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**STUDENTS' INTENTION TO USE IN-APP ADVERTISEMENTS IN PAKISTAN**



**Thesis Submitted to  
Othman Yeop Abdullah Graduate School of Business,  
Universiti Utara Malaysia,  
in Fulfilment of the Requirement for the Degree of Doctor of Philosophy**



**OTHMAN YEOP ABDULLAH GRADUATE SCHOOL OF BUSINESS  
UNIVERSITI UTARA MALAYSIA**

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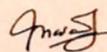
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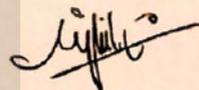
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## ABSTRACT

With the proliferation of smartphone apps, in-app advertisements (ads) have emerged as an important communication and financial tool. However, there are limited studies conducted in the developing countries on how app features in in-app ads influence students' intention to use in-app ads. Therefore, this research aims to examine the influence of perceived collaboration, perceived usefulness, and perceived financial benefits on students' intention to use in-app ads. The mediating roles of attitude and perceived usefulness and the moderating role of self-efficacy were also examined. The underpinning theory used in this study was the Technology Acceptance Model (TAM). Data were collected using the proportional stratified sampling technique among students from selected public universities in Pakistan. An online questionnaire was used for this purpose. Responses from 400 respondents were analyzed using the partial least squares-structural equation modelling (PLS-SEM) approach. The results revealed that the most significant factor influencing students' intentions to use in-app ads was their attitude. Other contributing factors were perceived financial benefits, perceived collaboration, and perceived usefulness. Apart from that, attitude and perceived usefulness showed mediation effects, while self-efficacy demonstrated no moderating effect. The findings conclude that advertisers should effectively use app features and consider the target market's attitude in order to influence their intention to use in-app ads. Advertisers and in-app service providers should collaborate and provide financial benefits to customers for increased business activity. This research has extended the findings on in-app ads from a developing country's perspective. The suggestions for future research are also discussed.

Keywords: in-app advertisements, self-efficacy, intention, attitude, perceived collaboration.

## ABSTRAK

Seiring dengan penerimaan terhadap aplikasi telefon pintar, pengiklanan dalam aplikasi telah muncul sebagai peralatan komunikasi dan kewangan yang penting. Walau bagaimanapun, hanya sedikit kajian dijalankan di negara-negara sedang membangun tentang bagaimana ciri-ciri aplikasi dalam pengiklanan dalam aplikasi mempengaruhi niat pelajar untuk menggunakan pengiklanan dalam aplikasi ini. Oleh yang demikian, kajian ini bertujuan untuk mengkaji pengaruh tanggapan kerjasama, tanggapan kebergunaan dan tanggapan manfaat kewangan terhadap niat pelajar untuk menggunakan pengiklanan dalam aplikasi. Peranan pengantara sikap dan tanggapan kebergunaan dan peranan penyederhana efikasi sendiri juga diuji. Teori dasar yang digunakan dalam kajian ini ialah Model Penerimaan Teknologi (TAM). Data dikumpul menggunakan teknik persampelan perkadaran berstrata dalam kalangan pelajar daripada universiti awam terpilih di Pakistan. Borang soal-selidik secara atas talian digunakan bagi tujuan ini. Maklum balas daripada 400 responden dianalisis menggunakan pendekatan pemodelan persamaan kuasa dua terkecil separa (PLS-SEM). Keputusan menunjukkan faktor yang paling signifikan mempengaruhi niat pelajar untuk menggunakan pengiklanan dalam aplikasi adalah sikap. Faktor penyumbang yang lain adalah tanggapan manfaat kewangan, tanggapan kerjasama dan tanggapan kebergunaan. Selain daripada itu, sikap dan tanggapan kebergunaan menunjukkan kesan pengantara, manakala efikasi sendiri tidak menunjukkan kesan penyederhana. Dapatan kajian memberi kesimpulan bahawa pengiklan patut menggunakan secara cekap ciri-ciri aplikasi dan mempertimbangkan sikap sasaran pasaran bagi mempengaruhi niat mereka untuk menggunakan pengiklanan dalam aplikasi. Pengiklan dan penyedia perkhidmatan pengiklanan dalam aplikasi perlu bekerjasama dan menyediakan faedah kewangan kepada pelanggan untuk meningkatkan aktiviti perniagaan. Kajian ini telah mengembangkan dapatan berkaitan pengiklanan dalam aplikasi daripada perspektif negara sedang membangun. Cadangan untuk penyelidikan masa hadapan juga dibincangkan. Pengiklanan Dalam Aplikasi, Efikasi Kendiri, Niat, Sikap, Tanggapan Kerjasama.

