, have an influence on the microsystem, which is the family, even though the other family members are not directly part of the workplace (Härkönen, 2001). Due to the existence of the digital environment, the exosystem is no longer limited to the physical space. According to Eaton (2014), Patel and Quan-Haase (2022), in the digital context, the exosystem consists of a system where decisions are made regarding the layout of the social networks, its functionality as well as policies, and regulations regarding the use of the platform. These decisions and their outcomes affect whether or not the users of the mobile social networks (MSNs) will use the platform, given their layout and laws. This is the part that influences the microsystem, since MSNs are used to communicate with people in the microsystem, such as peers and family members (Eaton, 2014).

According to Golf-Papez and Veer (2017), the limitations in current cyberbullying frameworks and the lack of controls online influence the way in which adolescents and young adult behave online. According to a survey conducted on Norwegian cyber victims, about 51% reported cyberbullying incidents that occurred on social network platforms did not receive a response and about 41% received a response, but not the final status of the case (Milosevic & Vladisavljevic, 2020). In addition, the regulations are also at an initial phase, and they do not explicitly cover cyberbullying. For example, in December 2020, a Cybercrime Bill was approved by the South African parliament, focusing on cybercrimes such as cyberbullying by distributing any content online that is intended to cause mental harm to the victim (BusinessTech, 2020). The first version of the legislation was drafted in 2017. Due to not having an

active law that deals with cyberbullying, the prevalence of this behaviour has increased in South Africa. In 2018, South Africa had the highest percentage for cyberbullying incidents compared to other 27 countries, according to the Ipsos Global adviser (Eyewitness News, 2019).

The impact of not having legislation active in combatting mobile bully-victim behaviour can be explained by Cohen and Felson's (1979) routine activities theory. This theory is an environmental-based description of how crime occurs. It considers three components, namely motivated perpetrators, a suitable target, and the absence of a guardian to explain the likelihood of the crime occurring, as illustrated in Figure 2.4 (Branic, 2015). This theory has been used by previous cyberbullying studies to examine the influence that risky behaviour has on the likelihood of being a cyber victim. Due to delayed response times to cyberbullying incidents from the social network help centres, and having legislations that are still at early stages of effectiveness, the South African youth is currently characterised by their exposure to violent, aggressive content on social networks, where they are behaving in a risky manner. These two characteristics are influencing factors of bully-victim behaviour online (Bae, 2021).

Figure 2.4. Routine Activity Theory (Branic 2015)

According to Choi, Cho and Lee (2019), risky online conduct enables the victim to be contacted by the perpetrator in the absence of a guardian. Based on the shortcomings of government legislation and social network platforms, there is no guardian online who ensures the perpetrators of online bullying are accountable for their online conduct. This also contributes to the two elements of MTAM (mobile technology acceptable theory), viz. perceived trust and perceived security risk. These elements play a role in enhancing the motivation of the perpetrator or the victim to retaliate. This is due to the fact that social networks provide individuals with features that enable them to bully such as anonymity; additional to this, there is no punishment. Therefore, the cyberspace is safe place for cyberbullying and retaliation,

where the youth perceive the virtual space as a trusted and secure platform for misbehaviour (Veenstra, 2011).

Macrosystem: this refers to the cultural blueprint that determines the social structures and activities that occur at the immediate systems level (Espelage, 2014). Previous studies on bullying, regard aggressive behaviour as a social process, meaning it does not arise only as a result of proximate relationships in the microsystem, such as friendships. However, this behaviour is also influenced by macrosystemic factors, such as culture and community norms. Cyberbullying studies have also observed that culture influences whether a student becomes a bully, or a bully-victim (Lapidot-Lefler & Hosri, 2016). This is due to the characteristics of the society, such as cultural norms, which promote violence, and supporting views on cyberbullying (Lozano-Blasco et al., 2020).

According to Hong et al. (2018), the sociology of bullying indicates that aggressive interchanges between adolescents function as interactional reproductions of structural inequalities inherent to society. The structural inequalities are more evident in the context of South African culture. For example, according to News24 (2016), South African culture for each tribe is dominated by men, and this affects toxic masculinity, even though the country is going through transformation. This is also evident in women versus men in terms of self-concept. South African female self-concept is more relational than that of males, according to a South African culture study by Eaton and Louw (2000). This indicates that females adopt a more collectivist culture, whilst men adopt an individualistic culture, and this can be explained by gender role socialisation theory, which explains that roles and norms of acceptable behaviour for men and women are different, due to societal expectations (Francis, 1997). This theory explains the significant differences in male versus female behaviour when it comes to bullying. For example, males are expected to be self-reliant and active in responding to bullying, whilst aggression from females is deemed inappropriate, where they avoid retaliating. Females tend to avoid conflict, or to seek support from personal relations through social support. This is aligned with findings by Eristi (2019), which state that males tend to become cyberbully-victims compared to females due to individualistic mindsets and cultural expectations.

Additional to cultural norms, exposure to violence at a macrosystem level has been found to predict both traditional, and online bully-victim behaviour. In the case of South Africa, it is important to investigate exposure to violence as one of the characteristics of mobile bully-victims, as this country is ranked the third most dangerous in world statistics of unsafe countries (BusinessTech, 2021). The negative effects of this are frequently reported in South African newsletters. For instance, violence at schools, especially

in the Gauteng, KwaZulu-Natal and the Western Cape province, is escalating. According to News24 the Department of Education's Member of the Executive Council (MEC) in Gauteng had to intervene in some of the most notorious bullying cases in the Gauteng region. Notably, these incidents were captured via mobile phones and shared on social networks. An example of this is a January 2020 high school incident of a learner hitting another learner at school that was captured on a mobile phone video and was shared on social networks by fellow learners. As a result of the video going viral, the MEC had to visit the school and the bully was arrested (News24, 2020). The video was shared on Twitter, which triggered insults that were directed at the bully. Incidents like this have been linked to societal violence (The Citizen, 2019). This link between exposure to violence and engaging in aggressive behaviour is explained through the general aggression model (GAM) by Anderson and Bushman (2002). According to the GAM, exposure to aggressive situations such as violence increases the positive attitude towards aggression, which results in high chances of an individual engaging in aggressive behaviour in future, such as cyberbullying or retaliation (Cavalcanti & Pimentel, 2016).

High school bully-victim incidents are highly likely to continue amongst undergraduate students at the tertiary level; however, these incidents remain undocumented. As a result, they are not dealt with by the university, government, or police. The key difference between online bully-victim incidents among high school learners and university students is that the aggression style at the tertiary level is indirect (Byers & Cerulli, 2020). This is done in order to avoid accountability for such behaviour. Furthermore, bystanders do not support victims of cyberbullying unless these victims are close to them. The support that is provided to friends includes assisting the friend to retaliate against the perpetrator. Furthermore, online aggression at the tertiary level is mostly socially accepted, and seen as a joke by the community of the campus students (Byers & Cerulli, 2020). Online bully-victim incidents are therefore more prevalent at the university level, compared to high schools.

Mobile Social Networks (MSNs): these communication social media platforms are accessible via mobile phones with access to the internet (Matthes et al., 2020). The four most prominent MSNs are Facebook, Twitter, Instagram, and WhatsApp (Nuseir, 2020). Instagram is a photo and short video sharing platform, whilst WhatsApp is more of an instant messaging service, whereby messages can be sent via text, pictures, and voice note (Nuseir, 2020). Facebook is a platform whereby a user can post a status, pictures, and videos, share their location and create groups (Kimmons et al., 2021). Twitter is similar to Facebook; however its key feature is the hashtag (#), which enables users to track a particular topic and contribute to it.

These popular platforms provide bully-victims with an opportunity to express themselves through posts, pictures and videos, which tends to invite inappropriate comments from bullies through the

comment feature enabled for each post (Mkhize & Gopal, 2021). These platforms also enable victims to retaliate or defend themselves. Even though this is the case, there were a few instances whereby a victim retaliated (Mkhize & Gopal, 2021). Retaliation was more prominent when a group is attacked by an individual (Rachoene & Oyedemi, 2015). Moreover, mobile bully-victims can use emojis (features indicating emotions) to partake in bullying, and to retaliate (Ndyave & Kyobe, 2019). Previous studies have found the motives for late adolescents at university level to engage in cyberbully-victim include to make fun of others, retaliate, and to empower themselves (Balakrishnan & Norman, 2020; Hamuddin et al., 2020). These findings indicate that MSN features and the lack of strict regulations online encourages mobile bullying and retaliation. Hence, cyberbullying studies are finding more the cyberbully-victim prevalence to be higher/equal to that of cyberbullies and cyber-victims in young adults at university level, as they have frequent access to MSNs (Skilbred-Fjeld et al., 2020; Alrajeh et., 2021). These findings indicate that cyberbully-victims tend to not hold back their emotions, associated with low levels of consciousness (Zhong et al., 2021). Based on the previous research findings on cyberbully-victims and mobile bully-victims, the author predicts socially integrated mobile bully-victims will have the same characteristics.

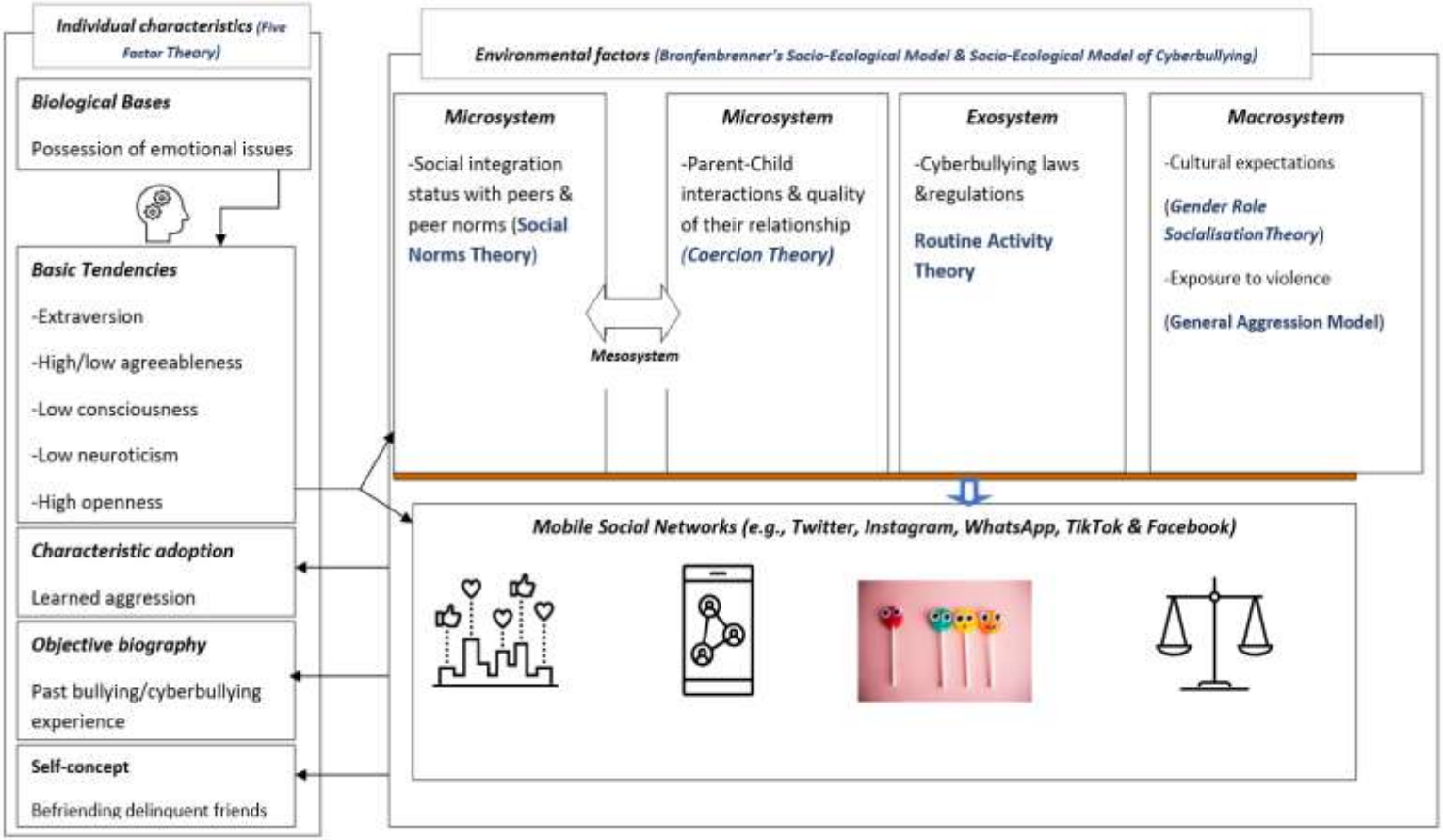
2.4. Proposed integrated framework identifying the characteristics of social integrated mobile bully-victims

The proposed integrative frameworks provide a consolidated view of the individual characteristics and the environmental factors that influences the development of socially integrated mobile bully-victim characteristics.

The arrows in Figure 2.5 above illustrate the individual characteristics of socially integrated mobile bully-victims are influenced by environmental factors and vice-versa. This is consistent with developmental systems theory (DST) principles, which posit that behaviour is a function of interactions between a human being and the social environments. These interaction are sources of developmental change. The socially integrated mobile bully-victims learn aggression from their immediate environments, and they adopt this behaviour, which then forms part of their individual characteristics (as per the arrow between environmental factors and characteristic adoption). Furthermore, bullying/victim past experiences (objective biography) which result from interacting on mobile platforms or at school can also influence or escalate bully-victim behaviour.

The individual characteristics of a socially integrated mobile bully-victim, on the other hand, influence how this group reacts to being bullied on mobile platforms. For example, individuals with low levels of consciousness i.e., self-control, tend to retaliate when they are bullied on social networks. The environmental factors also influence one another, for example, the cyberbullying policies set-up at an exosystem level influence how individuals behave on mobile social networks (MSNs). Lastly, biological bases influence the likelihood of developing certain basic tendencies, as shown in Figure 2.5, where individuals who possess emotional issues are likely to experience neuroticism i.e., anxiety, depression, and hostility.

Figure 2.5: Framework for identifying characteristics of social integrated mobile bully- victims



2.5. Chapter Summary

This chapter provides details of various dimensions of SIMBVs individual characteristics based on the Five Factor theory (FFT). This is view goes beyond what the existing cyberbullying have examined, which only extends to the basic tendencies. In addition, the environmental factors that influence the development of socially integrated mobile bully-victim individual characteristics. These included both the physical and digital context. The variables for individual characteristics and environmental factors were examined using various theories and existing literature. Thereafter, the variables were consolidated to formulate a framework for identifying SIMBVs, which shows the bi-directional relationship between individual characteristics and environmental factors as per the Developmental Systems Theory (DST).

Chapter 3: Conceptual model and hypotheses

3.1. Introduction

This chapter details how the integrative framework (explained in Chapter 2) was used to produce the conceptual model for this study. The researcher formulated hypotheses based on the proposed conceptual model and literature review findings. The conceptual model is discussed in the next section.

3.2. The conceptual model

Figure 3.1 shows the conceptual model, which was derived from the integrative framework in Chapter 2, Figure 2.5. The conceptual model illustrates the independent and dependent variables. The socially integrated mobile bully-victim characteristics are shown in the form of a dependent variable, which results from the interaction of individual characteristics and environmental factors.

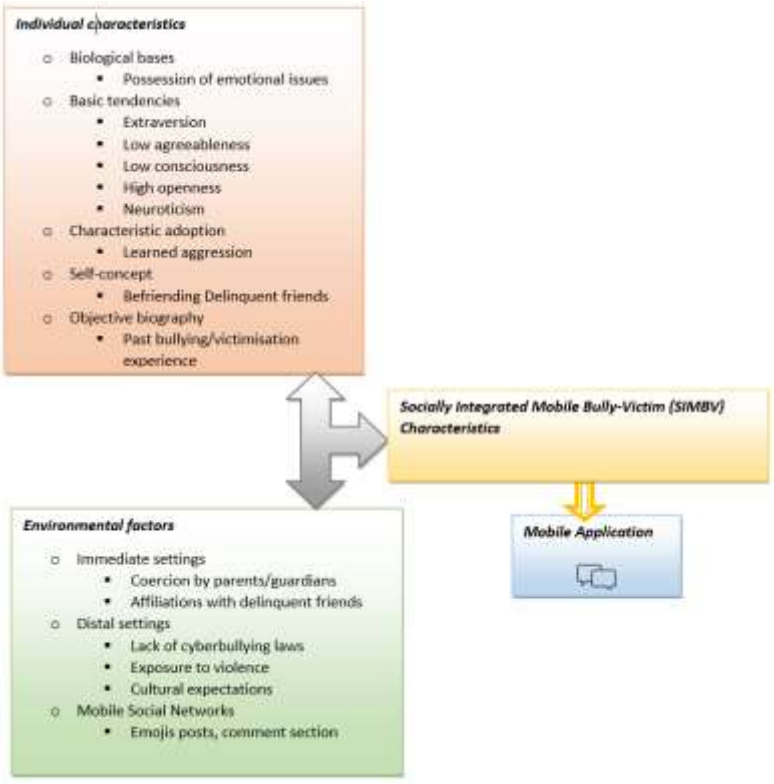


Figure 3.1: Conceptual model of the characteristics of SIMBV and the factors influencing them

The interactions are assumed to be bi-directional, as indicated by the arrows between the two constructs. This is consistent with the principles of the Developmental Systems Theory (DST), which states that the attitudes and behavioural characteristics of an individual result from the interaction between environmental factors and an individual's characteristics. A mobile application is added as a component

of the conceptual model, given the role it can play in the interactions between bullies and victims. Hall et al. (2021) report that mobile applications can be used to identify cyberbullying roles as well as the mental state of adolescent social media users.

Mobile applications can also be used to log incidences of online bullying and victimisation as well as assess the psychological state of an individual in real-time, thereby providing an opportunity for real-time intervention by psychologists (Morag Yaar et al., 2022). Furthermore, children prefer to not report any cyberbullying incidents to their parents. They would rather discuss with friends or outsiders, on mobile social media or other platforms, where they are not judged (Morag Yaar et al., 2022). Based on these findings, the author predicts that a mobile application would be appropriate in identifying the positive and negative characteristics of socially integrated mobile bully-victims. Table 3.1. below provides a list of the constructs and variables that were used to determine the characteristics of SIMBV.

Table 3.1. Constructs and their associated variables

Construct/Variable	Description	Sources
Individual Characteristics	Individual characteristics are interpersonal and intrapersonal traits that influence the way an individual behaves.	McCrae & John, 1992; McCrae & Costa, 2008
Biological bases	These refer to the biological make-up of an individual, which influences their individual behaviour and attitude. These include but are not limited to gender, as well as emotional issues such as depression and anxiety.	McCrae & Costa, 2008
Basic Tendencies	These are the basic dimensions of a person's character. They influence an individual's attitude and emotions.	McCrae & John, 1992
Characteristic Adoption	Individual characteristics that are obtained through observations and learnings of interactions.	McCrae & Costa, 2008
Characteristics resulting from objective biography	Refers to how an individual feels and thinks about historical events and incidents which they have experienced.	McCrae & Costa, 2008
Self-concept	Is based on the way individuals process information about themselves and the environments they are exposed to, which then impacts on the association they prefer to have.	Schmukle et al., 2008
Environmental factors	Are social context specific factors found at different levels of a socio-ecological environments which have a direct or indirect influence on individuals' characteristics and behaviour.	Bronfenbrenner, 1979 Görzig & Machackova, 2015
Immediate Settings	Closest environment to a person where they have direct relations.	Krishnan, 2010
Distal settings	Distal processes include events the person does not directly participate in, those that involve other people and occur in other places, but that shape or influence the ecosystem the person does experience.	Shelton, 2018
Mobile Application	"Is a software application that runs on mobile devices" (Wang et., 2013, p.12)	Wang et al., 2013

3.3. Hypotheses

Hypotheses were derived from the conceptual model and literature review findings. Below are the details of each hypothesis.

According to bullying and cyberbullying researchers, bullying is the result of interactions between an individual and the socio-ecological factors (O'Brien, 2019; Shaikh et al., 2020). As a result, both traditional bullying and cyberbullying studies have adopted Bronfenbrenner's socio-ecological model (1979) to identify and explain factors that influence bullying and cyberbullying (Patel & Quan-Haase, 2022). This position is consistent with the developmental systems theory (DST), which posits that behaviour is not the result of individual factors alone, but a result of interactions between an individual, the inherent environment, and the social context. Therefore, the researcher predicted the following:

Hypothesis 1: *Socially integrated mobile bully-victims possess negative individual traits (such as low consciousness and hostile behaviour) and are exposed to aggression at home and in their communities.*

Students engage in mobile bullying because they see no consequences for the bullies (Radebe & Kyobe, 2021). Another problem is that the Cybercrimes Act 2020 of South Africa does not adequately address

the burning issues that impact children online, such as cyberbullying (Mthembu, 2022). Furthermore, most public cases of cyberbullying have only resulted in obtaining protection orders and suspending learners or teachers (Mthembu, 2022). Therefore, a lack of appropriate legislation and lack of effective application of the law results in the perception of a lack of consequences for bullying and the continuation of this aggression. The researcher hypothesised that:

Hypothesis 2*: Tertiary students perceive the lack of mobile bullying consequences as a form of encouragement to continue bullying and retaliating.*

Researchers have reported that undergraduate university students use social media to bully others for their entertainment and to avenge against bullies (Balakrishnan & Norman, 2020; Hamuddin et al., 2020). Cyberbully-victims and Mobile bully-victims have been found to use posts, comments and emojis to express their anger, and to retaliate (Hamuddin et al., 2020; Ndyave & Kyobe, 2019). Therefore, since mobile bully-victims and cyberbully-victims use the features of mobile social networks (MSN), this study predicts that SIMBVs will use the same mechanisms, that is, Mobile Social Network (MSN) features:

Hypothesis 3: *SIMBV prefer to use mobile social network features, as they enable them to bully others and avenge against their perpetrators without revealing their identity.*

Kyobe (2016) found that prior victimisation experience in physical settings predicted mobile bully-victim behaviour of high school females in South Africa. Carvalho et al. (2021) echoed the same findings. They reported that cyberbully-victims tend to occupy the same role in physical settings. Moreover, Lozano-Blasco et al. (2020) also found that cyberbully-victims started off as cyber-victims.

Hypothesis 4: *prior mobile victimisation or bullying experiences result in students becoming socially integrated mobile bully-victims.*

3.4. Chapter summary and recommendations

This chapter presented the conceptual model through a diagram that consists of the constructs and variables identified through a literature review and the integrative framework in Chapter 2. The relationships between the constructs of the conceptual model as well as the definitions of the constructs, and related variables were discussed. Additionally, hypotheses were derived from the conceptual model and literature review. The conceptual model was used throughout this study to guide the validation and further exploration of the characteristics of undergraduate socially integrated mobile bully-victims through a mobile application.

Chapter 4: Research Design

4.1. Introduction

Chapter 4 provides details of how the data was collected and analysed to answer the research questions and fulfil the objectives of the current study. This process is referred to as research design. A modified version of Saunders et al. (2008) research onion by Mardiana (2020) was used as a guide to ensure that all aspects of the research design were considered. The components of the modified research onion include the philosophical stances that underpin the approach and methodology for collecting and analysing data, as well as the time frames for data collection. In addition to the research onion components, the research sample, ethical considerations, and privacy considerations were taken into account.

4.2. Research purpose

According to Kothari (2004), the research design of each study is dependent on the research questions and purpose. There are three main research purposes according to Ragab and Arisha (2018), namely, explanatory, exploratory, and descriptive. Explanatory research focuses on finding the reason why certain events occurred and the causal relationships among the variables that are selected as the main focus of the study (Sainani, 2014). Exploratory research, on the other hand, is intended to examine phenomena where there is scarce research to provide new insights (Swedberg, 2020). Descriptive research focuses on providing a detailed description of a phenomenon (Grimes & Schulz, 2002). The present study is exploratory, given the lack of literature on the socially integrated bully-victim role, especially on a mobile platform and in tertiary institutions. Therefore, the researcher aims to bring awareness and new insights into this least studied mobile bullying role.

4.3. Research Paradigms in Information Systems

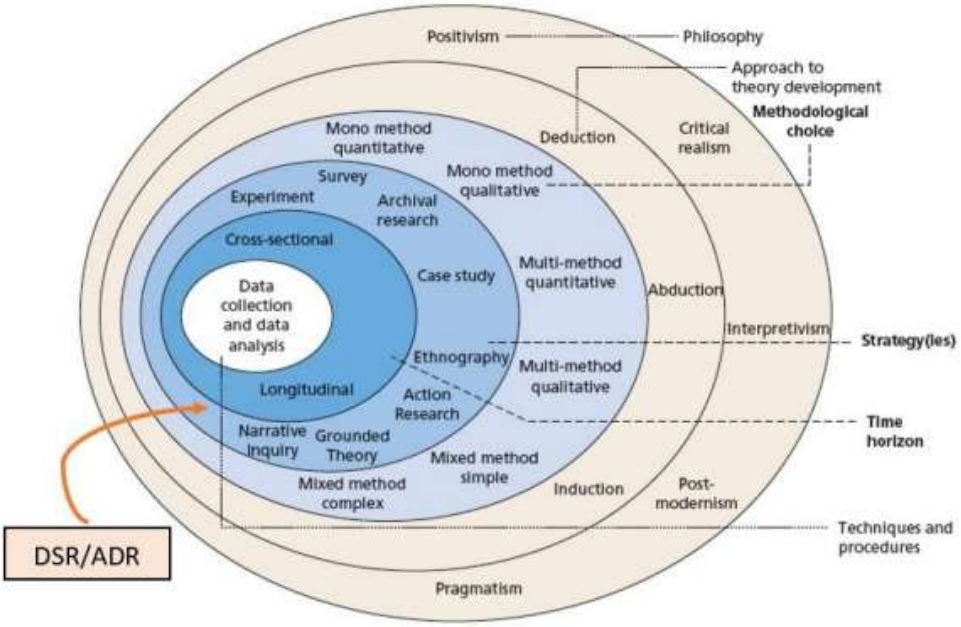


Figure 4.1: Research Onion by Mardiana (2020)

The exploration of socially integrated mobile bully-victim characteristics through a literature review resulted in the development of a conceptual model, which required validation. The conceptual model and the hypotheses formed in Chapter 3 were validated using data collected from undergraduate university students. The data was analysed using both qualitative and quantitative data analysis techniques. According to Saunders and Tosey (2013), data collection and analysis techniques are linked to the outer layer of the research onion, which consists of research paradigms and strategies, as shown in Figure 4.1. A paradigm consists of four elements, namely: ontology, epistemology, methodology, and methods. Ontology is concerned with finding reality, the existence of things (Scotland, 2012). Epistemology, on the other hand, is concerned with how knowledge can be obtained and created (Scotland, 2012). The methodological component involves a plan of action on how to conduct specific research. This consists of methods and techniques for collecting and analysing data. Thus, a methodology is concerned with why, what, from where, when, and how data is collected and analysed.

In the field of information systems (IS), there are two dominant paradigms, namely positivism and interpretivism (Chen & Hirschheim, 2004). These two paradigms differ ontologically, epistemologically, and methodologically. According to Chen and Hirschheim (2004), ontologically, positivists believe that reality exists independent of human actions and experiences, whereas

interpretivists see the existence of reality through human interpretations (Huizing, 2008). Epistemologically, positivists insist that knowledge ought to be verifiable and generalisable; conversely, interpretivists believe that knowledge should be obtained through experiences and human understanding of a specific subject (Thanh & Thanh, 2015). The methodologies that positivists and interpretivists employ are guided by their ontological and epistemological stances. Since positivists believe that reality exists objectively, they use objective methods to collect data, such as surveys, which do not require interaction between the researcher and the research participants. Interpretivists on the other hand employ methods that generate interpretable knowledge, such as focus groups, which enable them to engage in social settings as per their ontological and epistemological stance. Even though the two-contesting paradigms (positivism and interpretivism) have dominated the field of IS, the use of pragmatism, as an additional philosophical stance, has been recommended by Goles and Hirschheim (2000) for researchers in this field. Pragmatism does not solely view reality objectively, such as in the case of the positivism paradigm, but also acknowledges that reality is rooted in people's experiences in a specific environment, which characterises the interpretivism paradigm (Kaushik & Walsh, 2019). Pragmatism therefore provides a middle ground for the two-contesting paradigms, and adds more rigour to the research. It is seen as the philosophical stance representing the diversity of IS research (Goles & Hirschheim, 2000).

The interpretivism paradigm is informed by the subjectivist ontological stance, which views reality as a product of a person's imagination, experiences, and actions (Holden & Lynch, 2004; Goldkuhl, 2012). For those taking a subjectivism stance, knowledge is subjective to people's experiences and interpretations (Holden & Lynch, 2004). Hence, to obtain knowledge about a specific phenomenon, the researcher has to consult people who have experience and are exposed to the entity of enquiry (Willis, 2007). Interpretivism asserts that social life is dependent on the prior existence of shared knowledge about the world that is known by the people within that specific environment (Williams, 2000). The shared knowledge develops into a culture that shapes individual actions and interactions among the community. Hence, interpretivist proponents argue that in order to understand individual behaviour, the researcher must establish how that specific person or group views the world around them, and then explain why they conduct themselves in a certain manner (Willis, 2007).

Positivism, on the other hand, follows the objectivism ontological stance, which states that reality exists naturally independent of a person's views (Holden, Lynch, 2004). The aim is to find an explanation for causes of events or behaviour among humans, as well as theories that explain those events or behaviour without directly interacting with what is being observed (Wahyuni, 2012). Epistemologically, this means that knowledge already exists and is waiting to be uncovered (Holden, Lynch, 2004). Positivists reduce a problem into hypotheses, and knowledge is built by testing these hypotheses and generalising the results to a specific population (Bahari, 2010). Positivism is ideal for

discovering relationships between entities and examining causality. While positivists maintain that knowledge can be obtained objectively, Uduma and Sylva (2015) argues that science that is free of value is not possible because each decision or action is the result of subjective reasoning, emphasising the importance of identifying meaning through interactions. Uduma and Sylva (2015) therefore argue for a pragmatic approach that can address the limitations presented by both the interpretivism and positivism paradigms.

The pragmatic approach resolves the gaps that interpretivism and positivism leave in the in the field of IS. The pragmatism paradigm was first introduced by Charles Pierce in 1878, and it was put forward as one of the philosophical stances by William James (Ayer, 1982; Haack, 2004). Ontologically, pragmatism is based on an objective–subjective continuum, where the reality cycle is based on the existence of one reality and various perceptions of this reality in the minds of human beings (Maarouf, 2019). Furthermore, reality is both context and time centric, i.e., changing context leads to changing reality, and changes happen over time. Based on the pragmatic ontological stance, the behaviour of a human being is controlled by their perceptions of reality, and the interactions between various behaviours among humans result in a new context and new reality. Epistemologically, pragmatists switch between observable and unobservable knowledge based on the underlying ontological stance. This means that, depending on the goals of the research, the researcher will either focus on using law-like generalisation for practical benefits, or seek the perceptions of human beings to gain an in-depth understanding of reality (Maarouf, 2019). A suitable research paradigm for the present research was selected, taking into consideration the research questions and objectives of this study. Further details on the researcher's choice of paradigm are provided below.

4.3.1. Research Paradigms for this study

The philosophical stance of the current study was guided by the research questions and objectives as recommended by Wahyuni (2012). The main research question of this study is "*how can a mobile application be developed and used to identify socially integrated mobile bully-victim characteristics".* The researcher aims to develop a mobile application that can be used to identify the individual characteristics and environmental factors that influence these characteristics among SIMBV. Since this study concerns a phenomenon that is socially centred and revolves around information artefacts, an approach that draws from both objectivism and subjectivism was considered more appropriate (Huizing, 2008). Such an approach would assist the researcher in leveraging the key advantages of each paradigm. The objectivist paradigm provides structure that creates opportunities for reliable and actionable insight, whereas subjectivism enables the researcher to contextualise artefacts for meaning (Huizing, 2008). Therefore, the researcher adopted the pragmatism ontological stance, which posits

that knowledge acquisition is a continuous process, and not a mutually exclusive dichotomy between objectivity and subjectivity (Kaushik & Walsh, 2019).

This study also adopted a pragmatism epistemologically. When using pragmatism to develop knowledge, a researcher goes through four phases: pre-assessment, intervening, monitoring, and post-assessment (Goldkuhl, 2012). The pre-assessment stage is involves the study of the phenomena of interest and its environment, and develops ways of acting within that environment (Goldkuhl, 2006). Given the information that the researcher studied in the first phase and the perceived action that can be implemented, the second phase begins. here the researcher provides an intervention, either communicative or physical; and thereafter, the effects of this intervention are observed. The final stage is the post-assessment, whereby the researcher assesses whether the results were expected, or new insights were discovered. Depending on these results, the researcher can conclude or use the post-assessment outcomes as a pre-assessment for the next intervention (Goldkuhl, 2012). These stages for developing pragmatism knowledge were followed when examining the characteristics of socially integrated mobile bully-victims.

Before studying the potential contribution of a mobile application and understanding the characteristics of SIMBVs, the researcher required an understanding of what mobile bullying is, how it occurs, the role of social integration, and other elements that influence socially integrated mobile bully-victim behaviour. Hence, there was a need to evaluate the existing literature objectively. In that way, the study was guided by theories and previous research findings, which helped the researcher to identify gaps. Furthermore, based on the conceptual model derived from the literature review, a mobile application was developed to validate the identified characteristics from literature. In addition, the researcher wanted to gather any possible new characteristics that are currently not part of the model. This approach is also aligned with the principles of pragmatism, which posits that researchers ought to open to the advent of unexpected data, because human behaviour is unpredictable (Feilzer, 2010). Moreover, according to a pragmatist philosophical stance, the actions of individuals are also attributable to beliefs from social systems and past experiences (Kaushik & Walsh, 2019). Therefore, open-ended questions were included so as to gather the social experiences of SIMBVs in various environments, and to understand their individual characteristics. This is referred to as the intervention stage within the four pragmatism phases. Research participants were also requested to provide input on the functionality of the SIMBV mobile application. Feedback from students was used to evaluate the usability of the application, and the second component, where data about their experience and characteristics was used to determine whether the application fulfilled the research objectives. After assessing the results of the data collected from the first iteration of this study, gaps in the mobile

application and new unexpected characteristics were noted. This information was used to enhance the second version of the mobile application. This process showcased the continuous abductive nature of pragmatism.

4.4. Research Strategy

According to Melnikovas (2018), there are different types of research strategies that determine which method or methods to adopt for data collection. Examples of research strategies include surveys, experiments, case studies, action research, and design science. The researcher's choice of strategy should address the research question and the chosen research paradigm (Dresch, Lacerda & Miguel, 2015).

The current study examines the characteristics of socially integrated mobile bully-victims. From the literature, previous studies have suggested that in order to understand mobile bullying roles whereby the population of interest is young adults, it is better to use an online platform. This is based on the observation that young adults do not confide in their parents and their online access is not monitored by guardians. Instead, they express their true feelings online and deal with their matters there (Foody, Samara & Carlbring 2015). Given this observation, it was clear that a technological platform would provide a comprehensive view of socially integrated mobile bully-victim characteristics, and enable students to share details about their online experiences. The selected pragmatism paradigm also facilitates the strategy to use the technological platform. Pragmatism focuses on building knowledge whilst introducing a certain degree of change or action. It enables the provision of both descriptive and prescriptive knowledge. In the field of Information Systems (IS), there are two strategies that have pragmatic underpinnings, namely: Action Research (AR) and Design Science (DS) (Goldkuhl, 2012). These strategies serve different purposes. For example, action research is useful for bringing change to a specific environment. Design science is advantageous when the objective of the research is to design an artefact and prescribe a solution to a problem (Dresch, Lacerda & Miguel, 2015). In the present study, the research question seeks knowledge in order to develop an artefact (mobile application in this instance) that can be used to identify the characteristics of socially integrated mobile bully-victims. Therefore, design science was the most appropriate strategy.

4.4.1. Design Science

Research-by-design implies that theory and practice are linked with real cases for which the agenda of the analysis and related solutions are tailored to their specificity (Andoh-Baidoo et al., 2004). The

cyclical character of the pragmatic approach relates to the necessity to adopt systematic methods, rather than to rely only on analytical methods based on causality to arrive at problem solutions in the case of wicked problems (Geerts, 2011). Therefore, "design science research in Information Systems (IS) is, by definition, a purposeful way of designing and creating an IT artefact to address an important organisational problem' (Weigand, 2008, p.80). The main objective of this study was to design a mobile application that could be used to identify the characteristics of socially integrated mobile bully-victims. Hence, design science is suitable, and is informed by the chosen paradigm of pragmatism. Pragmatism is concerned with action, change, and the interplay between knowledge and action. This makes it appropriate as a basis for research approaches that intervene into the world and not merely observe the world (Goldkuhl, 2012).

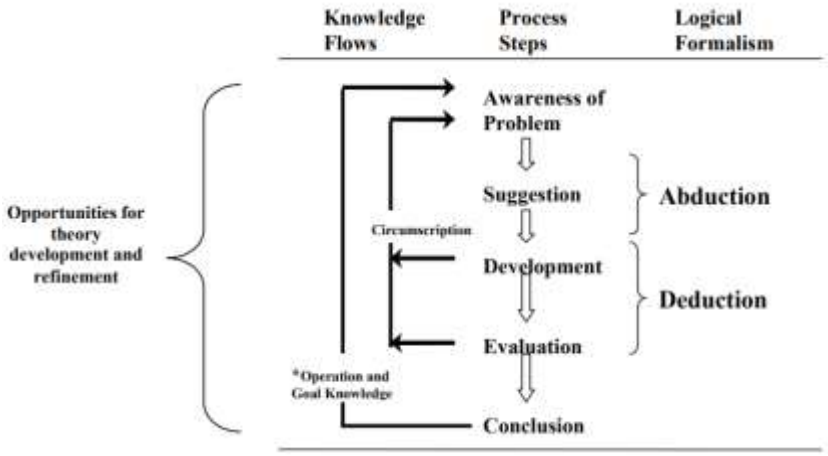


Figure 4.2: Design Science Process and Reasoning (Kuechler & Vaishnavi, 2008)

Figure 4.2 shows the design science process by Kuechler and Vaishnavi (2008) adopted in the present study. The study began with an awareness of the problem, namely the dearth of research on socially integrated mobile bully-victims. This was followed by an examination of ~~the~~ theories and existing literature, which helped in crafting an integrative framework and conceptual model to examine the characteristics of SIMBVs. In the third phase of the design science cycle (see Figure 4.2), the SIMBV mobile application was then designed and developed.

4.5. Research Approach

The research approach constitutes the second layer of the research onion, which focuses on a strategy for developing theory and reasoning. The three common research approaches are deductive, inductive, and abductive reasoning (Saunders, Lewis & Thornhil, 2007). This study adopted deductive and abductive reasoning at different stages of the Design Science Lifecycle (DS).

The researcher became aware of the problem, i.e., limited research and understanding of the characteristics of socially integrated mobile bully-victims, through an extensive literature review. This involved examining previous studies on traditional bullying, cyberbullying, and mobile bullying. The expected characteristics of the SIMBV were identified and used in the development of the application. Therefore, deductive reasoning was adopted during this phase.

The second phase of Design Science (DS), 'suggestion', is a creative step in the process where solutions to the problem are proposed in the form of a tentative design. This followed an abductive approach (see Figure 4.2). According to Liang et al. (2022), abduction constitutes a reasoning approach where inferences are drawn from incomplete observations. The researcher examined existing mobile applications and designs from various disciplines such as psychology, mHealth, and computer science. Useful insights were obtained on how to incorporate individual characteristics when designing algorithms and mobile applications able to identify cyberbullying roles and provide helplines. A mobile-based application (solution, i.e., the SIMBV) was therefore envisioned abductively in this phase.

The third phase of DS, that of 'development', involves the conversion of the tentative design into that artefact. During this phase, the researcher developed the SIMBV application. This development was guided by the research objectives, the conceptual model, and the outcome of the suggestion phase. Therefore, mostly deductive reasoning was used. In the next phase "evaluation", the artefact is evaluated. This involves evaluation of its functionality and its use, where the results it provides are compared to the intended goals. Any differences are noted and explained. The application developed in this study was used in two iterations to collect data. Its effectiveness was evaluated against the research questions, objectives, and conceptual model. Therefore, a deductive approach was adopted in this phase. After the evaluation, the final phase of DS, namely the 'conclusion', began. Conclusions about SIMBV characteristics were drawn using the findings from the two iterations.

4.6. Research methodology

Research methodology, which constitutes the core part of the research onion, focuses on data collection techniques and the associated data analysis procedures that can be adopted to gather knowledge (Hansen, 2010; Saunders & Tosey, 2013). There are two dominant methodologies in the field of information systems, namely qualitative and quantitative methodologies. The quantitative methodology is based on the positivist philosophical stance. This method breaks down research questions into hypotheses and variables, which are measured and tested using methods such as surveys

to obtain statistical data. Questions regarding causality are answered by analysing statistical data (Bahari, 2010). The qualitative methodology, on the other hand, is grounded in interpretivism beliefs, meaning that, when using this methodology, the aim is to gather detailed encounters of events or behaviour using methods such as interviews (Wahyuni, 2012). In addition to choosing between qualitative and quantitative methodologies, there are instances where researchers use both qualitative and quantitative methodologies for the same study to investigate a specific phenomenon (Abro, Khurshid & Aamir, 2015). The main aim of using mixed methodologies is to add more reliability and validity to the data required for the study. A researcher may also select a mixed method complex design, which employs a qualitative technique to collect data and uses both quantitative and qualitative techniques for analysis (Saunders & Tosey, 2013). The section below discusses these techniques in more detail.

4.6.1. Data collection techniques

This study adopted mixed methods, where the mobile application consisted of both close-ended and open-ended questions. These questions were in the form of a diary entry divided into three days. These questions were in the form of diary entries that had to be completed over a period of three days. The reason for using this method was to obtain a better understanding of the socially integrated mobile bully-victims experiences and their individual characteristics. Open-ended questions provide a view that closed-ended questions in a cross-sectional survey cannot provide (Neuert et al., 2021). These consist of insights into the experiences of participants, such as mobile victimisation, friendship dynamics, cultural beliefs, and expectation. Additionally, since the mobile application had to go through at least two iterations of evaluation, ways to improve the application from a user's perspective could only be obtained via open-ended questions.

The conceptual model of this study was used to guide the research questions on each diary page. The questions were related to the proposed SIMBV's individual characteristics and influencing environmental factors. Questionnaires used by previous studies to examine the variables in the conceptual model were also adapted. These include questions that referred to Mobile Social Network (MSN) experiences (Dredge, Gleeson, and De la Piedad Garcia, 2014). These questions were adapted because they help to identify whether a student is a socially integrated mobile bully-victim through their MSN experience. Other closed-ended and open-ended questions were based on studies cited in tables 4.2 and 4.3 (see Appendix 4 and 5 for better visibility). They were used to examine the nature and quality of friendships and parent-child relationships. Furthermore, the International Personality Item Pool-Neuroticism, Extraversion-Openness (IPIP NEO) questionnaire, which focuses on the basic

tendencies that form part of the five-factor theory, was used to validate the individual characteristics identified in the literature and to find additional ones.