Kata Kunci: pengiklanan dalam aplikasi, efikasi sendiri, niat, sikap, tanggapan kerjasama.

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## LIST OF ABBREVIATIONS

<b>Abbreviation</b>	<b>Term</b>
3G	Third-generation
4G	Fourth-generation
5G	Fifth-generation
AD	Advertisement
ADS	Advertisements
ATT	Attitude toward in-app ads
AVE	Average Variance Extracted
CFA	Confirmatory Factor Analysis
PC	Perceived Collaboration
$f^2$	Effect size
IDT	Innovation Diffusion Theory
IN-APP ADS	In application advertisements
IT	Information Technology
PBS	Pakistan Bureau of Statistics
PFB	Perceived Financial Benefits
INT	Students' Intention to use in-app ads
MOST	Ministry of Science and Technology
NGOs	Non-Governmental Organizations
OS	Operating System
PBC	Perceive Behavioural Control
PhD	Doctor of Philosophy
PLS	Partial Least Square
POI	Point of interest
POS	Point of sales
PTA	Pakistan Telecommunication Authority
PU	Perceived Usefulness
$R^2$	R Square
SCT	Social Cognitive Theory
SEF	Self-Efficacy
SEM	Structural Equation Modelling
SIG	Significant
SPSS	Statistical Package for Social Sciences
STD	Standard
TAM	Technology Acceptance Model
TRA	Theory of Reasoned Action
TPB	Theory of Planned Behaviour
DTPB	Decomposed Theory of Planned Behaviour
SCT	Social Cognitive Theory
Modified SCT	Modified Social Cognitive Theory
UTAUT	Unified Theory of Acceptance and Use of Technology

## CHAPTER ONE INTRODUCTION

### 1.1 Background of the Study

In-app ads are a natural transition from mobile advertisements (Wang & Genc, 2019). By definition, in-app ads are managed by cooperation between application developers, smartphone operating systems (OS), and 3rd party APIs providing the advertisements (Arisanda, 2018). In addition, in-app ads are associated with the app displaying them (Lee, 2016).

Apps need to inform and take permission from smartphone users/consumers before displaying in-app ads to them. Therefore, all in-app ads are permission-based (Salem et al., 2018). Consumers know about in-app ads even when they have not executed an app (Roma & Ragaglia, 2016). Apps use in-app ads as a revenue model. In this sense, if a mobile web browser app such as Brave browser is receiving revenue through the display of advertisements (ads), then ads are considered in-app ads (Arisanda, 2018).

The widespread availability of the 4G network resulted in smartphones as a daily usage device. Increased smartphone storage capacity at an economical price made it possible for consumers to install multiple apps. App acceptance grew rapidly. This led to the use of in-app ads as a feasible revenue model for app developers, advertisers, and other businesses involved. It also simultaneously gave consumers access to relevant in-app ads in the apps they have installed for various purposes (Yuce et al., 2019). Consumers could use highly innovative apps for free by agreeing to receive in-app ads (Roma & Ragaglia, 2016).

According to Johnson (2021), there are more than 4.9 billion internet users worldwide. Mobile internet users worldwide around the same time were 4.32 billion.

Almost 93% of mobile internet users use a smartphone. All smartphones have apps (Newman et al., 2018). Smartphone users spend more than 87% of their time inside apps (Hào et al., 2017). Considering these facts, in-app ads have been widely considered an attractive revenue model by app developers, advertisers, and cellular network service providers (Ku et al., 2017; Li et al., 2018). Entire businesses are structured around in-app ads (Wojdyski et al., 2018).

Although smartphones had arrived in the market in the early 2000s, they were so few, incapable, and expensive that the market was not feasible for even simple mobile ads (Ghaffar & Mohd, 2018). Therefore, mobile ads were done through SMS technology on a minimal scale. This was the case for developed countries. On the other hand, SMS technology was only used for general communication in developing countries due to smaller market sizes (Leek & Christodoulides, 2009). Therefore, it can be said mobile ads were done differently in various parts of the world depending on the acceptance of mobile communication technology.

In 2010, things started to change across the world. Many cellular companies started to provide mobile communication facilities at competitive rates. Even developing countries such as Pakistan had four mobile cellular companies providing various mobile communication services at affordable rates (Pakistan Telecommunication Authority [PTA], 2016). Cellular companies from Europe, China, and the Middle East heavily invested in Pakistan. The year 2014 is considered the start of the mobile internet era in Pakistan. The use of WhatsApp and other such mobile-internet-based apps increased compared to call, SMS, and MMS due to the introduction of the 4G network (Farooq & Raju, 2019).

In-app ads are very capable due to the support of app features. Today, even web browser apps that traditionally restrict ads are facilitating in-app ads since they can provide support to millions of websites using app features. As a result, they can generate revenue for themselves, advertisers, and websites in an extensively used media (Miroglio et al., 2018). Apps use their access to smartphone hardware, software, and communication capabilities to increase the effectiveness of in-app ads.

More importantly, apps are present on a smartphone as installed software that may run in the background and send notifications even when they are in the background. It can monitor smartphone usage and therefore provide sophisticated in-app ads. To capture the market quickly, app developers offer their app for free with a request for permission to present in-app ads. Apps advertise by taking care of consumer needs, such as safeguarding their privacy to develop a positive intention to use in-app ads (Gililand, 2018). In return, in-app ads generate revenue for app developers (Hao et al., 2017).

In-app ads can be of traditional format and newer formats, such as native ads in the form of blips on mapping apps or newsfeeds in the case of socialization apps (Chen et al., 2018; Li et al., 2018). In addition, in-app ads can be both pushed and pulled (Hsu & Yeh, 2018).

The use of in-app ads in an innovative format was, for the first time, widely experienced in Pokémon Go, a game app (Wu & Stilwell, 2018). It used both user profiles and contextual data to provide relevant in-app ads. Ads in Pokémon Go were also referred to as location-based/contextual ads. It was possible to purchase the

advertised items and discounts mentioned in the advertisement directly from within the app with the option to order, pay, and deliver (Li et al., 2018).

Collaboration between apps and advertised apps/brands often gives more discounts to consumers since both apps/brands may provide a benefit. In addition, in-app ads can be tailored based on user profile, context, and other aspects such as the type of bank card a user has (Noh & Lee, 2016; Sabri, 2019).

By 2016, numerous apps started incorporating in-app ads in developed countries (Chou & Wang, 2016). Therefore, the term in-app ads became common. Research began on in-app ads considering the increasing scope (Logan, 2017). Most of the research on in-app ads has occurred in South East Asia, the USA, and Europe.

Some apps display in-app ads in native advertisement format (Youn & Kim, 2019). Such apps often provide information-based services (Kapoor & Vij, 2018). For instance, reservation apps and mapping apps (Vasserman et al., 2015). They usually offer in-app ads disguised as the app's core service. Some apps only display in-app ads using the traditional format (Dehghani et al., 2016). Entertainment apps such as games can easily incorporate in-app ads in native advertising format (Yu et al., 2018).

Apps can provide the facility to purchase the advertised items and redeem discounts right from within the app (Folting et al., 2017). They can collaborate with advertised brands, delivery service providers, and payment handlers (Kapoor & Vij, 2018). Physical outlets can list themselves up on related apps to be advertised in the native advertising format (Cho et al., 2019). Such apps are known as online-to-offline apps. They mostly do location-based advertising in native advertising format while using monetary incentives to increase usage of in-app ads (Bauer & Strauss, 2016). Such

apps often state they provide services rather than presenting in-app ads (Roh & Park, 2018).

Multiple apps have gained popularity in Pakistan, such as Facebook, WhatsApp, Instagram, Twitter, TikTok, and Snapchat (Farooq et al., 2019; Similarweb, 2021). These apps generally fall under the category of social media and communication apps (Rowe, 2017). Games, navigation, shopping, and booking apps for various products/services have also gained popularity. These apps extensively use in-app ads in multiple formats to generate revenue (Youn & Kim, 2019). Apps have made smartphones a new medium for advertising and marketing purposes, so research is relevant (Rowe, 2017; Diaz, 2016).