Table 4.2: Reference for individual characteristics questions

Socio-Ecological level	Characteristic	Description	Measures used in the papers	Reference
Individual characteristics	Basic tendencies	Extraversion, Agreeableness, Conscientiousness, Emotional Stability. Measured	Using the IPI NEO-PI-R (Personality Item Pool-Neuroticism, Extraversion-Openness) questionnaire.	Dredge et al., 2015) John & Srivastava, 1999
	Objective biography	Past experience of being a victim in previous years.	Social Networking Experience	Dredge et al., 2015
	Bully-victim	The bully-victim status of the student is determined by whether they have been victimised, bullied/retaliated.	Cyberbully-victim scale: from 1- never to 5 - everyday (e.g., sent me a threatening comment, took a photo or a humiliating video, called me names, posted or forwarded a rumour & made fun of my looks).	Weffe et al., 2016 Kokkinos & Antoniadou, 2019 Betts et al., 2017 Ndyave & Kyobe, 2019
	Type of Cyberbullying or victimisation	The form of victimisation the bully-victim experienced, and the type of bullying they used towards others.	. Using a 3-point scale: 0-never, 1-sometimes, 2-often	Betts et al., 2017
	Social status and popularity	Social status is measured by the level of popularity. Research supports this position and demonstrates that bullies tend to strategically target those who are rejected by others in order to achieve and maintain social status. One reason is that the power of cyberbullies may originate from various sources, such as their social status in peer groups (as in traditional bullying), as well as from their technological skills, or the ability to bully anonymously online. cyberbullying predicted perceived popularity over time.	Measured using the number of social media friends and followers. A 5-pint scale was used.	Ndyave & Kyobe, 2019
	Coercion by parents/guardians	Individual increase in family conflict resulted in increased peer delinquency (Mowen et al., 2018). The cyberbully-victims were characterized by unstable family link (Lozano-Blasco et al., 2020).	Measured using the nature of relationships with family members e.g. avoidant, insecure (participants select from a 4-point scale- strongly agree, agree, disagree, strongly disagree).	Hong et al., 2019 Boman & Mowen, 2018 Lozano-Blasco et al., 2020

	Befriending delinquent friends	Bully-victims tend to report having delinquent friends instead of positive peer relationships. Delinquent friend are characterised by engaging/being part of the following incidents: assault, theft and arrest (Mowen & Boman, 2018).	Amongst your friends how many did the following: smoke, drink, truancy, running away, beat someone, stealing, gang fighting, threat someone.	Hong et al., 2019 Mowen & Boman, 2018
	Victimisation experience	Cyber bully-victim were characterised by initially being a victim of mobile bullying on social networks	A 5 point scale, ranging from 1-5 was used.	Hood & Duffy, 2018
	Depression and anxiety symptoms	The results revealed that cybervictims and cyberbully/victims have higher scores on depression and anxiety than those who were not involved in cyberbullying.	0 = poorly, 0 days; 1 = sometimes, 1–2 days; 2 = occasionally, 3–4 days; 3 = most days, 5–7 days; 4 = almost daily, 8–14 days). This scale was created by Radloff (1977). “I felt sad,” “Nothing made me happy,” and “I lost interest in daily activities.” such as restless sleep, poor appetite, and feeling lonely.	Boca-Zamfira et al., 2018

Table 4.3: Reference for microsystem– macrosystem questions

Socio-Ecological level	Characteristic	Description	Measure used in the papers	Reference
Microsystem	Peer norms	It was found that the higher the level of perceived peer norms, the higher the level of cyberbullying perpetration. Peers tend to rely on peer norms when they lack knowledge about appropriate behaviour online.	Participants were asked to indicate the extent to which behaviours were approved by their friends with whom participants were in contact with via social media e.g., how many of your friends tolerate someone who posts personal details online of someone else using a smartphone? How many of your friends approve/tolerate someone who sends offensive and vulgar messages to somebody using a smartphone. Measured using a 5 item scale 1= none of my friends and 5 – all of my friends.	Piccoli et al., 2020
Exosystem	Risky online behaviour & Tech-savvy	Internet use increased the risk of cyberbully-victims becoming cybervictims (Lozano-Blasco et al., 2020). The anonymity that digital platforms afford cyberbullies may also prompt victims to engage in bullying. This rewards bullies as they don't have to face consequences of their actions (Betts et al., 2017).	Frequency of using internet – 0-5hrs; 5-10 hrs; 10-15 hrs; 15-20 hrs (risk of being a victim). Number of sites used for internet access – 1 place; 2 places; 3 places; 4 or more places Number of activities – 1-2 activities; 3-4 activities Asked skill level by 1= I am comfortable to use computers, 2= I can "surf the net", use common software but not fix my computer, 3=I can use a variety of software and fix some my own computer problems, 4= I can use a variety of software and fix most my own computer problems, 5=I am comfortable manipulating or writing computer programs.	Lozano-Blasco et al., 2020 Sittichai & Smith 2020 Betts et al., 2017

Macrosystem	Gender socialisation values and norms	Participants with moderate or high levels of sexist attitudes are more empathic toward a female victim of workplace cyberbullying. Consequently, a female victim is more likely to receive help. Female victims are less likely to be attribute blame if the perpetrator is male. The results imply that male victims of cyberbullying are marginalised by their social environment (Weber et al., 2019).	It encompasses misconceptions concerning society, gender-specific expectations that families adhere to, and religious convictions. Measured using a 6-point scale. Measured using a 6-point scale.	Weber et al., 2019 Gurieva et al., 2022

Earlier studies used different Likert scales, however, here, the author used a five-point scale. Researchers frequently differ in their opinions on the use of different scales, e.g. four-point Likert scale and five-point Likert scale. There are also studies that have found the presence and absence of a midpoint to affect instrument validity and reliability differently (Adelson & McCoach, 2010). Therefore, the choice of scale may be debatable. Previous studies on mobile bully-victim have found a five-point scale to provide better quality data and where a mid-point is used, respondents have been found to express their opinions more freely so as not to be forced to agree or disagree (Kyobe et al., 2016; Chen & Cheng, 2017).

4.6.2. Data analysis techniques

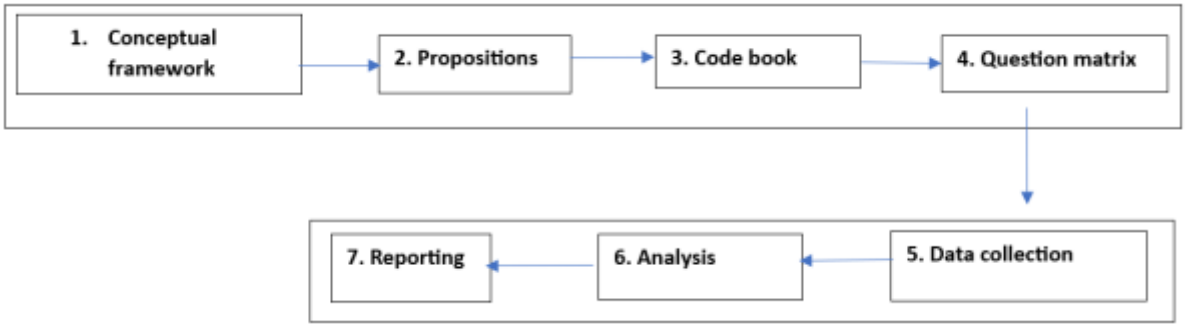
Data analysis, which is another component of the research methodology, focuses on analysing the data collected to provide answers to the research questions. The data analysis should demonstrate the trustworthiness of the data gathered, and the findings drawn from it (Roberts & Priest, 2006). There are two ways to demonstrate trustworthiness, viz. reliability and validity. Reliability illustrates whether the results of the data analysis can be replicated using the same research instrument (Karros, 1997). Validity, on the other hand, is a measure of whether what the research instrument measured is what the researcher intended to measure (Roberts & Priest, 2006). For both qualitative and quantitative data, collected through the SIMBV mobile application, the reliability and validity of the data were considered.

4.6.2.1. Qualitative data analysis

The data collected through diary entries within the SIMBV mobile application were analysed using both qualitative and quantitative methods. Qualitative data collected can be analysed using the deductive and inductive approaches. The deductive approach is primarily guided by the study's framework, which makes this approach more structured than an inductive approach (Burnard et al., 2008). The deductive approach is more suitable for research for which more is known about the possibilities of the participant's responses (Burnard et al., 2008). On the other hand, an inductive approach is suitable for studies where little is known about the research subject. The current study is guided by a conceptual model derived from an integrative model with theoretical bases. Furthermore, the conceptual model informed the development of the hypotheses. Given this, it is clear that the current research is structured, and this is consistent with the definition of the deductive approach; therefore, this study used the deductive approach for analysing the qualitative data.

The deductive approach consists of two methods, viz. deductive thematic analysis and pattern matching (Azungah, 2018). Deductive thematic analysis originated from thematic analysis; however, there is more structure and a different manner in which data analysis is conducted. Thematic analysis is a method used to identify and analyse themes emerging from qualitative data (Clarke, Braun & Hayfield, 2015). Deductive thematic analysis differs from traditional thematic analysis because it follows a more structured approach as coding is derived from theory. Pattern matching, on the other hand, involves identifying patterns from observed qualitative data and comparing this to previous studies or theories (Sinkovics, 2018). This study used both methods, i.e., deductive thematic analysis and pattern matching by adapting a framework developed by Azungah (2018), as displayed in Figure 4.3. This framework is a combination of the two methods of deductively analysing qualitative data.

Figure 4.3: Deductive qualitative analysis (Azungah, 2018)



Steps 1 and 2 have already been addressed in Chapter 3. Based on the conceptual model and the hypotheses, a code book was developed, following Azungah (2018), who suggested that the code book must at least consist of codes, code descriptions, qualifiers that indicate when the theme occurs, and points for exclusion. The code book is depicted in Table 4.4 (see Appendix 6 for better visibility).

Table 4.4: Socially integrated mobile bully-victim: Code book

Construct	Overarching Theme	Sub-theme	Source (Theory)
Individual characteristics	***Basic tendencies***	High openness	Five Factor Theory (FFT); Social Learning Theory
		Low agreeableness	
		low conscientiousness	
		Neuroticism	
		Extraversion	
	Biological tendencies	Emotional issues	
	Self-concept	Befriending delinquent friends	
	Objective biography	Past victimisation/bullying experience	
	Characteristics adoption	Learned aggression	
Environmental factors	***Immediate settings***	Coercion by parents/guardians Affiliations with delinquent friends	Coercion Theory; Social Norms Theory, Routine Activities Theory; General Aggression Model (GAM); Gender Role Socialisation Theory
		Lack of cyberbullying laws	
	Distal settings	Exposure to violence	
		Cultural expectations	
	Mobile Social Networks	Emojis	Mobile Technology Acceptance Theory (MTAM)
		Posting feature	
		Comment section	

The 4th stage is the question matrix, which is guided by the code book and hypotheses. The aim of this was to ensure that the mobile application obtains sufficient responses, which in turn enables the researcher to validate the conceptual model and answer the research questions.

The fifth stage involves actual ***data collection,*** which was conducted using the SIMBV mobile application. Furthermore, a guide (Appendix 2) was developed to provide the participants with an overview of what the application is about and how it functions. After the data was collected, it was analysed using both quantitative and qualitative methods. Thereafter, quantitisation was conducted, which means the coded qualitative data was converted to quantitative data for further analysis.

The ***data analysis*** stage of the qualitative analysis focused on the reliability and validity of the data collected. For qualitative analysis, Roberts and Priest (2006) recommend content analysis and intensive engagement with the respondent's input as methods for establishing reliability. Content analysis focuses on developing codes to provide a summary and group common responses from participants. To

showcase reliability, the researcher can check the stability of the codes over time. Intensive engagement with the respondent's input is the back and forth process, between our own interpretation of the data and the actual data, which is aimed at ensuring that interpretations are consistent with the data collected. For this study, content analysis was considered more suitable, as the code book was already developed as part of Stage 3 of the deductive qualitative analysis selected for qualitative data analysis. An NVIVO application was used to identify the common patterns related to each subtheme within the code book. Furthermore, the researcher engaged with the answers to open-ended questions to verify the patterns that were identified.

The validity of the open-ended data that was collected is illustrated through triangulation. Roberts and Priest (2006) defined triangulation as the use of more than one theory and method for data collection. Practical examples of this method include using a survey and interviews/focus groups, which is referred to as cross-case analysis. Other examples include comparing the findings with those in the literature and previous study findings. For the current study, the findings were compared with those of previous studies and the theories selected during the literature analysis.

4.6.2.2. Quantitative data analysis

According to Taherdoost (2022), there are six data analysis methods, namely: descriptive, explanatory, exploratory, inferential, mechanistic, and predictive. Explanatory analysis examines the dependencies or interdependencies among variables in order to answer questions related to relationships among variables. This method of analysis was appropriate for this study as the aim was to test the interplay between the environmental factors and individual characteristics of SIMBVs as illustrated by the conceptual model in Chapter 3. To examine relationship between these two constructs, cluster analysis was adopted. Furthermore, this technique was used to establish the validity of the conceptual model.

The reliability of the mobile application in identifying the characteristics of the socially integrated mobile bully-victims was also tested using Cronbach's alpha, which is a statistical technique used for fulfilling this purpose. More details are provided in the data analysis chapter.

4.7. Research timeframe

According to Sahay (2016), there are two timeframes that researchers use, namely: longitudinal and cross-sectional. When data needs to be collected at a specific point in time, a cross-sectional time frame is utilised, whereas, a longitudinal timeframe is employed when data is collected over a longer period of time. This study followed a design science approach, and data was collected over a period of three days. Kyobe (2016) argues that a cross-sectional timeframe is suitable for mobile bully-victim studies, because the variables that contribute to this behaviour, such as time spent online and personal traits, may influence the behaviour instantly, especially on a platform where there is limited accountability for user's posts. Therefore, these variables must be examined simultaneously. In addition, the questions for each day were based on past experiences and online events that occurred on the current day. The objective of including current-day incidents served to reduce the likelihood of recall bias (Smith et al., 2017).

4.8. Target Sample

At the university level, the use of technology such as desktops and mobile technology is a necessity; consequently, students have a high likelihood of being perpetrators, victims, and bully-victims online (Shaikh et al., 2020). Even though this is the case, there are limited studies that focus on students at the university level, especially in developing African countries (Khine et al., 2020; Ndiege et al., 2020). This is concerning, as studies have seen an increase in the prevalence of students occupying dual cyberbullying roles, i.e., being cyberbully-victims. In some studies, the prevalence of bully-victims exceeds that of cyberbullies and cybervictims (Alrajeh et al., 20221). This group has been reported to display high levels of aggression and depressive symptoms (Alrajeh et al., 2021; Kennedy, 2021). The socially integrated bully-victim (SIMBV) group, which is a subtype of bully-victim, is more prevalent during their late teenage years. This has been attributed to the fact that, as teenagers grow up, they transition from highly victimised bully-victims to relational aggressive victims (Ettekal & Ladd, 2017). Socially integrated mobile bully-victims are characterised by high levels of aggression and delinquent friends; hence, they inflict greater pain than marginalised bully-victims (Kennedy, 2021).

The general aggression model states that individuals who are exposed to situational factors such as violence in physical environments are more likely to engage in bullying online (Teng et l., 2020). Based on this framework, the current study predicts that South Africa has a high prevalence of SIMBVs, as its metro cities, where the biggest universities in Africa are based, are characterised by a high rate of crime. For example, Cape Town was ranked number 11 in cities with the highest rate of crimes in the world, including murder (BusinessTech, 2022). Given the findings from the literature, this study focussed on universities within the Western Cape Province of South Africa.

4.9. Ethical considerations

Academic research requires ethical considerations as part of the research process. Academic institutions select a team that oversees and regulates the processes, behaviour and information related to the research that any student or staff member conducts under the tertiary institution's guidance and approval (Davies, 2000). The main objective of regulating ethics is to protect the research participants and ensure that their human rights are not infringed upon at any stage during and after the research process.

To ensure the study was conducted ethically, the researcher followed these key points:

- **Approval for conducting the study:** according to Davies (2020), the protection of human rights in South Africa warrants an ethical mandate for institutions that research humans. Hence, the researcher applied for ethics approval from the relevant institutions such as the University where the researcher is registered as well as the universities within the Western Cape Province as the target sample consists of university students in these areas. There was no need for parent or guardian approval because the study targeted students 18 years and older.
- **Consent:** participants of this study were reminded through the email invitation and note on the application that being part of this study was voluntary. Furthermore, the researcher ensured that the participants understood what input is required from them and why. This is aligned with the guideline of consent by Connelly (2014), which states that participants should be made aware of the nature of the study in which they are participating, as well as what is expected from their input before participating. This enables the participants to have a view of what they are engaging in, and to provide consent in relation to that aspect (McNamee, 2021). Moreover, this is consistent with the duty of the researcher to conduct a study in an ethical manner that is not aimed at either forcing or deceiving the research participants.
- **Confidentiality and anonymity:** these two aspects are included in research ethics in order to protect the privacy of the research subjects at all stages of the research (Coffelt, 2017). In this regard, anonymity means that researchers are only allowed to collect demographic information, such as gender, age, and educational level, about the study participants, and not data that can lead to any participant being identifiable such as a name and home address (Wiles et al., 2008). Conducting research in this manner shields participants from stigmatisation or other repercussions. Furthermore, in terms of confidentiality, the data about each of the individual participants ought not to be disclosed intentionally or by accident; but researchers should only be interested in the consolidated data that represent the population of interest (Coffelt, 2017). In the current study, the researcher only requested demographic data

from the participants, such as age, gender, and the area in which they live (without the exact residential address).

4.10. Chapter Summary

The current chapter outlined the design of the current study. Each subsection provided a view of the available options and the one that has been selected specifically for this study as well as the reasons for choosing a specific element over others. The researcher selected the pragmatism philosophical state based on the research questions. Since the objective of this study is to develop an artifact for, the design science research strategy was adapted. In addition, to obtain knowledge throughout the process cycle of design science, deduction and abduction approaches were utilised. The artifact i.e., the mobile application that was developed using design science, consisted of both qualitative and quantitative questions, the data was collected over a period of 3 days, Western Cape undergraduate students.

Chapter 5: Development of the SIMBV mobile application

5.1. Introduction

The objective of this chapter is to provide details of how the design science phases were applied to develop the mobile application that can be used to identify the characteristics of Social Integrated Mobile Bully-Victims (SIMBVs). The current chapter is structured as follows. First, the limitations of the existing data collection methods used in cyberbullying and mobile bullying studies were examined, with a view to identify the best method. In addition, existing digital platforms used for identifying and helping adolescents who have been cyber-victims /perpetrators such as mobile applications and websites, were reviewed. The aim of the review was to answer the third sub-research question, namely "*What features should a mobile application have in order to identify the characteristics of socially integrated mobile bully-victims better?"* In addition to identifying the critical features to be used in the SIMBV application, the researcher also aims to ensure that the shortcomings presented in earlier studies are not repeated.

5.2. Evaluation of methods and platforms utilised by previous studies

The most common methods that has been used by previous studies to collect data in the field of cyberbullying and mobile bullying were examined. This was done in order to establish the shortcomings of these methods from the perspective of researchers, to establish how the structure of the methods impact of the way participants response, as well as to ensure the mobile application developed minimises the above limitations. This would also enable the researcher to get richer inputs from the participants and to optimise both the collection and maintenance of the data. After examining the methods and existing digital solutions, websites and mobile applications were reviewed to determine whether there are mobile application features and characteristics of bully-victim that can be incorporated in the SIMBV application.

5.2.1. Research method limitations identified in previous studies and recommendations

Several studies have been conducted using surveys. Surveys enable researchers to quantify the rate of cyberbullying incidents and group the type of cyberbullying in terms of prevalence. Online surveys have been found to be better in storing data safely and are effective in terms of availability and readiness for analysis by researchers (Van Selm & Jankowski, 2006; Nayak & Narayan, 2019). The

disadvantage of the survey is sometimes the scales used to capture the frequency and bullying incidents may fail to capture the choices of all the participants thereby forcing them to choose any available options. This may lead to false reporting of cyberbullying experiences, which affects the reliability of the data collected.

Given the limitations of surveys, interviews have been recommended as methods that better capture the experiences of respondents. According to Adhabi and Anozie (2017), the main advantage of interviews is that they provide interviewees with a chance to provide a detailed account of their experiences freely and without limitation in terms of words and questionnaire scales. From the interviewer's side, this is useful, as they gain a full view of the relevant experiences. However, interviews also have disadvantages. Interviewees might not want to disclose everything in face-to-face interviews, as they may perceive some incidents socially undesirable (Opdenakker, 2006).

Information Technology (IT) studies have started adopting the use of mobile applications such as Instant Messaging App (e.g. WhatsApp) to conduct interviews via chats. The result of a study by Kaufmaan (2020), indicate that overall participants preferred the interactions with the researcher via WhatsApp as they already had knowledge of using this application.Furthermore, participants enjoyed the fact that they had privacy, there was no face-to-face interactions, and they were also comfortable to share information about their experiences without feeling that they were being watched. However, some of the participants were uncomfortable to share screenshots.

Further studies also indicate that using a mobile application to collect data seems more promising than other methods. For example, the eMoods Bipolar Mood Tracker app (Luxton et., 2011) consists of a daily tracking system that enable users to input and keep track of subjective mood ratings in an electronic mood journal. This makes the smart apps much better than paper-based surveys, which have potential recall bias when filling in data retrospectively, e.g. where patients complete a lot of daily ratings at once. Furthermore, mobile devices tend to travel along with people wherever they find themselves, and whatever they are doing, and consequently enter various social contexts of that person (Mulder et al., 2005). This puts these devices in an ideal position to capture several aspects of social phenomena. Where monitoring applications can be installed directly on the smartphone, this eliminates the need for users to interact with a separate monitoring device. In addition, since most people carry their cell phones with them during most of the day and use it for normal communicative purposes, the risk of stigmatisation due to using a separate device for illness monitoring is not present (Faurholt-Jepsen et al., 2015).

Balesario et al (2015) also report that mobile applications are better suited for data collection in studies identifying symptoms or characteristics of participants where anonymity is a key requirement. Much information can be collected from students' confession pages since these pages enable the anonymous sharing of feelings and secrets instantly and openly. Kyobe (2016) also argues that smartphone features like Emojis, expressions, comments, etc. can instantly reveal mobile bullying and potential retaliative actions, making it possible to captured cyberbullying incidents in cross-sectional studies (Kyobe, 2016).

Mobile apps are increasingly used to identify categories of bullies. They utilise datasets and machine learning algorithms to identify and detect cyberbullying posts or search and analyse sentiments of users, exclamation mark count, hashtag count, profanity count, emoticon count, word Count, account creation (days), followers ratio, etc (Chatzakou et al., 2017; Hadiya, 2022). However, Thun, Teh and Cheng (2022) caution that emoticon count, exclamation mark count, and account creation (days) may fail to provide useful information for classification, especially if the above counts between cyberbullying and non-cyberbullying tweets are few. Monitoring account creation to identify hateful users may also be unsuccessful if respondents exist who do not want to reveal their identity when protecting cyberbullying victims. A bully may create a new user account instead of using their own account to avoid detection. In such case, the account creation date feature would not effectively differentiate bullies from victims (Thun et al., 2022). Another common problem is that the results may not be satisfactory if the dataset is small, making it difficult for the algorithm or model to learn from the context. There could also be access restrictions to quality datasets which could force researchers to use datasets that are not applicable.

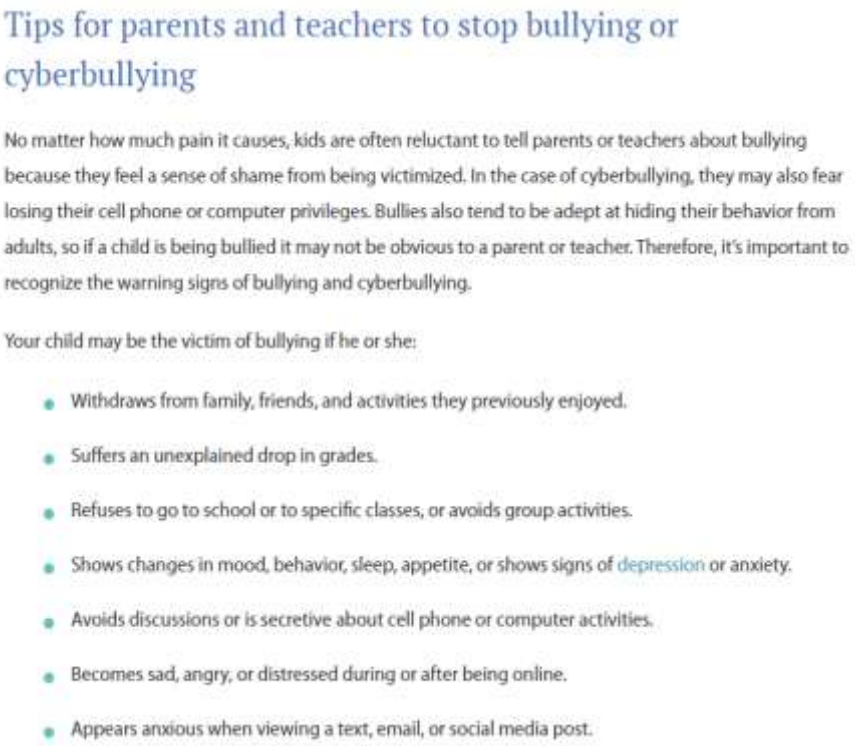
In light of the above limitations, the researcher decided to use open and closed questions embedded in the application. The questions were based on the individual characteristics and environmental factors presented in the conceptual model in chapter 3. The mobile application adopted the diary entry style for 3 days, and used pseudonyms to keep the participant anonymous, while tracking their daily entries. Furthermore, the application has a section which focuses on providing SIMBVs with the contact information they can use at their fingertips to seek professional help and ways to deal with victimisation. This is consistent with recommendations that applications developed should also play an awareness creation role among its users (van der Zwaan et al., 2014).

5.2.2. Existing international websites on anti-bullying and cyberbullying

Although the use of Information and Communication Technology (ICT) may present several risks (such as cyberbullying, and grooming), it also provides several benefits to promote people's wellbeing. It is possible to use ICT to manipulate the quality of experience, with the goal of increasing emotional, psychological, and social wellbeing. Virtual reality, as well as serious game and emerging mobile devices can exploit the potential of positive emotions (Jacobs et al., 2014). The current section is aimed at evaluating online platforms, such as websites and mobile applications. The main purpose of the evaluation is to identify the limitations and strengths for consideration in the development of the present mobile application.

5.2.2.1. HelpGuide.org

According to Segal (1999), the HelpGuide website was developed in memory of a writer in California who lost her life due to mental health issues. The purpose of this website is to raise mental health awareness for families. This includes discussions on bullying and cyberbullying. This website provides a distinction between traditional bullying (in physical environments such as schools) and cyberbullying. Furthermore, tips for parents in the form of characteristics of bullies/cyberbullies and victims/cyber-victims are provided as shown below in Figure 5.1.1.



Tips for parents and teachers to stop bullying or cyberbullying

No matter how much pain it causes, kids are often reluctant to tell parents or teachers about bullying because they feel a sense of shame from being victimized. In the case of cyberbullying, they may also fear losing their cell phone or computer privileges. Bullies also tend to be adept at hiding their behavior from adults, so if a child is being bullied it may not be obvious to a parent or teacher. Therefore, it's important to recognize the warning signs of bullying and cyberbullying.

Your child may be the victim of bullying if he or she:

- Withdraws from family, friends, and activities they previously enjoyed.
- Suffers an unexplained drop in grades.
- Refuses to go to school or to specific classes, or avoids group activities.
- Shows changes in mood, behavior, sleep, appetite, or shows signs of depression or anxiety.
- Avoids discussions or is secretive about cell phone or computer activities.
- Becomes sad, angry, or distressed during or after being online.
- Appears anxious when viewing a text, email, or social media post.

If your child is a bully

It can be difficult for any parent to learn that their child is bullying others but it's important to take steps to end the negative behavior before it has serious and long-term consequences for your child. Kids who bully others:

- Have a higher risk of abusing alcohol and drugs.
- Are more likely to get into fights, vandalize property, and drop out of school.
- Are twice as likely as their peers to have criminal convictions as adults and four times more likely to be multiple offenders.
- Are more likely as adults to be abusive toward their romantic partners, spouses, or children.

Figure 5.1.1: Helpguide anti-bullying website (Senegal, 1999)

5.2.2.2. The No Trap!

No Trap! is a school-based intervention that utilises a peer-led approach to prevent and combat both traditional bullying and cyberbullying (Palladino, Nocentini & Menesini, 2016). It was developed in Italy and launched in 2008, as an intervention for high schools. The first phase of the programme is managed by adults (psychologists and researchers). The second phase is led by peer educators and a group of students who assume a role of responsibility both in their classroom and online, after undergoing specific training. Peer educators enhance awareness and provide support in the virtual context. Figure 5.1.2 and 5.1.3 shows some of the website content. The website mainly advises how victims of bullying ought to deal with victimisation experience. For bullies, the website provides guidance on how parents should approach their children if they have been identified as bullies by the school. However, bully-victims or retaliation is not addressed on this site. Furthermore, even though victims are advised on what to do when they are bullied online, the characteristics for any bullying or victim role are not disclosed, so as to enable parents to determine if their children are being victimised or bully others. This is crucial, as the youth who get bullied online or bully others online is more likely not to disclose what happens online to adults.

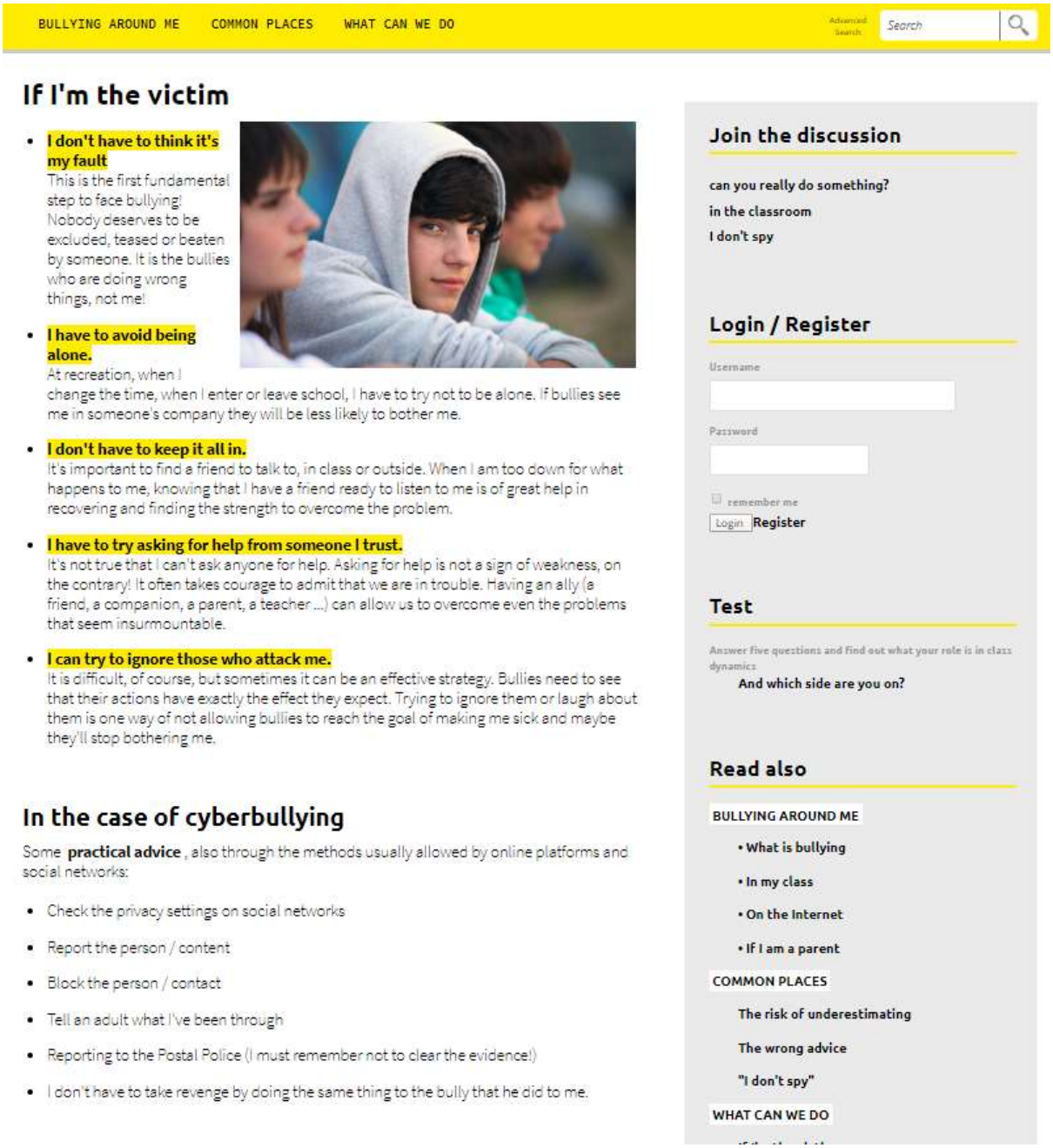


Figure 5.1.2: victim tips (Menesini, 2008)

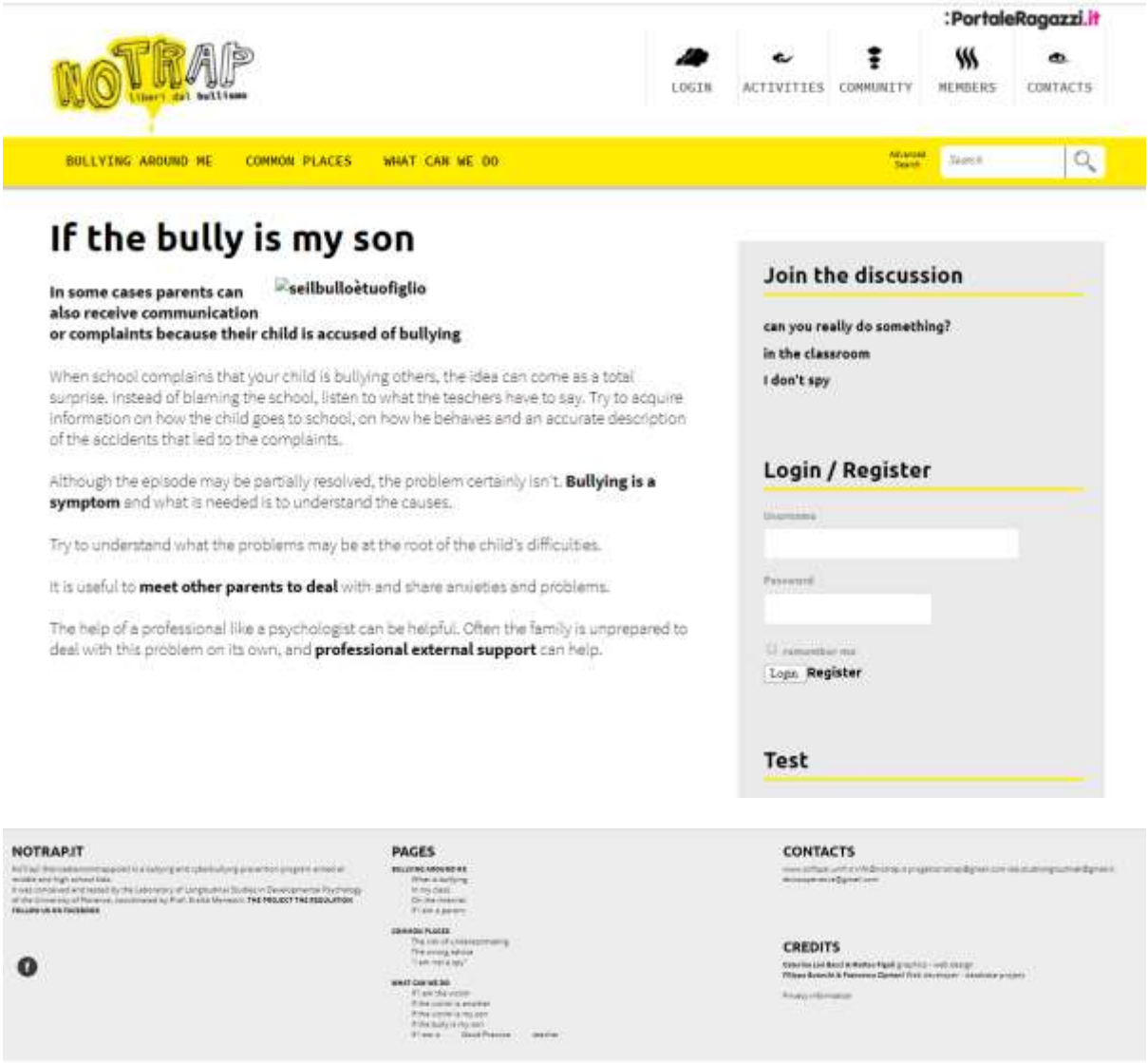


Figure 5.1.3: Identifying bullies (Menesini, 2008)

5.2.3. Existing mobile application on cyberbullying (victims and bullies)

5.2.3.1. Professor Garfield

Professor Garfield is a series of online interactive lessons on different topics concerning internet safety. This type of applications can be used individually, but also provide teaching material for classroom use. Available for iPad on the iTunes App Store, this is essentially a Garfield comic strip that helps kids identify bullying behaviour, and provide strategies for dealing with bullies (such as how important it is to seek the support of a trusted adult).

Figure 5.1.4: Professor Garfield (Tenkely, 2017)

5.2.3.2. Knowbullying

Knowbullying is an initiative by SAMHSA (Substance Abuse & Mental Health Services Administrator) of America, the main goal of which is to reduce alcohol abuse and raise mental health awareness. When it comes to bullying, this application is built to assist caregivers and educators to start conversations about bullying, and to support victims of bullying.

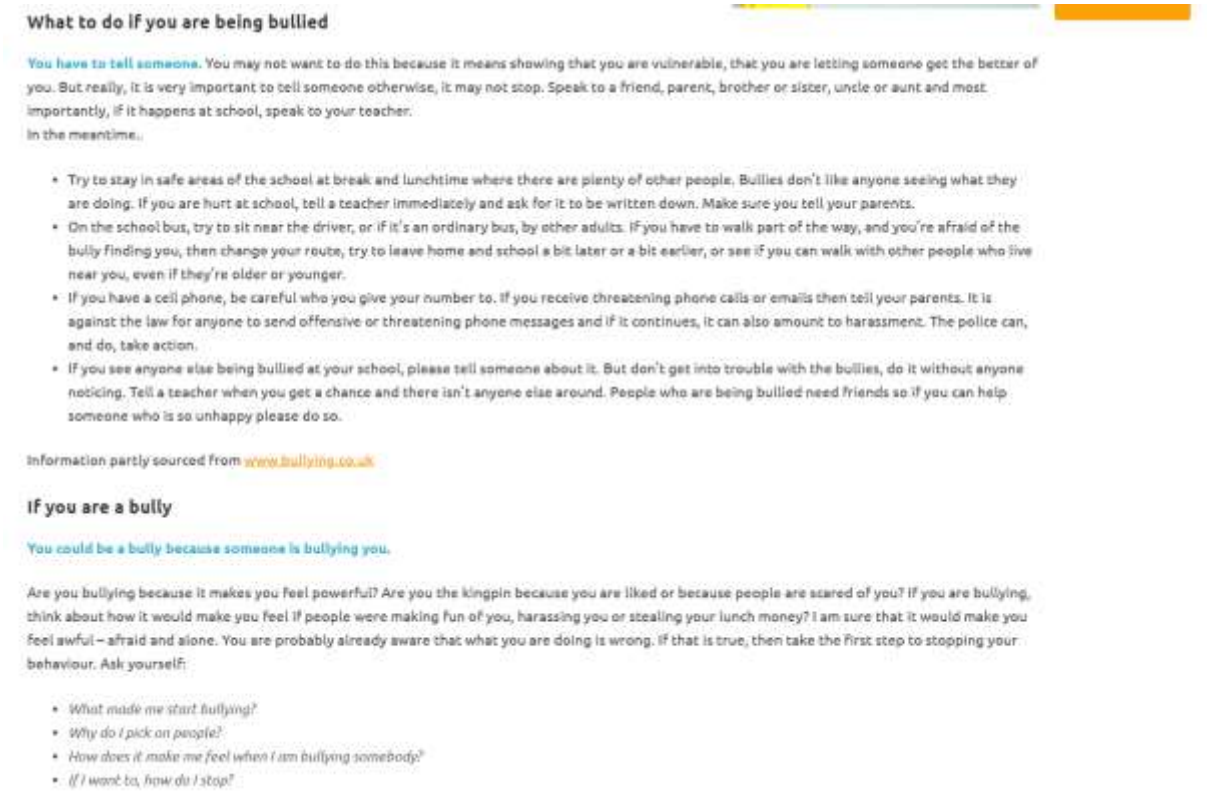
Figure 5.1.5: Knowbullying (U.S Department of Health & Human Services, 2008)

5.2.4. South African anti-bullying websites and applications

5.2.4.1. Childline

Childline is an online counselling service provided by the government to children in South Africa. This service is available weekly from 14:00 to 18:00 in the afternoon and not on weekends and public holidays. A learner or a concerned parent can contact ChildLine via a chat feature on the ChildLine website, or by calling the ChildLine national contact number.

The content on the website provides tips for victims of bullying at schools and online as shown in Figure 5.1.6. The website also provides a series of questions for the bullies so they can reflect upon and understand their impact for their behaviour. The shortcomings of this website is that the answers to the reflection questions for bullies are not captured anywhere so as to understand their characteristics and the reason that they may be involved in such behaviour. Moreover, recommendations on how to stop bullying or how to seek help are not provided.



What to do if you are being bullied

You have to tell someone. You may not want to do this because it means showing that you are vulnerable, that you are letting someone get the better of you. But really, it is very important to tell someone otherwise, it may not stop. Speak to a friend, parent, brother or sister, uncle or aunt and most importantly, if it happens at school, speak to your teacher.
In the meantime..

- Try to stay in safe areas of the school at break and lunchtime where there are plenty of other people. Bullies don't like anyone seeing what they are doing. If you are hurt at school, tell a teacher immediately and ask for it to be written down. Make sure you tell your parents.
- On the school bus, try to sit near the driver, or if it's an ordinary bus, by other adults. If you have to walk part of the way, and you're afraid of the bully finding you, then change your route, try to leave home and school a bit later or a bit earlier, or see if you can walk with other people who live near you, even if they're older or younger.
- If you have a cell phone, be careful who you give your number to. If you receive threatening phone calls or emails then tell your parents. It is against the law for anyone to send offensive or threatening phone messages and if it continues, it can also amount to harassment. The police can, and do, take action.
- If you see anyone else being bullied at your school, please tell someone about it. But don't get into trouble with the bullies, do it without anyone noticing. Tell a teacher when you get a chance and there isn't anyone else around. People who are being bullied need friends so if you can help someone who is so unhappy please do so.

Information partly sourced from www.bullying.co.uk

If you are a bully

You could be a bully because someone is bullying you.

Are you bullying because it makes you feel powerful? Are you the kingpin because you are liked or because people are scared of you? If you are bullying, think about how it would make you feel if people were making fun of you, harassing you or stealing your lunch money? I am sure that it would make you feel awful – afraid and alone. You are probably already aware that what you are doing is wrong. If that is true, then take the first step to stopping your behaviour. Ask yourself:

- *What made me start bullying?*
- *Why do I pick on people?*
- *How does it make me feel when I am bullying somebody?*
- *If I want to, how do I stop?*

Figure 5.1.6: ChildLine website (Childline South Africa, 2003)

5.2.4.2 STOP !T

STOP!T allows pupils to report on what they experience and what they see, from the comfort of their home, a friend's home, a community hall or library; anywhere with an internet connection. Using a very simple-to-use app or internet site, learners can send written messages, with a video or a picture as evidence. An administrator at the school replies to the pupil in real-time to gather further information.

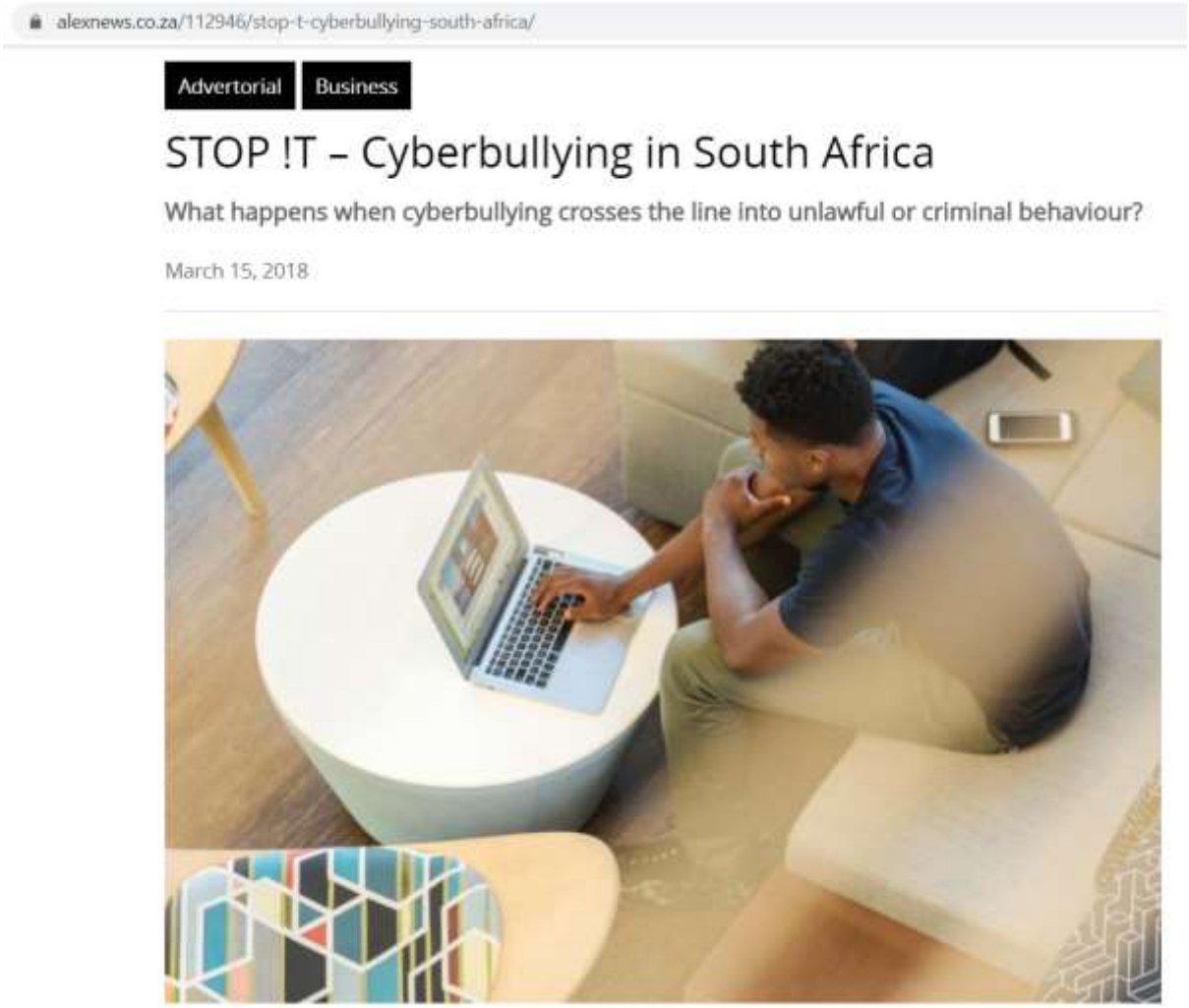


Figure 5.1.7: Stop !T application (STOPit Solutions, 2018)

5.2.5. Gap in existing applications and website interventions

Table 5.1. Existing website and mobile application limitations

Application/website name	Provides characteristics of Bullies	Provides characteristics of Victims	Provide Characteristics of bully-victims or signs of bully-victims behaviour
HelpGuide	✓	✓	✗
No Trap!	✗	✗	✗
SmartTalk	✗	✗	✗
Professor Garfield	✗	✗	✗
Know Bullying	✗	✗	✗
Childline South Africa	✗	✗	✗
Stop !T	✗	✗	✗

Key
✓ Feature is present
✗ Feature is absent

Based on the international and local (South African developed) anti-bullying websites and applications selected in this study, only one site (The Help Guide), appears to focus on the characteristics of both bullies and victims, as shown in Table 5.1. This is useful because both caregivers and the youth can see the necessary signs should a child get involved in cyberbullying, and ought to act on time to provide or seek help. However, this website does not cover the characteristics of bully-victims or retaliation. Other websites and applications such as No Trap! and Childline South Africa provide tips on how to cope with victimisation. Bullies receive questions to conduct a self-examination, but the answers to the questions are unrecorded. Furthermore, there are no suggestions on how bullies can stop engaging in such behaviour, as the available guidelines only cater for victims. As a result, these questions can cause a bully to feel guilty and helpless. The latest technology is influencing the evolution of online bullying, which is why it is important to constantly improve and update coping tips for victims provided by websites.