Mobile ads have witnessed a massive increase in Pakistan in digital ads taking over traditional ads (Khan, 2017). These advertisements are opened on both websites within mobile web browser apps or through dedicated apps (Sigurdsson et al., 2017).

Most consumers dislike receiving in-app ads (Scholz & Smith, 2016). Soon after installation, they uninstall apps, citing annoyance at in-app ads as a prominent reason (Lee, 2017). Usage of in-app ads is very low, especially with traditional mobile ads such as banner ads (Le & Vo, 2017; Raines, 2013). The biggest issue for Pakistani consumers with in-app ads is the negative attitude toward mobile ads. A negative attitude has developed due to fake claims in advertisements (PTA, 2018). Often advertised information is incorrect. Merchants dishonour advertised claims in mobile ads (Hameed et al., 2016). Financial benefits have been recognized as the most appropriate way to attract low-income consumers. However, fake and dishonoured

discount vouchers have resulted in a negative attitude towards mobile ads (Waheed et al., 2019).

Many services have been recognized as sophisticated forms of in-app ads (Kapoor & Vij, 2018). Apps and advertisers collaborate with other stakeholders to provide the benefit of synergy to consumers. Collaborating partners also benefit from this method (Hsu & Lin, 2019; Youn & Kim, 2019).

A prevalent in-app ads method is through social media and communication apps (Kowang et al., 2018). These apps have features that facilitate consumers' needs in terms of socialization, interaction, co-creation, ubiquitous computing, and localization (Alalwan, 2018; Smith, 2019). Most social media and communication platforms are both app and mobile web-based (Kowang et al., 2018). Gaming apps are also a substantial market for in-app ads, considering the large market size (Korea et al., 2018).

To capture the market quickly, most apps are made available free to consumers (Roma & Ragaglia, 2016). Consumers belonging to developing countries, such as Pakistan, belong to low and middle-income groups. Therefore, they prefer free apps (Waheed et al., 2019). To monetize Android apps, app developers use in-app ads since the Android platform targets both rich and poor consumers (Hao et al., 2017). Contrary to Android, Apple app developers target wealthy and status-conscious consumers. As a result, most apps on the Apple platform use an in-app purchase or subscription option to generate revenue (Liu, 2017).

Many established brands have developed brand apps along with websites. These apps provide options for online orders, payment, and home delivery of advertised products

and services through collaboration with relevant firms (KNN, 2021; United Bank Limited [UBL], 2021). Similarly, platform apps have appeared (Golootlo, 2021; Peekaboo Guru, 2021). They collaborate with multiple firms to deliver advertised products/services (Yu et al., 2018). Since they often charge the app user for the service, they are recognized as service apps. However, they closely follow the native in-app ad format.

App popularity has increased significantly in recent years in Pakistan. The reason for this is their advertisements through commonly visited websites such as social media and smartphone apps (Wu & Stilwell, 2018). In addition, the local apps of Pakistan are being advertised through traditional channels such as kiosks at point of sales (POS) to compete with well-established international apps (Golootlo, 2021; UBL, 2021).

Youngsters are the heaviest users of smartphone apps. They also tend to prefer using apps that are free to access. These apps quite often utilize in-app ads to generate revenue. They also collect consumer data regarding smartphone usage and share it with third-party apps and advertising agencies. Youngsters are not bothered with their information being captured since they do not have confidential organizational data. In fact, they want their activities to be shared (Owee Kowang et al., 2018).

Among youngsters, the student category is an attractive segment for advertisers. Students utilize apps for various reasons. Among students, university students are a desirable market. They desire to consume many products and services even though they have limited financial resources at their disposal. They are particularly interested in innovative products. They spend a significant proportion of their time using digital

technologies such as smartphones and tablet computers for a significant portion of their time. Most of them are digital natives. Therefore they find it comfortable to use smartphone apps. They extensively use in-app ads-supported apps as they don't want to spend money on apps.

## **1.2 Problem Statement**

### **1.2.1 Theoretical Issues/Gaps**

In recent years, most studies on in-app ads were conducted in China, India, Malaysia, Taiwan, and the USA. Research on in-app ads from a Pakistani perspective is negligible (Waheed et al., 2019). In-app ads in Pakistan are being carried out without much understanding of local aspects. Previous studies have generally considered factors that have been earlier considered for media very limited in terms of capability. These media included SMS and mobile websites (Sigurdsson et al., 2017). Very few factors applicable to apps and subsequently to in-app ads were added to the models to measure in-app ads' acceptance.