5.3. The design and Implementation of the Socially Integrated Mobile Bully-Victim (SIMBV) mobile application

The design and development of the SIMBV mobile application was guided by Kuechler, Vaishnavi and Petter (2005); and Kuechler and Vaishnavi (2008).

Table 5.2 below shows the steps followed:

Table 5.2: Stages followed in the design and development of the SIMBV

Design Science steps	**Outputs**
Awareness of the problem	Already done in ~~previous chapter,~~ Chapter 2
Suggestions	Prototype or tentative design
Artefact development	SIMBV App
Evaluation	Report on appropriateness of the app and inputs from study participants.
Conclusion	Results

5.3.1. Awareness of the problem

The researcher became aware of the problem, i.e., limited research and understanding of the characteristics of socially integrated mobile bully-victims, through an extensive literature review in Chapter 2. This involved examining previous studies on traditional bullying, cyberbullying and mobile bullying. The expected characteristics of the SIMBV were identified and used to develop a conceptual model in Chapter 3, which guided the development of the mobile application. For this reason, deductive reasoning was adopted during this phase.

5.3.2. Suggestion

Design Thinking is a non-linear and iterative process informed by external feedback to arrive at a final solution intended to solve a specific problem (Luchs, 2015). The Design Thinking (DT) process is made up of Figure 5.3.2.1.

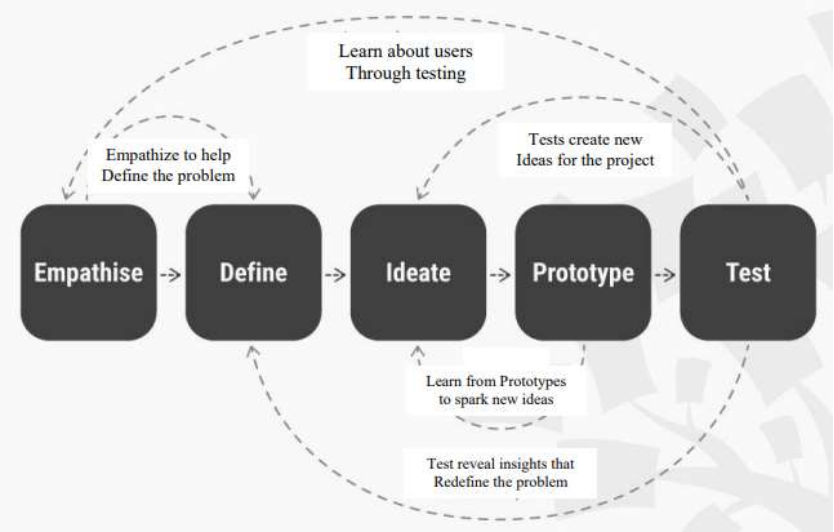


Figure 5.3.2.1: Design Thinking process (Dam & Siang, 2021)

Design Thinking was adopted in this study as a toolkit for developing the prototype of the mobile application, which is an output of the Design Science (DS) suggestion phase as shown in Table 5.2.

5.3.2.1. SIMBV prototype using Design Thinking

a) Iteration 1

Empathise: the first stage of DT is empathise as shown in Table 5.3.2.1. At this stage, the researcher must interpret the problem at hand with empathy. The researcher shows empathy by consulting the people who are affected by the problem at hand to understand their needs (Haque & Indah, 2022). In this thesis, the author conducted a literature review to gain an understanding of user's preferences for an application that captures their personal experiences. This is consistent with the recommendations of human-centred research, which emphasises that understanding the end user needs is the first step in design these types of technology-based interventions.

Define: the second stage of DT is called define, where the researcher describes the needs of the users. The needs of the users are an output of the consultation sessions. The literature review findings are used to provide a summary view of the user's needs in the current study. A study was conducted by Kenny, Dooley and Fitzgerald (2016) to identify what adolescents would prefer in terms of design for mobile applications. These researchers found that confidentiality, functionality, and the manner of engagement were the key concerns from the youth that utilise smartphones (Kenny, Dooley, & Fitzgerald, 2016). Adolescents prefer safe applications that are free of cyberbullying and do not expose their identity or label them (Kenny et al., 2016; Wang et al., 2019). They also prefer the instructions on how the application functions to be clear and get

straight to the point, while providing relevant content. When it comes to the way in which the mobile application functions, adolescents highlighted that the application must focus on relevant functionality and useful information. Information relating to coping and advice on mental health, communicated with a positive tone, was of utmost significance to the youth. Males preferred utilising mobile applications that ensured confidentiality and anonymity, as this would enable them to express their views and emotions without hiding their feelings. Societies sometimes expects males to 'act tough', even when they experience negative feelings (Kenny, Dooley, & Fitzgerald, 2016).

Ideate: the researcher moved to the third stage of DT, viz. ideate. This stage is used by researchers to craft possible solutions based on the user's needs (Haque & Indah, 2022). The literature presented in section 5.2 shows the limitations of the current cyberbullying websites and applications. These solutions do not take the experiences of their users into account. Moreover, the learners involved in cyberbullying are advised to seek help from parents and teachers. This is not consistent with the mobile app user's preference to remain anonymous (Kenny et al., 2016; Lui et al,. 2017). These findings were used as input into the prototype ideation phase. The review of existing solutions and literature, however, do not provide all the required features of the SIMBV app prototype. Hence, the mobile app prototype was envisioned abductively in this phase. In addition to the user's requirements, the conceptual model of this study was used to brainstorm the features of the application. The author used the Figma application to craft the layout of the mobile application as shown in Figure 5.3.2.2.

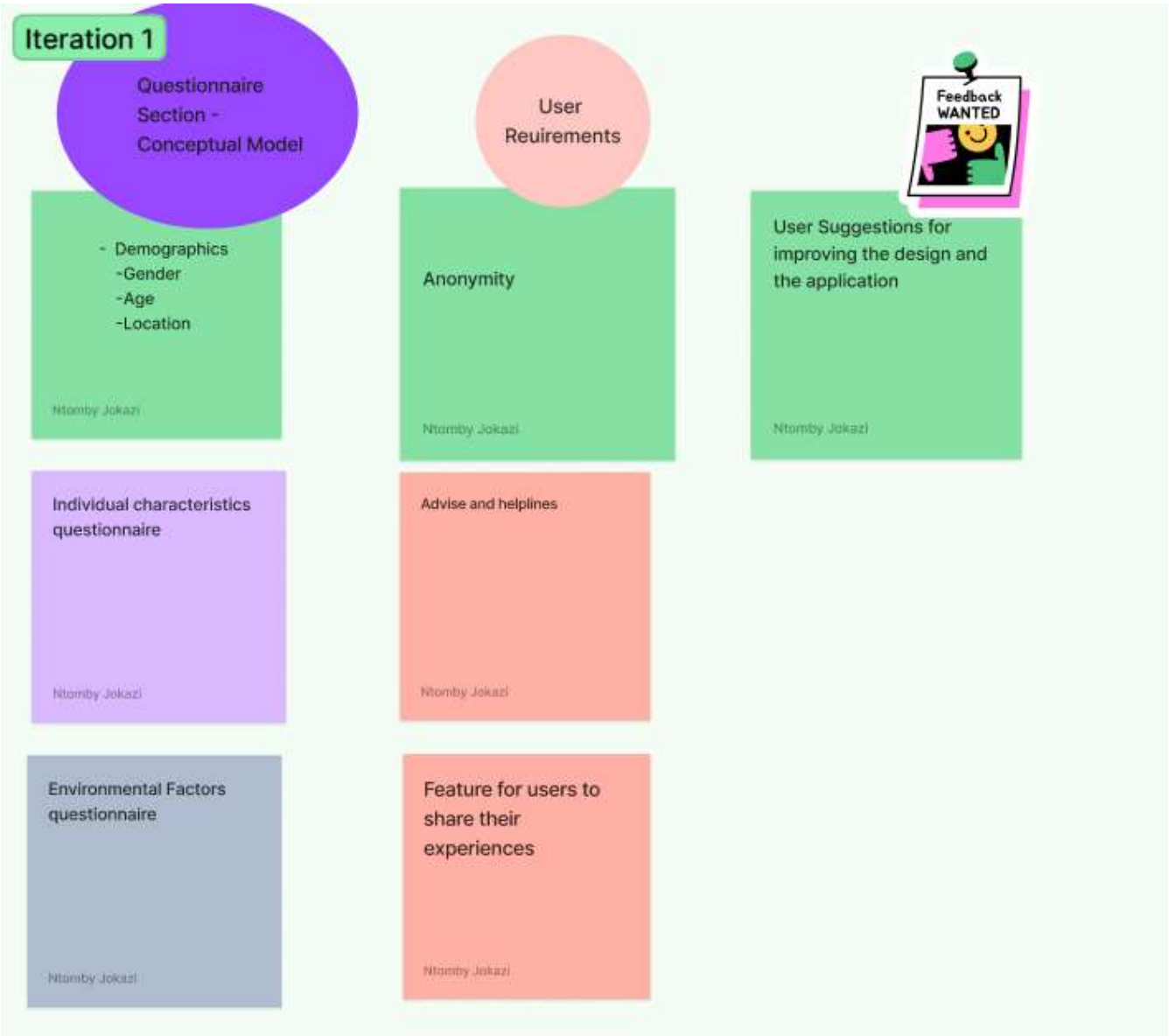


Figure 5.3.2.2: SIMBV application ideation (by the Author)

The author refined Figure 5.3.2.2 and used a UML Use Case diagram to depict the interactions between the user and the prototype as shown in Figure 5.3.2.3. According to Matz and Germanakos (2016), Use Case diagrams are critical during the Design Thinking process, as they are better at visually depicting how the users will interact with the proposed solution. The Use Case diagrams provide all the possible usage scenarios of a proposed solution and enable ease of communication between designers and users. The Use Case diagram was used to show users the features that will be included as part of the prototype and as a guide for the researcher during the prototype development phase.

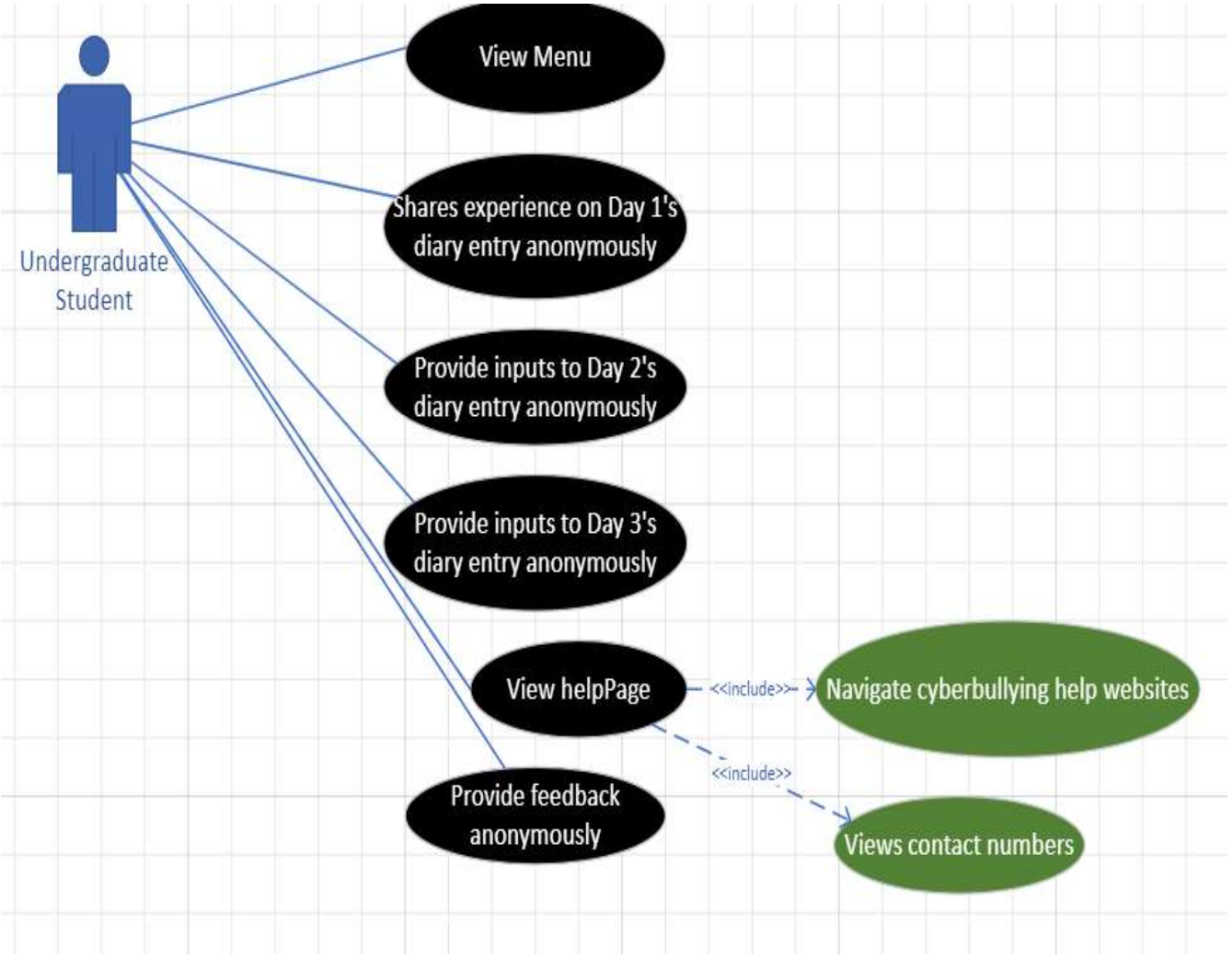


Figure 5.3.2.3: Initial SIMBV App Use Case diagram(by the Author)

Prototype: following ideation, the prototype of the mobile application was created using the ideas in Figure 5.3.2.3. The first prototype of the mobile application was drawn on draw.io platform as shown in Figure 5.3.2.4. This design thinking phase is critical, as it helps the researcher to better conceptualise the tool being developed and to think of the software and effort required (Brath & Peters, 2004). This eliminates the risk of developing without fully understanding the solution and its requirements. Furthermore, it is easy and less time consuming to make design changes on an editable platform. Based on figure 5.3.2.3, the application was designed to have a menu page (page 1) that consists of the diary page, about page, and emergency phone numbers.

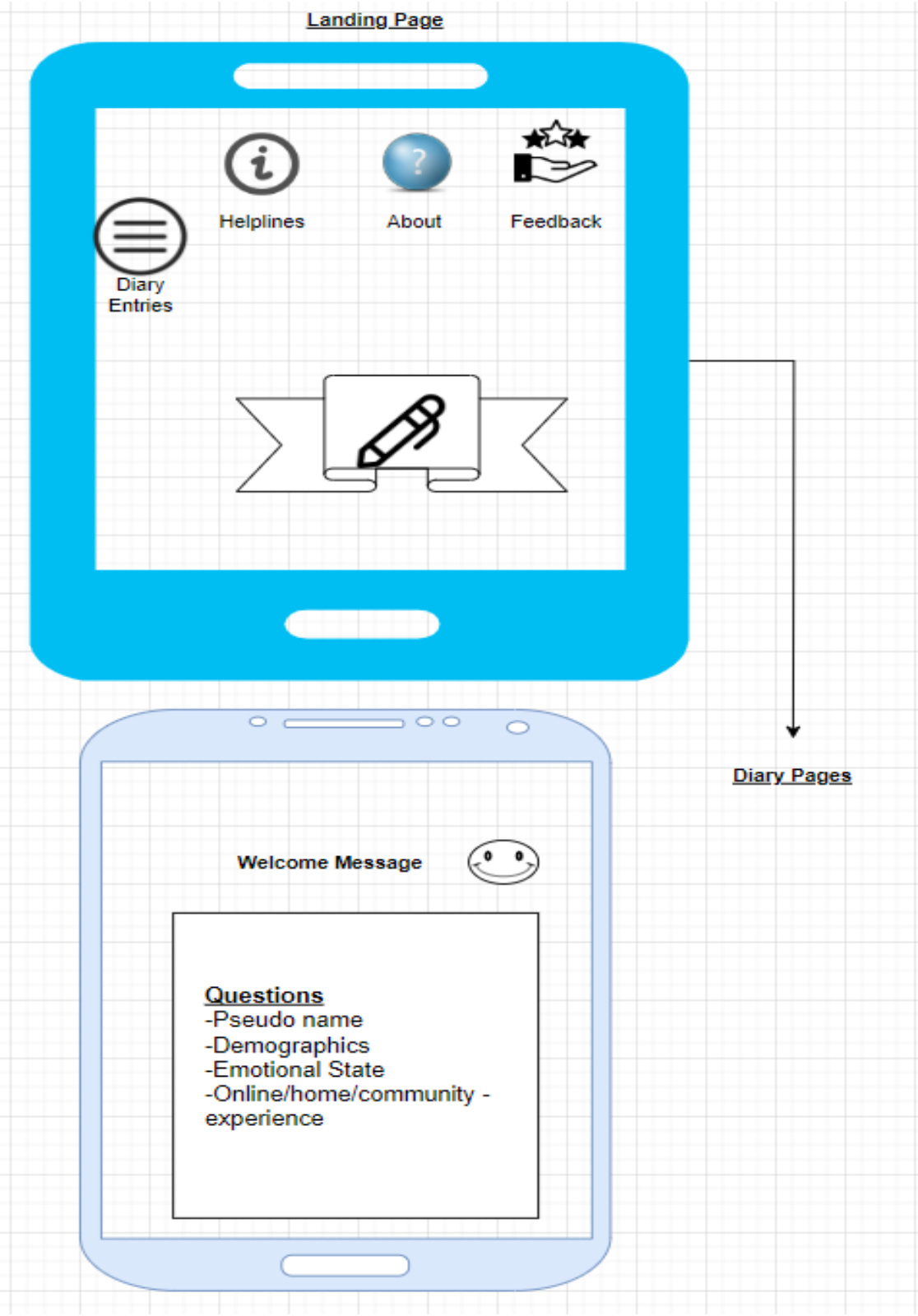


Figure 5.3.2.4 SIMBV application design on draw.io (by the Author)

The diary page consists of several days. Within each of the diary pages, the researcher's questions were guided by the conceptual model in Chapter 3. The questions relate to the individual

characteristics and experiences and are drawn from both the physical and digital environments as indicated in the conceptual model. The actual survey questions were adapted from previous questionnaires as shown in tables 4.2 and 4.3.

Test: the mobile application prototype was tested as per the last stage of DT. This testing involved two experienced people in the field and five undergraduate students. Improvements to the interface were suggested by the users, including enhancement of the colour schemes, and showing how the mobile application would look on a smartphone to enhance understanding of its functionality.

b) Iteration 2

Iteration 2 - Ideate: the researcher incorporated this feedback into the ideation stage as shown in Figure 5.3.2.5.

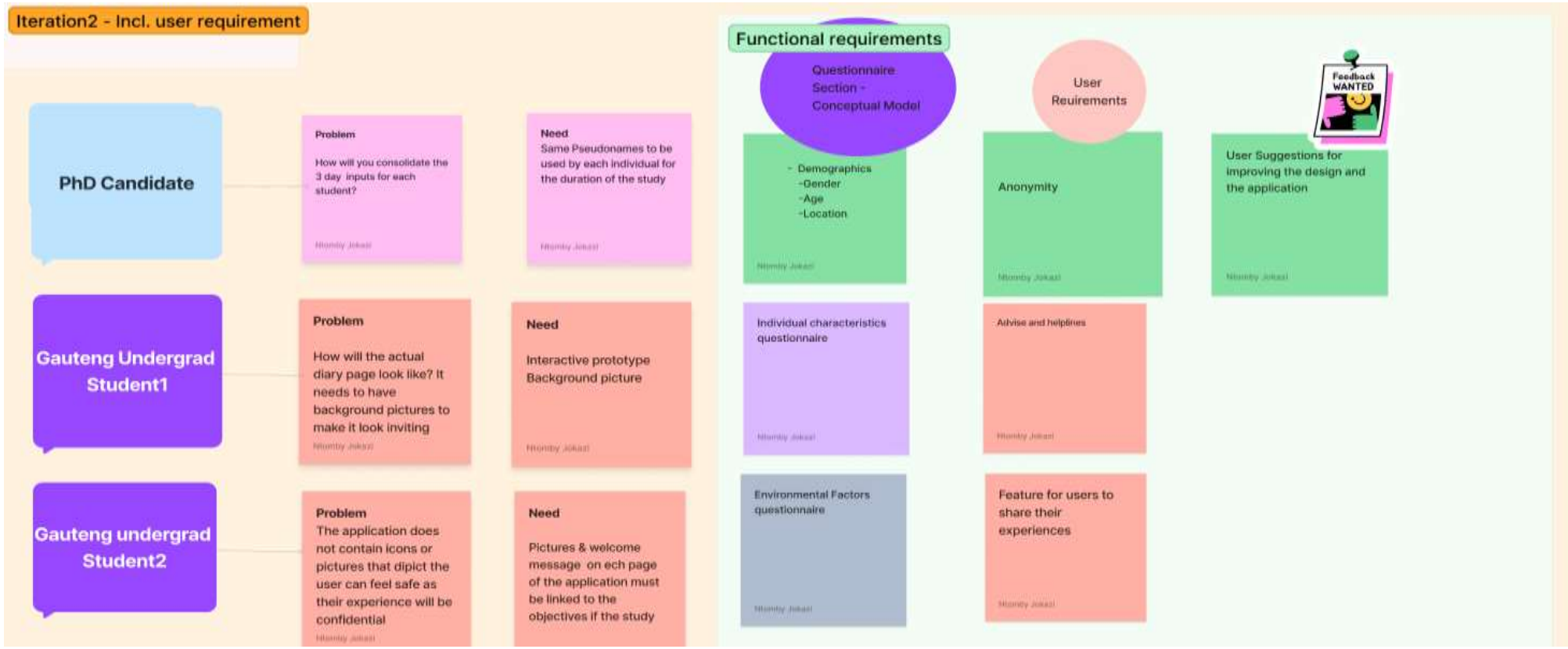


Figure 5.3.2.5: Improved SIMBV application ideation (by the Author)

Figure 5.3.2.5 translated the user requirements as per Figure 5.3.2.6 into features that the researcher used to inform the development of the improved prototype.

Figure 5.3.2.6: Updated SIMBV App Use Case diagram (by the Author)

Iteration 2- prototype: the researcher analysed the top ten applications for mobile app design. Invision was the application that was selected. InVision is a prototyping tool, which provides users with a platform for creating interactive mockups for applications and websites. This was based on the fact that the application included an option to see how the design will look like on different types of mobile devices such as smartphones, iPads, laptops. The application also included different types of smartphones. This was helpful as the interface of an application has a usability impact on respondents (Balisario et al., 2015). It assists in determining whether the respondents find it easy to navigate through the pages whilst gaining an understanding of how the application

works. The Use Case Diagram in Figure 5.3.2.7, includes the designs of the home page and diary page.

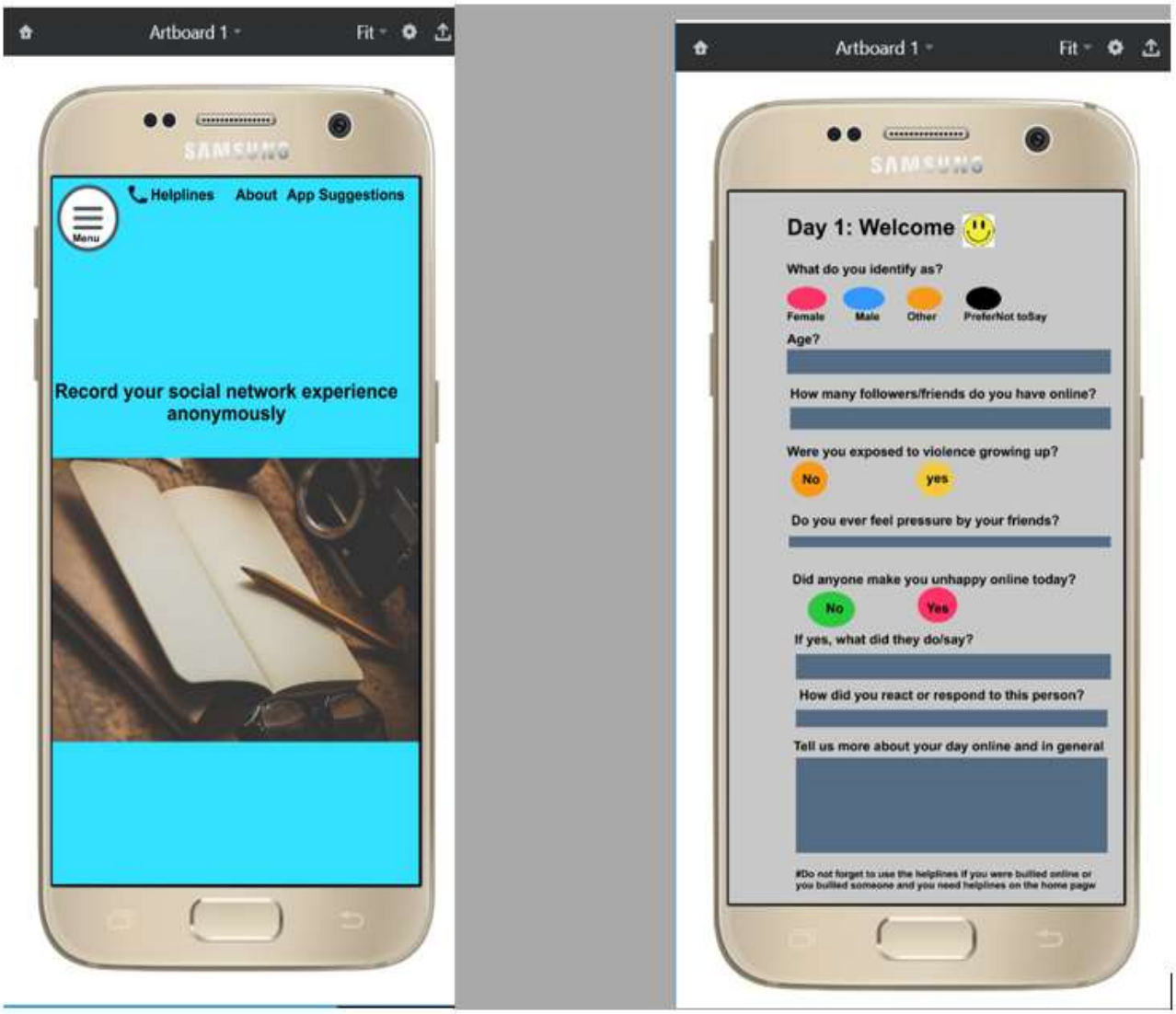


Figure 5.3.2.7 Envisioned home and diary page designs (by the Author)

The questions on the diary pages were informed by the conceptual model and the interface was informed by the requirements of the users.

Iteration 2- Test -Positive feedback on the enhanced prototype was provided by the same users (five undergraduate students and two experienced people in the field). The researcher then proceeded to the Third phase of Design Science (DS) (i.e., the actual development of the mobile application), having completed the second phase.

5.3.3. Artefact Development

Considering the target audience and objectives of the mobile application, the researcher had to choose a suitable tool for development. Mobile application development can be done on three platforms, namely: native, hybrid, and web platforms. Each one has its own benefits and drawbacks, and serves a specific purpose. The native platform only caters for specific operating systems, whilst the hybrid platform caters for various operating systems (Joy, 2018). A web platform on the other hand runs on a web browser, and can be accessed using a link. Since the population of interest is the youth at the tertiary level, who use smartphones with Android and iOS operating system, a hybrid platform is more suitable for developing the mobile application. This is in line with the 2018 survey conducted by the BusinessTech online newsletter, which showed that a majority of smartphone adopters in South Africa either use an Android or iOS smartphones (BusinessTech, 2018).

The mobile platform that was used to develop the SIMBV mobile application is Thunkable. Thunkable is a Google platform for developing applications that can be used by both iOS and Android devices. Once the application has been fully implemented it can be uploaded on Google Play (Joy, 2018). Thunkable, is a Low-Code Development (LCD) platform that consists of implementation units which are readily available to developers. The readily available implementation units decrease the development effort required, making it more agile to develop solutions (Luo et al., 2021). Furthermore, the Airtable database was selected as it is free and the most Thunkable compatible database. Airtable is an interactive agile storage platform that has various features, such as housing user inputs from forms or applications and managing solution developments through a kanban board (Faub, 2020). One of the key advantages of developing on this platform is that it also enables the developer to preview the application and test it before publishing, which makes the application development process more agile (Joy, 2018; Luo et al., 2021).

The development of each page was informed by both the conceptual model, user requirements, and adherence to standard methodologies and principles for software development. Therefore, mainly a deductive approach was followed. Figure 5.3.1 shows the home page and the about page of the SIMBV mobile application. The home page consists of a menu that directs the user to pages such as the About page, Feedback Page, Helpline page and the Diary page. Figure 5.3.2., on the other hand, shows the code behind the menu on the home page. This code indicates the page to which the user will be directed, depending on the item selected from the menu.

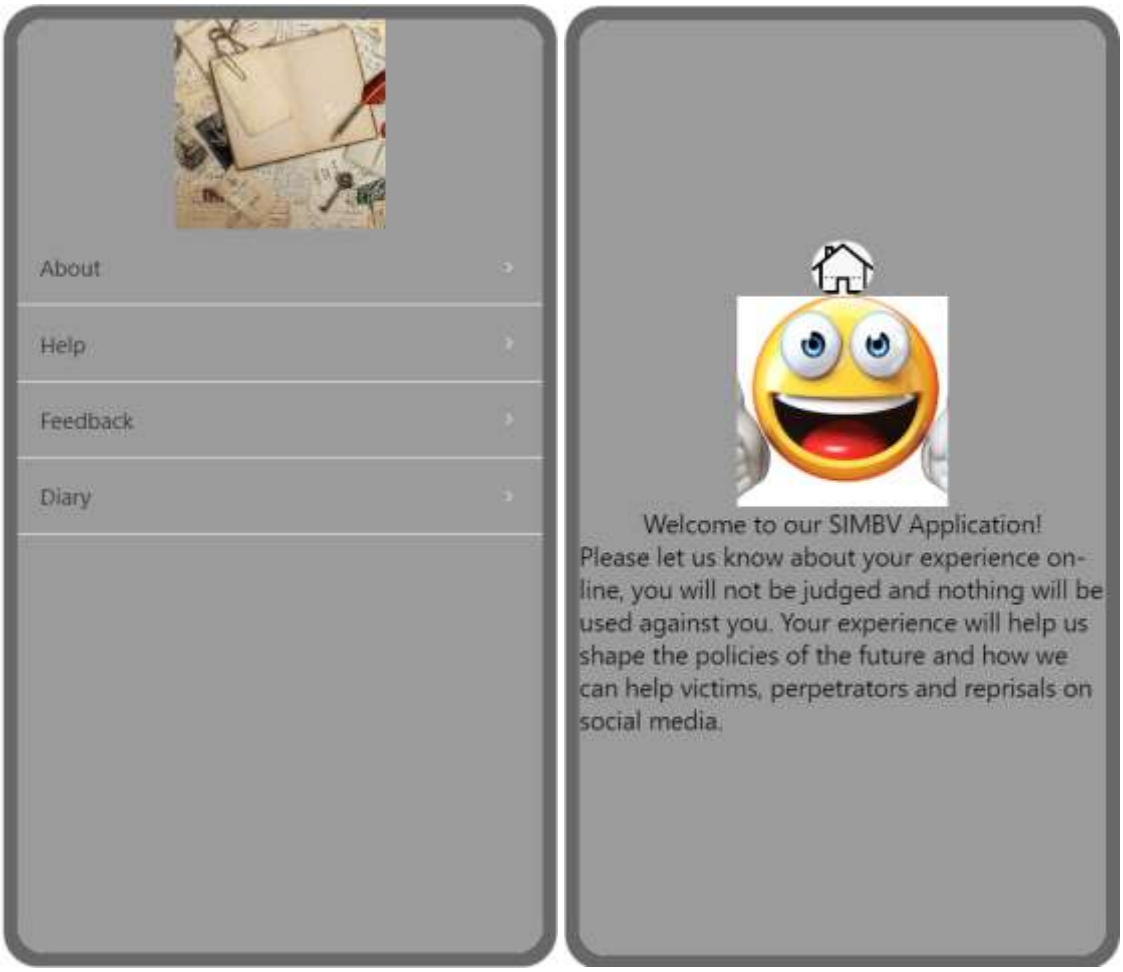


Figure 5.3.1 Home and About

Figure 5.3.2 Code for the Home page menu (developed by the Author)

Figure 5.3.3 indicates how the help page and feedback page appears on the application. The feedback page focuses on capturing the features that the users liked, as well as suggestions that serve to help the researcher to improve the mobile application in the next iteration. Figure 5.3.4 indicates the code for the feedback page. The first code is that used to redirect the user to the home page once having provided feedback on the page. The next line of code is for capturing the user inputs from the feedback page to an Airtable. An Airtable is a spreadsheet that can be used as a database to store user inputs captured via an application.

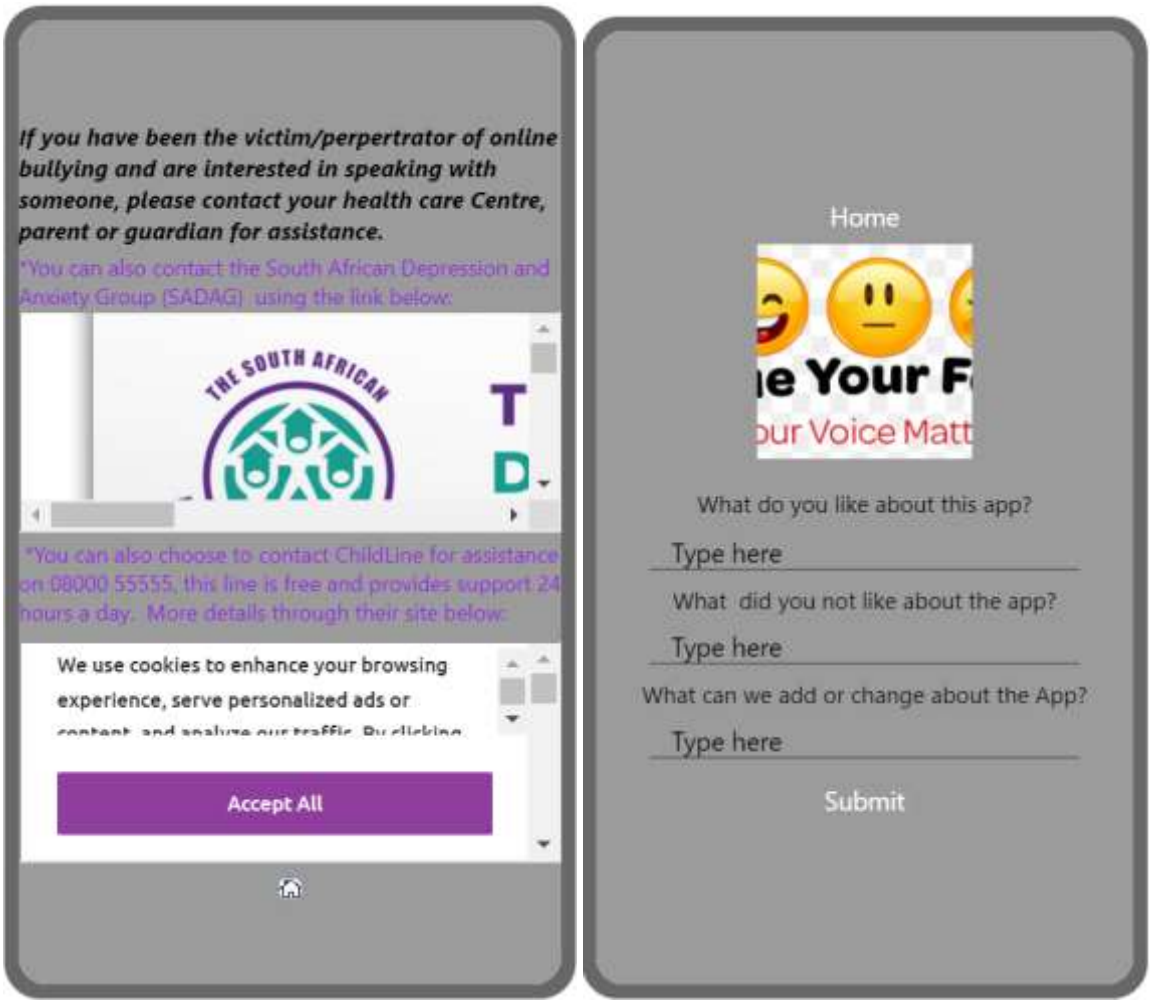


Figure 5.3.3 Help and Feedback Page (developed by the Author)

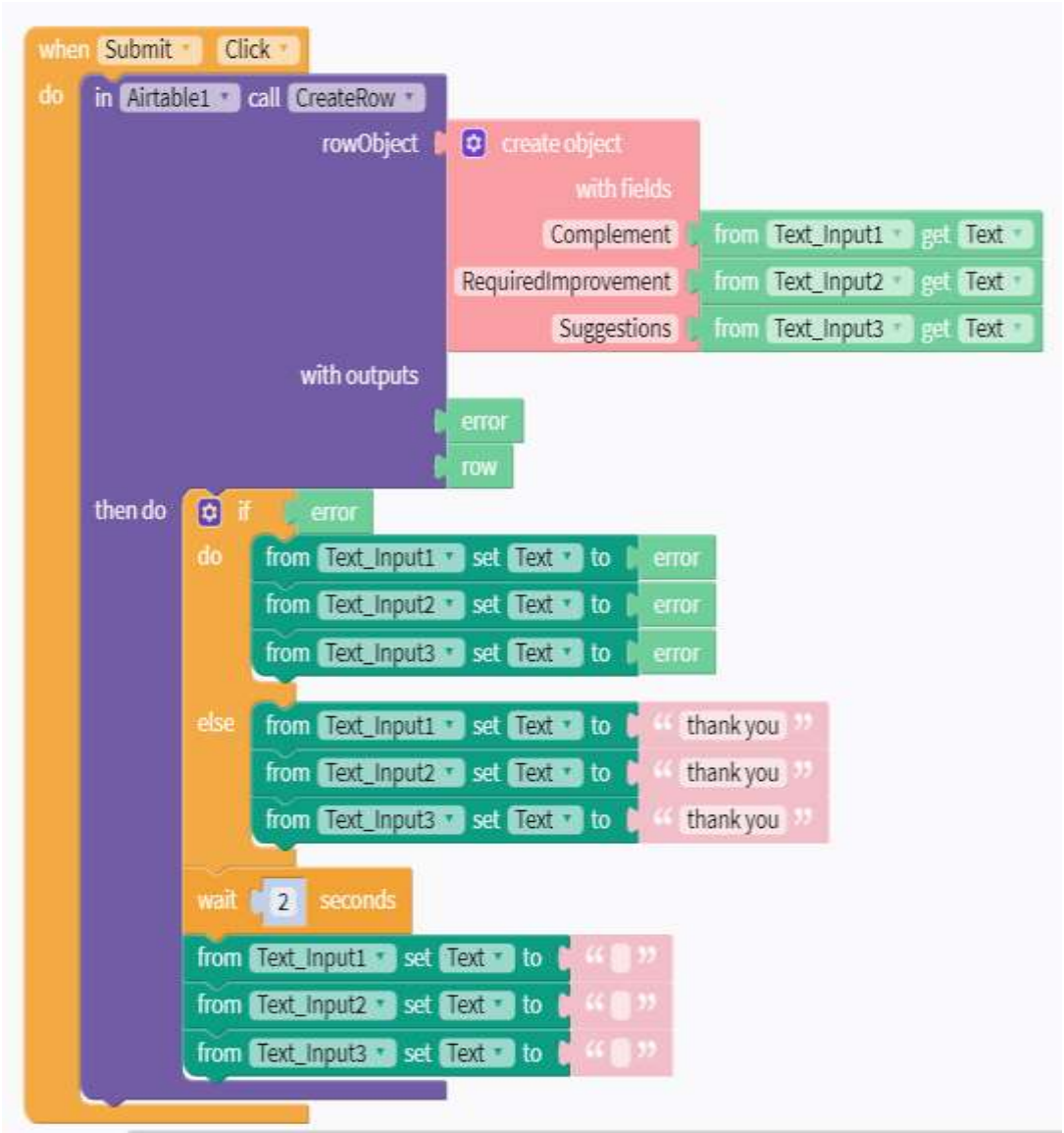


Figure 5.3.4 Code for the home and feedback page *(developed by the Author)*

Figure 5.3.5 shows the landing pages, whilst Figure 5.3.6 shows the diary page, which consists of several days for capturing the user's version of online events for three days.

Figure 5.3.5 Diary Landing Page (developed by the Author)

About Me	Family & Friends	Day1	Day 2	Day3

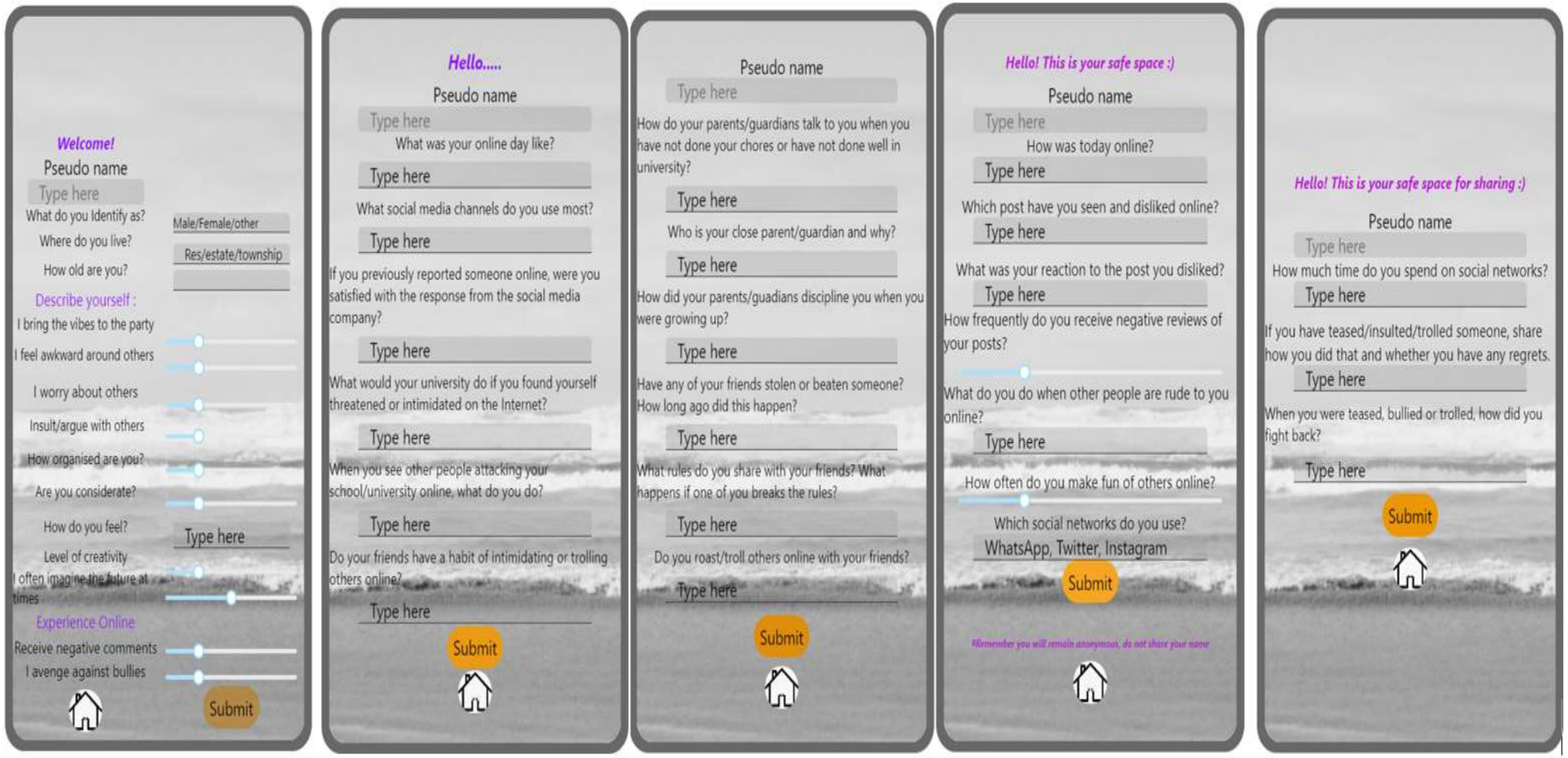


Figure 5.3.6: Diary questions (developed by Author)

Figure 5.3.6 above shows the five pages for the first version of the mobile application. Each page serves a specific purpose, and the questions relate to the conceptual model in Chapter 3:

About Me: the objective of this page is to verify more of the individual characteristics.