For this reason, many advertisers in Pakistan are apprehensive about utilizing in-app ads. The few who opt for it only advertise on the most popular apps/platforms such as Facebook, Instagram, and YouTube without understanding when, why, and how in-app ads are successful. They don't consider nor understand the impact of app/platform type and advertised product type on the success of in-app ads. As a result, many advertisers opt to advertise using all mobile advertising channels, which is inefficient (Farooq & Raju, 2019).

Pakistan has unique socio-economics, technology, and demographics (Hanif et al., 2018). Therefore, app features and factors relevant to Pakistani consumers need to be

considered. In-app ads can be a lot more versatile than mobile web ads and SMS ads if done by considering relevant factors.

Any feature that influences intention to use in-app ads is relevant to a model measuring acceptance of in-app ads. One such feature is collaboration. Its usage has been determined from service apps (Kapoor & Vij, 2018). The effect of collaboration should be determined from the perspective of in-app ads. A lot of research has focused on how collaboration can be used to increase inter-organizational business performance (Hew, 2017). However, collaboration has not been tested in terms of whether it can improve students' intention to use in-app ads due to enhanced coordination between advertisers, merchants, and apps and subsequent benefits possible for the end-users (Jan et al., 2019; Ray et al., 2019). Therefore, there is a need to determine whether perceived collaboration influences the students' intention to use in-app ads.

Intention to use advertisements is a robust antecedent of acceptance of advertisements in terms of purchase/redemption of the advertised item (Jang & Lee, 2018; Martins et al., 2019). Collaboration positively influences the intention to take advantage of App services (Kapoor & Vij, 2018). The increased benefit of better redemption options, the convenience of availing services from trustworthy service providers, and loyalty are significant collaboration results (Bidgoli, 2012; Kapoor & Vij, 2018).

Another relevant factor is usefulness (Yeo et al., 2017). Usefulness has been used in terms of perceived and perceivable. During the introduction stage of computers in the 1980s, perceived usefulness was a common term. However, since technology has evolved over three decades, perceivable (post usage usefulness) is also relevant.

Apps have been in existence for more than a decade, and they are installed for long-term usage purposes. Therefore, post usage usefulness has been extensively used in conjunction with pre usage usefulness/adoption (Carter, 2012; Compeau & Higgins, 1995a; Dolawattha et al., 2019; Venkatesh & Bala, 2008). However, its usage alone is uncommon. It was considered alone in a model measuring consumer acceptance of online food delivery apps (Yeo et al., 2017).

Considering in-app ads are also a type of app service, perceived collaboration and POST usage usefulness should be utilized in a model measuring acceptance of in-app ads (Tongaonkar et al., 2013). In this study, the term perceived usefulness is used for simplicity. However, it is kept in mind consumers have both perceived and perceivable usefulness of in-app ads.

Two factors necessary to include when measuring acceptance of in-app ads are the perceived financial benefits and attitude (Dastjerdi et al., 2019; Weng et al., 2017). Iqbal et al. (2017) found these factors relevant to Pakistani consumers and other developing countries. Cheung and To (2017) also found perceived financial benefits to significantly influence the acceptance of in-app ads. Perceived financial benefits are necessary, considering most Pakistani consumers belong to the low and middle-income groups (Khalid & Farooq, 2019). They desire good deals. Whether in a traditional format or a native advertisement format, in-app ads are considered sponsored messages (Li et al., 2018). Consumers are irritated by mobile ads (Le & Vo, 2017). To overcome the negative effect of irritation, they expect a reward.

For this reason, perceived financial benefits are considered an essential factor in positively influencing the intention to use in-app ads (Wang et al., 2019). Attitude

towards mobile ads has developed and evolved in consumers over many years. Attitude is a mediator in numerous studies (Raska et al., 2017; Verstraten, 2015). It also has a direct influence on intention.