Family & Friends: the purpose of this page is to examine the quality and types of microsystem relationships. This is to validate the personal traits and characteristics identified within the microsystem and the mesosystem using theories and literature in Chapter 2.

Day1: the objective of this page is to capture the social network experience that the student had for the day and in the past to determine the bully-victim status.

Day2: this page further captures the social network experience of the student to determine their socially integrated mobile bully-victim status and individual characteristics.

Days3: capture in depth view of both bullying and victimisation online.

The inputs from the SIMBV mobile application are captured in the Airtable, which is the database that each of the pages with user input is linked to. Below is an example of the code associated with Day 3, which shows the Airtable component at the back-end of the SIMBV app. Furthermore, a screenshot of the columns that store data from Day 3's input is displayed in Figure 5.3.7.

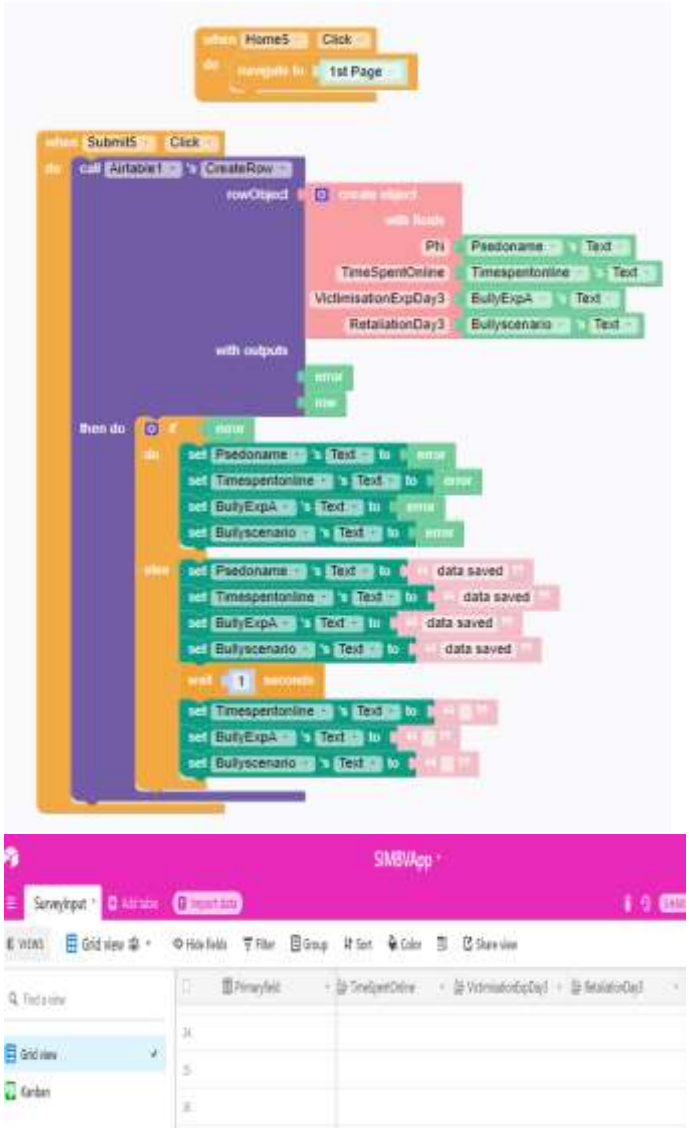


Figure 5.3.7: Day 3's back-end code & database (developed by the Author)

5.4. Mobile application testing (functional testing)

Following the development of this the SIMBV mobile app, testing was conducted in order to ensure each feature (e.g. buttons, navigation and recording of user inputs) of the application functions according to its objective. Please note that this is not the artefact evaluation phase of DS. The evaluation phase of the completed application will be explored in chapter 6 and 7 using the data collected from the respondents. The results of the functional testing are indicated below for each of the pages that require user inputs. The application further captures user suggestions which formed part of the improvements for the second iteration of the enhanced version of the application.

My Family & Friends:

ParentalRelations1	ParentalRelations2	Coercion	PeerRelations
We close	Mom, she is nice to me	Slap me	Partying
[object Object]	[object Object]	[object Object]	[object Object]
Not sure	Yes mom	Slap	Partying
They are reasonable	Mom, WWE get along, she ...	They reduce pocket money	Yes, last year
they discipline me through ...	my mom, she understands ...	they would give me chores	yes, last year

Day 1

OnlineExpDay1	SocialNetworks	SocialMediaPolicy	UniversityPolicy
			blue
67	yes ithink so	yesat school back in primay	
Was okay	Whatsapp	Yes, but did not receive a r...	Send a person to help
it was okay, I only talked to...	WhatsApp	yes, I did and they took lon...	I'm not sure

Day 2

OnlineExpDay2	LeastFavouritePost	Retaliation	Victimisation
Very good	The one about a lady celeb...	Type here	4
Not bad	A post about on another u...	Type here	3
Not bad	a post on a facebook page,...	I responded to defend my f...	3

Day 3

TimeSpentOnline	VictimisationExpDay3	RetaliationDay3
15 hours	I posted a funny meme ab...	I fought back
17 hours	I trolled someone. No I hav...	I respond back immediately

User input

Compliments	Suggestions	NewInput
The layout and its anonym...	some of the imges	more days of the diary entry

5.5. Chapter Summary

This chapter examined methods used by previous studies to examine cyberbullying and mobile bullying. Furthermore, existing websites and mobile applications were evaluated. This was done to conceptualise the design of the mobile application, and to ensure it is free of the currently reported shortcomings by previous methods, websites, and applications. The Design Thinking process was followed to produce a prototype of the mobile application. Thereafter, the mobile application was developed. This application was used to collect the data from undergraduate students, the details of which are considered in chapters 6 and 7, which also include the 4th and last stage of DS i.e., evaluation and conclusion.

Chapter 6

Iteration 1: Data analysis and SIMBV application evaluation

6.1. Introduction

The main aim of this study was to develop a mobile application that can be used to identify the characteristics of socially integrated bully-victims that use mobile technology. There are limited studies on this subcategory of mobile bully-victims. Therefore, this chapter aims to provide details of the results obtained from the study respondents. Data was collected using the SIMBV mobile application. Previous studies have shown that students always remain in proximity to their mobile phones, which makes mobile devices ideal for capturing insights related to a social phenomenon and for reducing the risk of recall bias (Faurholt-Jepsen et al., 2015).

The SIMBV mobile application includes a combination of open-ended and closed-ended questions. The primary purpose of using closed-ended questions was to validate the characteristics of socially integrated mobile bully-victims identified in the literature. The open-ended questions were necessary to obtain a thorough understanding of students' online experiences and interactions in physical environments. This is consistent with Tahmasbi and Rastegari (2018), who highlight the importance of understanding the socio-ecological context and the personalities of those who partake in deviant behaviour online. According to Tahmasbi and Rastegari (2018), using a mobile application to understand the full context of students who partake in mobile bullying yields better results than limiting the assessments to text screening.

This chapter begins with an overview of the students who participated in the study and the mobile bullying roles associated with the students. This is followed by the discussion of demographics to understand the make-up and representativeness of students who possess SIMBV attributes at the university level. Thereafter, the open-ended and close-ended responses are analysed separately. This is followed by merging the two datasets to test the conceptual model and identify the cluster that possessed most of the characteristics of SIMBVs. Finally, the effectiveness of the mobile application in identifying the characteristics of SIMBVs is evaluated.

6.2. Response rate and demographics

A total of 143 undergraduate students from a university in the province of the Western Cape, South Africa participated in the first iteration of the study. The specific university was selected because it is based in a city with the highest rate of extreme forms of violence in South Africa (BusinessTech, 2023). Furthermore, the university has confession pages on social media, which have the largest following compared to all the universities in the same city, where bullying posts and reactions are posted. Upon examining whether the universities in Cape Town have cyberbullying policies, it was noted that the university selected for this study is the only one with a cyberbullying policy. The policy gives students the option to report and cope with cyberbullying incidents. Other universities do not have a policy that focuses specifically on cyberbullying. Instead, this phenomenon is grouped as a subcomponent of inequality and cyber security. These characteristics of the university under study are consistent with the environmental factors that form part of the conceptual model that guided this study.

The researcher focused on both past and current experiences of students. The current experiences were centred around mobile bullying, retaliation, mobile victimisation, and the student's emotional state. Therefore, the study had to be conducted over a short period (three days) as, according to Kyobe (2016), the usage of smartphones and individual characteristics influence mobile bully-victim behaviour instantly. The data was collected during the COVID-19 pandemic, so students took part in the study from different locations, anywhere and at varied times. The students were invited to participate via an email. The email included the purpose of the study and guidelines on how to use the SIMBV mobile application to answer the closed-ended and open-ended questions. Close-ended questions were used to assess the basic tendencies that form part of the individual characteristics. On the other hand, environmental factors are inherently based on an individual’s existing knowledge, experiences, and future expectations. These were examined using open-ended questions (Doubleday et al., 2022). Moreover, open-ended questions do not restrict respondents to a particular predefined ranking, instead, they are posed in a manner that draws insights on a specific variable, while allowing for unanticipated responses (Doubleday et al., 2022).

Sixty-five of the 143 respondents were involved in mobile bullying. Of these, 14% as bullies; 22% as victims; and 29% possessed characteristics of SIMBV, as illustrated in Figure 6.1. Students who indicated that they had been bullied online were classified as mobile victims, whereas students who indicated that they had bullied others online through teasing, excluding others, and spreading rumours, were classified as mobile bullies.

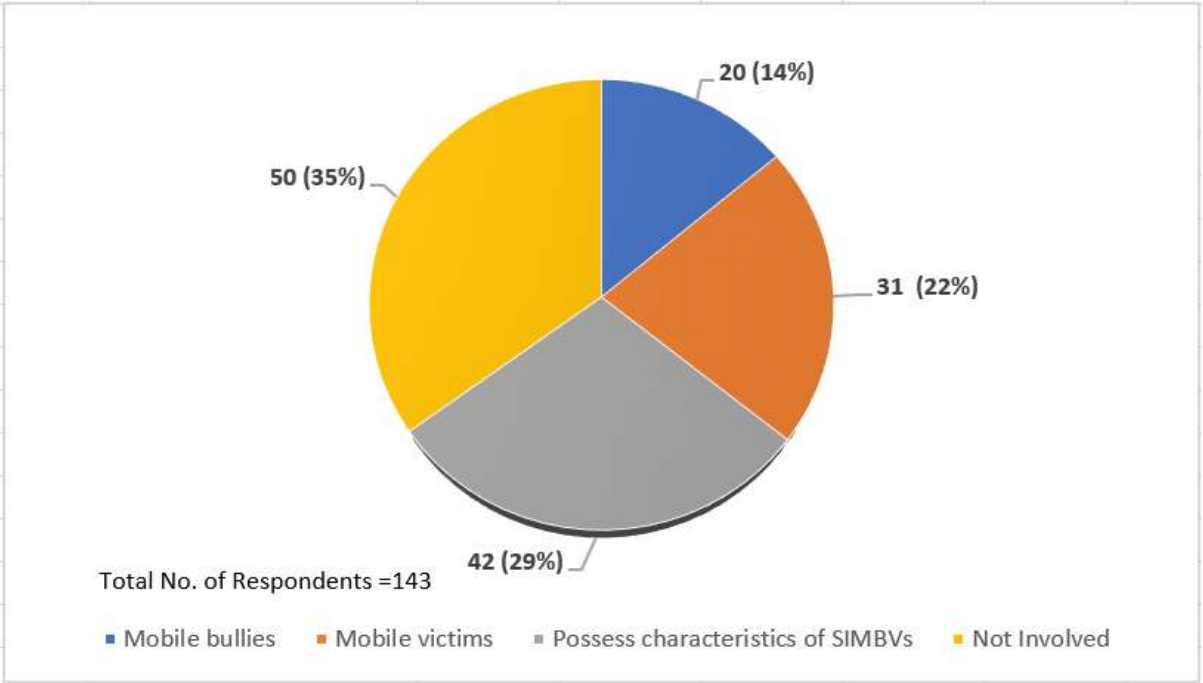


Figure 6.1: Number of students per mobile bullying role

Students who indicated these behaviours: bullied others online; were themselves victimised; displayed aggressive behaviour when arguing with others; and were socially integrated via peer groups, were classified as socially integrated mobile bully-victims. This classification is based on the Ettekal and Ladd's (2020) definition of socially integrated bully-victim, where they define this group as aggressive victims with better relational experiences as they are accepted by peers and have friends. Kennedy (2021) also confirms that this group tends to have aggressive tendencies. Compared with mobile bullies (14%) and mobile victims (22%), students with characteristics of socially integrated mobile bully-victims (29%), were more prevalent.

Further analysis reveals that those possessing attributes of SIMBVs were predominantly females (55%), while 13% were males, and 14% were identified as non-binary (14%), as shown in Figure 6.2. Non-binary means that an individual does not identify as a male or female; instead, they fall in between, outside, or beyond this (Cheung et al., 2020).

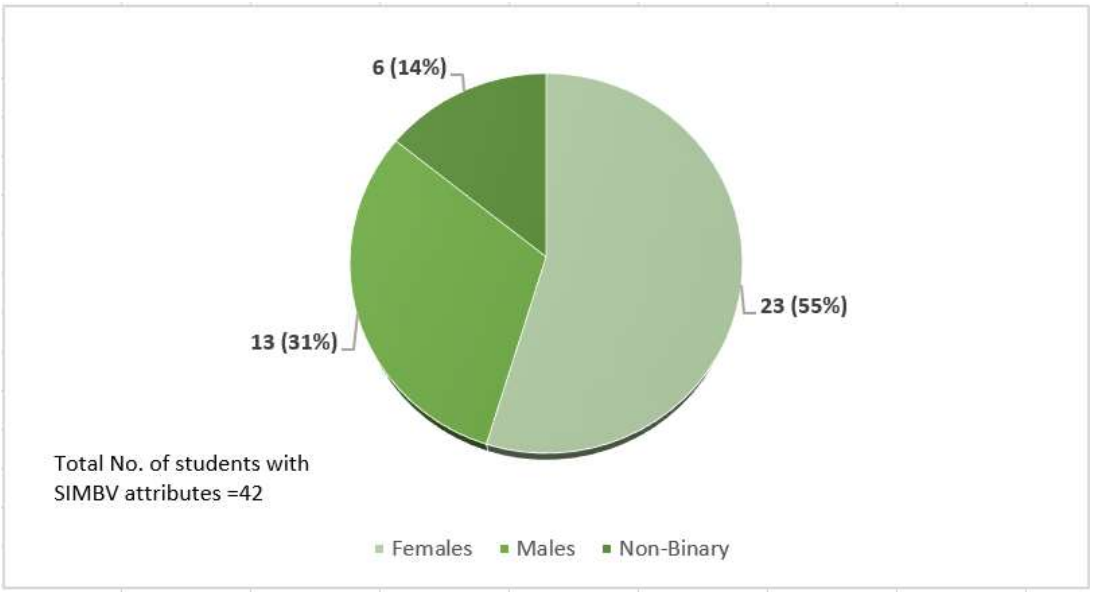


Figure 6.2: Respondents possessing attributes of SIMBVs by gender

Most students who possessed SIMBV attributes were 18-19 years of age, as shown in Figure 6.3. The graph also shows a decreased prevalence of socially integrated mobile bully-victim behaviour as students get older.

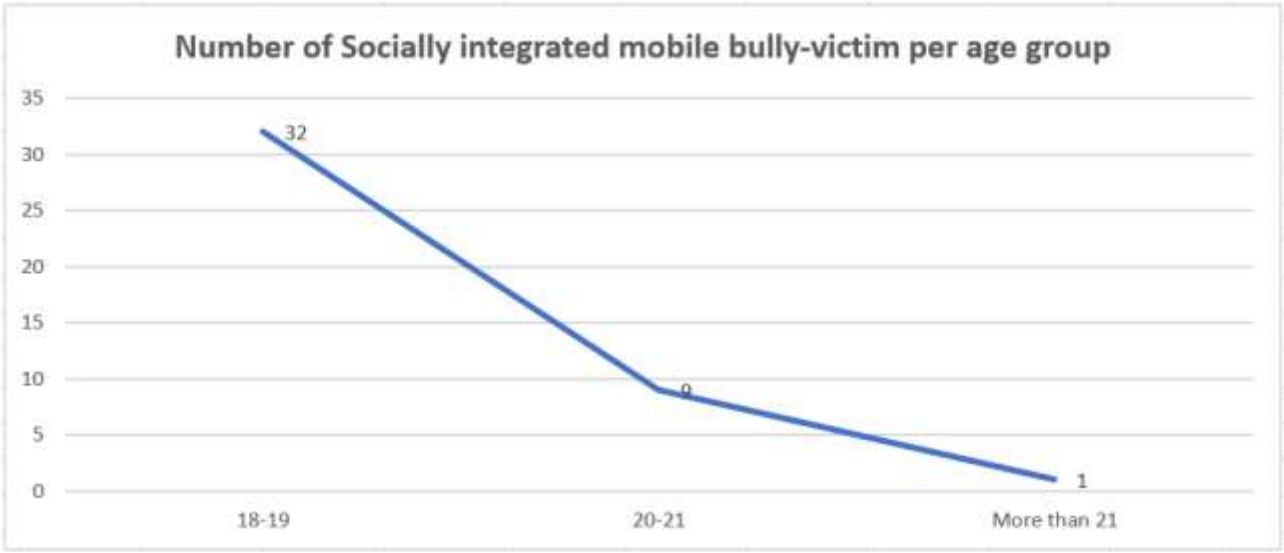


Figure 6.3: Respondents possessing characteristics of SIMBVs by age

This observation is consistent with the findings of Giumetti, Kowalski, and Feinn (2022), who stated that, in general, various forms of cyberbullying decrease with age in young adults at the tertiary level. Similar findings have been observed within the African continent, such as Ghana. Sam et al. (2019) for instance report that cyberbullying was prevalent in the later years of high school and the early years of undergraduate students.

6.3. Data screening and preparation (iteration 1)

The data was downloaded as a CSV file from an Airtable, where each participant's response was saved during their use of the mobile application. The file format was then converted to an Excel file. Using unique pseudonyms for each participant, the inputs shared by respondents over three days were consolidated. Thereafter, the mobile bullying role of each participant was noted from the data. Those that met the criteria for socially integrated mobile bully-victims (i.e., those individuals who bullied others, who were also victimised on mobile social networks, who displayed aggression and are part of a social or peer-group), were analysed further.

Quantitative and qualitative data were analysed separately to identify the characteristics of socially integrated mobile bully-victims in each dataset. Qualitative data were analysed in section 6.4 using NVIVO Pro to capture more insights and trends about the participants. Thereafter, the quantitative data analysis is presented in section 6.6.

6.4. Qualitative data analysis

The qualitative data were analysed using content analysis. Content analysis refers to the process of analysing chunks of data and classifying them under specific categories (Erlingsson & Brysiewicz, 2017). Content analysis can be deductive or inductive. Deductive content analysis is suitable for a structured study that tests existing theories and hypotheses. Inductive content analysis, on the other hand, is ideal when little is known about the phenomena under examination (Pandey, 2019). The current study is guided by the conceptual model developed and presented in Figure 3.1). The code book (Figure 4.3), which forms part of the research design chapter, guides the content analysis. As such, the current study is structured hence, deductive content analysis is appropriate Elo and Kyngäs (2008) offer three general steps for conducting deductive content analysis namely, preparation, organisation, and reporting. These steps are detailed in Table 6.4.1.

Table 6.4.1: Phases of the deductive content analysis (Elo & Kyngäs, 2008)

Phase	Action	Action Description
1	Preparation	The preparation phase involves a researcher selecting a unit of analysis, for example, a theme or a word. The unit of analysis depends on the detail of the analysis that the researcher would like to provide.

2	Organising	Organising involves developing a matrix for categorising qualitative data. The category matrix serves as a guide for coding the data.
3	Reporting	This phase focuses on reporting on the data in relation to the categories defined in the organising step.

The themes for analysis were identified through the word cloud feature of the NVIVO software. The identified themes serve as the units of analysis for this study. The word cloud assisted the researcher in identifying the frequently used words in the data, and their associated content. Following the conceptual model as a guide, the characteristics of the 42 socially integrated mobile bully-victims were examined. The characteristics are divided into three categories i.e., socially integrated mobile bully-victim behaviour, individual characteristics, and socio-ecological (environmental) factors. Looking at the environmental factors that describe the behaviour of socially integrated mobile bully-victims, experiences from both the virtual and physical environments were analysed. Students shared details of past events, including physical bullying dating back to high school. The details of these incidents are further discussed below.

i) Mobile bully-victimisation experiences

According to the evidence, for online victimisation, the recurring themes were body shaming, rude comments, and discrimination against the LGBTQAI (Lesbian, Gay, Bisexual, Transgender, Queer, Intersex, Asexual) community. For instance, one student was referred to as "*an angry lesbian*". The students responded to some mobile bullying incidents using Mobile Social Network (MSN) features, such as the comments section. The following verbatim responses show how students who possess characteristics of socially integrated mobile bully-victims responded to attacks on MSNs:

- Student number 38 said, *"I clap back and troll, unless I was the one who wronged the person."* As a result, this student indicated that he was often victimised and bullied others. Furthermore, the student spent five or more hours online across four mobile social media accounts, namely X (Twitter), Instagram, WhatsApp, and Facebook.

- Student number 7 said: *"I clap back at bullies; I have zero tolerance for rude people."* This student also defends others as she shared that,

  "I have, it's usually people who were attacking other people in their post like making fun of people of a specific background; I usually make fun of such people as a way to make fun of their view and cheer up the people who they were attacking."

Due to fighting back online and being keen to defend others, this student indicated that she often bullies others and, at times, is a victim.

- Student 2 said, *"If it is extreme, I report it, but at times, I handle it and deal with the person, I cannot allow myself to be mistreated."*
  This student spent more than two hours online, and sometimes was a bully-victim.

The three student cases represent examples of students who have SIMBV characteristics, have bullied others (often), and experienced victimisation. It is crucial to note that these students either spent more time online or had more than three MSN accounts. The usage of mobile social media and spending more time online increases the chances of being a cyberbully-victim (Wang et al., 2019; Azami & Taremian, 2021). This is consistent with routine activities theory, as the two variables, coupled with a lack of online supervision, making the student a suitable target of the bullying perpetrator (Wang et al., 2019; Bashir, 2022). At the same time, victims are aware that bullies will not be held accountable, so they learn to stand up for themselves (Machackova et al., 2013; Young et al., 2017).

Other students who possessed characteristics of SIMBVs did not directly respond to bullying. However, they used MSNs to exclude perpetrators from their online list of followers. For example, Student 18 said,

"I delete their comments and block/unfriend/unfollow them."

This student was rarely victimised and bullied, even though she had four social media accounts. While student number 17 stated that she usually *"exit the app."* They were also rarely victimised and bullied. Student Number 5, on the other hand, stated that,

"I delete comments and block people, I don't have time for negativity and ignorance."

This indicates that these students prefer to not fight with mobile bullies directly. However, they indicated that they bullied others by using aliases at times. The key difference between the students who retaliated directly against the perpetrators and those who deleted the post/comment is the mobile bully-victim frequency. The students who chose to not be confrontational were rarely bullied.

The other group of students who possess SIMBVs attributes indicated that they had regrets after bullying others. For example, student number 23 said, *"teased them about their exes, yes I regretted it".* Student number 29 also indicated that,

"I bullied them through the comment section, and I do regret it mainly because nothing good can come from that for all involved".

Student number 31 also said *"I teased someone about their sexuality after seeing their picture without the intention of hurting them, and I regret it since I saw that he was hurt".*

Student numbers 29 and 31 also indicated that they were bullied in high school.
"Back in high school, I would report them to the principal because I was not fit enough to stand up for myself".

These students demonstrate awareness of how this behaviour might affect their mobile victims, and this could be the reason why they felt guilty after bullying others. Furthermore, according to Buglass et al. (2021), the online social interaction of university students is governed by social rules and cues. Therefore, students tend to not want to be seen as not abiding by the social rules, due to fear of social stigma. Students then felt guilty when they noticed their behaviour hurt the victim. These emotional issues are discussed in the next section.

ii) Individual characteristics: emotional issues

Participants were asked about their emotional state in order to assess whether students who possess SIMBV characteristics have emotional issues, and whether they show symptoms of depression as part of their individual characteristics (biological bases). Based on the data gathered, only 24% (10) of students who possess SIMBV attributes appeared to have emotional difficulties. Four (4) of these students indicated that they felt sad, whereas others also added "*mostly sad*". Another common emotion among the students who possessed SIMBVs characteristics was anxiety. These emotional difficulties are consistent with the findings of Lozano-Blasco, Cortés-Pascual, and Latorre-Martínez (2020), who noted that cyberbully-victims tend to be anxious and depressed. The students who felt sad were those who indicated that they bullied/often retaliated and were often victimised.

In contrast, six of the students indicated that they were stressed. This response was provided by three (student 23,29 and 31), who indicated that they bullied by teasing them. However, they later regretted it. For instance, one student said: "*I tease them about their ex, and I regret it*."

Student 15 teased someone about their sexuality without the intent to hurt them and regretted it. Other students who possessed SIMBV attributes expressed positive emotions, which may be because this group perceives bullying as fun. For instance, Student Number 9 commented that "*I usually tease fun,*

it was just fun to do it." This is consistent with the findings of previous studies, which noted that mobile bullying is not taken seriously by students, and that they perceive it as a joke (Myers & Cowie, 2019; Balakrishnan & Norman, 2020). In addition to the emotional factors, it is necessary to analyse the data for the findings related to environmental factors. The next section presents the environmental factors.

iii) Environmental factors

a. Microsystem

The relationships that students who possess SIMBV attributes have with family and friends in their immediate environment were evaluated. The most common theme for relationships with parents was that most of the students were only close to one parent. In most cases, it was the mother as shown in Figure 6.4. This is because 17 students had single mothers or parents who were divorced. Students who were close to their fathers were the second most prevalent theme. About 10 students reported having a better relationship with their fathers than with their mothers. This was because of the disciplinary methods that father figures used compared to mothers. For example, student 6 commented: *"my mother shouts, my father sits me down."*

Figure 6.4: Parent-student relationships

Students were also asked to share how their parents disciplined them when they had not done well in their studies or had not attended to the chores assigned by their parents. These questions were asked to determine whether students who possess SIMBV attributes were subjected to coercion. Emerging themes indicate that most parents tend to be disappointed when students are unsuccessful at university, as illustrated in Figure 6.5. The second most common reaction from parents is to understand their children and encourage them.

Figure 6.5: Coercion

Regarding household chores, parents tended to scream/ be harsh / be frustrated / reprimand / be condescending. For example, some students shared the following disciplinary method that their parents used:

- Student 23 said *"Long shouting lectures".*
- Student 2 said *"they at shout at me, most of the time".*
- Student 8 said *"very harshly".*
- Student 29 said *"Quite harshly, as if I'll turn out a failure".*

This way of disciplining children was consistent throughout the students who both sometimes, and often possessed characteristics of socially integrated mobile bully-victims. There were, however, a few exceptions. For example, students 7, 9, 26, and 38, who often bullied others and were victimised on mobile platforms, indicated they were disciplined through shouting, noting that their parents sometimes used corporal punishment. Regarding friendships, healthy social bonds emerged, as indicated in Figure 6.6. Peer norms involve respect for one another and honesty. If a friend broke these rules, the students said they would have an argument and would distance themselves from this friend. In addition, other peer norms included not going out with the other's boyfriends or former boyfriends.

Figure 6.6: peer norms

b. Exosystem

In this study, the ecosystem consists of universities and social media companies that provide mobile social networks (MSNs). Most students who possess SIMBV attributes indicated that were they were to report an online bullying incident, the university would do nothing about it as shown in Figure 6.7. There were many other mixed responses. Some stated that the university would recommend therapy at the university, others indicated the institution would only act if the incident went viral, while others stated the university would discipline/investigate if the perpetrator resides at the same university.

Figure 6.7: University and social media responses to bullying reports

Regarding reporting bullying incidents or inappropriate content, students indicated that the social media companies tended to not respond or responded in a manner that indicates action was taken yet it was not, since the posts remained online. Those who felt their responses were unsatisfactory could easily

retaliate against their bullies on MSN. Student 2, with typical characteristics of a socially integrated mobile bully-victim, stated:

"No, whatever my complaint was, it never meets community guidelines".

c. Macrosystem

The students who possess SIMBV attributes were asked about their least favourite post online for each day during the three days of data collection. The question about the students' least favourite online post was to understand the type of content that they were exposed to, as well as to determine whether it promoted violence. The most common themes included bullying captured on video or occurring through comments on a post/picture, assault, racism, and sexual content. Below are the examples shared by the respondents:

- Student 2 said that *"a post where a girl was bullied because of their structure".*
- Student 31 said, *"the post of a young boy being bullied by a group of other young boys went viral on Facebook".*
- Student 40 said that *"post about racism".*
- Student 5 said that *"posts, which justified assault and others blame victims who were assaulted".*

Another emerging theme was that of content, which undermines students from other faculties. From the qualitative results, students were exposed to aggression from both proximal and distal environments. At home, the students are exposed to verbal aggression, which is triggered by not performing house chores as entrusted to them by their parent/guardians. The home environment is an immediate environment. This influenced the choice of preferred parent. In terms of the distal environment, students were exposed to violent and inappropriate content that was distributed on social networks. Where such posts have been reported to social media companies, the common themes were lack of response and unsatisfactory responses. This might be the reason students retaliated. as they perceived that the social media companies would not assist when the students were trolled online. In addition, the universities do not have measures in place to assist students beyond recommending therapy.

Moving to phases 2 and 3 of the deductive content analysis, as shown in Table 6.1, the themes identified and analysed above using word cloud were organised and reported in Table 6.4.2 (individual characteristics) and Table 6.4.3 (environmental factors). These themes are also presented in appendix 8 and 9 for better visibility.

Table 6.4.2: Individual characteristics associated with students classified as SIMBVs

Construct	Overarching Theme	Sub-theme	Qualitative data	Data Extracts
Individual Factors	Mobile bully-victim behaviour	Mobile bullying/Retaliation	Block/Delete/report	***Case 18*** "I delete their comments and block/unfriend/unfollow them"
			Defend myself and others	***Case 7*** "I get rude back; I have zero tolerance when it comes to people being rude". **Case 01** "Consider their points, if they're valid I try to find out more if not then I defend the faculty/university". "Try and reprimand them". **Case 13** "I have, it's usually people who were attacking other people in their post like making fun of people of a specific background; I usually make fun of such people as a way to make fun of their view and cheer up the people who they were attacking".
			Bullying for fun	**Case 18:** "I usually tease in a fun way".
			Bullied others once/ bullied and later regretted it	***Case 23*** "Teased them about their exes, yes I regretted it later." ***Case 29*** "Through the comments section. and i do regret it mainly because nothing good can come from that for all involved"
	Objective biography	Prior victimisation	I was bullied at school and reported it	***Case 29*** "I was teased as a child at school, it wasn't severe, and I don't remember ever really saying anything to the perpetrator's face but i did report them to my older brother who then told my parents, and it was dealt with from there".
			Bullied online by others and did nothing about it	**Case 10:** "Once when I was much younger (about 10 years ago), I had a few experiences of being bullied on various online platforms (qoohme & MXIT) - I didn't really stand up for myself".
	Biological Tendencies	Emotional Issues	Basic level, monotonous	**Case 03:** "Dull and mean I guess"
			Annoyed, angry	**Case 10:** "Annoyed". **Case 38:** Angry".
			Stressed	**Case 13:** "stressed". **Case 19:** "Anxious".
			Sad/Depressed	**Case 15:** "Lately, I cry a lot and it's very uncomfortable". **Case 40**: "I feel depressed today because I skipped my medication".

Table 6.4.3: Environmental factors associated with students who possess SIMBV attributes

Construct	Overarching Theme	Sub-theme	Qualitative data	Data Extracts
Environmental factors	Immediate Settings	Insecure Child-Parent relations	Closer to grandparent but not biological parent	**Case 09**: "My grandmother because i grew up in her hands and taught me many things about life".
			Close to one parent due to relations between parents (divorce/separation)	**Case 12:** "Mother, parents divorced, and I live with my mom".
			Close to one parent due to preferences	**Case 19:** "I'm closer to mom, dad doesn't like technology". **Case 7:** "My dad. I feel like I easily relate with him and he is more approachable ad easy to talk to compared to my mom". **Case 33:** "I'm closer to my father, easier to communicate".
			Not close to parents/guardians	**Case 17:** "Not close to parents, I have a stepmom". **Case 12:** "Neither, I have a somewhat estranged relationship with both of my parents".
		Coercion	Grounded, timeout, naughty corner	**Case 12:** "Time out in my room".
			Scolding/shouting	**Case 8:** "Shouting with occasional spanking". **Case 11**: "Scold you when you did something wrong". **Case 2:** "They shout at me, most of the time."
			Hiding/corporal	**Case 13:** "They use a belt" **Case 19:** "My mom used all kinds of methods - hit me with a belt, tree branch and pinching, yy dad never hit; his look was enough to warn me". **Case 40:** "My mom hits with a shoe".
		Delinquent friends	No delinquent friends	**Case 40:** "No, not that I am aware of."
			Occasionally	**Case 9**: "Yes, at times"
		Peer norms	No rules	**Case 7:** "No rules".
			Respect and Honesty-breaking rule resolved via confrontation and talking/apology	**Case 10:** "If you have a problem with me, talk to me and we will find a way to fix. And if that doesn't happen then we stop talking".
			Confrontations	**Case 23**: "We are always kind, respectful, honest and helpful. If we abuse someone's help or trust then we confront each other and talk things through".
			Respect & Honesty-breaking rule leads to exclusion	**Case 19:** "Always being honest, if someone lies about something big there'll be some distance but will eventually be resolved by speaking about it."

				Case 36: "Respect each other, you get dropped as a friend". **Case 39:** "What is said in private, stays in private, breaking them automatically ends the friendship and ties are cut".
	Distal Settings	Lack of policies and accountability on social network platforms	Response was satisfactory	**Case 16:** "Yes, they did my report justice".
			Response unsatisfactory	**Case 9:** "Yes, I reported someone, but the response of the company did not satisfy me"
			Incident not against their user guidelines	**Case 2:** "No, whatever my complaint was never it meets community guidelines"
			Yes-no response	**Case 4:** "Yes, but they did not respond".
		Lack of policies at university	offer counselling	**Case 11:** "I think they would provide support and counselling services."
			Take a legal action/disciplinary action	**Case 21:** "Something along the lines of a stern warning at most" **Case 35:** "They would take disciplinary actions".
			Might investigate if the incident goes viral	**Case 17:** "Nothing really, they seemingly do not involve themselves in matters unless they are viral stories".
			I don't know/ I don't think so	**Case 10:** "Not sure" **Case 23:** "I'm actually not sure".
			Do nothing	"Nothing"
		Exposure to violence	Bullying/ street fights	**Case 2:** "a post where girl was bullied because of their structure"
			Racism, xenophobia	**Case 40:** "A post about racism". **Case 33**: "A repost of a racist email someone received".
			Homophobic/abuse and assault of women	**Case 30:** "A guy was being hateful towards LGBTQ+" **Case 10:** "Posts about GBV content was a bit disturbing".

The themes were organised using the code book designed in Chapter 4. Finally, supporting details for each theme are provided as part of the reporting. After the content analysis of the qualitative data, quantitisation was applied to the qualitative dataset in order to prepare it for quantitative analysis.

6.5. Quantitative Data analysis

The output of the close-end survey questions provided quantitative data, which was recorded in an Airtable once the SIMBV mobile app respondents submitted their selections. The close-ended questions were based on a subcomponent of the individual characteristics i.e., participant basic tendencies and mobile bully-victim status. Table 6.4 shows the descriptive statistics of the quantitative data generated using Statistica software. The variables listed in Table 6.5.1 were measured on a five-point Likert scale,

e.g., 1 = always, 5 = never. Students who agreed that they argued with others on social media, had friends, had low agreeableness, and were bully-victims, were considered to possess characteristics of socially integrated mobile bully-victims.

Table 6.5.1: Descriptive statistics of basic tendencies and mobile bully-victim status

Descriptive Statistics					
Variable	***Valid N***	***Mean***	***Min***	***Max***	***Std Dev***
Individual Characteristics (Basic Tendencies)					
Extroversion	42	2.45	1	5	0.77
Consciousness	42	3.45	1	5	1.15
Openness	42	3.85	2	5	0.95
Neuroticism(hostility)	42	2.64	1	5	1.05
Agreeableness2(ArguingwithOthers Online)	42	3.04	1	4	1.24
Agreeableness1(Empathy)	42	3.72	1	5	0.86
BullyDay1	42	2.74	2	5	0.93
VictimDay1	42	2.90	2	5	1.18

Key
***The study ws conducted over a period of 3 days**
Day1: denotes the data about the variable was collected during the 1st day of the study
Day2: denotes the data about the variable was collected during the 2nd day of the study
Day3: denotes the data about the variable was collected during the 3rd day of the study

6.6. Reliability and validity

Validity and reliability tests are two methods for evaluating the research instrument. Validity is concerned with the extent to which an instrument measures what it is intended for, whereas reliability is concerned with the ability of the instrument to measure variables consistently (Tavakol & Dennick, 2011). It is critical to emphasise the relationship between validity and reliability. An instrument cannot be valid unless it is reliable, however, the reliability of an instrument is not dependent on its validity (Tavakol & Dennick, 2011; Sullivian, 2011).

6.6.1. Reliability test

The widely used reliability measure is Cronbach's alpha. This test is utilised when there is more than one item that measures a specific construct. Cronbach's alpha was developed by Lee Cronbach in 1951 (Frank, 2017). This test measures the internal consistency of a scale and indicates the extent to which all the items in a test measure the same construct (Tavakol & Dennick, 2011). The reliability of the constructs described in the code book was tested using the variables in the SIMBV mobile application questionnaire matrix. The results in Table 6.6.1 (see Appendix 9 for better visibility) show the Cronbach's alpha for the variables of this study, with the lowest being 0.50. The threshold for Cronbach's alpha ranges from 0.7 to 0.9 according to Nunnally (1967). However, other studies indicate that an Alpha score of 0.6 provides moderate reliability (Felder et al., 2005; Ursachi, Horodnic, & Zait, 2015). In addition, Dacakis et al. (2022) also suggest a score of 0.5 still provides moderate reliability.

According to Kopalle and Lehmann (1997), Cronbach's alpha is a function of the variables intended for measuring one item, the correlation among those variables, and the sample size of the study. Hence, having fewer variables that measure an item has been found to cause lower Cronbach's alpha. This could explain the low Cronbach scores of 0.50, 0.54, and 0.58. Furthermore, the extracted sample size of those that met the categorisation of socially integrated mobile bully-victims was 42. Although the sample size for this study may be small, it constitutes 29% of the total respondents. However, it must be noted that the sample size for cyberbully-victims is usually small, ranging from 3%-15% (Kelly et al., 2015). For example, Kennedy (2021) had 165 (3.6%) bully-victims. In addition, since the nature of this study is exploratory, given that there are limited studies on mobile bully-victims in general and research on the socially integrated subcategory is scarce, a Cronbach's alpha of 0.5 or greater is still acceptable (Ekolu & Quainoo, 2019; Felder et al., 2005; Ndyave & Kyobe, 2019).

Table 6.6.1.: Cronbach's alpha results

Socio-ecological model Component	Contruct	Variable	Cronbach Alpha
Individual characteristics	Retaliation	RetaliationDay1	0.86
		RetaliationDay2	
		RetaliationDay3	
	Mobile bully-victim	BullyDay1	0.50
		VictimDay1	
	Emotional Issues	Emotional IssuesDay1(Biological Bases)	0.58
		Emotional IssuesDay2(Biological Bases)	
Environmental Factors	Exosystem	University Policy(LackofCyberbullyingLaws)	0.66
		SocialMediaPolicy (lackofAccountability)	

6.6.2 Construct validity

Common methods for assessing internal validity are content validity, criterion-related validity, and construct validity. Content validity has been used in the above section to assess qualitative results. Construct validity, on the other hand, is intended for measuring relationships between constructs related to a specific model or theory (Drost, 2011). Criterion validity is suitable for this study as the open-ended and closed-ended questions were derived from various sources, including questionnaires and literature review. Therefore, construct validity was ensured in this study by drawing questions from previous studies as indicated in Table 6.6.2 below.

Table 6.6.2: Individual Characteristics Questionnaire

Variable	Source	Questionnaire
Extraversion	International Personality Item Pool-Neuroticism, Extraversion-Openness (IPIP NEO) questionnaire	(IPIP NEO) questionnaire
Consciousness		
Openness		
Nueroticism (hostility)		
Agreableness2 (ArguingwithOthers)		
Agreableness1 (Empathy)		
BullyDay1	Kyobe & Ndyave, 2019	Mobile bully-victim questionnaire
VictimDay		

6.7. Discussion of the quantitative findings from Iteration 1

The average level of extroversion is 2.45, as indicated by Table 6.5.1, which implies that students with SIMBV characteristics tend to be extroverts. This is consistent with the qualitative findings of this study as students indicated that they are direct and opinionated, for example Student 2 said: *"If bullying is extreme, I report it, but at times, I handle it and deal with the person, I cannot allow myself to be mistreated".*

Student 7 said: *"I have, it's usually people who were attacking other people in their post like making fun of people of a specific background; I usually make fun of such people as a way to make fun of their view and cheer up the people who they were attacking".*

It is essential to note that Student 7 demonstrated empathy towards mobile victims who are unable to defend themselves. As a result, quantitative descriptive statistics indicate that students who possess SIMBV attributes have a certain degree of agreeability (m=3.72). Furthermore, due to showing empathy by being aggressive towards the mobile bullies, the agreeableness 2 variable had a mean of 3.04. Based on this score, it is apparent that SIMBVs engage in arguments with others on Mobile Social Networks (MSNs). From the qualitative findings, SIMBVs indicated that they engage in arguments through trolling others. For example, Student number 38 said:

"I clap back and troll, unless I was the one who wronged the person".

Trolling is defined as an act of provoking others to engage in a heated discussion online (Aydın et al., 2021). Another positive individual characteristic of students who possess SIMBV is that they are sometimes self-disciplined individuals. This is evident as the consciousness variable has a mean of 3.45. These findings are in line with those reported by Jara, Casas, and Ortega-Ruiz (2017), who found that consciousness is an unstable individual characteristic of bully-victims. Other studies have findings that differ from this study. For example, Alonso and Romero (2017) and Koukia (2020) reported that bully-victims are individuals who generally display low consciousness.

Negative individual characteristics included low openness for these students, as the openness variable had a mean value of 3.85. SIMBVs tend to lack a creative and innovative mindset, which is why this is the case. These results are consistent with the findings of Alonso and Romero (2017), who reported cyberbully-victims tend to be disinterested in art and they are not good at managing their emotions. The findings on emotion management are in accordance with the quantitative findings, as students with SIMBV attributes displayed high levels of hostility (m=2.64). This is further supported by the qualitative

results as SIMBVs displayed aggressive behaviour when retaliating towards mobile bullies. For example, Student number 7 said:

"I clap back at bullies; I have zero tolerance for rude people".

6.8. Iteration 1 SIMBV App Evaluation

This section focuses on the evaluation of the mobile app, which is the fifth step in the design sciences (DS) life cycle by Koehler, Vaishnavi, and Peter (2005). The application was evaluated based on of two principles: does it address all concepts of the conceptual model and work according to the design? This is an important stage in the DS as it provides feedback on the components of the artefact that need further development. Both goals of DS serve to determine whether the artefact fulfils its purpose and to show that theory can be used to derive useful solutions.

Table 6.8.1: Stages followed in the design and development of the SIMBV

Design Science steps	**Outputs**
Awareness of the problem	Already done in previous chapter
Suggestions	Prototype or tentative design
Artefact development	SIMBV App
Evaluation	Report on appropriateness of the app and inputs from study participants.
Conclusion	Results

One of the sub-research questions was: *what features should a tool have to identify the characteristics of socially integrated mobile bully victims better?*

This means that the primary purpose of the mobile application is to identify the characteristics of socially integrated mobile bullying victims. The design of the mobile application was informed by the conceptual model. Furthermore, the conceptual model was used to derive the questionnaire matrix embedded in the mobile application. The questionnaire examined both individual characteristics and environmental factors using open- and closed-ended questions. When comparing the conceptual model with the data collected via the mobile app, the following gaps were identified:

- **Hostile attractor:** hostile interactions within the microsystem were not examined fully. Although students indicated being exposed to aggression, both verbal and physical, as a method of discipline, it was not examined as to whether students retaliated, or how parents received this reaction. This would have provided a full cycle of the hostile attractor between the parent and child. Therefore, in the updated application, students were asked whether they retaliated, and how their parents responded.
- **Technology affordances (security & usefulness):** the influence of technological affordances such as security provided by mobile social networks through anonymity and pseudonyms was not examined. This would have provided more details on what motivates socially integrated mobile bully-victims to continue bullying others on social networks.
- **Cultural expectations:** the expectations for males versus females were not examined, which poses a gap on the SIMBV mobile application and determines whether cultural expectations have an influence on socially integrated mobile bully-victim characteristics.

In addition to the SIMBV application not considering some of the above conceptual model concepts, the functionality and design of the application were assessed. This was accomplished by seeking feedback on improvements that can be added to the application for a better user experience. Based on the feedback from iteration 1, key areas for improvement identified by the students included:

- ensure that the images are not cropped;
- colours must not be dull;
- make hotlines more prominent;
- introduce a back button on every page;
- fit the icon to the dimensions of the screen;
- improve font and colouring;
- make the app more interesting; and
- make more space for user input.

Guided by feedback from users, the application was improved in preparation for the second iteration, the details are unpacked in Chapter 7. Although there were limitations in the first version of the application, this version had its advantages. The use of the mobile application to collect data proved to be advantageous, as it provided more context on the experiences of socially integrated mobile bully victims. This can be attributed to the anonymity and flexibility offered by the mobile application, which differed from traditional methods for data collection, such as interviews and surveys. The personal

details of the student were not collected, and the application offered the flexibility to add daily entries over a period of three days, where students were asked for their feedback. Student 10 said:

"It feels like I am actually talking to someone, and it is simple and easy to navigate".

Another participant (Student 2) said:

"*It gives me a safe space where I can fully express things that are hard to tell in reality".*

This indicates that students felt free to share details of their experiences on the mobile application. According to Drouin et al. (2018), as students join the university, their support system, such as high school friends, fades; therefore, they seek emotional support from social media. It was noted that more depressed or anxious students use social media than seek professional help from on-campus psychologists. These findings indicate the need for applications that can be used to assess and assist students who engage in mobile bullying. These applications should consider the preferences of students, such as anonymity, in their design.

6.9. Chapter summary and key findings

This chapter provides a view of the prevalence of each role of mobile bullying. It was reported that 50% of the study samples were not involved in mobile bullying. In contrast, there was a high prevalence of socially integrated mobile bully-victims (29%). The second predominant role was that of mobile victims (22%), whereas the role of mobile bullies was the least prevalent (14%). Subsequently, focus was placed on the role of Socially Integrated Mobile Bully-Victims (SIMBVs). Demographic characteristics of this group (age and gender) were also included. It was noted that the behaviour of SIMBVs decreased with age. Moreover, this role was primarily occupied by females. and less by students who self-identified as non-binary. In addition, most SIMBVs were between the ages of 18 and 19 years. This is consistent with previous studies that highlighted that the SIMBV group mainly comprises of individuals at the late adolescent stage (Ettekal & Ladd, 2017).

Following the demographics, an in-depth analysis of the qualitative and quantitative responses from SIMBVs was conducted. Overall, the findings revealed that students who possess SIMBV attributes have both positive and negative individual characteristics. These include consciousness, empathy, hostility, extroversion, and low openness. The positive basic tendencies such as agreeableness (empathy) contradict the low levels of agreeableness reported by Alonso and Romero (2017). Qualitative analysis

illuminated this, indicating that some students engaged in mobile bullying tend to defend mobile victims. This suggests that SIMBVs can start off as mobile bullies. When it comes to environmental factors, most students who possess SIMBV attributes tend to be closer to their mothers. The SIMBVs indicated that they used shouting to pressure them to complete house chores. Furthermore, in distal settings, SIMBVs were exposed to higher levels of aggression such as racist comments and to violent incidents that were uploaded online, such as assault and xenophobic attacks. These incidents were more prevalent online, as it seems there is a lack of accountability for any form of aggression on social media platforms. Therefore, it is not surprising that they have individual characteristics such as hostility, which became evident in their online interactions. Thus, SIMBVs learn from their environment, as per social learning theory, and adopt certain characteristics, which alter how they will interact with others in future. These findings are consistent with the conceptual model of this study, which proposes that SIMBVs characteristics exist due to interactions between individual characteristics and environmental factors.

Finally, the mobile application was evaluated based on its usability responses of the students and the conceptual model. The students shared their sentiments on how the mobile application made them feel free to share experiences they would not share in normal settings. In addition, students indicated that sharing their experiences made them feel like they were talking to someone. The mobile application was not without its shortcomings, which were listed based on the conceptual model and feedback from students. These limitations were addressed in the enhanced version of the application, which is evaluated in the next chapter.

Chapter 7

Iteration 2: Data Analysis and SIMBV application evaluation

7.1. Introduction

This chapter discuss how the limitations identified in the first version of the SIMBV application were addressed in order to produce an enhanced version of the application. The enhanced version was then tested by students to determine the extent to which it identifies the characteristics of SIMBVs. Qualitative and quantitative data was collected from students using the enhanced application. This data was analysed and compared to those obtained in the first iteration. Lastly, the SIMBV mobile application is evaluated against its objectives and the feedback from the students involved in the second iteration.

7.2. Updated SIMBV application

The current section provides details of how the first version of the SIMBV application was improved. The enhancements and improvements were guided by user inputs and the conceptual model, which ensured that the mobile application met the needs and preferences of the users. This user-centred approach has been recommended by previous studies in Mobile Health (mHealth) and Psychology, which focused on digital mental health tools (Vo, Auroy & Sarradon-Eck, 2019; Newton et al., 2020). The application was evaluated against the conceptual model, which outlined the variables that influence the characteristics of SIMBVs and the influencing environmental factors. Therefore, it is crucial to ensure the application measured the variables adequately in order to answer the research question of this study correctly.

7.2.1. Limitations identified in the first version of the SIMBV application

Some of the environmental factors within the immediate and distal settings were not sufficiently examined in the first iteration, for example, coercion, exposure to violence and cultural/gender role expectations. While coercion by parents was found to be a significant influencing factor, the first iteration of results did not confirm whether students retaliated when they were scolded or placed on time out. The participants were also asked about the nature of violence they found on MSNs. The qualitative results indicate that the violence taking place in the physical environments is usually captured using smartphones, and shared online by students. It was necessary to understand more about this type of captured or witnessed violence. In addition, cultural expectations based on gender were not assessed adequately in the first iteration. These were investigated further in the improved version of the application. The researcher also needed to do a further examination of the MSN features, such as the comment section, which is normally used for retaliation. Other features, such as being popular and using a fake account to remain anonymous, were evaluated in the enhanced version. Furthermore, the users were concerned about the ease in use of the application. They required the hotlines to be prominent, the inclusion of a back button on all the pages of the application and more space provided for user input. They also recommended that colours should not be dull, the pictures should appear complete on the screen and the links and contact numbers should be clearly visible.

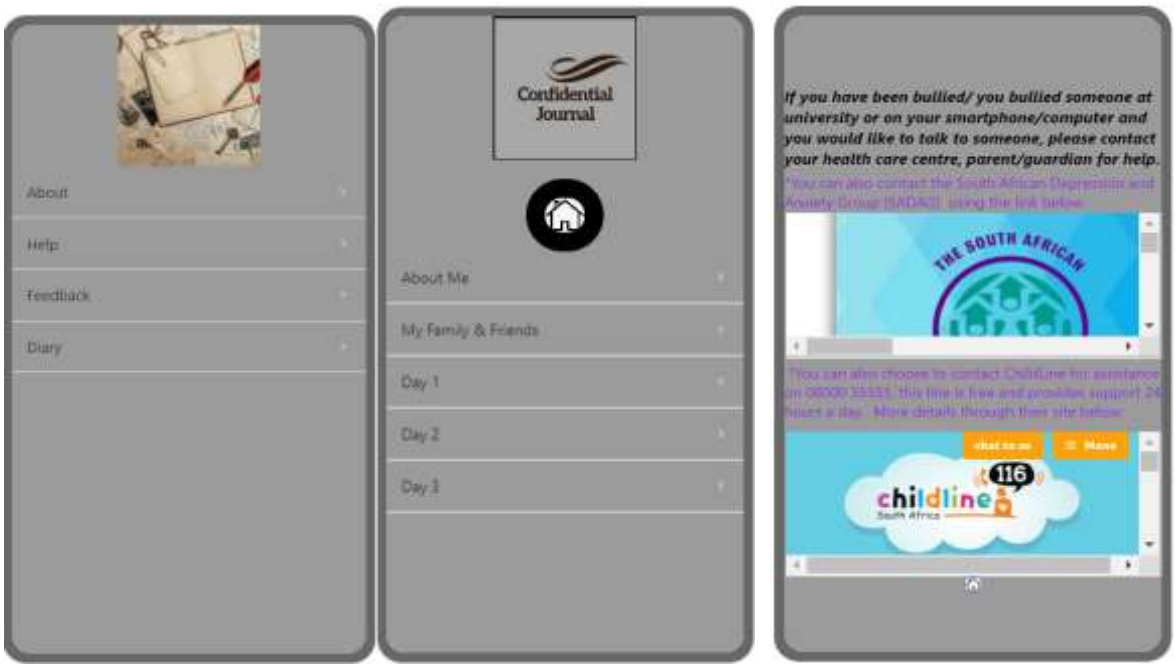


Figure 7.2.1: First version SIMBV Application

7.2.2. Improved and enhanced SIMBV Application

This section showcases the improved second version of the SIMBV application following the input from the students. Figure 7.2.2 shows the home page was made more interesting and inviting by including brighter colours and an animation. Secondly, every page contains the ‘back” button with bright colours across the pages. Thirdly, the website names and contact numbers were listed for each organisation.

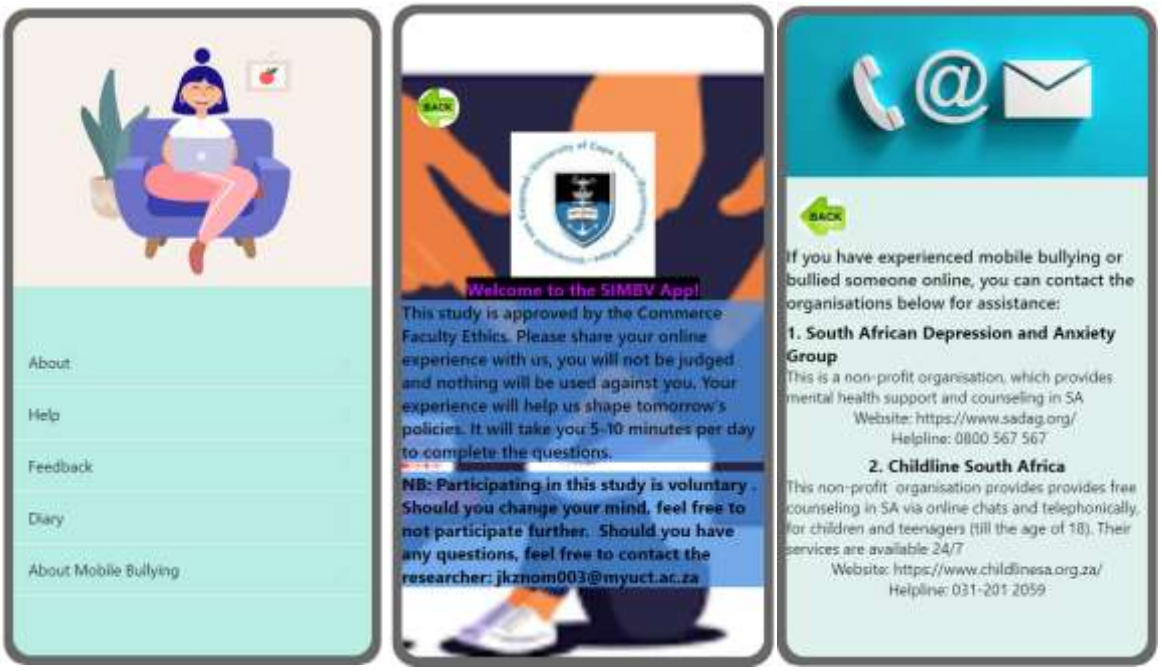


Figure 7.2.2: Second version of SIMBV application- home page, About and Help page

The diary page was also enhanced to make it more appealing and easier to navigate as shown in Figure 7.2.3. In addition, questions were included to get more insights on the environmental factors.

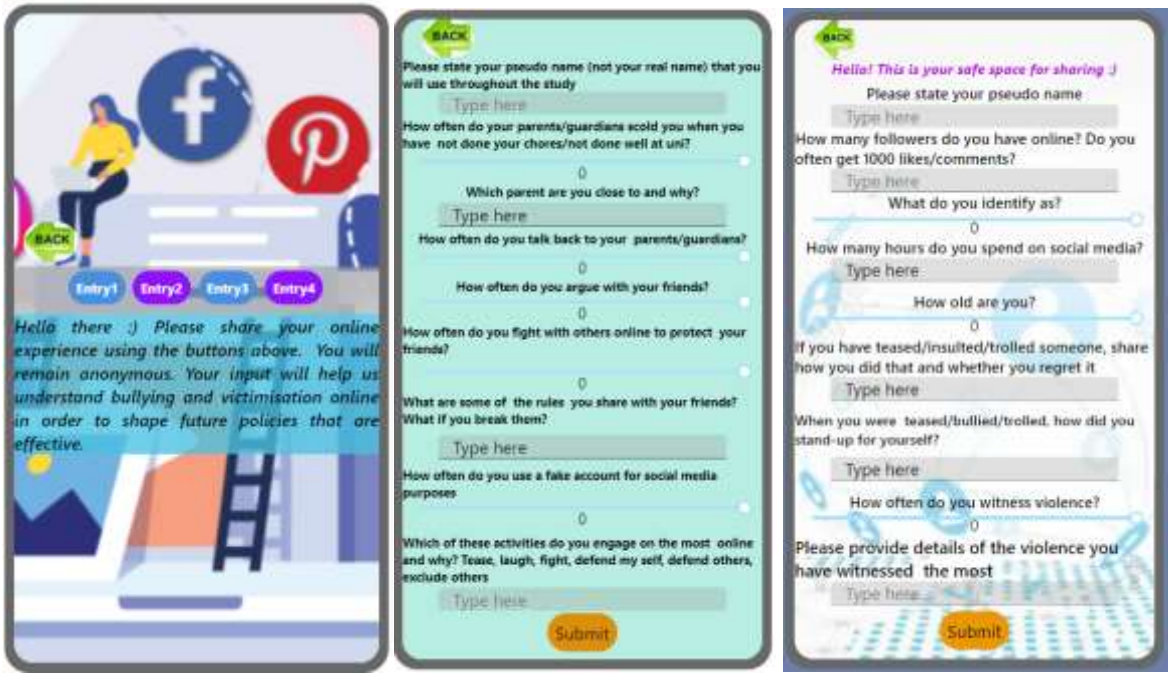


Figure 7.2.3: second version of SIMBV application -Diary and questionnaire

The second version of the SIMBV application was also enhanced with a page dedicated to raising awareness and providing students with brief details of what mobile bullying is about as shown in Figure 7.2.4. The next sections will present the details about the participants involved in the second iteration and their responses.

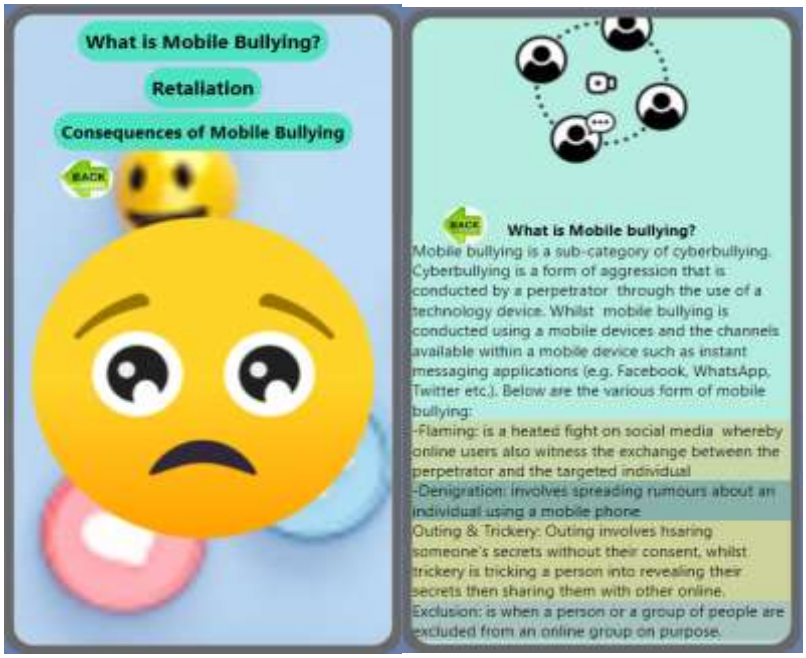


Figure 7.2.4: second version of SIMBV application – Mobile bullying awareness

7.3. Response rate and demographics (Iteration 2)

A total of 54 undergraduate students participated in the second iteration of the study. These included 42 from Iteration 1, and 12 new participants, who were also found to possess characteristics like those of SIMBVs. Just like in Iteration 1, students who indicated that they had been bullied retaliated when they were bullied/ bully others (defend friends, tease, make fun of others) and belonged to certain friendship groups were classified as those possessing attributes of socially integrated mobile bully-victims. This is consistent with the key characteristics of a socially integrated bully-victim, viz. being a bully-victim whilst also having social support from others (Kennedy, 2018).

While the sample of 54 is small, it would be sufficient in an exploratory study (Hill, 1998; Dworkin, 2012). The present researcher's approach is consistent with previous studies that focused on examining behaviour or health-related phenomenon using mobile applications (Johnson et al., 2016 and Han et al., 2020). Coutrot et al. (2019) tested a mobile application to predict dementia over two iterations, using a sample size of 23 on the first iteration and 30 on the second iteration.

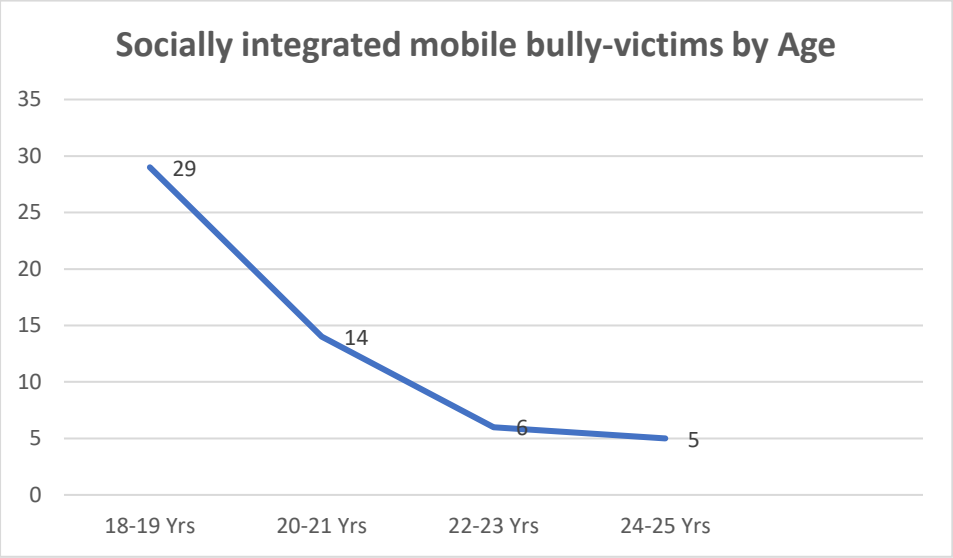


Figure 7.3.1: Age distribution of socially integrated mobile bully-victims

Figure 7.3.1 illustrates that the majority of the respondents with socially integrated mobile bully-victims characteristics were between the ages of 18 and 19 years, whilst a few were between 24-25 years. When it comes to sexual orientation, a majority were females, followed by those who preferred to not disclose their sexual orientation. The remainder of the students consisted of males and the LGBTQAI students as shown in figure 7.3.2.

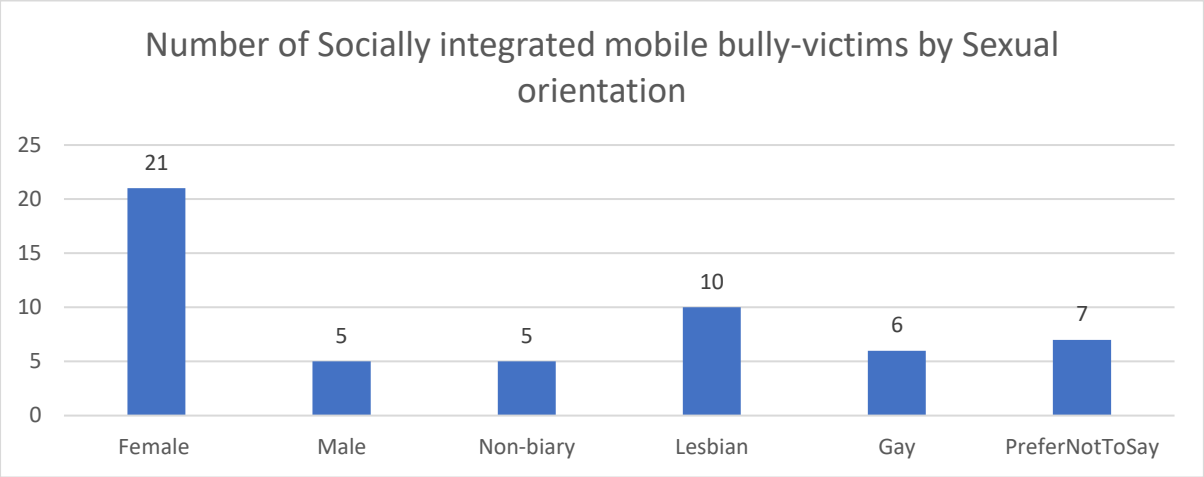


Figure 7.3.2: Sexual orientation distribution of socially integrated mobile bully-victims

7.4. Qualitative analysis

Content analysis was conducted based on the responses to the open-ended questions. These questions were intended to capture bully-victim experiences in the physical and online environments. Furthermore, the nature of interactions and experiences from both immediate and distal settings (environmental factors) were examined using open-ended questions. Qualitative content analysis is defined as an empirical and methodological approach for analysing text in relation to a specific context (Drisko & Maschi, 2016). Qualitative analysis was conducted using word cloud, which is the same method used in the previous chapter. Word cloud is a visual representation of how frequently words appear in a specific text (Drisko & Maschi, 2016). This feature lists the words and the number of times they occur in selected items. The most frequent words appear larger, which assists the researcher to easily identify themes (Olapane, 2021).

a) Individual characteristics

In the second iteration of the study, students were asked questions related to their individual characteristics in the open-ended question section. These include prior victimisation experience during school years and SIMBV behaviour. Below are more details relating to individual characteristics.

i) Victimisation experience during school years

The students who possess SIMBV attributes indicated that they were bullied during their school years, as shown in Figure 7.4.1. Furthermore, they also shared how they reacted to being bullied. Most of the victims did not react, they walked away. for example:

- Student 9 said, *"I kept quiet."*
- Student 26 said: *"yes, I was bullied back in high school and I kept quiet."*

Other students sometimes defend themselves. Student 29 stated:

"Although I kept quiet most of the time, I did occasionally defend myself."

Figure 7.4.1: prior victimisation experience

It is crucial to also note that being a victim has a negative psychological impact, where some victims felt it compromises their self-esteem.

ii) SIMBV Behaviour

In addition to earlier victimisation, students who possess SIMBV attributes were asked about their bully-victim experience on MSNs. Thirty-one out of 54 (57%) indicated that they usually laugh at others using the laughing emoji, as shown in Figure 7.4.2.

Figure 7.4.2: SIMBV experience

- Student 26 said, "*Most of the time a fight breaks out and funny comments get posted, so I laugh at them and I also tease others sometimes."*
- Student 15 said: "*Although I laugh at times, I always defend myself against negative comments on a WhatsApp group.*"
- Student 17 said, "*I defend others when I feel it is right because no-one should be without a friend who protects them."*

The responses above indicate that the SIMBVs not only participate in bullying by using laughing emojis, but also tease and retaliate when they are bullied, or see others being bullied. These findings are consistent with those reported in the first iteration of the study.

b) Environmental factors

Regarding environmental influences, this study collected data relating to immediate settings and distal settings. Immediate settings focused on peer norms, while the distal setting questions gathered MSN responses to incidents reported by students, gender role expectations, and exposure to violence.

i) Peer Norms

Figure 7.4.3 presents positive peer norms, such as respect and honesty among male friends. These are also known as "bro code".

Figure 7.4.3: SIMBV peer norms

This shows that socially integrated mobile bully-victims have healthy peer norms within their friendship groups. However, they had a negative way of dealing with differences such as social exclusion by "*taking a break*", which is the most common theme among the SIMBV friendship

groups. Even in this case, the minority found positive ways of dealing with differences e.g. through intervention and apologising.

ii) MSN Response

The SIMBVs indicated that they reported mobile bullying incidents in the past to the social media platforms they frequently use. The response from MSN companies when they received incident reports was mixed, i.e., some were positive, while some were unsatisfactory.

When it comes to positive responses, MSNs promised to evaluate the posts. For example, Student Number 4 said, "*I received a positive reply; therefore, the response was satisfactory*."

Figure 7.4.4: MSN response to the mobile bullying incident

When it comes to negative responses, some SIMBVs reported that no action was taken against the mobile bullies and their accounts. For example, Student Number 24 said:

"*Instagram insisted that the account wasn't harassing me and kept it up despite defamatory statements and posts about me."*

In some cases, mobile social networks (MSNs) also provided automatically generated responses upon receiving bullying/harassment reports from students. For example, Student 7 reported the following:

"*The responses from social media moderators are usually unsatisfactory because they are automated and generic hence, they do not dive into the specifics of the issue you are reporting*."

iii) Gender Role Expectations

In addition to the experience within the digital environment, students were asked about their experiences within their broader community, which was centred around the cultural blueprint that informs gender role expectations. Furthermore, exposure to violence at the community level was also assessed.

Figure 7.4.5: Gender role expectations

Based on the students' responses, the key theme that emerged was that there are different expectations for males and females. Moreover, females and the LGBTQ community are marginalised, for example, Student 10 reported:

"*The LGBTQAI community is not tolerated and women are still treated poorly in my community*."

Furthermore, extreme cases of marginalisation and violence because of gender role expectations were reported by students from rural areas and townships. For example, student 9 said:

"*The belief in my rural community is that women should be faithful and persevere when they are being abused by their partners."*

Student 18, on the other hand, said: *"I'm from a township, so sexual and gender-based violence are normalised such that hiding them as a way of silencing this plight is also taken as ordinary."*

iv) Exposure to violence

At the community level, students reported that they were mostly exposed to physical violence during the school years, as shown in Figure 7.4.6. For example, Student 30 said:

"*I have witnessed two boys from my school beating a learner as a result of bullying their brother."*

Figure 7.4.6: Exposure to Violence

Other SIMBVs also reported a woman being assaulted, such as Student 9, who said:

"*I witnessed a man hitting a woman once*."

This experience is consistent with the gender role expectations findings above, whereby Gender Based Violence (GBV) is normalised by the community. This type of violence was also witnessed by students and was also witnessed at home. For example, student 21 said:

"*My uncle attempted to kill my grandmother."*

In addition to GBV, SIMBVs witnessed other extreme types of violence in their communities, such as collective violence. For example, Student 25 shared that:

"*In my hometown, they favour community justice, and if someone steals in the neighbourhood, they are caught and subjected to violence as a form of justice."*

Lastly, SIMBVs were exposed to violence via mass media such as television, as per

Student 11's response: "*I have only seen violence on TV, particularly the news.*"

Summary

Table 7.4.1 and 7.4.2 (also presented in Appendix 10 and 11, for better visibility) below summarise the themes that were identified by analysing the content of the answers provided to open-ended questions, using the code book in Chapter 4 as a guide (derived from the conceptual model). These questions focused more on the experiences of socially integrated mobile bully victims on Mobile

Social Networks (MSNs). The questions also aimed to capture experiences in various distal environments (exosystem and macrosystem) that students are exposed to and are impacted by, which then shape their characteristics as socially integrated mobile bully-victims.

Table 7.4.1. Summary of socially integrated mobile bully-victim characteristics themes (individual characteristics)

Construct	Variable	Themes	Examples
Individual Characteristics	Mobile bully-victim behaviour	Laughing and protecting myself/other	Case 26 -"I laugh at times, but I always defend myself when someone sends negative comments or messages". Case 17 - "When I feel the need to defend others, I do so because it is crucial that everyone has a friend who protects them".
		Have share opinions on topics which sometimes leads to online fights	Case 15 - "When a fight happens and funny comments are posted, I laugh at them and also tease others".
		Tease others in a fun and sometimes unkind manner	Case 16 - Sometimes I tease people on social media, its harmless but it is not always kind".
		Bullying someone online and regretted it	Case 7 - "I used the messaging feature to tease someone, and I felt guilty for being rude because it was unnecessar". Case 3 - "I made a mistake by insulting my friends on group chats and later regret it because I was acting out of spite".
	School Bullying experience	Bullied and did nothing	Case 9, Case 26 - I was bullied and I kept quiet".
		Bullied and cried/had low self-esteem	Case 28 - "Yes, I was very sad and myself esteem took a deep dive".
		Bullied and fought back	Case 11, Case 29 - "In primary school, I had a fight, but I don't consider myself a violent person, I was young.".

Table 7.4.2. Summary of socially integrated mobile bully-victim characteristics themes (environmental factors)

Construct	Variable	Themes	Examples
Environmental factors	Social Media company response	Incident was not against the guidelines	Case 22: "*The response was the post did not go against any community guidelines, this was not satisfactory because the girl in the video was body shaming a certain group of women.* " Case 24: "*Instagram said the account was not harassing me and left it up even though it was making defamatory statements and posts about me.* "
		Generic response	Case 1: "*They said I won't see any posts from the user again, so no I was not satisfied.* " Case 7: "*Usually, it is not really satisfactory because the responses tend to be automated and general, it does not dive into specifics of the issue you are reporting.* "
	Violent incidents witnessed	Domestic violence	Case 27: "*There was this one time I saw a guy hitting a woman.* " Case 23: "*My uncle tried to kill my grandma.* "
		Community justice and gang violence	Case 2: "*I am from a crime-filled township so there are lots of gang fights I have witnessed.* " Case 5: "*Community justice, when someone steals in the neighbourhood a group catch the individual and beat them.* "
		School fights	Case 1: "*At my high school there was a lot of fighting amongst the students.* " Case 30: "*I've witnessed two guys who were not from my school beating up a learner because he bullied their younger brother.* "
		Fights on Television	Case 11: "*The only violence I have witnessed is from the news channels and movies.*" Case 19: "*Mostly on movies.* "
	Gender Based cultural expectations	Gender Based Violence (GBV)	case 9: "*In my community because it is rural, the belief is women should be obedient and persevere when they are being abused by their partners.* " Case: 18: "*I'm from a township, so sexual and gender based violence are normalised such that hiding them as a way of silencing this plight is also taken as ordinary.* "
		Community norm to be treated based on gender	Case 16: "*Yes, because of different gender roles and orientations.* " Case 23: "*Yes, women tend to be shamed more for what they wear and how they act, whereas men have more freedom of expression.* "
		Men are treated better in general	Case 21: "*Women are not given leadership roles in my community, their capabilities are only acknowledged at home.* " Case 14: "*There is a lot of patriarchy in my village, unlike women the guys can go drinking the whole day and they will not be judged.* "

7.5. Quantitisation of the qualitative dataset

According to Doubleday et al. (2022), qualitative methods are crucial, as they enable researchers to gather rich insights into the experiences of individuals and their perceptions. However, when qualitative findings are quantitised, these insights can be applicable to a broader field and not limited to a particular context (Doubleday et al., 2022). Therefore, the qualitative findings presented above were converted to quantitative data through a process called quantitisation. Quantitisation is the process of taking qualitative data that has already been analysed and coded and converting it into quantitative data (Driscoll, 2007).

As explained in the research design chapter, the objective of quantitising the qualitative data was to merge it with the quantitative dataset to form a complete dataset for testing the conceptual model and the relationships between the constructs, using the cluster analysis technique. This is consistent with the objectives for quantitisation, e.g., to identify behavioural patterns and testing hypotheses (Sandelowski et al., 2009). Sandelowski et al. (2009) provide the following steps to follow when quantitising data:

1. Clean-up of qualitative data in a manner that optimises descriptive and interpretive validity.
2. Decide on the best representation (numbers/words/visuals) of the phenomena under examination.
3. Constant comparison of the codes/themes identified from the collected qualitative data against existing domain information.
4. Place judgement on whether something is present or absent in the dataset.
5. Consider using a prior quantitative dataset as a framework for converting qualitative data to quantitative data.
6. Decide on the method of counting.

Accordingly, the qualitative dataset was cleaned by grouping all the open-ended responses from the participants separately from the closed-ended data. The unique identifier for each entry, which was the pseudonym of each participant, was used to consolidate the environmental factors and individual characteristics for each SIMBV. Thereafter, themes were identified by analysing the qualitative content using Word cloud, an NVIVO12 feature for identifying common words and associated codes for a qualitative dataset. The strength of this feature is that it eliminates the bias for imposing the pre-identified themes by enabling the structure of the data to emerge independently based on the co-occurrence and relationship between words from participant responses (Jackson & Trochim, 2002). The themes generated by the word cloud were compared to the codebook, which was derived from the

conceptual model, in order to determine whether the themes aligned with the existing conceptual model. In addition, there was a back-and-forth comparison of the themes to the raw dataset (participants responses), to ensure that the respondents' points of view were captured accurately. The final view of the themes is presented in section 7.4 (Table 7.4.1. and Table 7.4.2).

In steps 5 and 6, the qualitative data is converted to quantitative data using a specific measure. In the social sciences, an individual's subjective reality relating to aspects such as behaviour, perceptions, and attitude can be converted into an objective reality, using various types of scales (Joshi et al., 2015). The common scales in social sciences are the interval scale, categorical scale, and ordinal scale. The interval scale uses a set of statements to indicate possible specific dimensions relating to a certain behaviour/attitude (Lara-Muñoz et al., 2004; Baak et al., 2020). These statements reveal the level of agreeability and disagreement. An ordinal scale, on the other hand, measures a subjective phenomenon to indicate whether it is present or absent (Lara-Muñoz et al., 2004), although this may not be adequate for some parametric analyses. Categorical scale, also known as the nominal scale, consists of two or more categories without a specific order, e.g., gender (Thompson, 2009; Baak et al., 2020). Research shows that ordinal data can be converted or transformed into interval data if one would like to analyse the data using statistical parametric (Asdar & Badrullah, 2016). However, in the present study, the researcher aims to use non-parametric techniques like cluster analysis. Ordinal scales can provide data suitable for cluster analysis and inferential statistics (Mooi and Sarstedt, 2011, Gadrich & Bashkansky, 2012).

Ordinal scales can, "minimise the loss of sampling and analytic power, resulting from dichotomisation and preserve the shades of grey in the qualitative data undergoing conversion" (Sandelowski et al., 2009, p. 217).

As indicated above, an ordinal scale is compatible with nonparametric statistical methods such as cluster analysis, which is an exploratory technique that uncovers various interrelationships of multiple motives across individuals (Csizer´ & Dornyei, 2005). This type of classification is also common in the field of personality psychology, where individuals can be grouped into different personality types based on their shared traits (Csizer´ & Dornyei, 2005; Ibrahimoglu et al., 2013). The present study is exploratory due to its limited research on SIMBVs, where the research objective is to identify the characteristics of this group and determine the relationship between environmental factors and individual characteristics. The ordinal scale was therefore used in the quantitisation as explained in the following sections. Furthermore, while the researcher is aware of the limitations of the ordinal scale, effort was made to ensure that the intervals between the choices or the spacing between the values of each ordinal scale were meaningful and the values could be distinguished largely from each other. The researcher also made sure the values were consistent with those obtained from the survey (quantitative) responses, e.g. (always, often,

sometimes, rarely, and never). Step 5 of Sandelowski et al. (2009) quantisation procedure requires the researcher to consider using a prior quantitative dataset as a framework for converting qualitative data.

a) Individual characteristics

Cyberbullying experiences directed at individuals range from insults/negative comments to social exclusion, rumour, and the distribution of personal details without consent (Kyobe, Oosterwyk & Kabiawu, 2016; Buelga et al., 2019). Some people may 'always' experience cyberbullying, while others may not ('never'), and those cyber-bulled would tend to experience the worst, than those not frequently cyber-bulled (Kyobe et al., 2016). Therefore, an ordinal scale of 1 to 5 was assigned to mobile victimisation and mobile bullying incidents. A value of 1 would indicate 'always experience cyberbullying/victimisation' (or worst experience), and 5 would indicate 'never experienced', or absence of such experience (never experienced cyberbullying/victimisation).

b) Environmental factors

o Distal settings

The distal environmental settings that influence bully-victims included the absence or presence of measures for combatting cyberbullying and mobile bullying at institutions such as universities and Mobile Social Networks (MSNs). Furthermore, community factors such as exposure to violence also play a key role. According to the American Educational Research Association (2013), tertiary institutions face challenges in addressing bullying and cyberbullying, because these phenomena do not fall under legally protected categories. On the other hand, some universities in developing African countries provide counselling to students, train students about online safety, implement cyberbullying policies, and take disciplinary actions against perpetrators (Ogolla et al., 2023). Therefore, an institution may or may not have measures to deal with cyberbullying.

MSNs may or may not implement self-regulatory mechanisms to address harassment and cyberbullying on their platforms. These include filtering, blocking, removing content, suspending an account, or deleting an account. The most popular sites such as Facebook, Twitter, and Instagram have content moderators who monitor posts and process incident reports instead of using the filtering mechanism, which is said to clash with freedom of speech (Milosevic, 2016). The moderators can remove content, suspend an account, or delete an account depending on whether it violates the community rules/guidelines defined by the social media site (Milosevic, 2016; Barlett et al., 2018).

An ordinal scale of 1 – 5 was used whereby 1 denotes the lack or absence of mobile bullying interventions, while 5 indicated the presence of interventions, e.g., the institution or social media platform takes disciplinary action against a mobile bully based on their cyberbullying policy, or incidents are dealt with in a satisfactory manner (e.g., by deleting the offender's account).

At the community level of the distal setting, there are three types of violence according to the World Health Organisation (WHO), namely, self-directed violence, interpersonal violence, and collective violence. Self-directed violence is defined as any form of self-abuse/injury, whereas interpersonal violence is made up of violence that is inflicted by one person on another (Etienne et al., 2002). Interpersonal violence can occur where a person with whom an individual is familiar, such as a family member/intimate partner, and at times by a community member they may/may not have interacted with before (Etienne et al., 2002). The most prevalent form of interpersonal violence is gender-based violence (GBV) in South Africa (Hoeffler, 2018). Collective violence is driven by political, economic, and social objectives. This type of violence is usually committed by a group that has common interests (Abrahams, 2010). In South Africa, collective violence usually occurs in large urban cities such as Johannesburg (Gauteng province) and Cape Town (Western Cape province). Gang violence and xenophobic attacks are some of the most common types of collective violence post-apartheid in South Africa. Collective violence negatively influences the complex socio-cultural context, resulting in more devastating consequences that affect both individuals and cultural groups physically and psychologically (Robben & Su'arez-Orozco, 2000). This shows how extreme and complex collective violence is compared to other types of violence. In the present study, the researcher ranked witnessing collective violence like gang violence, xenophobia, or racism as 1, whereas witnessing no type of violence at the community level as 5.

The gender-based role expectation variable was also quantitised by adapting a five-point ordinal scale by Gurieva et al. (2022). The gender role expectations are linked to gender inequality which range from family beliefs, religious beliefs, stereotypes, and everyday life expectations. Family beliefs in the context of gender expectations include norms about which duties should be performed by women vs those for men. For example, in some African societies, men are usually expected to work and earn income, while women do family chores like cleaning and raising children. Religious beliefs include perceiving LGBTQAI community as sinners (Woodford et al., 2021). Stereotypes, on the other hand, include community norms about how females and males ought to behave, while everyday life expectations would include normalising GBV, criticising women drivers, and beauty standards (Shyian et al., 2021; Stewart et al., 2021). A scale of 1 to 5 was applied to the gender role expectations variable, with 1 indicating the presence of such expectations and 5 indicating the absence of these expectations.

After ranking each of the supporting sub-theme responses, a Microsoft Excel worksheet was created, which contained the sub-themes as variables and the participant's responses as scores ranging from 1 to 5. The data was uploaded to Statistica for further analysis. First, the descriptive data analysis was conducted, and a summary of the results is presented in Table 7.5.1. This quantitised data will be further analysed in the next sections.

Table 7.5.1: Descriptive statistics of quantitised qualitative data

Descriptive Statistics					
Variable	**Valid N**	**Mean**	**Min**	**Max**	**Std.Dev**
SchooBully/VictimExperience	54	2.50	1	5	1.56
Mobile bully-victim behaviour	54	2.85	1	5	1.27
GenderBasedCommunityNorms(CulturalExpectations)	54	2.11	1	5	1.11
WitnessedCommunityViolence	54	2.31	1	5	1.24
MSNResponse(lackofAccountability)	54	2.79	1	5	1.24

7.6. Quantitative data analysis

The close-end survey questions provided quantitative data, which was recorded in an Airtable, once the SIMBV mobile app respondents submitted their selections. The close-ended questions were based on a subcomponent of the individual characteristics, i.e., participant basic tendencies and mobile bully-victim status. Table 7.6.2 shows the descriptive statistics of the quantitative data generated using Statistica software. A five-point Likert scale was used, e.g., 1 = always, 5 = never.

Table 7.6.2: Descriptive statistics of quantitative data

Descriptive Statistics					
Variable	**Valid N**	**Mean**	**Min**	**Max**	**Std.Dev**
EmotionalIssues1(sadness)	54	2.67	1	5	1.09
EmotionalIssues2(anger)	54	2.66	1	5	1.04
Consciousness	54	3.05	1	5	1.23
Agreeableness	54	2.53	1	5	1.12
Extroversion	54	2.55	1	5	1.19
FakeAccount(Openness)	54	2.50	1	5	1.28
MobileBullyStatus	54	3.43	1	5	1.48
DelinquentFriends	54	2.61	1	5	1.05
PeerNorms	54	2.74	1	5	1.05
ExposureToCommunityViolence	54	2.38	1	5	1.26
IncidentReport(mobile victimisation)	54	3.50	1	5	1.58
UniversityPolicy(LackofCyberbullyingLaws)	54	2.55	1	5	1.09
CoercionRetaliation(hostility)	54	3.01	1	5	1.31
Retaliation	54	2.98	1	5	1.46

7.7. Combining the quantitative and quantitised datasets

The quantitative data in section 7.6 from the close-ended questions was combined with the quantitised data from the open-ended questions using Microsoft Excel. As indicated above, this was done to obtain one complete dataset, consisting of all the variables in the conceptual model. Tests for reliability and validity were also done. Table 7.7.1 presents the descriptive statistic of the combined dataset.