Another factor relevant in the case of Pakistani consumers is self-efficacy (Qazi et al., 2018). Although most young and middle-aged users, such as students in the world can interact with technology, this is not the case in Pakistan. They are found at low and high self-efficacy levels (Abbas et al., 2019; Awan & Zahra, 2016; Iftikhar Bakht, 2021). Due to the negative experience of interacting with SMS and mobile web ads, Pakistani consumers do not find many reasons to learn about the usage of in-app ads.

Cheap yet powerful smartphones became available in the last decade, allowing many consumers to acquire them. The mass majority of consumers use apps to achieve the purpose marketed by the app. They do not intend to use in-app ads while using apps. Research has confirmed consumers have different views regarding ads and app services (Shekhar et al., 2012).

Many consumers have reduced their usage of apps containing in-app ads (Youn & Kim, 2019). In-app ads are considered an advanced feature of an app (Lee & Hsieh, 2009). Therefore, advertisements are deemed unnecessary and forced media. Consumers only agree to use ad-supported apps since they get the app for free (Roma & Ragaglia, 2016). However, most student category consumers only learn to cancel and avoid in-app ads (Obermiller et al., 2005). In-app ads can provide many benefits to users by using app features. However, self-efficacy might be required to use in-app ads beneficially.

### **1.2.2 Practical Issues/Gaps**

In Pakistan, the intention to use in-app ads is negative (Zaheer & Kline, 2018). Even with capabilities available to smartphone apps, in-app ads have not gained popularity in the eyes of Pakistani consumers. Consumers have complained excessively on the Google Play store and social media on issues faced while availing the in-app ads (Golootlo, 2021; Peekaboo Guru, 2021; Sabri, 2019). Most in-app ads are still in a traditional format, such as banner ads. They have no authenticity. A local Pakistani information-providing app, Peekaboo Guru, started providing information on various brands offering financial benefits based on bank cards (Peekaboo Guru, 2021). It used a native advertisement format. As per the Web Advertising Model, it should have caused negligible irritation. However, the app and the advertised brands received negative reviews on various forums. The usefulness of storing information resulted in negative intention towards in-app ads, reason being discount information was often wrong. The app now collaborates with multiple firms to deliver advertised products/services to consumers. Purpose was to overcome issue faced by consumers regarding dishonour of advertised benefit by merchants. Many such apps do the same thing to offer services (Das, 2015; Sabri, 2019).

Poorly implemented in-app ads irritate consumers to such an extent that most consumers stop using apps in which in-app ads appear (Noerkaisar et al., 2016). Many consumers have reduced usage of default smartphone apps such as Waze and Google Maps due to in-app ads (Vasserman et al., 2015). Similarly, smartphone users have reduced their usage of YouTube and Facebook apps which have started doing in-app ads by embedding ads in videos and news feeds (Shaheen et al., 2017). Smartphone

users have begun using alternate apps with fewer in-app ads (Owee et al., 2018; Yu, 2019).

According to statistics, the most popular apps in Pakistan still present in-app ads (Similarweb, 2021). Smartphone users need information and entertainment, providing various benefits (Smith, 2019; Wang et al., 2016). However, they are concerned about the credibility of advertisements (Martins et al., 2019). Research on in-app ads has found that financial benefits should outweigh the negatives. In-app ads can utilize app features that take care of users' concerns.

Pakistani consumers have experienced issues with mobile ads based on SMS, call, mobile web, or apps. Major issues they have experienced are fake financial benefits and privacy invasion in terms of the intrusive nature of advertisements (Aamir et al., 2015; Javeed, 2015). Moreover, often availing of the advertised discount is difficult, which leads to irritation and a lack of credibility towards mobile ads. As a result, Attitude toward mobile ads is generally negative. Nowadays, the only reason smartphone users install in-app ads-supported apps is that they can use the app for free (He et al., 2018).

Recent mobile ads in the form of in-app ads have also created a negative attitude among consumers (Shahzad & Kausar, 2016). Considering an economically strapped nation, most in-app ads in Pakistan are incentive-based (Waheed et al., 2018). The problem arises due to the dishonour of financial benefits advertised in in-app ads (Khan et al., 2017). When consumers try to use in-app ads, they find out the benefits are invalid. Often the procedure of availing the benefits is unclear. At times, it is so

cumbersome to avail benefits that the negatives of using in-app ads outweigh the positives. As a result, consumers develop a negative attitude toward in-app ads.