Table 7.7.1:Descriptive statics of the combined quantitative data

Descriptive Statistics					
Variable	**Valid N**	**Mean**	**Min**	**Max**	**Std.Dev**
SchooBully/VictimExperience	54	2.50	1	5	1.56
Characteristic adoption (LearnedAggression)	54	1.71	1	5	0.47
EmotionalIssues1(sadness)	54	2.67	1	5	1.09
EmotionalIssues2(anger)	54	2.66	1	5	1.04
Consciousness	54	3.05	1	5	1.23
Agreeableness	54	2.53	1	5	1.12
Extroversion	54	2.55	1	5	1.19
FakeAccount(Openness)	54	2.50	1	5	1.28
MobileBullyStatus	54	3.43	1	5	1.48
DelinquentFriends	54	2.61	1	5	1.05
PeerNorms	54	2.74	1	5	1.05
IncidentReport(mobile victimisation)	54	3.50	1	5	1.58
GenderBasedCommunityNorms(CulturalExpectations)	54	2.11	1	5	1.11
ExposureToCommunityViolence	54	2.38	1	5	1.26
Mobile bully-victim behaviour	54	2.85	1	5	1.27
WitnessedCommunityViolence	54	2.31	1	5	1.24
MSNResponse(lackofAccountability)	54	2.79	1	5	1.24
UniversityPolicy(LackofCyberbullyingLaws)	54	2.55	1	5	1.09
CoercionRetaliation(hostility)	54	3.01	1	5	1.31
Retaliation2	54	2.98	1	5	1.46

7.7.1 Reliability test

The widely used reliability measure is Cronbach's alpha, introduced earlier. The reliability of the constructs described in the code book was tested using the variables in the SIMBV mobile application questionnaire matrix. The results in Table 7.7.2 show the Cronbach's alpha for the variables of this study, with the lowest being 0.50. As indicated in Chapter Six, the threshold for Cronbach's alpha ranges from 0.7 to 0.9 (Nunnally (1967), however, scores of 0.5 – 0.6 can provide moderate reliability (Felder et al., 2005; Ursachi, Horodnic, & Zait, 2015; Dacakis et al., 2022), especially in exploratory studies.

According to Kopalle and Lehmann (1997), Cronbach's alpha is a function of the variables intended for measuring one item, the correlation among those variables, and the sample size of the study. Hence, having fewer variables that measure an item has been found to cause lower Cronbach's alpha. This could explain the low Cronbach scores of 0.50, 0.54, and 0.58. However, it must be noted that the sample size for cyberbully-victims is usually small, ranging from 3%-15% (Kelly et al., 2015). For example, Kennedy (2021) reported (3.6%) of his sample consisting of bully-victims.

Table 7.7.2: Iteration 2 Cronbach's alpha results

Socio-Ecological Element	Construct	Variable	Cronbach Alpha
Individual Characteristics	Basic Tendencies	Extroversion	0.60
		Consciousness	
		Agreeableness	
		CoercionRetaliation (hostility)	
		FakeAccount(Openness)	
	Biological Basis	EmotionalIssues1(sadness)	0.50
		EmotionalIssues2(anger)	
	CharacteristicAdoption(Learnedaggression)	ParentalCoercion	0.69
		ViolentExposure	
Environmental Factors	MSNPolicy (LackofAccountability)	IncidentReport(mobile victimisation	0.74
		MSNPolicy	
	ExposureToVoilence	ExposureToCommunityViolence	0.55
		WitnessedCommunityViolence	

7.7.2. Construct validity

As indicated in Chapter 6, the questions set were drawn from previous questionnaires and literature thereby ensuring the validity of the constructs used in the present study. The sources used are presented in Table 7.7.2.1

Table 7.7.2.1: Individual characteristics and environmental factors questionnaire

Variable	Source	Questionnaire
Consciousness	International Personality Item Pool-Neuroticism, Extraversion-Openness (IPIP NEO) questionnaire, Alonso & Romero, 2017	(IPIP NEO) questionnaire and Alonso & Romero's questionnaire
Agreeableness		
Extroversion		
FakeAccount(Openness)		
CoercionRetaliation(hostility)		
EmotionalIssues(sadness)	Berrett, 2004	Dimensions of emotions questionnaire
EmotionalIssues2(anger)		
SchoolBully/VictimExperience	Hood & Duffy, 2018	Hood & Duffy, 2018, questionnaire
MobileBullyingStatus		Mobile bully-victim questionnaire
Mobile bully-victim behaviour		
IncidentReport(mobile victimisation)		
Popularity		
Retaliation	Kyobe & Ndyave, 2019	
TimeOnline	Kyobe, 2016	
DelinquentFriends	Hong et al., 2019; Mowen & Boman, 2018	Questionnaires by Hong et al., 2019; Mowen & Boman, 2018
PeerNorms	Piccoli et al., 2020	Questionnaire by Piccoli et al., 2020
GenderBasedCommunityNorms (Cultural Expectations)	Gurieva et al, 2022	Gurieva et al, 2022 Questionnaire
ExposureToCommunityViolence	Zwi et al., 2002	World Report on Violence and Health
WitnessedCommunityViolence		
MSNResponse	Milosevic, 2016; Barlett et al., 2018	Social anti-harassment measures questionnaire
UniversityPolicy	Ogolla et al., 2023	Methods of addressing bullying
CoercionByParents	Rodriguez & Sutherland, 1999	Rodriguez & Sutherland, 1999 questionnaire

7.8. Quantitative analysis of the full dataset: Cluster analysis

Cluster analysis is a quantitative method for identifying groups and patterns from a dataset related to a specific phenomenon (Frades & Matthiesen, 2010). Using computer software such as SPSS and Statistica, data is grouped into clusters (subsets) based on similarities. Data points within a specific cluster are more similar than those that belong to another cluster. There are three types of cluster analysis, namely: k-means clustering, hierarchical clustering, and latent class analysis (Hofstetter et al., 2014). The two common types of cluster analysis are hierarchical clustering and k-means, which have been used in psychology, economics, and data mining (Kodinariya & Makwana, 2013; Sinaga & Yang, 2020). There is limited use of cluster analysis in the field of information systems; however, some cyberbullying studies have used this method. For example, Betts, Baguley, and Gardner (2019) used cluster analysis to identify various types of cyberbully-victims among young adults. Ding et al. (2020) went further by examining the individual factors of cyberbullying roles using cluster analysis.

In this study, cluster analysis was used to test the conceptual model which predicted that SIMBV behaviour results from the interaction of both individual characteristics and environmental factors. The researcher indicated that these attributes interact, i.e., they affect each other, which makes it difficult to measure them accurately in isolation. Cluster analysis is suitable for an inquiry where there are interplays between variables (Ryan, Martin & Brooks-Gunn, 2019). The use of this multivariate analysis method allows for the identification of person-based patterns and differences between those patterns (Ryan et

al., 2006; Sinaga & Yang, 2020). This offers a comprehensive perspective on human experiences (Ryan et al., 2006). The next sections provide more details on the common cluster analysis methods and a suitable one that was selected for this study.

Hierarchical clustering

The hierarchical cluster method is presented in a dendrogram, whereby the clusters are derived from a dataset comprising child and sibling clusters that belong to a specific parent (Kaushik & Mathur, 2014). The dendrogram resembles a tree, as similar items are grouped into branches (Frades & Matthiesen, 2010). Using this method, each item is assigned to a cluster. Having N items means that the output will be N clusters. The dendrogram is formed by grouping clusters that are closer in terms of distance into one cluster (Frades & Matthiesen, 2010).

Hierarchical clustering is advantageous compared to other methods, because the number of clusters *(k)* does not have to be specified before assigning the items to clusters (Ketchen & Shook, 1996). This makes this method simple. Hierarchical clustering also provides a visual view of how items in the dataset relate to each other. This method is preferable when the underlying pattern of the datasets is unknown (Ketchen & Shook, 1996). The hierarchical clustering method is not without its disadvantages. It is not predominantly used for a small sample, as this results in unstable cluster outcomes when certain items are dropped (Ketchen & Shook, 1996). Furthermore, this method makes a single pass through the data, which can result in poor item classification.

K-means cluster analysis

K-Means is also used to group similar cases of data based on the characteristics in which the researcher is interested; however, this method is iterative. This means that the researcher re-runs the dataset several times before arriving at the final solution. This iterative process is driven by changing the number of desired clusters/groups *(K)* (Schreiber & Pekarik, 2014). Proving the desired numbers of clusters upfront is a requirement for the K-means clustering method. Once this information is provided, each item in the dataset is assigned to the closest centroid (Ketchen & Shook, 1996). Collection of all items assigned to a centroid form a cluster.

The advantages of the K-means method include an optimised final solution as the dataset goes through an iterative process. This makes K-means preferable compared to hierarchical clustering. In addition, outliers have no influence over this method, due to the iterative process the data goes through, which

enables self-correction if any outliers are identified in initial sequences (Ketchen & Shook, 1996). This method is also not without its disadvantages. The requirement to provide the number of clusters (k) may be challenging for exploratory studies in which the underlying pattern is unknown (Ketchen & Shook, 1996; Frades & Matthiesen, 2010).

Two-step cluster analysis

The two-step clustering method differs from hierarchical clustering and K-means because of the type of values it accepts (Şchiopu, 2010). This method uses both categorical and continuous values, whereas the other two methods use continuous data. Furthermore, this method is primarily designed for large datasets (Shih et al., 2010; Tkaczynski, 2017). In addition, unlike the K-means method, which requires the number of clusters (K) to be defined prior, this method provides the optimal number of clusters (Şchiopu, 2010).

Why K-Means clustering?

Since the dataset of this study is made up of 54 socially integrated mobile bully-victims, K-Means cluster analysis was selected as a suitable method, because it works well with small samples compared with other clustering methods (Yuan & Yang ,2019). Furthermore, K-Means is fast and less complex (Kaushik & Mathur, 2014). The challenge of identifying the number of clusters beforehand was addressed using the elbow method to determine the appropriate number of clusters. Additionally, the conceptual model provided in Chapter 3 assisted in identifying the ideal number of clusters as it has three constructs, viz.: socially integrated mobile bully-victim behaviour; individual factors; and environmental factors.

The elbow technique is a visual method for determining the best number of clusters (K) using the K-means clustering method. The outputs of the elbow method consist of various values of k on the *x*-axis and the Sum of Square Error (SSE) on the *y*-axis. The ideal number of k according to this method is positioned by the elbow of the graph, with an associated value of SSE. Figure 7.8.1 depicts the results of the elbow method after both categorical data and data with interval scales were specified in Statistica. The results indicate that the optimal number of clusters is 3. This is consistent with the number of constructs in the conceptual model used in this study.

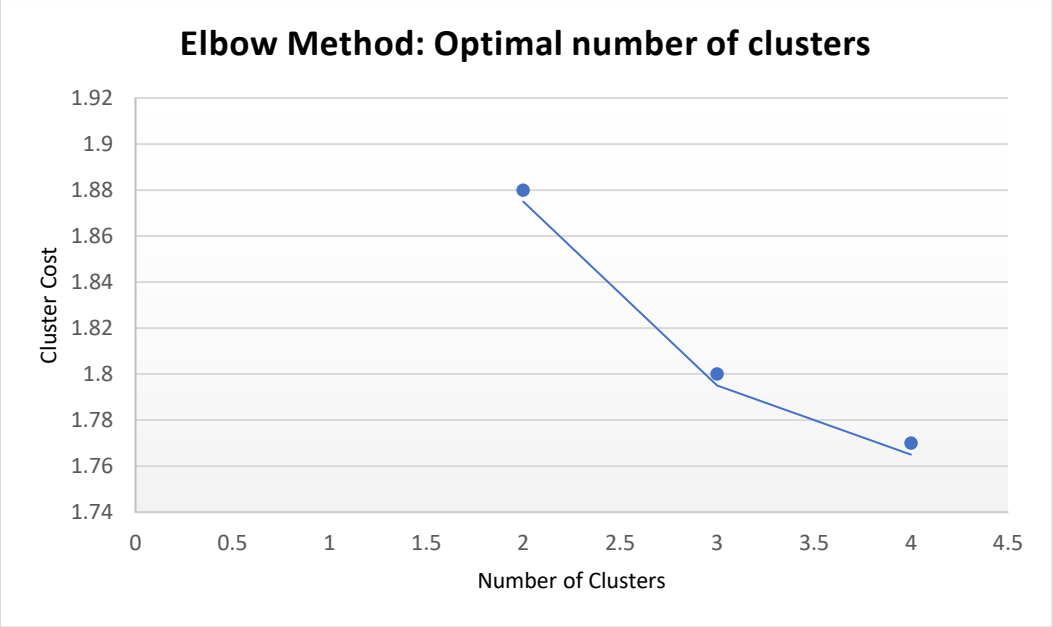


Figure 7.8.1: Optimal number of clusters

Analysis of Variance

After finding the optimal number of clusters from the SIMBV data, the researcher analysed the variables for variances. The ANOVA results are displayed in Table 7.8.1. All other 14 individual characteristics (IC) were significant except for the following 3:

- Extroversion,
- Emotional issues (sadness)
- Emotional issues (anger)

These results are consistent with the findings of Topcu et al. (2013), who found that cyber bully-victims can be either introverts or extroverts. Introverts tend to be perceived as weak targets, whereas extroverts are provoked because other students are jealous of their popularity (Wen et al., 2023). Furthermore, Zhou et al. (2019) found no correlation between extraversion and cyberbullying.

Table 7.8.1: ANOVA results

Analysis of Variance (Quantitised SIMBV in Consolidated-Iteration2-SIMBV Data)							
Variable		Between SS	df	Within SS	df	F	signif. P <=0.05
Individual Characteristics							
IC1	CharacteristicAdoption	41.62	2.00	14.52	51.00	73.08	**0.00**
IC2	CoercionRetaliationA(Hostility)	9.16	2.00	57.68	51.00	4.05	**0.02**
IC3	Extro	6.96	2.00	68.38	51.00	2.60	0.08
IC4	Agreeableness	9.60	2.00	57.83	51.00	4.23	**0.02**
IC5	Consc	21.49	2.00	59.34	51.00	9.24	**0.00**
IC6	TimeOnline	16.90	2.00	66.60	51.00	6.47	**0.00**
IC7	FakeAccountA(Openness)	12.83	2.00	74.68	51.00	4.38	**0.02**
IC8	Emo1(sadness)	0.82	2.00	63.18	51.00	0.33	0.72
IC9	Emo2(anger)	0.83	2.00	57.18	51.00	0.37	0.69
IC10	Popularity	49.55	2.00	59.78	51.00	21.14	**0.00**
IC11	SchoolBully/VictimExp	75.24	2.00	54.24	51.00	35.37	**0.00**
IC12	Bully-victimStatus	21.58	2.00	65.24	51.00	8.43	**0.00**
IC13	Retaliation2	20.80	2.00	92.18	51.00	5.75	**0.01**
Environmental Characteristics							
EF1	DelinquentFriends	2.65	2.00	56.18	51.00	1.20	0.31
EF2	DefendingFriends (PeerNorms)	14.36	2.00	60.01	51.00	6.10	**0.00**
EF3	UniPolicy	2.93	2.00	60.40	51.00	1.24	0.30
EF4	MSNResponse1	0.84	2.00	81.92	51.00	0.26	0.77
EF5	GenderExp(CulturalExpectations)	13.15	2.00	52.18	51.00	6.43	**0.00**
EF6	VoilenceExposure	29.87	2.00	54.97	51.00	13.86	**0.00**
EF7	WitnessedViolence	41.56	2.00	40.09	51.00	26.43	**0.00**
EF8	ParentCoercion	47.31	2.00	43.68	51.00	27.62	**0.00**

Environmental factors (EF) construct also had three variables that were insignificant p-value, i.e., delinquent friends, MSN response, and university policy. SIMBVs indicated they had occasional fights and banter with their friends on WhatsApp groups, where no additional delinquent behaviour was reported. Therefore, it is not surprising the delinquent friend's variable was not significant. Mixed responses were received from those who reported mobile bullying incidents to social media moderators. Some reported getting satisfactory results, while others reported receiving generic responses from social media moderators, hence, this variable was not significant. When it comes to the cyberbullying policy of the university from which the sample of this study was drawn, there were some students who were not aware of the policy whereas other knew about it. Consequently, this variable was not significant.

Nature of socially integrated mobile bully–victim characteristics across

The results of the k-means cluster analysis based on the combined datasets are displayed in Table 7.8.2. ANOVA and means of variables across all three clusters are included in the results.

Table 7.8.2: K-Means clustering solution for socially integrated mobile bully-victims

Analysis of Variance (Quantitised SIMBV in Consolidated-Iteration2-SIMBV Data)								Cluster 1 (SIMBVs)	Cluster 2 (SIMBVs)	Cluster 3 (SIMBVs)
Variable		Between SS	df	Within SS	df	F	ignif. P <=0.0	N=8	N=30	n=16
Individual Characteristics										
IC1	CharacteristicAdoption	41.62	2.00	14.52	51.00	73.08	**0.00**	2.42	1.71	3.71
IC2	CoercionRetaliationA(Hostility)	9.16	2.00	57.68	51.00	4.05	**0.02**	1.88	2.20	3.00
IC3	Extro	6.96	2.00	68.38	51.00	2.60	0.08	1.88	2.50	3.00
IC4	Agreeableness	9.60	2.00	57.83	51.00	4.23	**0.02**	1.88	2.40	3.13
IC5	Consc	21.49	2.00	59.34	51.00	9.24	**0.00**	1.63	3.47	3.00
IC6	TimeOnline	16.90	2.00	66.60	51.00	6.47	**0.00**	2.50	1.33	2.44
IC7	FakeAccountA(Openness)	12.83	2.00	74.68	51.00	4.38	**0.02**	2.13	2.20	3.25
IC8	Emo1(sadness)	0.82	2.00	63.18	51.00	0.33	0.72	2.38	2.73	2.69
IC9	Emo2(anger)	0.83	2.00	57.18	51.00	0.37	0.69	2.38	2.70	2.75
IC10	Popularity	49.55	2.00	59.78	51.00	21.14	**0.00**	1.88	1.53	3.69
IC11	SchoolBully/VictimExp	75.24	2.00	54.24	51.00	35.37	**0.00**	2.63	1.57	4.25
IC12	Bully-victimStatus	21.58	2.00	65.24	51.00	8.43	**0.00**	3.25	2.30	3.69
IC13	Retaliation2	20.80	2.00	92.18	51.00	5.75	**0.01**	4.38	2.57	3.06
Environmental Characteristics										
EF1	DelinquentFriends	2.65	2.00	56.18	51.00	1.20	0.31	2.63	2.43	2.94
EF2	DefendingFriends (PeerNorms	14.36	2.00	60.01	51.00	6.10	**0.00**	1.88	2.60	3.44
EF3	UniPolicy	2.93	2.00	60.40	51.00	1.24	0.30	2.00	2.63	2.69
EF4	MSNResponse1	0.84	2.00	81.92	51.00	0.26	0.77	3.00	2.83	2.63
EF5	GenderExp(CulturalExpectation	13.15	2.00	52.18	51.00	6.43	**0.00**	1.38	1.93	2.81
EF6	VoilenceExposure	29.87	2.00	54.97	51.00	13.86	**0.00**	1.50	2.03	3.50
EF7	WitnessedViolence	41.56	2.00	40.09	51.00	26.43	**0.00**	3.13	1.53	3.38
EF8	ParentCoercion	47.31	2.00	43.68	51.00	27.62	**0.00**	3.63	2.20	4.25

Key

*Bold values in the Signif. P column are significant variables.

the mean is below 3.5

the mean is above 3.5

Scale: 1 = always
2=often
3=sometimes
4= rarely
5 = never

The means for each cluster are determined by the responses of participants in that specific cluster, not by the whole sample. Table 7.8.3 displays the profiles of the three clusters in Table 7.8.2. These are discussed in the next section. Subsequently, the results of the cluster analysis are discussed in relation to each of the 2 constructs, i.e., individual characteristics and environmental factors.

Cluster Profiles

Table 7.8.3 shows the profiles of the 3 SIMBV clusters. SIMBVs are students who indicated that they have bullied others online, have also been victimised, display aggression through arguing with others and are socially integrated via peer groups.

From Table 7.8.3, Cluster 1, which had the least number of SIMBVs, mainly consists of SIMBVs in the late adolescent stage (18–19-year-olds) and a few students in their early 20s. Furthermore, this cluster is not diverse, as it consists of females and males only. Cluster 2, which consists of 30 SIMBVs, had a more diverse age group as some of the SIMBVs were mostly in their late adolescent stage and others in their early 20s. This cluster had diverse SIMBVs in term of gender orientation. Cluster 3 has a more diverse SIMBV. It also had females, males, and LGTB individuals just like Cluster 2. A majority of Cluster 3 SIMBVs (50%) were females.

Table 7.8.3: Cluster profiles

Variables		Cluster 1 (N=8)		Cluster 2 (N=30)		Cluster 3 (N=16)	
Characteristics	**Total**	**Count**	**%**	**Count**	**%**	**Count**	**%**
Age							
18 – 19 Years	29	6	75%	15	50%	8	50%
20 – 21 Years	14	2	25%	9	30%	3	19%
22 – 23 Years	6	0	0%	4	13%	2	13%
24 – 25 Years	5	0	0%	2	7%	3	19%
Total	**54**	**8**	**100%**	**30**	**100%**	**16**	**100%**
Gender							
Female	21	5	63%	13	43%	3	19%
Male	5	2	25%	2	7%	1	6%
Non-Binary	5	1	13%	1	3%	3	19%
Lesbian	10	0	0%	6	20%	4	25%
Gay	6	0	0%	4	13%	2	13%
PreferNotToSay	7	0	0%	4	13%	3	19%
Total	**54**	**8**	**100%**	**30**	**100%**	**16**	**100%**

Cluster analysis results overview

The cluster analysis results confirm that SIMBVs in all clusters have individual characteristics and are influenced by environmental factors. This is consistent with the proposed conceptual model in Figure 3.1 (Chapter 3). The model predicted that SIMBV characteristics are determined by both environmental factors and individual characteristics. A scale ranging from 1 to 5 was used, where 1 represents 'Always' or the worst-case scenario, and 5 indicates 'never' or a better case scenario. In Table 7.8.2, significant cluster means from 1 to 3.5 are highlighted in amber, whereas those above 3.5 are highlighted in blue.

Environmental factors of SIMBVs

Cluster 1 SIMBVs mostly reported negative environmental factors, such as having peer norms that promoted aggression e.g., defending others online (EF2, m=1.88). This is not surprising as this group comes from communities which have normalised GBV (EF3, m=1.38) and are often exposed to violence (EF8, 1.50). However, this cluster has one positive factor, namely that they rarely experience coercion from parents (EF6, m=3.63).

Cluster 2 SIMBVs also had peer norms that involved online aggression among their friendship circles (EF1, m=2.60). They were also exposed to gender stereotypes (EF3, m=1.92). Despite their exposure to violence frequently (EF6, m=2.03), they have also witnessed extreme forms of violence, such as

community justice and gang violence (EF7, m=1.53). Furthermore, this group frequently encountered aggression at home through parental coercion (EF8, m=2.20).

Cluster 3 SIMBVs on the other hand, had mostly positive experiences within the physical environments to which they belonged. Even though they are aware of the religious beliefs that condemn the LQBTQAI within their communities (EF5, m=2.81), they were rarely exposed to violence in their societies (EF6, m=3.50) or at home (EF8, m=4.25).

Individual Characteristics (IC) of SIMBVs

Cluster 1 SIMBVs demonstrated mostly negative individual characteristics. First, they adopted aggressive behaviour (IC1, m=2.42), learnt from the environment (EF6, m=1.50) they have been exposed to. This is likely to have led them to often react in a hostile manner (IC2, m=1.88), towards their parents after being coerced to fulfil their house chores/duties. It is therefore not surprising they have low agreeableness (IC6, m=2.40) and low consciousness (IC5, M=1.63). However, they rarely retaliate against their mobile bullies (IC15, m=4.38) and according to the qualitative responses, they laugh at others and participate in heated debates. According to Akeusola (2023), engaging in heated debates constitutes a form of cyberbullying. Ndyave and Kyobe (2019) also found mobile bully-victim tended to use laughing emojis to react to offensive posts directed towards mobile victims. Additionally, Cluster 1 SIMBVs created their social media accounts using pseudonyms (IC7, m=2.13). This is consistent with the findings of Guo et al. (2021), who reported that cyberbully-victims tend to have high levels of openness when driven by anger and curiosity (Zhong et al., 2021; Giumetti & Kowalski, 2022).

Cluster 2 SIMBVs also adopted aggressive behaviour (IC1, m=1.71), hence they respond in a hostile manner when they are coerced by their parents (IC2, m=2.20). This cluster used retaliation even on MSNs (IC13, m=2.57), when they were bullied. Retaliation could be due to constantly engaging in mobile bully-victim behaviour (IC12, m=2.30). This is not surprising as this group is always online (IC6, m=1.33), hence they had a higher chance of engaging in bully-victim behaviour. This is consistent with the propositions of routine activities theory, which states that spending more time online makes users suitable targets for victimisation (Ngo et al., 2020). Even though this group is mainly characterised by negative attributes, sometimes they had consciousness (IC5, m=3.47), revealing their social aspects and apparently subscribing to peer norms (EF2, m=2.60) in an effort to defend friends during online fights.

Cluster 2 SIMBV were also popular (IC10, m=1.53). According to Ndyave and Kyobe (2019), popularity is a form of implicit power, where those who possess it are more likely to engage in mobile bully-victim behaviour compared to those who do not possess such power. These researchers indicate that popular adolescents may be bullied by spreading rumours or exposing their secrets, which triggers those with power to retaliate. It is crucial to note that cluster 2 SIMBVs were also bullied/marginalised during their school years (IC12, m=1.57). According to Ettekal and Ladd (2017) majority of SIMBVs are students who were victims or marginalised bully-victims during their early teenage years. Hence, it is not surprising that cluster 2 SIMBVs engage in bully-victim behaviour more compared to other clusters.

Cluster 3 SIMBVs on the other hand, rarely adopted aggressive behaviour (IC1, m=3.31), even though they sometimes retaliated towards their parents (IC2, m=3.00). This is not surprising as this group was rarely exposed to violence (EF6, m=3.50). This may have had a positive impact on how Cluster 3 SIMBVs were treated online and how they interacted with others. During their school years, they rarely had negative experiences (IC12, m=4.25). This group also engaged in bully-victim behaviour on rare occasions (IC12, m=3.69). However, since they spend more time online (IC6, m=2.44) they were sometimes bullied, and sometimes retaliated (IC15, m=3.06).

Relationships among the conceptual model constructs

Based on cluster analysis findings, there is a relationship between environmental factors and individual characteristics. For example, Cluster 2 SIMBVs were exposed to violence in their communities (EF6, m=2.03) and aggression within their immediate environments via coercion by parents (EF8, m=2.20). This resulted in Cluster 2 SIMBVs adopting aggressive tendencies (IC1, m=1.71) as part of their individual characteristics. These characteristics were evident through frequent hostile behaviour towards their parents at home (IC2, m=2.20). In addition, Cluster 2 SIMBVs retaliated against mobile bullies frequently (IC15, m=2.57). This shows how environmental factors (immediate and distal) influence the individual characteristics of socially integrated mobile bully-victims. These findings are consistent with the General Aggression Model (GAM), which states that exposure to violence influences an individual's aggression (Bushman & Anderson, 2020). It is important to note that the opposite was observed with cluster 3 SIMBVs, who were rarely exposed to violence (EF6, M=3.50) and as a consequence, became less likely to adopt aggressive behaviour as their individual characteristic (IC1, m=3.71).

The results also show that individual characteristics influence how SIMBVs react in digital environments when they see their friends being bullied. For example, Cluster 2 SIMBVs had high levels of consciousness, which influenced how they viewed peer norms of their friendship groups. These individuals were diligent in following the peer norms of their groups such as defending one another online (EF2, m=2.60). Thus, a high degree of consciousness influenced SIMBV behaviour on Mobile Social Networks (MSNs). These findings are consistent with the Developmental System Theory (DST) used to explain the relationship between the conceptual model constructs in Chapter 3. According to the DST, a person's behaviour is an outcome of a two-way relationship between environmental factors, and individual characteristics. The cluster analysis results of Cluster 2 support this view.

Most representative cluster of SIMBV characteristics

Table 7.8.2 shows that the typical characteristics of SIMBVs in a South African university are revealed in Cluster 2. Most of the negative individual characteristics predicted by the conceptual model (highlighted in amber) are prevalent in Cluster 2 when compared to other clusters. We see almost a similar pattern with environmental influences. In addition, Cluster 2 had the greatest number of (30/54) i.e., 55%+ of those SIMBVs studied. It reveals that a typical SIMBV in a South African university would have the following individual characteristics (characteristics adoption, hostility, high consciousness, popularity, spending more time online, low agreeableness, school victimisation experience, use of fake accounts, engage in bully-victim behaviour often) and be influenced by the following environmental influencing factors (peer norms, coercion, exposure to violence & cultural expectations).

The quantitative findings of Cluster 2 provided a list of significant SIMBV characteristics. These findings were complemented by the qualitative findings. When examining environmental factors, cluster analysis showed that Cluster 2 SIMBVs were bullied/marginalised bully-victims during their school years. Student 29, who is a member of Cluster 2 revealed that:

"I kept quiet most of the time, but sometimes I defend myself."

In addition, cultural expectations were one of the significant environmental factors of the cluster analysis and Cluster 2 was mainly influenced by gender stereotypes of the community.

Student 23 reported that:

"*Women tend to be shamed more for what they wear and how they act whereas men have more freedom of expression.*"

Cluster 2 SIMBVs also witnessed extreme forms of violence, as reported by Student 2:
"*I'm from a township, so there are lots of gang fights I have witnessed*."

7.9. Iteration 2 SIMBV App evaluation

The objective of this section is to assess whether the updated SIMBV mobile application sufficiently measured the components of the conceptual model. Furthermore, the user's feedback on the functionality of the application was used to assess the mobile application.

Cultural expectations, exposure to violence, and technological affordance such as using a fake accounts, were incorporated to the updated version of the application. These variables were not examined during the first iteration. Cluster analysis results indicate that these factors had a significant influence of SIMBVs (cultural expectations). Therefore, individual factors, environmental factors, and socially integrated mobile bully-victim variables which formed the conceptual model were sufficiently examined.

The functionality and usability of the SIMBV application was further assessed through student feedback. The students were asked to comment on what works and what needs to improve. Below is a summary of the feedback, presented in Table 7.9.1.

Table 7.9.1: Mobile application positive feedback

Useful Features	Examples
Confidentiality	**Case 7:** "*IThis app is a useful tool for sharing people's social media experiences and how it impacts them. This can be employed to create strategies that aid in the fight against cyber bullying*". **Case 19:** "*Documenting people's feelings and experiences with bullying is a good and interesting idea*".
Informative content	**Case 10:** "*In my opinion, this is an excellent application that can greatly assist victims of mobile bullying*". **Case 4:** "*Its informative*".
Ease of use	**Case 22:** "*I think this app is great and easy to use*". **Case 3:** "*I think it is a great app that is very easy to navigate*". **Case 1:** "*The simplicity*".

Based on the feedback of students in Table 7.9.1 above, it is clear in order to obtain honest experiences and views on mobile bullying and mobile victimisation, the research instrument must have anonymity as a feature. This makes students to feel safe and free to express their views and to share experiences. These views are consistent with the feedback provided in the first iteration. In addition, the features of the application must be interesting, inviting, and easy to use. Students also provided compliments centred around the mobile application being informative. This is due to the inclusion of the mobile bullying section which provides information on mobile bullying, retaliation, and the consequences of mobile bullying.

Table 7.9.2: Mobile application feedback, features to be improved

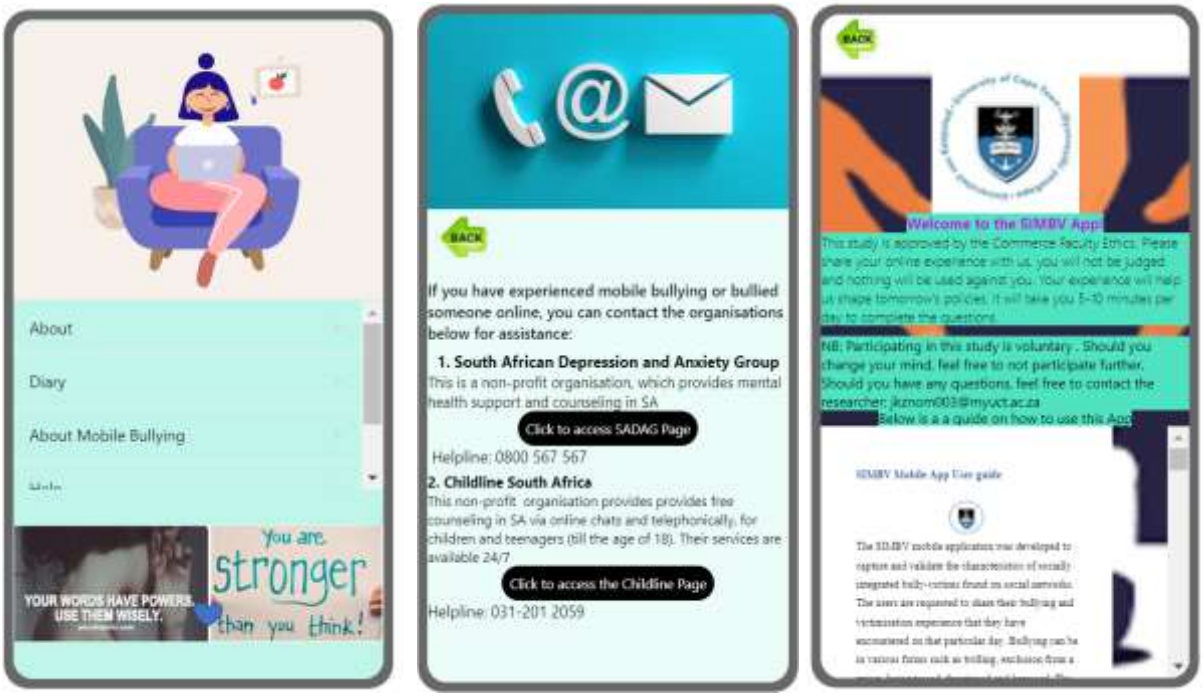
Improvements/suggestions	Examples
Words of affirmation	**Case 3:** *"It may be worth adding some random messages with positive affirmations to remind victims that they are worthy and wonderful".*
Format	**Case 4:** *"To make it easier for the user to continue reading the information, it's best to break it up into chunks and add a 'next' arrow instead of a whole paragraph".*
Navigation	**Case 7:** *"Although his app may look basic at first, once you examine it in detail, you will discover that it provides all the necessary help/guidelines for those involved in bullying, it would be helpful to have some quick links in the 'Help' tab, though".* **Case 10:** *"It was initially difficult for me to navigate because I couldn't easily find the 'back' button".*
User guide	**Case 5:** *"There are no instructions on how to use it".*

In terms of improving the mobile application, as per the feedback in Table 7.9.2 from the students, the main focus was the interface and functionality of the mobile application. Below are the common points of improvements that the participants suggested:

1. links for help lines
2. words of affirmation for victims
3. Add the guide on the app

The above concerns were addressed as per the Figure 7.9.1. The "Home" page now includes words of affirmation, which are also included in the "Diary" landing page. Additionally, the links to the organisations that help victims of cyberbullying have been included in the "Help" page. The guide on how to use the application was sent to students separately via the invitation email, now the PDF has been uploaded as part of the "About" page of the SIMBV mobile application. In addition, the text input boxes have autocorrect and text editing enabled so that students can modify their input.

Figure 7.9.1: Enhanced (Third Version) SIMBV mobile application



7.10. Chapter summary and key findings

This chapter presents and analyses the combined results from the enhanced version of the mobile application. A total of 54 students, with attributes of a socially integrated mobile bully-victims participated on the second iteration. Consistent with the first iteration, a majority of the socially integrated mobile bully-victims were between the ages of 18-19 years, and they were females. More LGBTQAI SIMBVs, such as lesbians and gays, were identified in the second iteration. This follows the enhancement to the gender selection options of the mobile application, which allowed for diverse options compared to the version used in the first iteration. Furthermore, the improved version of open-ended questions relating to macrosystem, such as cultural expectations, provided new insights. According to students' observations, men have more privileges, and they are free whereas women are subjected to violence and stereotypes.

To determine the characteristics of socially integrated mobile bully-victims, K-means cluster analysis was used. In previous studies, this statistical technique has been used to identify characteristics of behaviours and the associated individual profiles (White & McNair, 2002; Antonenko et al., 2012). Cluster analysis was suitable for this study due to its ability to reveal individual characteristics and environmental factors of SIMBVs and the relationship between these two constructs. Overall, the findings revealed by Cluster 2 (most representative cluster of SIMBVs characteristics) are consistent with the conceptual model in the sense that individual characteristics and environmental factors influence the characteristics of SIMBVs. There were some slight differences in some variables of individual characteristics, for example, Cluster 2 results indicate that SIMBVs sometimes showed high consciousness. This conclusion contradicts the low levels of consciousness expected from the literature review by Alonso and Romero (2017). Qualitative analysis shed light on this, as it indicated that some students engage in mobile bullying to defend their friends, as per the peer norms of the group. This provided a view that SIMBVs can start off as mobile bullies, and they only show consciousness for within their friendship circles. In addition, the cluster analysis results revealed that students can also start as victims and end up as bully-victims. This is due to retaliating against mobile bullies. The cluster profiles provided an advantage in showcasing the profile of this group. Previous studies have highlighted that the SIMBV group mainly comprises individuals in the late adolescent stage (Ettekal & Ladd, 2017). This is consistent with the findings of the present study, as most Cluster 2 SIMBVs were between the ages of 18 and 19 years. Finally, the cluster 2 findings revealed that there is indeed a bi-directional relationship between individual characteristics and environmental factors, as proposed by the conceptual model of this study. The SIMBVs of Cluster 2 had mostly negative characteristics, such as hostility and low agreeableness, as proposed by the conceptual model, and these resulted from being exposed to aggression at home via coercion by parents, and at the community level through witnessing extreme violence such as community injustice. Furthermore, Cluster 2 SIMBVs also adopted aggressive behaviour they learnt through observations as they often retaliated and engaged in mobile bully-victim behaviour in digital environments. This shows how environmental factors influenced the SIMBVs as individuals, where their own individual characteristics are revealed in their interactions online.

Chapter 8

Discussion of the research findings

8.1. Introduction

The previous two chapters provided an overview of the data collected in two iterations using the mobile application. In addition, qualitative and quantitative datasets were analysed to draw conclusions based on the sub-research questions and objectives. The results and findings were presented. In addition, the application was evaluated based on feedback from participants and improved. The current chapter presents the findings from the previous chapters and discusses them in the context of the research questions. The hypotheses are tested and finally the main research question of this study is answered.

8.2. Demographics

8.2.1. Age

Both iterations showed that most socially integrated mobile bully-victims were between the ages of 18 and 19 years. When compared to earlier studies of mobile bully-victims (MBVs), the current findings differ from those of Kyobe (2019), who found that MBV behaviour would increase with age among high school students in South Africa. The present results, however, consistent with those of they are consistent with those of Lam et al. (2022), who reported that cyberbullying and cybervictimisation among college students decrease with age. On the other hand, Saleem, Khan, and Zafar (2021) found no age differences among undergraduate students between the ages of 18 and 25. Overall, this indicates that there are varying findings regarding age (Musharraf et al., 2019).

8.2.2. Gender

Iterations 1 and 2 found that the majority of the socially integrated mobile bully-victims were females. These findings are consistent with those of Skilbred-Fjeld, Reme and Mossige (2020), who reported that females between the ages of 18 and 21 tend to occupy the cyberbullying role more than their male counterparts. It is also crucial to note that gender is one of the demographic variables found to vary from study to study (Musharraf et al., 2019; Alrajeh et al., 2021). The varying findings are attributable to different cultural contexts (Myers & Cowie, 2016). This is clear from the findings of the second iteration. SIMBVs primarily consisted of females and the LGBTQ community. The qualitative findings of the first iteration indicate that there were homophobic attacks that the SIMBVs encountered online. This is not surprising in the context of South Africa, where women and the

LGBTQAI community are marginalised due to cultural and religious beliefs (Maake et al., 2023). Moreover, the cluster analysis and qualitative findings in Chapter 7 confirmed that in South Africa, the cultural norms and types of violence students have witnessed are centred around marginalising women and the LGBTQAI community. This study shows that marginalised groups have learnt to retaliate. This finding is consistent with a South African study by Kyobe (2016), also based in the Western Cape Province, which found pre-traditional victimisation (at school/within the community) results in females becoming mobile bully-victims later in life.

8.3. Study findings in relation to the research questions

The main research question for this study is: *How can a mobile application be developed and used to identify socially integrated mobile bully-victim characteristics?* To answer this question, the following sub-questions were formulated:

- What are the characteristics of socially integrated mobile bully-victims?
- How do the characteristics of socially integrated mobile bully-victims lead to social integration and mobile bully-victim behaviour?
- What features should a mobile application have in order to identify the characteristics of socially integrated mobile bully-victims better?

To answer these questions, existing literature on cyberbullying, mobile bullying, traditional bully-victims, cyberbully-victims, and socially integrated bully-victims was examined. The outcome of this examination was the proposed conceptual model, which was used to guide this study. The open-ended and closed-ended questions that formed part of the mobile application were based on the constructs used in the conceptual model. The use of the mobile application to collect data was guided by the Design Science (DS) research strategy. This strategy was also used to evaluate and improve the mobile application. The answers to the sub-questions and the main question are discussed in detail below.

8.3.1. What are the characteristics of socially integrated mobile bully-victims?

The findings in Chapter 7 (Table 7.6.3) confirm that the individual characteristics of SIMBVs mainly include: characteristic adoption (learnt aggressive behaviour); hostility; low agreeableness; openness; previous victimisation; frequent engagement in bully-victim behaviour; retaliation; popularity and at times, high consciousness. Some of these characteristics are the result of immediate and distal environmental factors. For example, learned aggression (characteristic adoption) behaviour is reported to result from parents coercing students to complete their chores. The qualitative findings presented in Chapter Six show that most parents tend to shout when the students do not attend/complete their chores. Hostility and low agreeableness displayed by SIMBVs can be attributable to being exposed to violence and witnessing extreme forms of violence, such as gang violence and community justice. The experiences shared by SIMBVs from a university in the Western Cape are consistent with the 2023 crime statistics presented by the South African Mister of Police. According to the BusinessTech (2023) online newsletter, as the biggest city in the Province, Cape Town is in the top 20 of the most violent cities in the world. Cape Town also has the largest number of universities in South Africa. Moreover, the SIMBVs grew up in communities (both rural and urban areas) that subscribe to cultural norms that promote gender stereotypes, whereby gender-based violence (GBV) is concealed. On the basis of the qualitative findings reported by SIMBVs, women are expected to be faithful to their partners and to persevere, instead of reporting abuse. These findings are consistent with a qualitative study by Dlamini (2023), who found that in South Africa, gender-based stereotypes that marginalise women and the LGBTQAI community are embedded within specific cultural and religious contexts. Therefore, it is not surprising that SIMBVs are hostile and have adopted aggressive behaviour as part of their individual characteristics.

The cluster analysis results in Table 7.6.3 (Chapter 7) confirm the General Aggression Model (GAM) prediction that environmental factors such as exposure to violence influence individual characteristics, resulting in changes in a person's behaviour (Allen et al., 2018). Moreover, the social learning theory posits that children learn aggression through observing interactions within proximal environments such as at home and at school (Bandura, 1977). In addition, victimisation and seeing parents/guardians being aggressive towards others encourage students to model the same behaviour to their peers (Moutloutse, Barkhuizen & Oliver, 2022).

It is also crucial to note that the individual characteristics of SIMBVs, such as hostility and popularity, had an impact on how they conducted themselves in the digital environment. Due to their hostile attitude, SIMMBVs frequently retaliated online. These results are consistent with the conclusions of Bondü (2018), who associates the trait of hostility with reactive aggression bully-victims. In addition, the fact that SIMBVs were popular (see Table 7.6.3) played a role in them frequently engaging in mobile bully-

victim behaviour. This group could use their implicit power to defend themselves and close friends. Based on the qualitative findings of iteration one, the SIMBVs would mock the mobile bullies. This act is not surprising as SIMBVs knew they had a larger audience (as they had many followers and likes) that would react to their comments. These findings are consistent with those of Ndyave and Kyobe (2019), who reported that popular students are more likely to engage in mobile bully-victims compared with unpopular ones. Overall, the results of the cluster analysis and qualitative findings show the interplay between individual characteristics and environmental factors.

8.3.2. How do the characteristics of socially integrated mobile bully-victims lead to social integration and mobile bully-victim behaviour?

The peer norms that SIMBVs subscribed to within their friendship circles promoted social integration. Based on the cluster analysis in Table 7.6.3, the key peer norm of the representative cluster (Cluster 2) was defending friends online. This resulted in SIMBVs retaliating on behalf of their friends and others as per the qualitative findings in chapter 6 and 7. This shows how peer norms influence the behaviour of SIMBVs online. This finding is consistent with social norms theory, which posits that behaviour is influenced by norms (Sunstein, 1996). Diligently (consciousness) adhering to peer norms that promote defending others online resulted in SIMBVs being well integrated, where, as a result, they had more likes on their posts and a larger number of followers on MSN i.e., they were characterised by popularity as per the cluster analysis findings. This could be the reason that troubling emotions such as anger and sadness were not significant variables in this study. Adolescents' self-concept, that is, how they perceive themselves, is influenced by popularity and social support, as reported by Fernández-Zabala et al. (2020). Therefore, being well integrated through friendship groups and popularity was a protective factor against negative self-concept and emotions.

The qualitative findings in Chapter 6, show that SIMBVs used exclusion and trolling to retaliate. Chapter 7 qualitative findings also showed that the SIMBVs engaged in heated arguments, which resulted in this group swinging between being a victim and a bully on MSN. The blocking feature, unfollow button, and comment section were instrumental features of MSNs that were used in relational bullying to retaliate, as per the qualitative findings in Chapter 6.

8.3.3. What features should a tool have to identify the characteristics of socially integrated mobile bully-victims better?

The features of the SIMBV application were first established through the design thinking (DT) process in Chapter 5. The key features based on previous studies and user feedback are that users prefer to remain anonymous, instructions on how to use the application must be clear, and information relating to coping mechanisms should be communicated with a positive tone.

These features were used to develop the SIMBV application, which mainly consisted of closed-end and open-ended questions relating to individual characteristics and experiences of students in digital and physical environments. The students who participated in the first iteration felt at ease when expressing themselves on the mobile application. This was because the mobile application allowed the user to respond anonymously. This shows the benefits of adopting the user-centered approach of Design Thinking (DT). In the second iteration, users found the mobile application to be informative and easy to use. This was the result of improving the application based on users' feedback about the user interface (UI) and the functionality of the application. The features requested by users were as follows: hotlines must be prominent, navigation buttons (back) must be consistent on every page, brighter colours are required, and background and font must be more inviting and interesting. In addition, the researcher added educational content about mobile bullying to raise awareness of this phenomenon; hence, the students found the application informative. Although positive feedback was received from the second iteration, there was still room for improvement. The SIMBVs shared additional requirements, such as words of affirmation, and noted that the format of educational information must be easy to navigate.

8.4. Hypotheses testing

In this section, the hypotheses made in Chapter 3 are tested.

> ***Hypothesis 1:*** *Socially integrated mobile bully-victims possess negative individual traits (such as low consciousness and hostile behaviour) and are exposed to aggression at home and in their communities.*

Hypothesis 1 is partially accepted, because the results of the cluster analysis in Chapter 7 (Table 7.6.3) showed that socially integrated mobile bully-victims also have both positive and negative basic tendencies. The negative basic tendencies were hostility, characteristic adoption, and low agreeableness. These findings are consistent with those by Ildirim Çalici and Erdoğan (2017) and Alonso and Romero (2017), who found a positive correlation between mobile bully-victim behaviour and individual factors such as hostility and low agreeableness.

The positive basic tendencies were openness and consciousness. Openness may be attributed to the fact that SIMBVs their being imaginative and creative. Furthermore, the cluster analysis results (see Table 7.6.3) indicated that the mean for consciousness was high (m=3.47). This is a result of socially integrated mobile bully-victims showing sympathy towards victims of mobile bullying. Based on the content analysis, students from both iterations of the study indicated that they sometimes defend mobile bully-victims whom they do not know, and sometimes they also defend their friends.

The cluster analysis results in Chapter 7 (Table 7.6.3) show that SIMBVs were exposed to aggression at home in the form of coercion and within their communities through collective violence and cultural norms. According to the qualitative findings of the first iteration (chapter 6), parents/guardians used corporal punishment when the students were younger, whereas now that they are young adults, parents tend to shout. At times, the students retaliated as per the quantitative findings of the second iteration. Maltreatment shapes the child's self-image, resulting in a child feeling inadequate, which makes them perceived as weak by perpetrators of bullying (Li, Liu & Yu, 2022). Furthermore, according to Sun et al. (2020), childhood maltreatment at home is a risk factor, as it can lead to tertiary students being perpetrators of cyberbullying. Therefore, it is not surprising that being coerced at home impacted the bully-victim behaviour of the students. In addition, negative environmental factors, such as exposure to violence and cultural norms that promoted GBV, were significant variables, according to the cluster analysis result. These factors influenced individual characteristics such as hostility.

> ***Hypothesis 2:*** *Tertiary students perceive the lack of mobile bullying consequences as a form of encouragement to continue bullying and retaliating.*

This hypothesis was rejected because the lack of university and MSN policies focusing on mobile bullying were not significant variables in the cluster analysis results. Even though this is the case, the students do not rely on the university to act on mobile bullying incidents. The students shared that their incidents might be actioned were the matter to go viral, or counselling will be recommended. This shows that, even though the plans for dealing with mobile bullying are not robust, there are certain measures in place. From an MSN perspective, Iteration 2 qualitative findings indicate that there were some satisfactory responses from the platform moderators.

> ***Hypothesis 3:*** *socially integrated mobile bully-victims prefer to use mobile social network features, as they enable them to bully others and avenge against their perpetrators without revealing their identity.*

The use of a fake account (openness) was a significant individual characteristic of SIMBVs. These findings are consistent with those of Lareki, Altuna and Martínez-de-Morentin (2023), who reported a positive correlation between the use of fake accounts and a high rate of cyberbullying. Therefore, Hypothesis 3 is accepted. Previous studies have attributed the high levels of openness for online bully-victims to anger and curiosity (Guo et al., 2021; Zhong et al., 2021; Giumetti & Kowalski, 2022).

> ***Hypothesis 4:*** *prior mobile victimisation or bullying experiences result in students becoming socially integrated mobile bully-victims.*

Cluster 2 SIMBVs, which are the representative group of this study, experienced more victimisation during their school years than the other clusters. As a result, as this group grew older, they became socially integrated mobile bully-victims at the undergraduate level. These findings are consistent with those of a South African study by Kyobe (2016), which found that a history of traditional victimisation caused students to later become mobile bully-victims.

8.5. Answer to the main research question

In this section, a response to the main research question of this study is provided and a view of the updated conceptual model is discussed. Lastly, a summary of the chapter is presented.

8.5.1. How can a mobile application be developed and used to identify socially integrated mobile bully-victim characteristics?

Based on the findings, a mobile application for identifying SIMBV characteristics must be developed using recognised development techniques, such as a Design Thinking (DT) process. DT is a user-centric approach, which aims to align the proposed solution to user's needs and solving the problem at hand in a way that is useful to the intended users. The developer /researcher must also select the appropriate tools (e.g. software) to use and should take into consideration the cost and ease to use of the development software. The development process should go through iterations where work is mapped to the design principles, guidelines, or theories, and employ both deductive and abductive reasoning.

The qualitative feedback from both iterations shows that in order for students to be willing to share details of their sensitive experiences relating to individual characteristics and environmental factors, the application should ensure the participant anonymity. It must also have an appealing design, be informative, and easy to navigate. These features impact how the participants interact with the

application and their willingness to share sensitive information about themselves, which assists in establishing their characteristics and factors that influence their behaviour. In addition, the researcher observed the significance of open-ended questions as part of the application. These enabled the SIMBVs to provide some context to the closed-ended questions. Furthermore, the responses from open-ended questions assisted in identifying how the interplay between individual characteristics and environmental factors occur and result in the development of SIMBV characteristics.

8.6. Summary

This chapter identified the key characteristics of SIMBV and environmental factors that influence them. The findings confirm the interplay between individual characteristics and environmental factors and how these inform the characteristics of SIMBV. The findings show the usefulness of using techniques, such as cluster analysis, which can measure the level of interaction between the characteristics and the influencing factors. This also emphasises the importance of considering both environmental factors and individual characteristics in the design of solutions intended to detect bullying behaviour on social networks as predicted by earlier studies (Balakrishnan, Khan & Arabnia, 2020). Various potential causes of social integration are highlighted and the relevant features that form part of the tool that identifies the characteristics of a SIMBV are presented. Most of the hypotheses have also been confirm in this study.

Chapter 9: Conclusion

This chapter concludes the current thesis by discussing the recommendations and limitations and future research.

9.1. Recommendations

Universities can use the findings of this study to craft anti-cyberbullying policies and awareness campaigns. University health care centres can also use the findings from this study develop appropriate treatment for socially integrated mobile bully-victims, given their characteristics. Policy makers, whose focus is on privacy regulations of the country, ought to partner up with universities to craft regulations that clearly stipulate the anti-bullying responsibilities of social media companies. This would ensure that social media companies exert greater effort in developing safety measures for their users and they are held accountable for incidents that are not addressed adequately. Furthermore, the police force in South Africa ought to have a unit dedicated to dealing with bullying online and on physical environments. This unit can take cases reported to social media companies by users and address them accordingly. This would also lessen the number of bully-victims as students will feel heard, and it will also decrease the likelihood of other users bullying students as they will be held accountable for their actions. Lastly, the social network platforms will be safer. These recommendations are consistent with previous calls for collaboration by different stakeholders if successful interventions are to be developed to address cyberbullying challenges.

9.2. Limitations

While this research provides insights into the characteristics of SIMBVs, there are some limitations. The samples size was 42 for the first iteration and 54 for the second iteration. Future studies should aim for larger samples. Internationally however, the prevalence of cyberbully-victims varies, where some studies have reported as little as 2.4%, and others as much as 33.3% (Costales et al., 2013; Balakrishnan, 2018). Therefore, it is not surprising that the percentage of socially integrated mobile bully-victims was 29% (42) on the first iteration. The second iteration had 54 socially integrated mobile bully-victims. Given that the current study is exploratory in nature and the sample exceed 30, the number recommended for qualitative studies, the identified socially integrated mobile bully-victims sample is sufficient (Hill, 1998).

Although the mobile application was enhanced with animations, background photos, consistent look and feel, the application is text heavy. This can impact user's appetite to continue answering the

questions and engaging with the application. In addition, the pre-requisite for accessing the mobile application is having a Gmail account. even though no personal information of the user is collected, some students might not have a Google account. Therefore, some students may be discouraged to participate in the study. Moreover, students from underprivileged upbringings, without constant internet connection may exit the study before 3 days or choose to not participate at all.

9.3. Future research

The findings of this research showed that a majority of the socially integrated mobile bully-victims were females. This is not surprising, given the cultural norms and the history of South Africa. Future research can be done to further explore the challenges that young females face in society and how this influences the development of socially integrated mobile bully-victim behaviour. Some LGBT students were also identified as socially integrated mobile bully-victims, even though they were few in number. Students also highlighted this group was discriminated against based on the cultural norms. Therefore, it would be interesting for future studies to identify the severity of the cultural norms, and their impact in the development of bully-victim behaviour of LGBTQAI students. Furthermore, it would be of benefit to compare and contrast these to those of young females. The feedback that was received from students during the mobile application evaluation phase suggests that students want to confide and share their mobile bullying and victimisation experiences, however, they still prefer to remain anonymous. Therefore, future studies can use this to explore ways to make the on-campus counselling available in a digital manner, whilst ensuring the students remain anonymous. This would mean that students feel free to share their experiences, increasing the chances of suggesting suitable treatment. Furthermore, this would make students see value in therapy sessions, as the findings of this study suggest students did not see how being referred to counselling instead of dealing with their report would add value to their lives.

Future studies can also incorporate machine learning algorithms to analyse posts and daily social media activities of the SIMBV App users, this would provide psychologists and policy makers with more context of how mobile bullying emerges and evolves. Keeping them up to date and ensuring treatments and policies tailor made for mobile bullying roles remain up to date and effective. Moreover, a dashboard that provides real-time insights of the prevalence of each mobile bullying role and the associated top drivers and characteristics per role. A roll out of the mobile application throughout South Africa coupled with an additional feature on the mobile application i.e., a drop down selection feature with the list of universities in South Africa would enhance the value of the dashboard. A 360 view of mobile bullying per tertiary institution would be of value to each university.

This would enable each university with actionable insights that can be used to inform the crafting of ant-cyberbullying policies, mental health facilities and services offerings of the university. Overall, the Department of Higher Education in South Africa can get a view of how mobile bullying is impacting students. This would trigger a plan of action from the government and inform the continuous improvement of the Cybercrimes Act which has limited scope on cyberbullying.

To continuously improve the mobile application, a feedback section dedicated to psychologists would beneficial. In addition, due to South Africa having limited facilities that deal with mobile bullying, adding contact details of psychologists that specialise in mobile bullying cases can assist the students to get help on time. The mobile bullying awareness section can also be enhanced with interactive content instead of being more text-based. Periodic themed campaigns would be beneficial as they would ensure sufficient focus is applied on each aspect of this phenomena. Prizes associated with campaigns would also attract more students to participate and encourage them to go through the content of the mobile application.

References

1. Abrahams, D. (2010). A synopsis of urban violence in South Africa. *International review of the Red Cross*, *92*(878), 495-520.
2. Abro, M.M.Q., Khurshid, M.A. and Aamir, A., 2015. The use of mixed methods in management research. *Journal of Applied Finance and Banking*, *5*(2), p.103.
3. Adelson, J. L., & McCoach, D. B. (2010). Measuring the mathematical attitudes of elementary students: The effects of a 4-point or 5-point Likert-type scale. *Educational and Psychological measurement*, *70*(5), 796-807.
4. Adhabi, E., & Anozie, C. B. (2017). Literature review for the type of interview in qualitative research. *International Journal of Education*, *9*(3), 86-97.
5. Akeusola, B. N. (2023). Social Media and the Incidence of Cyberbullying in Nigeria: Implications for Creating a Safer Online Environment. *KIU Journal of Humanities*, *8*(3), 125-137.
6. Anderson, C. A., & Bushman, B. J. (2002). Human aggression. *Annual review of psychology*, *53*(1), 27-51.
7. Andoh-Baidoo, F., White, E. and Kasper, G., 2004. Information Systems' Cumulative Research Tradition: A Review of Research Activities and Outputs Using Pro forma Abstracts. *AMCIS 2004 Proceedings*, p.524.
8. Adzobu, P., Okyere, S., & Banji, G. T. (2021). Innovation in the library: Adoption of smartphones in accessing electronic resources in a Ghanaian university. *Journal of Librarianship and Information Science*, *53*(3), 367-381.
9. Alonso, C. and Romero, E., 2017. Aggressors and victims in bullying and cyberbullying: A study of personality profiles using the five-factor model. *The Spanish journal of psychology*, *20*.
10. Alrajeh, S. M., Hassan, H. M., Al-Ahmed, A. S., & Alsayed Hassan, D. (2021). An investigation of the relationship between cyberbullying, cybervictimization and depression symptoms: A cross sectional study among university students in Qatar. *PloS one*, *16*(12), e0260263.
11. Anderson, G. M. (2019). Autism Risk and Serotonin Reuptake Inhibitors. *JAMA psychiatry*, *76*(5), 547-548.
12. Antiri, K. O. (2016). Types of bullying in the senior high schools in Ghana. *Journal of education and practice*, *7*(36), 131-138.

13. Antonenko, P. D., Toy, S., & Niederhauser, D. S. (2012). Using cluster analysis for data mining in educational technology research. *Educational Technology Research and Development*, *60*, 383-398.

14. Asdar, & Badrullah (2016). Method of Successive Interval in Community Research (Ordinal Transformation Data to Interval Data in Mathematic Education Studies) 1.

15. Aydın, A., Arda, B., Güneş, B., & Erbaş, O. (2021). Psychopathology of cyberbullying and internet trolling. *Journal of Experimental and Basic Medical Sciences*, *2*(3), 380-391.

16. Ayer, A. J. (1982). *The origins of pragmatism: Studies in the philosophy of Charles Sanders Peirce and William James*. Springer.

17. Azungah, T. (2018). Qualitative research: deductive and inductive approaches to data analysis. *Qualitative research journal*, *18*(4), 383-400.

18. Baak, M., Koopman, R., Snoek, H., & Klous, S. (2020). A new correlation coefficient between categorical, ordinal and interval variables with Pearson characteristics. *Computational Statistics & Data Analysis*, *152*, 107043.

19. Bae, S.M., 2021. The relationship between exposure to risky online content, cyber victimization, perception of cyberbullying, and cyberbullying offending in Korean adolescents. *Children and youth services review*, *123*, p.105946.

20. Bahari, S.F., 2010. Qualitative versus quantitative research strategies: contrasting epistemological and ontological assumptions. *Sains Humanika*, *52*(1).

21. Balakrishnan, V., Khan, S., Fernandez, T., & Arabnia, H. R. (2019). Cyberbullying detection on twitter using Big Five and Dark Triad features. *Personality and individual differences*, *141*, 252-257.

22. Balakrishnan, V., Khan, S., & Arabnia, H. R. (2020). Improving cyberbullying detection using Twitter users' psychological features and machine learning. *Computers & Security*, *90*, 101710.

23. Balakrishnan, V., & Norman, A. A. (2020). Psychological motives of cyberbullying among Malaysian young adults. *Asia Pacific Journal of Social Work and Development*, *30*(3), 181-194.

24. Baldry, A. C., Farrington, D. P., & Sorrentino, A. (2017). School bullying and cyberbullying among boys and girls: Roles and overlap. *Journal of Aggression, Maltreatment & Trauma*, *26*(9), 937-951.

25. Ball, H. A., Arseneault, L., Taylor, A., Maughan, B., Caspi, A., & Moffitt, T. E. (2008). Genetic and environmental influences on victims, bullies and bully-victims in childhood. *Journal of Child Psychology and Psychiatry*, *49*(1), 104-112.

26. Bandura, A., 1978. Social learning theory of aggression. *Journal of communication*, *28*(3), pp.12-29.

27. Bandura, A. and McClelland, D.C. (1977) Social Learning Theory. Prentice Hall, Englewood Cliffs.

28. Bashir, M. U., Ibrahim, M., & Saidu, A. S. (2022). Cyberbullying victimization amongst undergraduate students in university of Maiduguri, Borno State, Nigeria. Kaduna Journal of Humanities 6 (1), 1-15. https://www.researchgate.net/publication/364323399

29. Barlett, C. P., Prot, S., Anderson, C. A., & Gentile, D. A. (2017). An empirical examination of the strength differential hypothesis in cyberbullying behavior. *Psychology of violence*, *7*(1), 22.

30. Barlett, C. P., DeWitt, C. C., Maronna, B., & Johnson, K. (2018). Social media use as a tool to facilitate or reduce cyberbullying perpetration: A review focusing on anonymous and nonanonymous social media platforms. *Violence and gender*, *5*(3), 147-152.

31. Bayles, M. D. (2017). A concept of coercion. In *Coercion* (pp. 16-29). Routledge.

32. Belisario, J. S. M., Jamsek, J., Huckvale, K., O'Donoghue, J., Morrison, C. P., & Car, J. (2015). Comparison of self-administered survey questionnaire responses collected using mobile apps versus other methods. *Cochrane database of systematic reviews*, (7).

33. Betts, L. R., Baguley, T., & Gardner, S. E. (2019). Examining adults' participant roles in cyberbullying. *Journal of social and personal relationships*, *36*(11-12), 3362-3370.

34. Betts, L. R., Spenser, K. A., & Gardner, S. E. (2017). Adolescents' involvement in cyber bullying and perceptions of school: The importance of perceived peer acceptance for female adolescents. *Sex roles*, *77*(7), 471-481

35. Boman, J. H., Mowen, T. J., & Higgins, G. E. (2019). Social learning, self-control, and offending specialization and versatility among friends. *American Journal of Criminal Justice*, *44*, 3-22.

36. Bondü, R. (2018). Is bad intent negligible? Linking victim justice sensitivity, hostile attribution bias, and aggression. *Aggressive behavior*, *44*(5), 442-450.

37. Brath, R., & Peters, M. (2004). Dashboard design: Why design is important. *DM Direct*, *85*, 1011285-1.

38. Branic, N., 2015. Routine activities theory. *The encyclopedia of crime and punishment*, pp.1-3.

39. Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Harvard university press.

40. Buelga, S., Martínez-Ferrer, B., Cava, M. J., & Ortega-Barón, J. (2019). Psychometric properties of the CYBVICS cyber-victimization scale and its relationship with psychosocial variables. *Social Sciences*, *8*(1), 13.

41. Buglass, S. L., Abell, L., Betts, L. R., Hill, R., & Saunders, J. (2021). Banter versus bullying: A university student perspective. *International journal of bullying prevention*, *3*, 287-299.

42. BusinessTech: The most dangerous cities in South Africa. (2021, January 20). Retrieved from https://businesstech.co.za/news/lifestyle/462264/the-most-dangerous-cities-in-south-africa/

43. BusinessTech: These are the biggest social media and chat platforms in 2019. (2019, February 1). Retrieved from https://businesstech.co.za/news/internet/296752/these-are-the-biggest-social-media-and-chat-platforms-in-2019/

44. BusinessTech: New rules for WhatsApp and other messages in South Africa set to be signed into law. (2020, December 3). Retrieved from https://businesstech.co.za/news/technology/454236/new-rules-for-whatsapp-and-other-messages-in-south-africa-set-to-be-signed-into-law/

45. BusinessTech: The latest crime stats for South Africa; everything you need to know. (2023, August 18). Retrieved from https://businesstech.co.za/news/lifestyle/711992/the-latest-crime-stats-for-south-africa-everything-you-need-to-know-1/

46. Burnard, P., Gill, P., Stewart, K., Treasure, E., & Chadwick, B. (2008). Analysing and presenting qualitative data. *British dental journal*, *204*(8), 429-432.

47. Burke WinkelmAn, S., Oomen-Early, J., Walker, A.D., Chu, L. and Yick-Flanagan, A., 2015. Exploring cyber harassment among women who use social media. *Universal journal of public health*, *3*(5), p.194.

48. Burton, P., & Mutongwizo, T. (2009). Inescapable violence: Cyber bullying and electronic violence against young people in South Africa. *Centre for Justice and Crime Prevention*, *8*, 1-12.

49. Byers, D.S. and Cerulli, M., 2020. Staying in their own lane: Ethical reasoning among college students witnessing cyberbullying. *Journal of Diversity in Higher Education*.

50. Campfield, D.C., 2008. *Cyber bullying and victimization: Psychosocial characteristics of bullies, victims, and bully/victims*. University of Montana.

51. Carvalho, M., Branquinho, C., & de Matos, M. G. (2021). Cyberbullying and bullying: Impact on psychological symptoms and well-being. *Child Indicators Research*, *14*, 435-452.

52. Cavalcanti, J.G. and Pimentel, C.E., 2016. Personality and aggression: A contribution of the General Aggression Model. *Estudos de Psicologia (Campinas)*, *33*, pp.443-451.

53. Chatzakou, D., Kourtellis, N., Blackburn, J., De Cristofaro, E., Stringhini, G., & Vakali, A. (2017, June). Mean birds: Detecting aggression and bullying on twitter. In *Proceedings of the 2017 ACM on web science conference* (pp. 13-22).

54. Chen, W. and Hirschheim, R., 2004. A paradigmatic and methodological examination of information systems research from 1991 to 2001. *Information systems journal*, *14*(3), pp.197-235.

55. Cheung, A. S., Leemaqz, S. Y., Wong, J. W., Chew, D., Ooi, O., Cundill, P., ... & Pang, K. C. (2020). Non-binary and binary gender identity in Australian trans and gender diverse individuals. *Archives of sexual behavior*, *49*, 2673-2681.

56. *Childline South Africa (2003, August 29). Childline. Retrieved August 12, 2021, from https://www.childlinesa.org.za/*

57. Choi, K. S., Cho, S., & Lee, J. R. (2019). Impacts of online risky behaviors and cybersecurity management on cyberbullying and traditional bullying victimization among Korean youth: Application of cyber-routine activities theory with latent class analysis. *Computers in Human Behavior*, *100*, 1-10.

58. Cho, Y. K., & Yoo, J. W. (2017). Cyberbullying, internet and SNS usage types, and perceived social support: A comparison of different age groups. *Information, Communication & Society*, *20*(10), 1464-1481.

59. Chu, X., & Xie, R. (2023). Parental Harsh Discipline and Cyberbullying Perpetration among Chinese College Students: Why and When are They Related?. *Deviant Behavior*, *44*(1), 57-74.

60. Chung, J.Y. and Lee, S., 2020. Are bully-victims homogeneous? Latent class analysis on school bullying. *Children and youth services review*, *112*, p.104922.

61. Chughtai, B. R. (2021). Effects of Cyberbullying on the Youth: A Comparative Study of Online Bullying and Mobile Bullying. *Social Work Chronicle*, *10*(1), 51.

62. Cilliers, L., & Pylman, J. (2022). South African students' perceptions of the flipped classroom: A case study of higher education. *Innovations in Education and Teaching International*, *59*(3), 296-305.

63. Clarke, V., Braun, V., & Hayfield, N. (2015). Thematic analysis. *Qualitative psychology: A practical guide to research methods*, *3*, 222-248.

64. Cohen, L. E., & Felson, M. (1979). Social change and crime rate trends: A routine activity approach. *American sociological review*, 588-608.

65. Çokluk, G., 2019. *Examining the predictive roles of cyber victimization, gender, revenge, and empathy on cyber bullying perpetration* (Master's thesis).

66. Connelly, L. M. (2014). Ethical considerations in research studies. *Medsurg nursing*, *23*(1), 54-56.

67. Coutrot, A., Schmidt, S., Coutrot, L., Pittman, J., Hong, L., Wiener, J. M., ... & Spiers, H. J. (2019). Virtual navigation tested on a mobile app is predictive of real-world wayfinding navigation performance. *PloS one*, *14*(3), e0213272.

68. Cronin, T. J., Pepping, C. A., & O'donovan, A. (2018). Attachment to friends and psychosocial well-being: The role of emotion regulation. *Clinical Psychologist*, *22*(2), 158-167.

69. Csizér, K., & Dörnyei, Z. (2005). The internal structure of language learning motivation and its relationship with language choice and learning effort. *The modern language journal*, *89*(1), 19-36.

70. Dacakis, G., Erasmus, J., Nygren, U., Oates, J., Quinn, S., & Södersten, M. (2022). Development and initial psychometric evaluation of the self-efficacy scale for voice modification in trans women. *Journal of Voice*.

71. Davies, S. E. (2020). The introduction of research ethics review procedures at a university in South Africa: Review outcomes of a social science research ethics committee. *Research Ethics*, *16*(1-2), 1-26.

72. De Bolle, M. and Tackett, J.L., 2013. Anchoring bullying and victimization in children within a five–factor model–based person–centred framework. *European Journal of Personality*, *27*(3), pp.280-289.

73. Ding, Y., Li, D., Li, X., Xiao, J., Zhang, H., & Wang, Y. (2020). Profiles of adolescent traditional and cyber bullying and victimization: The role of demographic, individual, family, school, and peer factors. *Computers in Human Behavior*, *111*, 106439.

74. Donegan, R., 2012. Bullying and cyberbullying: History, statistics, law, prevention and analysis. *The Elon Journal of Undergraduate Research in Communications*, *3*(1), pp.33-42.

75. Doubleday, K. F., Crews, K. A., Eisenhart, A. C., & Young, K. R. (2022). Post-survey Likert constructions: an adaptive method for generalizing perceptions of environmental variability. *GeoJournal*, 1-15.

76. Dredge, R., Gleeson, J. F., & De la Piedad Garcia, X. (2014). Risk factors associated with impact severity of cyberbullying victimization: a qualitative study of adolescent online social networking. *Cyberpsychology, behavior, and social networking*, *17*(5), 287-291.

77. Dresch, A., Lacerda, D. P., & Miguel, P. A. C. (2015). A distinctive analysis of case study, action research and design science research. *Revista brasileira de gestão de negócios*, *17*, 1116-1133.

78. Driscoll, D. L., Appiah-Yeboah, A., Salib, P., & Rupert, D. J. (2007). Merging qualitative and quantitative data in mixed methods research: How to and why not.

79. Drisko, J. W., & Maschi, T. (2016). *Content Analysis*. Pocket Guide to Social Work Re.

80. Drost, E. A. (2011). Validity and reliability in social science research. *Education Research and perspectives*, *38*(1), 105-123.

81. Dworkin, S. L. (2012). Sample size policy for qualitative studies using in-depth interviews. *Archives of sexual behavior*, *41*, 1319-1320.

82. Eaton, P.W., 2014. Viewing digital space (s) through Bronfenbrenner's Ecological Model. *Choreographies of becoming. Personal research blog*.

83. Eaton, L. and Louw, J., 2000. Culture and self in South Africa: Individualism-collectivism predictions. *The Journal of social psychology*, *140*(2), pp.210-217.

84. Egan, V. and Beadman, M., 2011. Personality and gang embeddedness. *Personality and Individual Differences*, *51*(6), pp.748-753.

85. Ekolu, S. O., & Quainoo, H. (2019). Reliability of assessments in engineering education using Cronbach's alpha, KR and split-half methods. *Global journal of engineering education*, *21*(1), 24-29.

86. Elo, S., & Kyngäs, H. (2008). The qualitative content analysis process. *Journal of advanced nursing*, *62*(1), 107-115.

87. Escortell, R., Aparisi, D., Martínez-Monteagudo, M. C., & Delgado, B. (2020). Personality traits and aggression as explanatory variables of cyberbullying in Spanish preadolescents. *International journal of environmental research and public health*, *17*(16), 5705.

88. Espelage, D. L. (2014). Ecological theory: Preventing youth bullying, aggression, and victimization. *Theory into Practice*, *53*(4), 257-264.

89. Espelage, D.L., RAO, I.A. and Craven, R.G., 2012. Theories of cyberbullying. In *Principles of cyberbullying research* (pp. 77-95). Routledge.

90. Erişti, B., 2019. Reactions Victims Display Against Cyberbullying: A Cross-cultural Comparison. *International Journal of Contemporary Educational Research*, *6*(2), pp.426-437.

91. Erlingsson, C., & Brysiewicz, P. (2017). A hands-on guide to doing content analysis. *African journal of emergency medicine*, *7*(3), 93-99.

92. Ettekal, I., & Ladd, G. W. (2017). Developmental continuity and change in physical, verbal, and relational aggression and peer victimization from childhood to adolescence. *Developmental psychology*, *53*(9), 1709.

93. Fahy, A. E., Stansfeld, S. A., Smuk, M., Smith, N. R., Cummins, S., & Clark, C. (2016). Longitudinal associations between cyberbullying involvement and adolescent mental health. *Journal of Adolescent Health*, *59*(5), 502-509.

94. Faub, H. (2020). *Project management tools to support agile methods in the workplace* (Doctoral dissertation, North Carolina State University).

95. Faurholt-Jepsen, M., Vinberg, M., Frost, M., Christensen, E. M., Bardram, J. E., & Kessing, L. V. (2015). Smartphone data as an electronic biomarker of illness activity in bipolar disorder. *Bipolar disorders*, *17*(7), 715-728.

96. Felder, R., Litzinger, T., Lee, S. H., & Wise, J. (2005, June). A study of the reliability and validity of the felder soloman index of learning styles. In *2005 Annual Conference* (pp. 10-95).

97. Fernández-Zabala, A., Ramos-Díaz, E., Rodríguez-Fernández, A., & Núñez, J. L. (2020). Sociometric popularity, perceived peer support, and self-concept in adolescence. *Frontiers in Psychology*, *11*, 594007.

98. Foody, M., Samara, M., & Carlbring, P. (2015). A review of cyberbullying and suggestions for online psychological therapy. *Internet Interventions*, *2*(3), 235-242.

99. Fors Connolly, F., & Johansson Sevä, I. (2021). Agreeableness, extraversion and life satisfaction: Investigating the mediating roles of social inclusion and status. *Scandinavian journal of psychology*, *62*(5), 752-762.

100. Frades, I., & Matthiesen, R. (2010). Overview on techniques in cluster analysis. *Bioinformatics methods in clinical research*, 81-107.

101. Francis, L.J., 1997. The psychology of gender differences in religion: A review of empirical research. *Religion*, *27*(1), pp.81-96.

102. Gadrich, T., & Bashkansky, E. (2012). ORDANOVA: analysis of ordinal variation. *Journal of Statistical Planning and Inference*, *142*(12), 3174-3188.

103. Gámez-Guadix, M., Gini, G., & Calvete, E. (2015). Stability of cyberbullying victimization among adolescents: Prevalence and association with bully–victim status and psychosocial adjustment. *Computers in human behavior*, *53*, 140-148.

104. Geerts, G.L., 2011. A design science research methodology and its application to accounting information systems research. *International journal of accounting Information Systems*, *12*(2), pp.142-151.

105. Giang, M. T., & Graham, S. (2008). Using latent class analysis to identify aggressors and victims of peer harassment. *Aggressive Behavior: Official Journal of the International Society for Research on Aggression*, *34*(2), 203-213.

106. Giumetti, G. W., & Kowalski, R. M. (2022). Cyberbullying via social media and well-being. *Current Opinion in Psychology*, 101314.

107. Giumetti, G. W., Kowalski, R. M., & Feinn, R. S. (2022). Predictors and outcomes of cyberbullying among college students: A two wave study. *Aggressive behavior*, *48*(1), 40-54.

108. Goldkuhl, G. (2006). Practice theory vs practical theory: Combining referential and functional pragmatism. *Information Systems (ALOIS)*, *1*(2).

109. Goldkuhl, G. (2012). Pragmatism vs interpretivism in qualitative information systems research. *European journal of information systems*, *21*(2), 135-146.

110. Goles, T. and Hirschheim, R., 2000. The paradigm is dead, the paradigm is dead… long live the paradigm: the legacy of Burrell and Morgan. *Omega*, *28*(3), pp.249-268.

111. Golf-Papez, M. and Veer, E., 2017. Don't feed the trolling: rethinking how online trolling is being defined and combated. *Journal of Marketing Management*, *33*(15-16), pp.1336-1354.

112. Görzig, A., & Machackova, H. (2015). Cyber-bullying from a socio-ecological perspective: a review of evidence from cross-national data.

113. Grimes, D. A., & Schulz, K. F. (2002). Descriptive studies: what they can and cannot do. *The Lancet*, *359*(9301), 145-149.

114. Guo, S., Liu, J., & Wang, J. (2021). Cyberbullying roles among adolescents: a social-ecological theory perspective. *Journal of School Violence*, *20*(2), 167-181.

115. Gurieva, S. D., Kazantseva, T. V., Mararitsa, L. V., & Gundelakh, O. E. (2022). social Perceptions of gender Differences and the subjective significance of the gender inequality issue. *Psychology in Russia*, *15*(2), 65.

116. Hadiya, B. (2022). Cyber Bullying Detection in Twitter using Machine Learning Algorithms. *Journal of Computer Science IJCSIS*.

117. Hamuddin, B., Rahman, F., Pammu, A., Sanusi Baso, Y., & Derin, T. (2020). CYBERBULLYING AMONG EFL STUDENTS'BLOGGING ACTIVITIES: MOTIVES AND PROPOSED SOLUTIONS. *Teaching English with Technology*, *20*(2), 3-20.

118. Hansen, D.T., 2010. Walking with Diogenes: Cosmopolitan accents in philosophy and education. *Philosophy of Education Archive*, pp.1-13.

119. Hall, D. L., Silva, Y. N., Wheeler, B., Cheng, L., & Baumel, K. (2021). Harnessing the power of interdisciplinary research with psychology-informed cyberbullying detection models. *International journal of bullying prevention*, 1-8.

120. Haque, M., & Indah, D. R. (2022). Design of Digital Library Prototype Using The Design Thinking Method. *Jurnal Riset Informatika*, *5*(1), 7-14.

121. Härkönen, U., 2001. The Bronfenbrenner ecological systems theory of human development.

122. Hellfeldt, K., López-Romero, L., & Andershed, H. (2020). Cyberbullying and psychological well-being in young adolescence: the potential protective mediation effects of social support from family, friends, and teachers. *International journal of environmental research and public health*, *17*(1), 45.

123. Hensums, M., De Mooij, B., Kuijper, S. C., Fekkes, M., & Overbeek, G. (2022). What works for whom in school-based anti-bullying interventions? An individual participant data meta-analysis. *Prevention science*, 1-12.

124. Hill, R. (1998). What sample size is “enough” in internet survey research. *Interpersonal Computing and Technology: An electronic journal for the 21st century*, *6*(3-4), 1-12.

125. Hinduja, S. and Patchin, J.W., 1998. Cyberbullying research summary. *Developmental Psychology*, *34*(2), pp.299-309.

126. Hinduja, S., & Patchin, J. W. (2008). Cyberbullying: An exploratory analysis of factors related to offending and victimization. *Deviant behavior*, *29*(2), 129-156.

127. Hinduja, S. and Patchin, J.W., 2010. Bullying, cyberbullying, and suicide. *Archives of suicide research*, *14*(3), pp.206-221.

128. Hoeffler, A. (2018). Security and development: Shifting the focus to interpersonal violence.

129. Hofstetter, H., Dusseldorp, E., Van Empelen, P., & Paulussen, T. W. (2014). A primer on the use of cluster analysis or factor analysis to assess co-occurrence of risk behaviors. *Preventive medicine*, *67*, 141-146.

130. Holden, M.T. and Lynch, P., 2004. Choosing the appropriate methodology: Understanding research philosophy. *The marketing review*, *4*(4), pp.397-409.

131. Holt, M.K. and Espelage, D.L., 2007. Perceived social support among bullies, victims, and bully-victims. *Journal of youth and adolescence*, *36*(8), pp.984-994.

132. Holt, M. K., Vivolo-Kantor, A. M., Polanin, J. R., Holland, K. M., DeGue, S., Matjasko, J. L., ... & Reid, G. (2015). Bullying and suicidal ideation and behaviors: A meta-analysis. *Pediatrics*, *135*(2), e496-e509.

133. Hood, M., & Duffy, A. L. (2018). Understanding the relationship between cyber-victimisation and cyber-bullying on Social Network Sites: The role of moderating factors. *Personality and Individual Differences*, *133*, 103-108.

134. Hong, J. S., Espelage, D. L., & Lee, J. M. (2018). School climate and bullying prevention programs. *The Wiley handbook on violence in education: Forms, factors, and preventions*, 359-374.

135. Hornor, G., 2018. Bullying: What the PNP needs to know. *Journal of Pediatric Health Care*, *32*(4), pp.399-408.

136. Huizing, A. (2008). Objectivist by default: why information management needs a new foundation.

137. Ibrahimoglu, N., Unaldi, I., Samancioglu, M., & Baglibel, M. (2013). The relationship between personality traits and learning styles: a cluster analysis. *Asian Journal of Management Sciences and Education*, *2*(3), 93-108.

138. ILDIRIM, E., ÇALICI, C., & Erdoğan, B. (2017). Psychological correlates of cyberbullying and cyber-victimization. *International Journal of Human and Behavioral Science*, *3*(2), 7-21.

139. Jacobs, M. L., Clawson, J., & Mynatt, E. D. (2014, April). My journey compass: a preliminary investigation of a mobile tool for cancer patients. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 663-672).

140. Jaiswal, H., 2021. Memes, Confession Pages and Revenge Porn-The Novel Forms of Cyberbullying. *Indore Institute of Law-Udyam Vigyati*.

141. Jara, N., Casas, J. A., & Ortega-Ruiz, R. (2017). Proactive and reactive aggressive behavior in bullying: The role of values. *International Journal of Educational Psychology*, *6*(1), 1-24.

142. Jenkins, L.N. and Demaray, M.K., 2012. Social support and self-concept in relation to peer victimization and peer aggression. *Journal of School Violence*, *11*(1), pp.56-74.

143. John, O. P., & Srivastava, S. (1999). The Big-Five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin & O. P. John (Eds.), Handbook of personality: Theory and research (Vol. 2, pp. 102–138). New York: Guilford Press.

144. Jokazi, N., & Kyobe, M. (2017). EXAMINING THE EXTENT TO WHICH MOBILE BULLY-VICTIM BEHAVIOUR IN SOUTH AFRICAN HIGH SCHOOLS IS A CONSEQUENCE OF AGGRESSIVE BEHAVIOUR OR SOCIAL INTEGRATION. *Rethinking Education in the 21st Century*.

145. Joshi, A., Kale, S., Chandel, S., & Pal, D. K. (2015). Likert scale: Explored and explained. *British journal of applied science & technology*, *7*(4), 396-403.

146. Joy, J. (2018). Review on different types of drag and drop mobile app development platforms.

147. Kaiser, S., Martinussen, M., Adolfsen, F., Breivik, K., & Kyrrestad, H. (2021). An app-based intervention for adolescents exposed to cyberbullying in Norway: protocol for a randomized controlled trial. *JMIR Research Protocols*, *10*(11), e31789.

148. Karros, D. J. (1997). Statistical methodology: II. Reliability and validity assessment in study design, Part B. *Academic Emergency Medicine*, *4*(2), 144-147.

149. Kaufmann, K., & Peil, C. (2020). The mobile instant messaging interview (MIMI): Using WhatsApp to enhance self-reporting and explore media usage in situ. *Mobile Media & Communication*, *8*(2), 229-246.

150. Kaukiainen, A., Salmivalli, C., Lagerspetz, K., Tamminen, M., Vauras, M., Mäki, H. and Poskiparta, E., 2002. Learning difficulties, social intelligence, and self–concept: Connections to bully–victim problems. *Scandinavian journal of psychology*, *43*(3), pp.269-278.

151. Kaushik, M., & Mathur, B. (2014). An Experimental analysis of Parent Teacher Scale Involvement with help of K Mean Clustering Technique using Matlab. *International Journal of Advance Research in Computer Science and Management Studies (IJARCSMS)*, *2*(9), 117-123.

152. Kaushik, V., & Walsh, C. A. (2019). Pragmatism as a research paradigm and its implications for social work research. *Social sciences*, *8*(9), 255.

153. Kelly, E. V., Newton, N. C., Stapinski, L. A., Slade, T., Barrett, E. L., Conrod, P. J., & Teesson, M. (2015). Suicidality, internalizing problems and externalizing problems among adolescent bullies, victims and bully-victims. *Preventive medicine*, *73*, 100-105.

154. Kennedy, R. S. (2021). Bully-victims: An analysis of subtypes and risk characteristics. *Journal of interpersonal violence*, *36*(11-12), 5401-5421.

155. Kenny, R., Dooley, B., & Fitzgerald, A. (2016). How psychological resources mediate and perceived social support moderates the relationship between depressive symptoms and help-seeking intentions in college students. *British Journal of Guidance & Counselling*, *44*(4), 402-413.

156. Khine, A. T., Saw, Y. M., Htut, Z. Y., Khaing, C. T., Soe, H. Z., Swe, K. K., ... & Hamajima, N. (2020). Assessing risk factors and impact of cyberbullying victimization among university students in Myanmar: A cross-sectional study. *PloS one*, *15*(1), e0227051.

157. Kim, B. K., Park, J., Jung, H. J., & Han, Y. (2020). Latent profiles of offline/cyber bullying experiences among Korean students and its relationship with peer conformity. *Children and Youth Services Review*, *118*, 105349.

158. Kimmons, R., Rosenberg, J., & Allman, B. (2021). Trends in educational technology: What Facebook, Twitter, and Scopus can tell us about current research and practice. *TechTrends*, *65*, 125-136.

159. Ketchen, D. J., & Shook, C. L. (1996). The application of cluster analysis in strategic management research: an analysis and critique. *Strategic management journal*, *17*(6), 441-458.

160. Klomek, A. B., Sourander, A., Niemelä, S., Kumpulainen, K., Piha, J., Tamminen, T., ... & Gould, M. S. (2009). Childhood bullying behaviors as a risk for suicide attempts and completed suicides: a population-based birth cohort study. *Journal of the American academy of child & adolescent psychiatry*, *48*(3), 254-261.

161. Kodinariya, T. M., & Makwana, P. R. (2013). Review on determining number of Cluster in K-Means Clustering. *International Journal*, *1*(6), 90-95.

162. Kokkinos, C. M., & Antoniadou, N. (2019). Cyber-bullying and cyber-victimization among undergraduate student teachers through the lens of the General Aggression Model. *Computers in Human Behavior*, *98*, 59-68.

163. Kopalle, P. K., & Lehmann, D. R. (1997). Alpha inflation? The impact of eliminating scale items on Cronbach's alpha. *Organizational Behavior and Human Decision Processes*, *70*(3), 189-197.

164. Kothari, C. R. (2004). *Research methodology: Methods and techniques*. New Age International.

165. König, A., Gollwitzer, M., & Steffgen, G. (2010). Cyberbullying as an act of revenge?. *Journal of Psychologists and Counsellors in Schools*, *20*(2), 210-224.

166. Koukia, E. (2020). The effect of personality traits on the roles of traditional bully-victim and cyberbully–Cybervictim among Greek adolescents. *Int. J. Caring Sci*, *13*, 1639.

167. Krishnan, V., 2010, May. Early child development: A conceptual model. In *Early Childhood Council Annual Conference* (pp. 1-17).

168. Kuechler, W., Vaishnavi, V.K. and Petter, S., 2005. The aggregate general design cycle as a perspective on the evolution of computing communities of interest. *Computing Letters*, *1*(3), pp.123-128.

169. Kuechler, W., & Vaishnavi, V. (2008). The emergence of design research in information systems in North America. *Journal of Design Research*, *7*(1), 1-16.

170. Kyobe, M. (2016). Investigating the Evolution of Female Mobile Bully-Victims in Cape Town High Schools, South Africa. *Paper Proceedings of Advances in Women's Studies 2016*, 61.

171. Lam, T. N., Jensen, D. B., Hovey, J. D., & Roley-Roberts, M. E. (2022). College students and cyberbullying: how social media use affects social anxiety and social comparison. *Heliyon*, *8*(12).

172. Lapidot-Lefler, N. and Hosri, H., 2016. Cyberbullying in a diverse society: Comparing Jewish and Arab adolescents in Israel through the lenses of individualistic versus collectivist cultures. *Social Psychology of Education*, *19*(3), pp.569-585.

173. Lara-Muñoz, C., De Leon, S. P., Feinstein, A. R., Puente, A., & Wells, C. K. (2004). Comparison of three rating scales for measuring subjective phenomena in clinical research: I. Use of experimentally controlled auditory stimuli. *Archives of medical research*, *35*(1), 43-48.

174. Lozano-Blasco, R., Cortés-Pascual, A., & Latorre-Martínez, M. P. (2020). Being a cybervictim and a cyberbully–The duality of cyberbullying: A meta-analysis. *Computers in Human Behavior*, *111*, 106444.

175. Lareki, A., Altuna, J., & Martínez-de-Morentin, J. I. (2023). Fake digital identity and cyberbullying. *Media, Culture & Society*, *45*(2), 338-353.

176. LEE, J. and JIN, C., 2019. THE RELATIONSHIP BETWEEN SELF-CONCEPTS AND FLAMING BEHAVIOR: POLARITY OF THE ONLINE COMMENTS. *Journal of Theoretical and Applied Information Technology*, *97*(19).

177. Liang, C., Wang, W., Zhou, T., & Yang, Y. (2022). Visual abductive reasoning. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition* (pp. 15565-15575).

178. Li, Q. (2006). Cyberbullying in schools: A research of gender differences. *School psychology international*, *27*(2), 157-170.

179. Lodi-Smith, J. and Roberts, B.W., 2007. Social investment and personality: A meta-analysis of the relationship of personality traits to investment in work, family, religion, and volunteerism. *Personality and social psychology review*, *11*(1), pp.68-86.

180. Lozano-Blasco, R., Cortés-Pascual, A., & Latorre-Martínez, M. P. (2020). Being a cybervictim and a cyberbully–The duality of cyberbullying: A meta-analysis. *Computers in Human Behavior*, *111*, 106444.

181. Luchs, M. G. (2015). A brief introduction to design thinking. *Design thinking: New product development essentials from the PDMA*, 1-12.

182. Luo, Y., Liang, P., Wang, C., Shahin, M., & Zhan, J. (2021, October). Characteristics and challenges of low-code development: the practitioners' perspective. In *Proceedings of the 15th ACM/IEEE international symposium on empirical software engineering and measurement (ESEM)* (pp. 1-11).

183. Luxton, D. D., McCann, R. A., Bush, N. E., Mishkind, M. C., & Reger, G. M. (2011). mHealth for mental health: Integrating smartphone technology in behavioral healthcare. *Professional Psychology: Research and Practice*, *42*(6), 505.

184. Maake, T. B. (2023). Intersectional Masculinities in Heteronormative Spaces: Exploring Power and Privilege amongst Gay Men in South Africa. *Gender Questions*, *11*(1).

185. Maarouf, H. (2019). Pragmatism as a supportive paradigm for the mixed research approach: Conceptualizing the ontological, epistemological, and axiological stances of pragmatism. *International Business Research*, *12*(9), 1-12.

186. Machackova, H., Cerna, A., Sevcikova, A., Dedkova, L., & Daneback, K. (2013). Effectiveness of coping strategies for victims of cyberbullying. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*, *7*(3), 1-12.

187. Macklem, G.L., 2003. *Bullying and teasing: Social power in children's groups*. Springer Science & Business Media.

188. Maciantowicz, O., & Zajenkowski, M. (2020). Is narcissistic anger fueled by neuroticism? The relationship between grandiose and vulnerable narcissism, neuroticism, and trait anger. *Current Psychology*, *39*, 1674-1681.

189. Mardiana, S. (2020). Modifying Research Onion for Information Systems Research. *Solid State Technology*, *63*(4), 5304-5313.

190. Matz, A., & Germanakos, P. (2016). Increasing the quality of use case definition through a design thinking collaborative method and an alternative hybrid documentation style. In *Learning and Collaboration Technologies: Third International Conference, LCT 2016, Held as Part of HCI International 2016, Toronto, ON, Canada, July 17-22, 2016, Proceedings 3* (pp. 48-59). Springer International Publishing.

191. Matthes, J., Karsay, K., Schmuck, D., & Stevic, A. (2020). "Too much to handle": Impact of mobile social networking sites on information overload, depressive symptoms, and well-being. *Computers in Human Behavior*, *105*, 106217.

192. McCrae, R. R., & Costa, P. T. (2008). Empirical and theoretical status of the five-factor model of personality traits. *The SAGE handbook of personality theory and assessment*, *1*, 273-294.

193. McCrae, R. R., Gaines, J. F., & Wellington, M. A. (2013). The Five-Factor Model in fact and fiction.

194. McCrae, R. R., & John, O. P. (1992). An introduction to the five-factor model and its applications. *Journal of personality*, *60*(2), 175-215.

195. McCrae, R. R., & Sutin, A. R. (2018). A five–factor theory perspective on causal analysis. *European journal of personality*, *32*(3), 151-166.

196. Melnikovas, A., 2018. Towards an explicit research methodology: Adapting research onion model for futures studies. *Journal of Futures Studies*, *23*(2), pp.29-44.

197. Menesini, E. M. (2008, October 31). Liberi dal bullismo. NOTRAP. Retrieved August 12, 2021, from https://www.notrap.it/cose-il-bullismo/

198. Millman, C. M., Winder, B., & Griffiths, M. D. (2019). UK-based police officers' perceptions of, and role in investigating, cyber-harassment as a crime. In *Social Issues Surrounding Harassment and Assault: Breakthroughs in Research and Practice* (pp. 113-130). IGI Global

199. Milosevic, T. (2016). Social media companies' cyberbullying policies. *International Journal of Communication*, *10*, 22.

200. Milosevic, T. and Vlisavljevic, M., 2020. Norwegian children's perceptions of effectiveness of social media companies' cyberbullying policies: an exploratory study. *Journal of children and media*, *14*(1), pp.74-90.

201. Mimbi Dr, L., Nembandona, P., & Mtshazi, S. (2018). Mobile bullying among rural South African students: Examining the applicability of existing theories. *The African Journal of Information Systems*, *10*(2), 1.

202. Mitsopoulou, E. and Giovazolias, T., 2015. Personality traits, empathy and bullying behavior: A meta-analytic approach. *Aggression and violent behavior*, *21*, pp.61-72.

203. Mkhize, S., & Gopal, N. (2021). Cyberbullying perpetration: Children and youth at risk of victimization during Covid-19 lockdown. *International Journal of Criminology and Sociology*, *10*, 525-537.

204. Mooi, E., Sarstedt, M. (2011). The Market Research Process. *A Concise Guide to Market Research: The Process, Data, and Methods Using IBM SPSS Statistics*, 11-23.

205. Mooketsi, B. E. (2018). An investigation on the prevalence of cyberbullying amongst undergraduate students in the University of Botswana. *Mosenodi Journal*, *21*(2), 44-54.

206. Mooradian, T. A., & Swan, K. S. (2006). Personality-and-culture: The case of national extraversion and word-of-mouth. *Journal of Business Research*, *59*(6), 778-785.

207. Morag Yaar, N., Grossman, E., Kimchi, N., Nash, O., Hatan, S., & Erel, H. (2022, April). Tobe: a virtual keyboard and an animated character for individual and educational cyberbullying intervention. In *CHI Conference on Human Factors in Computing Systems Extended Abstracts* (pp. 1-6).

208. Morcillo, C., Ramos-Olazagasti, M.A., Blanco, C., Sala, R., Canino, G., Bird, H. and Duarte, C.S., 2015. Socio-cultural context and bulling others in childhood. *Journal of child and family studies*, *24*(8), pp.2241-2249.

209. Moreno, M. A., Egan, K. G., Bare, K., Young, H. N., & Cox, E. D. (2013). Internet safety education for youth: stakeholder perspectives. *BMC public health*, *13*, 1-6.

210. Moutloutse, K. J., Barkhuizen, J., & Oliver, C. E. (2022). The Nature And Extent Of Bullying: A Case Study Of Students From A South African University. *Journal of African Education*, *3*(3), 131.

211. Mthembu, M. (2022). Challenges of Enforcing Anti-cyber Bullying Laws on Teen Sexting in South Africa. *Commonwealth Youth and Development*, *20*(1), 17-pages.

212. Mulder, I., ter Hofte, H., & Mulder, I. I. (2005, April). Sociosensor: An extensible toolkit for capturing social phenomena with mobile devices. In *International Forum 'Less is more-Simple Computing in an Age of Complexity* (pp. 27-28).

213. Musharraf, S., Bauman, S., Anis-ul-Haque, M., & Malik, J. A. (2019). General and ICT self-efficacy in different participants roles in cyberbullying/victimization among Pakistani university students. *Frontiers in psychology*, *10*, 1098.

214. Myers, C.A. and Cowie, H., 2017. Bullying at university: The social and legal contexts of cyberbullying among university students. *Journal of Cross-Cultural Psychology*, *48*(8), pp.1172-1182.

215. Myers, C.A. and Cowie, H., 2019. Cyberbullying across the lifespan of education: Issues and interventions from school to university. *International journal of environmental research and public health*, *16*(7), p.1217.

216. Namane, K. C., & Kyobe, M. (2017, March). Examining the evolution of mobile bully-victims across different schools located in low to high safety risk areas in Cape Town, South Africa. In *2017 Conference on Information Communication Technology and Society (ICTAS)* (pp. 1-5). IEEE.

217. Nayak, M. S. D. P., & Narayan, K. A. (2019). Strengths and weaknesses of online surveys. *technology*, *6*(7), 0837-2405053138.

218. Ndiege, J. R., Okello, G., & Wamuyu, P. K. (2020). Cyberbullying among university students: The Kenyan experience. *The African Journal of Information Systems*, *12*(1), 2.

219. Ndyave, Z. C., & Kyobe, M. (2019, October). Mobile bully-victim behaviour on Facebook: the case of south African students. In *2019 IEEE 10th Annual Information Technology, Electronics and Mobile Communication Conference (IEMCON)* (pp. 0743-0749). IEEE.

220. Nesdale, D. and Scarlett, M., 2004. Effects of group and situational factors on pre-adolescent children's attitudes to school bullying. *International Journal of Behavioral Development*, *28*(5), pp.428-434.

221. Neuert, C., Meitinger, K., Behr, D., & Schonlau, M. (2021). The use of open-ended questions in surveys. *Methods, data, analyses: a journal for quantitative methods and survey methodology (mda)*, *15*(1), 3-6.

222. News24: Gauteng pupil arrested in connection with viral bullying video says sorry. (1AD, January 1). Retrieved from https://www.news24.com/news24/gauteng-pupil-arrested-in-connection-with-viral-bullying-video-20200131

223. News24: Race,Class,Gender in an unequal South Africa. (2016, January 18). Retrieved from https://www.news24.com/news24/mynews24/raceclassgender-in-an-unequal-south-africa-20160118

224. Newton, A., Bagnell, A., Rosychuk, R., Duguay, J., Wozney, L., Huguet, A., ... & Curran, J. (2020). A mobile phone–based app for use during cognitive behavioral therapy for adolescents with anxiety (MindClimb): User-centered design and usability study. *JMIR mHealth and uHealth*, *8*(12), e18439.

225. Ngo, F. T., Piquero, A. R., LaPrade, J., & Duong, B. (2020). Victimization in cyberspace: Is it how long we spend online, what we do online, or what we post online?. *Criminal Justice Review*, *45*(4), 430-451.

226. Nocentini, A., Calmaestra, J., Schultze-Krumbholz, A., Scheithauer, H., Ortega, R., & Menesini, E. (2010). Cyberbullying: Labels, behaviours and definition in three European countries. *Journal of Psychologists and Counsellors in Schools*, *20*(2), 129-142.

227. Ntsabo, M. (2019, February 25). SA has one of the highest prevalence of cyberbullying. Retrieved from https://ewn.co.za/2019/02/25/sa-has-one-of-the-highest-prevalence-of-cyberbullying

228. Nunnally, J.C. (1967) Psychometric Theory. New York: McGrawHill.

229. Nuseir, M. T. (2020). Is advertising on social media effective? an empirical study on the growth of advertisements on the big four (Facebook, Twitter, Instagram, WhatsApp). *International Journal of Procurement Management*, *13*(1), 134-142.

230. O'Brien, N. (2019). Understanding alternative bullying perspectives through research engagement with young people. *Frontiers in Psychology*, *10*, 1984.

231. Ogolla, E., Kwanya, T., Kibe, L., Kogos, A., & Onsare, C. (2023). Curbing cyberbullying on Facebook: An analysis of mitigation strategies in universities in Kenya. *Information Impact: Journal of Information and Knowledge Management*, *14*(1), 1-21.

232. Oishi, S., 2004. Personality in culture: A neo-Allportian view. *Journal of Research in Personality*, *38*(1), pp.68-74.

233. Olapane, E. C. (2021). An in-depth exploration on the praxis of Computer-assisted Qualitative Data Analysis Software (CAQDAS). *Journal of Humanities and Social Sciences Studies*, *3*(11), 57-78.

234. O'Neill, B., & Dinh, T. (2015). Mobile technologies and the incidence of cyberbullying in seven European countries: Findings from Net Children Go Mobile. *Societies*, *5*(2), 384-398.

235. Olweus, D., 1994. Bullying at school. In *Aggressive behavior* (pp. 97-130). Springer, Boston, MA.

236. Oosterwyk, G. W., & Kabiawu, O. (2016). The Nature Of Mobile Bullying & Victimisation In The Western Cape High Schools of South Africa. *Nature*.

237. Opdenakker, R. J. G. (2006). Advantages and disadvantages of four interview techniques in qualitative research. In *Forum Qualitative Sozialforschung= Forum: Qualitative*

Social Research (Vol. 7, No. 4, pp. art-11). Institut fur Klinische Sychologie and Gemeindesychologie.

238. Palladino, B. E., Nocentini, A., & Menesini, E. (2016). Evidence-based intervention against bullying and cyberbullying: Evaluation of the NoTrap! program in two independent trials. *Aggressive behavior*, *42*(2), 194-206.

239. Patel, M. G., & Quan-Haase, A. (2023). The social-ecological model of cyberbullying: Digital media as a predominant ecology in the everyday lives of youth. *New Media & Society*, 14614448221136508.

240. Patterson, G.R., 2016. Coercion theory: The study of change. *The Oxford handbook of coercive relationship dynamics*, *1*, pp.7-22.

241. Patchin, J. W., & Hinduja, S. (2006). Bullies move beyond the schoolyard: A preliminary look at cyberbullying. *Youth violence and juvenile justice*, *4*(2), 148-169.

242. Paulson, A., 2003. Internet bullying. *Christian Science Monitor*, *96*(11).

243. Patel, M. G., & Quan-Haase, A. (2023). The social-ecological model of cyberbullying: Digital media as a predominant ecology in the everyday lives of youth. *New Media & Society*, 14614448221136508.

244. Peebles, E., 2014. Cyberbullying: Hiding behind the screen. *Paediatrics & child health*, *19*(10), pp.527-528.

245. Perkins, H. W., & Berkowitz, A. D. (1986). Perceiving the community norms of alcohol use among students: Some research implications for campus alcohol education programming. *International journal of the Addictions*, *21*(9-10), 961-976.

246. Piccoli, V., Carnaghi, A., Grassi, M., Stragà, M. and Bianchi, M., 2020. Cyberbullying through the lens of social influence: Predicting cyberbullying perpetration from perceived peer-norm, cyberspace regulations and ingroup processes. *Computers in human behavior*, *102*, pp.260-273.

247. Popovac, M., & Leoschut, L. (2012). Cyber bullying in South Africa: Impact and responses. *Centre for justice and crime prevention*, *13*(6), 1-16.

248. Rachoene, M. and Oyedemi, T., 2015. From self-expression to social aggression: Cyberbullying culture among South African youth on Facebook. *Communicatio*, *41*(3), pp.302-319.

249. Radebe, F., & Kyobe, M. (2021, October). Towards an App to Aid South African Crime Prevention Police in Diagnosing Mobile Bully-Victims among School Children. In *2021 International Conference on Electrical, Computer, Communications and Mechatronics Engineering (ICECCME)* (pp. 01-08). IEEE.

250. Ragab, M. A., & Arisha, A. (2018). Research methodology in business: A starter's guide. *Management and organizational studies*, *5*(1), 1-14.

251. Regchand, S. (2022, June 29). Bullying violence deepens. Retrieved from https://www.citizen.co.za/witness/news/bullying-violence-deepens-20190318-2/

252. Robben, A. C., & Su'arez-Orozco, M. (Eds.). (2000). *Cultures under siege: Collective violence and trauma* (Vol. 11). Cambridge University Press.

253. Roberts Jr, W. B. (2007). *Working with parents of bullies and victims*. Corwin Press.

254. Roberts, P., & Priest, H. (2006). Reliability and validity in research. *Nursing standard*, *20*(44), 41-46.

255. Rodkin, P.C., Espelage, D.L. and Hanish, L.D., 2015. A relational framework for understanding bullying: developmental antecedents and outcomes. *American Psychologist*, *70*(4), p.311.

256. Ryan, R. M., Martin, A., & Brooks-Gunn, J. (2019). Is one good parent good enough? Patterns of mother and father parenting and child cognitive outcomes at 24 and 36 months. In *The Early Head Start Fathers And Children* (pp. 211-228). Routledge.

257. Sahay, A., 2016. Peeling Saunder's research onion. *Research Gate, Art*, pp.1-5.

258. Sainani, K. L. (2014). Explanatory versus predictive modeling. *PM&R*, *6*(9), 841-844.

259. Saleem, S., Khan, N. F., & Zafar, S. (2021). Prevalence of cyberbullying victimization among Pakistani Youth. *Technology in Society*, *65*, 101577.

260. Sam, D. L., Bruce, D., Agyemang, C. B., Amponsah, B., & Arkorful, H. (2019). Cyberbullying victimization among high school and university students in Ghana. *Deviant Behavior*, *40*(11), 1305-1321.

261. Sandelowski, M., Voils, C. I., & Knafl, G. (2009). On quantitizing. *Journal of mixed methods research*, *3*(3), 208-222.

262. Saunders, M., Lewis, P. H. I. L. I. P., & Thornhill, A. D. R. I. A. N. (2007). Research methods. *Business Students 4th edition Pearson Education Limited, England*, *6*(3), 1-268.

263. Saunders, M. N. K., & Tosey, P. C. (2013). The layers of research design. *Rapport*, (Winter), 58-59.

264. Scheithauer, H., Schultze-Krumbholz, A., Pfetsch, J., & Hess, M. (2021). Types of cyberbullying. *The Wiley Blackwell Handbook of Bullying: A Comprehensive and International Review of Research and Intervention*, *1*, 120-138.

265. Şchiopu, D. (2010). Applying TwoStep cluster analysis for identifying bank customers' profile. *Buletinul*, *62*(3), 66-75.

266. Schreiber, J. B., & Pekarik, A. J. (2014). Using Latent Class Analysis versus K-means or Hierarchical Clustering to understand museum visitors. *Curator: The Museum Journal*, *57*(1), 45-59.

267. Schenk, A. M., Fremouw, W. J., & Keelan, C. M. (2013). Characteristics of college cyberbullies. *Computers in Human Behavior*, *29*(6), 2320-2327.

268. Schmukle, S. C., Back, M. D., & Egloff, B. (2008). Validity of the five-factor model for the implicit self-concept of personality. *European Journal of Psychological Assessment*, *24*(4), 263-272.

269. Scotland, J., 2012. Exploring the philosophical underpinnings of research: Relating ontology and epistemology to the methodology and methods of the scientific, interpretive, and critical research paradigms. *English language teaching*, *5*(9), pp.9-16.

270. Segal, J. (1999, April 11). *Our trusted guide to mental health & wellness*. HelpGuide. Retrieved August 12, 2021, from https://www.helpguide.org/articles/abuse/bullying-and-cyberbullying.htm

271. Shadmanfaat, S.M., Howell, C.J., Muniz, C.N., Cochran, J.K., Kabiri, S. and Fontaine, E.M., 2020. Cyberbullying perpetration: An empirical test of social learning theory in Iran. *Deviant Behavior*, *41*(3), pp.278-293.

272. Shaikh, F. B., Rehman, M., & Amin, A. (2020). Cyberbullying: A systematic literature review to identify the factors impelling university students towards cyberbullying. *IEEE Access*, *8*, 148031-148051.

273. Shaikh, F. B., Rehman, M., Amin, A., Shamim, A., & Hashmani, M. A. (2021). Cyberbullying behaviour: a study of undergraduate university students. *IEEE Access*, *9*, 92715-92734.

274. Shih, M. Y., Jheng, J. W., & Lai, L. F. (2010). A two-step method for clustering mixed categroical and numeric data. *Journal of Applied Science and Engineering*, *13*(1), 11-19.

275. Shyian, O. M., Foster, L. F., Kuzmenko, T. M., Yeremenko, L. V., & Liesnichenko, N. P. (2021). Socio-Psychological criteria of the formation of gender stereotypes of appearance. *Journal of Intellectual Disability-Diagnosis and Treatment*, *9*, 651-666.

276. Sinaga, K. P., & Yang, M. S. (2020). Unsupervised K-means clustering algorithm. *IEEE access*, *8*, 80716-80727.

277. Smit, D. M. (2015). Cyberbullying in South African and American schools: A legal comparative study. *South African Journal of Education*, *35*(2), 1-11.

278. Sullivan, G. M. (2011). A primer on the validity of assessment instruments. *Journal of graduate medical education*, *3*(2), 119-120.

279. Swedberg, R. (2020). Exploratory research. *The production of knowledge: Enhancing progress in social science*, 17-41.

280. Shaikh, F. B., Rehman, M., & Amin, A. (2020). Cyberbullying: A systematic literature review to identify the factors impelling university students towards cyberbullying. *IEEE Access*, *8*, 148031-148051.

281. Singelis, T.M. and Brown, W.J., 1995. Culture, self, and collectivist communication: Linking culture to individual behavior. *Human communication research*, *21*(3), pp.354-389.

282. Sinkovics, N. (2018). Pattern matching in qualitative analysis.

283. Sittichai, R., & Smith, P. K. (2020). Information technology use and cyberbullying behavior in south Thailand: a test of the Goldilocks hypothesis. *International journal of environmental research and public health*, *17*(19), 7122.

284. Skilbred-Fjeld, S., Reme, S. E., & Mossige, S. (2020). Cyberbullying involvement and mental health problems among late adolescents. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*, *14*(1).

285. Slonje, R. and Smith, P.K., 2008. Cyberbullying: Another main type of bullying?. *Scandinavian journal of psychology*, *49*(2), pp.147-154.

286. Smith, P. K. (2019). Research on cyberbullying: strengths and limitations. *Narratives in research and interventions on cyberbullying among young people*, 9-27.

287. Sunstein, C. R. (1996). Social norms and social roles. *Colum. L. Rev.*, *96*, 903.

288. Sun, X., Chen, L., Wang, Y., & Li, Y. (2020). The link between childhood psychological maltreatment and cyberbullying perpetration attitudes among undergraduates: Testing the risk and protective factors. *PLoS one*, *15*(9), e0236792.

289. Taherdoost, H. (2022). Different types of data analysis; data analysis methods and techniques in research projects. *International Journal of Academic Research in Management*, *9*(1), 1-9.

290. Tahmasbi, N., & Rastegari, E. (2018). A socio-contextual approach in automated detection of public cyberbullying on Twitter. *ACM Transactions on Social Computing*, *1*(4), 1-22.

291. Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International journal of medical education*, *2*, 53.

292. Thanh, N. C., & Thanh, T. T. (2015). The interconnection between interpretivist paradigm and qualitative methods in education. *American journal of educational science*, *1*(2), 24-27.

293. Thompson, C. B. (2009). Descriptive data analysis. *Air medical journal*, *28*(2), 56-59.

294. Thun, L. J., Teh, P. L., & Cheng, C. B. (2022). CyberAid: Are your children safe from cyberbullying?. *Journal of King Saud University-Computer and Information Sciences*, *34*(7), 4099-4108.

295. Tkaczynski, A. (2017). Segmentation using two-step cluster analysis. *Segmentation in social marketing: Process, methods and application*, 109-125.

296. Topcu, Ç., Yıldırım, A., & Erdur-Baker, Ö. (2013). Cyber bullying@ schools: What do Turkish adolescents think?. *International Journal for the Advancement of Counselling*, *35*, 139-151.

297. Torous, J., & Powell, A. C. (2015). Current research and trends in the use of smartphone applications for mood disorders. *Internet Interventions*, *2*(2), 169-173.

298. Uduma, I. A., & Sylva, W. (2015). A critique of the adequacy of positivist and interpretivist views of organisational studies for understanding the 21st century organisation (s). *International Journal of Business and Management Review*, *3*(8), 44-52.

299. Ursachi, G., Horodnic, I. A., & Zait, A. (2015). How reliable are measurement scales? External factors with indirect influence on reliability estimators. *Procedia Economics and Finance*, *20*, 679-686.

300. U.S. Department of Health & Human Services (2008, October 31). U.S. Department of Health & Human Services. Https://www.Samhsa.gov/. Retrieved August 12, 2021, from https://store.samhsa.gov/product/knowbullying

301. van der Zwaan, J. M., Dignum, V., Jonker, C. M., & van der Hof, S. (2014). On technology against cyberbullying. *Responsible Innovation 1: Innovative Solutions for Global Issues*, 369-392.

302. Van Selm, M., & Jankowski, N. W. (2006). Conducting online surveys. *Quality and quantity*, *40*, 435-456.

303. Veenstra, S., 2011. Cyberbullying: an explanatory analysis. *Preuzeto s: http://www. cyrenjeugd. nl/files/Veenstra,% 20S*, *20*(282011), p.29.

304. Voss, K., 1999. *Understanding adolescent antisocial behaviour from attachment theory and coercion theory perspectives* (Doctoral dissertation, Concordia University).

305. Vo, V., Auroy, L., & Sarradon-Eck, A. (2019). Patients' perceptions of mHealth apps: meta-ethnographic review of qualitative studies. *JMIR mHealth and uHealth*, *7*(7), e13817.

306. von Meullen, N., & van der Waldt, G. (2022). Promoting Gender-based Violence Awareness in Higher Education Institutions: The Case of Student Representative Councils in Selected South African Universities. *Administration Publica*, *30*(3), 126-147.

307. Wahyuni, D., 2012. The research design maze: Understanding paradigms, cases, methods and methodologies. *Journal of applied management accounting research*, *10*(1), pp.69-80.

308. Wang, H. Y., Liao, C., & Yang, L. H. (2013). What affects mobile application use? The roles of consumption values. *International Journal of Marketing Studies*, *5*(2), 11.

309. Wang, C. W., Musumari, P. M., Techasrivichien, T., Suguimoto, S. P., Chan, C. C., Ono-Kihara, M., ... & Nakayama, T. (2019). "I felt angry, but I couldn't do anything about it": a qualitative study of cyberbullying among Taiwanese high school students. *BMC public health*, *19*, 1-11.

310. Wang, M. J., Yogeeswaran, K., Andrews, N. P., Hawi, D. R., & Sibley, C. G. (2019). How common is cyberbullying among adults? Exploring gender, ethnic, and age differences in

the prevalence of cyberbullying. *Cyberpsychology, Behavior, and Social Networking*, *22*(11), 736-741.

311. Weber, M., Koehler, C., & Schnauber-Stockmann, A. (2019).

312. Weigand, H. (2008). DESIGN RESEARCH FROM A COMMUNICATIVE PERSPECTIVE: HOW TO DESIGN THINGS WITH WORDS. *Working Papers on Information Systems ISSN 1535-6078*.

313. Wen, X., Shu, Y., Qu, D., Wang, Y., Cui, Z., Zhang, X., & Chen, R. (2023). Associations of bullying perpetration and peer victimization subtypes with preadolescent's suicidality, non-suicidal self-injury, neurocognition, and brain development. *BMC medicine*, *21*(1), 141.

314. White, S. G., & McNair, P. J. (2002). Abdominal and erector spinae muscle activity during gait: the use of cluster analysis to identify patterns of activity. *Clinical Biomechanics*, *17*(3), 177-184.

315. Widiger, T. A., & Oltmanns, J. R. (2017). Neuroticism is a fundamental domain of personality with enormous public health implications. *World psychiatry*, *16*(2), 144.

316. Williams, M., 2000. Interpretivism and generalisation. *Sociology*, *34*(2), pp.209-224.

317. Willis, J., 2007. History and foundations of interpretivist research. *Foundations of qualitative research: Interpretive and critical approaches*, pp.95-146.

318. Wilton, C., & Campbell, M. (2011). An exploration of the reasons why adolescents engage in traditional and cyber bullying. *Journal of Educational Sciences and Psychology*, *1*(2), 101-109.

319. Woodford, M. R., Atteberry-Ash, B., Jaffee, K., & Dessel, A. B. (2021). "My Church Teaches Homosexuality is a Sin" Religious Teachings, Personal Religious Beliefs, and MSW Students' Attitudes toward Sexual Minorities. *Journal of Religion & Spirituality in Social Work: Social Thought*, *40*(2), 216-235.

320. World Health Organization. (2002). World Report on Violence and Health, edited by Etienne G. Krug, Linda L. Dahlberg, James A. Mercy, Anthony B. Zwi and Rafael Lozano. *World Health Organization, Geneva, Switzerland. Accessed on July*, *15*, 2009.

321. Young, R., Tully, M., & Ramirez, M. (2017). School administrator perceptions of cyberbullying facilitators and barriers to preventive action: A qualitative study. *Health Education & Behavior*, *44*(3), 476-484.

322. Yuan, C., & Yang, H. (2019). Research on K-value selection method of K-means clustering algorithm. *J*, *2*(2), 226-235.

323. Yvonne Feilzer, M. (2010). Doing mixed methods research pragmatically: Implications for the rediscovery of pragmatism as a research paradigm. *Journal of mixed methods research*, *4*(1), 6-16.

324. Zhen, Z. (2014). An Analysis on Public Policies in Universities' Obligation of Ensuring Students' Safety. Int'l J. Soc. Sci. Stud., 2, 96.

325. Zhong, J., Zheng, Y., Huang, X., Mo, D., Gong, J., Li, M., & Huang, J. (2021). Study of the influencing factors of cyberbullying among Chinese college students incorporated with digital citizenship: from the perspective of individual students. *Frontiers in psychology*, *12*, 621418.

326. Zhou, Y., Zheng, W., & Gao, X. (2019). The relationship between the big five and cyberbullying among college students: The mediating effect of moral disengagement. *Current Psychology*, *38*(5), 1162-1173.

Appendices

Appendix 1: Ethics approval letter from the Faculty of Commerce

Faculty of Commerce
Private Bag X3, Rondebosch, 7701
2.26 Leslie Commerce Building, Upper Campus
Tel: +27 (0) 21 650 4375/ 5748 Fax: +27 (0) 21 650 4369
E-mail: jacques.rousseau@uct.ac.za
Internet: www.uct.ac.za
@Commerce UCT **UCT Commerce Faculty Office**

07 09 2021

Nombulelo Jokazi

Department of Information Systems

University of Cape Town

REF: REC 2021/09/004

Towards identifying characteristics of socially integrated mobile bully-victims through a mobile application

We are pleased to inform you that your ethics application has been approved. Unless otherwise specified this ethical clearance is valid until 31-Dec-2022 .

Your clearance may be renewed upon application.

Please be aware that you need to notify the Ethics Committee immediately should any aspect of your study regarding the engagement with participants as approved in this application, change. This may include aspects such as changes to the research design, questionnaires, or choice of participants.

The ongoing ethical conduct throughout the duration of the study remains the responsibility of the principal investigator.

We wish you well for your research.

Signed by candidate 2021.09.07 17:46:08 +02'00'

Jacques Rousseau
Commerce Research Ethics Chair
University of Cape Town
Commerce Faculty Office
Room 2.26 | Leslie Commerce Building

Office Telephone: +27 (0)21 650 2695 / 4375
Office Fax: +27 (0)21 650 4369
E-mail: jacques.rousseau@uct.ac.za
Website: http://www.commerce.uct.ac.za/com/Ethics-in-Research

Appendix 2: Consent Letter from Department of Student Affairs

	RESEARCH ACCESS TO STUDENTS	DSA 100

NOTES

1. This form must be **FULLY** completed by all applicants who want to access UCT students for the purpose of research or surveys.
2. Return the fully completed **(a) DSA 100** application form **by email**, in **the same word format**, together with **your: (b) research proposal inclusive of your survey, (c) copy of your ethics approval letter / proof (d) informed consent letter** to: Nadierah.Pienaar@uct.ac.za. You application will be attended to by the Executive Director, Department of Student Affairs (DSA), UCT.
3. The turnaround time for a reply is **approximately 10 working days.**
4. NB: It is the responsibility of the researcher/s to apply for and to obtain **ethics approval and to comply with amendments that may be requested;** as well as **to obtain** approval to access UCT staff and/or UCT students, from the following, at UCT, respectively: (a) **Ethics:** Chairperson, Faculty Research Ethics Committee' (FREC) for ethics approval, (b) **Staff access:** Executive Director: HR for approval to access UCT staff, and (c) **Student access:** Executive Director: Student Affairs for approval to access UCT students.
5. **Note:** UCT Senate Research Protocols requires compliance to the above, **even if prior approval has been obtained from any other institution/agency. UCT's research protocol requirements applies to *all* persons, institutions and agencies from UCT and external to UCT who want to conduct research on human subjects for academic, marketing or service related reasons at UCT.**
6. **Should approval be granted to access UCT students for this research study, such approval is effective for a period of one year from the date of approval (as stated in Section D of this form), and the approval expires automatically on the last day.**
7. **The approving authority reserves the right to revoke an approval based on reasonable grounds and/or new information.**

SECTION A: RESEARCH APPLICANT/S DETAILS

Position	Staff / Student No	Title and Name	Contact Details (Email / Cell / land line)
A.1 Student Number	JKZNOM003	Miss Nombulelo Jokazi	Jkznom003@myuct.ac.za/ ntombyjoannas@gmail.com / 0632007924
A.2 Academic / PASS Staff No.			
A.3 Visitor/ Researcher ID No.			
A.4 University at which a student or employee	University of Cape Town	Address if *not* UCT:	
A.5 Faculty/ Department/School	Faculty of Commerce, Department of Information Systems		
A.6 APPLICANTS DETAILS If different from above	Title and Name	Tel.	Email

SECTION B: RESEARCHER/S SUPERVISOR/S DETAILS

Position	Title and Name	Tel.	Email
B.1 Supervisor	Prof M ichael E Kyobe	021 6502597	michael.kyobe@uct.ac.za
B.2 Co-Supervisor/s			

SECTION C: APPLICANT'S RESEARCH STUDY FIELD AND APPROVAL STATUS

C.1 Degree – if applicable	PhD (Information Systems)
C.2 Research Project Title	Towards identifying characteristics of socially integrated mobile bully-victims through a mobile application
C.3 Research Proposal	Attached: Yes ■ No ☐
C.4 Target population	UCT Undergraduate students
C.5 Lead Researcher details	If different from applicant:
C6. Will use research assistant/s	Yes ☐ No ■ If yes- provide a list of names, contact details :
C.7 Research Methodology and Informed consent	**Research methodology:** Quantitative and qualitative using a mobile application for test and questionnaires. **Informed consent:** Yes, consent requested from participant for informed voluntary participation.
C.8 Ethics clearance status from UCT's Faculty Ethics in Research Committee /Chair (EiRC)	Approved by the UCT EiRC: Yes ■ With amendments: Yes ☐ No ■ (a) Attach copy of your UCT ethics approval. Attached: Yes ■ No ☐ (b) State date / Ref. No / Faculty of your UCT ethics approval: 7/09/2021 Ref. / Faculty: REC 2021/09/004

SECTION D: APPLICANT/S APPROVAL STATUS FOR ACCESS TO STUDENTS FOR RESEARCH PURPOSE

(To be completed by the ED, DSA or NOMINEE)

	Approved / With Terms / Not	* Conditional approval with terms	Applicant/s Ref. No.:	
D.1 APPROVAL STATUS	(i) Approved ■ ~~(ii) With terms~~ ~~(iii) Not approved~~	a) Access to students for this research study must only be undertaken after written ethics approval has been obtained. b) In event any ethics conditions are attached, these must be complied with before access to students.	JKZNOM003 / Miss Nombulelo Jokazi	
D.2 PREPARED BY:	Designation	Name	Signature	Date of Approval
	Personal Assistant	*Nadierah Pienaar*	Signed by candidate	9/10/2021
D.3 APPROVED BY:	Designation	Name	Signature	Date of Approval
	Executive Director Department of Student Affairs	*Mr Pura Mgolombane*	Signed by candidate	*10/10/2021*

Appendix 3: SIMBV App User guide

SIMBV Mobile App User guide

The SIMBV mobile application was developed to capture and validate the characteristics of socially integrated bully-victims found on social networks. The users are requested to share their bullying and victimisation experience that they have encountered on that particular day. Bullying can be in various forms such as trolling, exclusion from a group, being teased, threatened and harassed. The users are also asked to share their experience of when they reported a bullying incident either to the university or a social network company. Furthermore, the users are requested to share the nature of the social interaction that they have with family and friends.

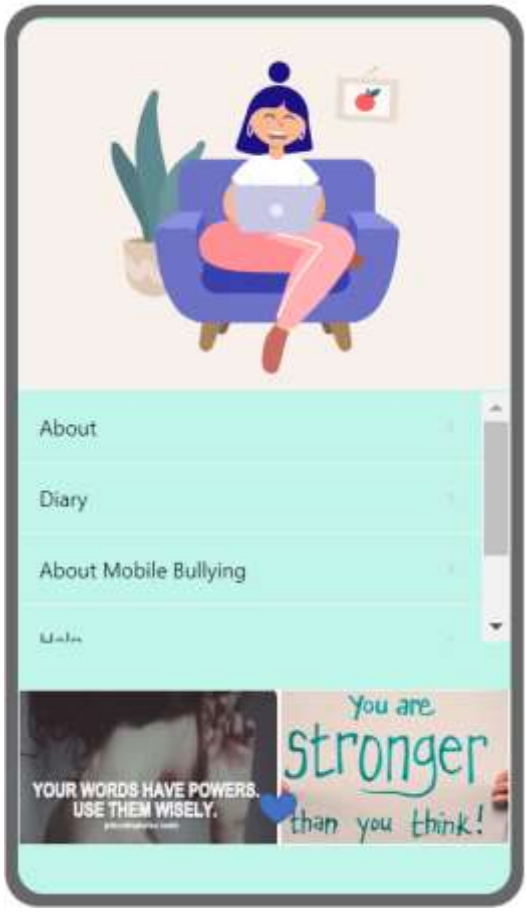
Prerequisite: to use the app, please ensure you have a thunkable account or download thunkable live or use your existing Gmail account to sign in

App link: https://x.thunkable.com/projectPage/612d452bc1d87a0011f88915

Note: the user is not required to reveal their identity, please use any pseudo name of your choice for every entry throughout the research, in order for the researcher to consolidate experiences that relate to each individual over the period of 4 days. ***Participating in this study is voluntary.***

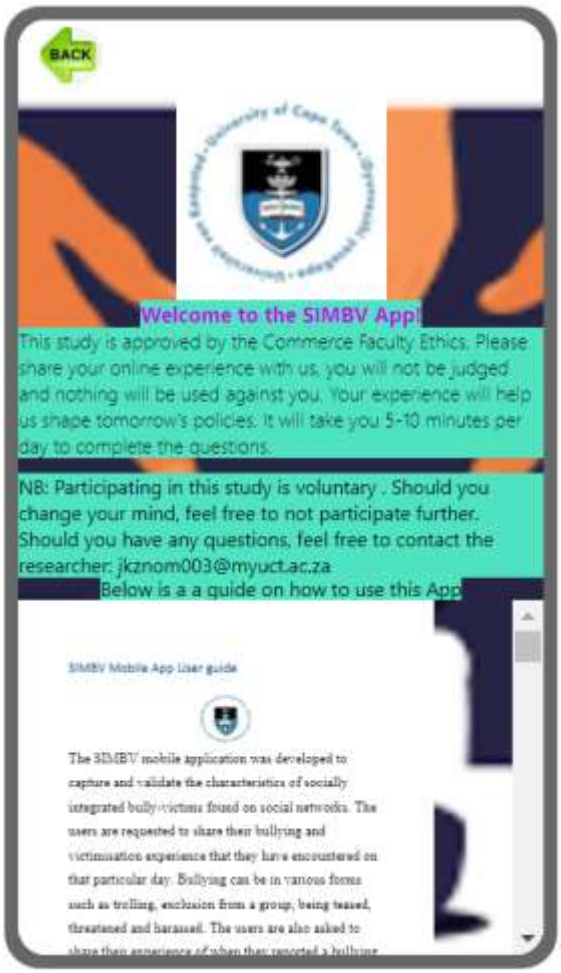
When you open the application, the landing page contains buttons that are labelled based on the type of content they contain, these buttons will direct you to each of the pages as show in figure 1 below:

Figure 1: Landing page



If you select **'About',** the application will redirect you to figure 2 below, where you can get an overview of what the application is about. Once you have read about the application, you can go back to the home page by clicking the green **'Back'** Button in figure 2 below.

Figure 2: About Page



If you need help regarding any of the bullying incidents you are facing or experienced before, the **'Help'** page has contact numbers of institutions in South Africa that can assist, as shown in figure 3.

If you would like to go back to the main page, select the '***Back'*** button.

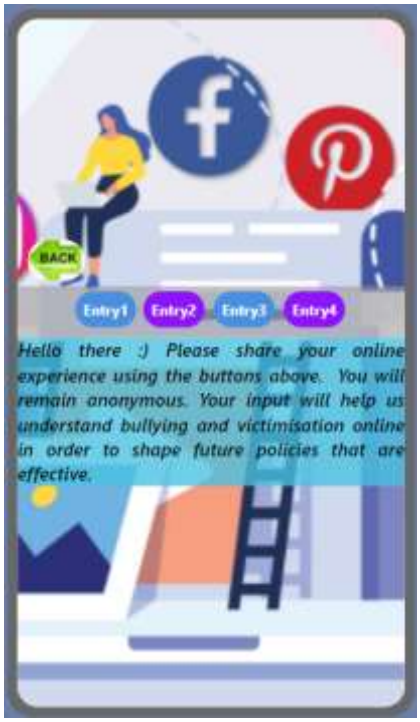
Figure 3: Help Page

The **'Feedback'** page, is where you can let us know what you liked about the application and share suggestions that can help us to improve this application, as shown in figure 4.

Figure 4: Feedback page

Figure 5 is the **'Diary'** landing page, where you can select **'Entry1'** page to tell us about yourself without revealing your real name. The second page would be the **'Entry2'**, where you can share with us the nature of your family and friendship relations. The other pages can be completed in the next 2 days. Please, do not complete the Entry 1,2,3 & 4 pages at the same time. On each day complete one page till you also complete Entry 4.

Figure 5: Diary landing page



In the **'Entry1** to **'Entry4'**pages, the sliders show values from 0-4. Below is what each value indicates:

1 = Always

2= Often

3=Sometimes

4 =Rarely

5: Never

When it comes to '**gender'**, each of the slides means the following:

1=Female

2=Male

3=Non-Binary

4=Lesbian

5=Gay

6=Prefer not to say

Lastly, for '**age'** the slider numbers indicate the following:

1= 18-19

2=20-21

3=22-23

4=24-25

5=Older than 25

Figure 6: Entry1

Figure 7: Entry2

Figure 8: Entry3

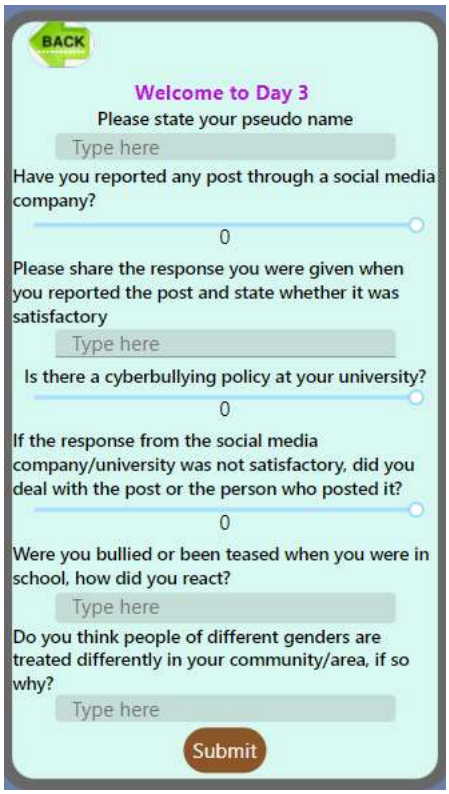


Figure 9: Entry4

The last tab of mobile application called ***'About Mobile Bullying'*** consists of 3 tabs explaining mobile bullying, mobile bully-victim behaviour and consequences of mobile bullying as per the screenshots below:

Figure 10: About Mobile Bullying