Some apps doing in-app ads in this way have opted to provide complete solutions in terms of delivery of advertised items (Das, 2015). They make sure advertised financial benefits are availed by consumers. They collaborate with advertised brands. Such apps appear to be complete service providers. For this reason, they have been considered service providers such as ride-hailing apps and food delivery apps (Najmah et al., 2019). Some apps have appeared which advertise as an extension of their core service. For instance, the Facebook and Waze apps advertise using traditional and native ad formats within their standard app interfaces (Vasserman et al., 2015). When a consumer interacts with in-app ads in the Facebook app, they can check the details of the advertised item and order within the Facebook app. Cash on delivery is the payment option in the Facebook app (Voorveld et al., 2018).

Self-efficacy, also referred to as mobile literacy, is an issue with Pakistani consumers when using in-app ads (Hassan & Read, 2018). No doubt, app usage has increased tremendously. However, it is for the purpose marketed by the app rather than interacting with in-app ads (Rowley & Keegan, 2017). Moreover, many consumers use apps out of necessity. Therefore, their self-efficacy is often less to perform complex tasks within the apps. This is especially pertaining to interaction with in-app ads (Lee & Hsieh, 2009).

Usage of in-app ads, such as native ads in the form of sponsored messages in the newsfeed on the Facebook app or advertisements in the map interface of the Waze app, requires a higher amount of self-efficacy (Noerkaisar et al., 2016; Youn & Kim,

2019). Even for traditional advertisements, pulling in-app ads is a difficult task. Many game apps, such as 8 Ball Pool, do both standard banner/video ads in push format and allow consumers to initiate execution of in-app ads to receive benefits. However, this is more than the primary purpose an app is used for by most consumers. In case apps present both complex and straightforward advertisements, consumers with low self-efficacy only interact with simple in-app ads. As a result, they miss the advantage of using elaborate advertisements with coupon redemption options. They also don't use in-app ads on a need basis, hence miss receiving free benefits in apps (Shao et al., 2018). Therefore, consumers with low self-efficacy only experience pushed advertisements with limited benefit. Thus, they soon reduce or stop using the app.

In-app ads are an evolving field. High-speed internet through the 4G network arrived late in Pakistan, so there is still a chance of increasing usage of in-app ads (PTA, 2018). A particular segment highly relevant for research is educated youngsters.

To summarize, practical issues in Pakistan are that in-app ads are considered fake, non-trustworthy, irrelevant, difficult to avail, and negligible in providing financial benefits (Waheed et al., 2019). The economic benefits mentioned in advertisements are simply ignored since consumers do not trust mobile ads. Due to a lack of trust, financial benefits are considered low value. Therefore, they do not find in-app ads helpful. They have a negative attitude toward in-app ads. Consumers also vary in self-efficacy to interact with in-app ads. Therefore, most consumers ignore in-app ads. Consumers low in self-efficacy consider in-app ads as unauthentic, useless, irritating, and difficult to benefit from.

University students in Pakistan are at a stage where attitudes can still be moulded for use of in-app ads. In-app ads provide the option to consumers to restrict in-app ads. They can know before using an app whether it presents in-app ads or not. Although attitude has been negatively developed towards mobile ads such as SMS and web ads, there is a chance attitude can be modified for in-app ads. Similarly, the intention to use in-app ads can be enhanced by utilizing app features that are very different from SMS and web browser service. By collaborating, in-app ads can be more relevant, trustworthy, beneficial, and easy to avail. Financial benefits alone can significantly influence intention since university students are on a limited budget yet desire to experience many products and services.

### 1.3 Research Questions

Based on the problem statement, the following research questions are proposed:

- RQ 1) Do attitudes toward in-app ads, perceived usefulness, perceived collaboration, and perceived financial benefits influence students' intention to use in-app ads?
- RQ 2) Do perceived usefulness and perceived financial benefits influence attitude toward in-app ads?
- RQ 3) Do perceived collaboration and perceived financial benefits influence perceived usefulness?
- RQ 4) Does attitude toward in-app ads act as a mediator for the relationship between students' intention to use in-app ads and its predictors?
- RQ 5) Does perceived usefulness act as a mediator for the relationship between perceived financial benefits and students' intention to use in-app ads?

RQ 6) Does perceived usefulness act as a mediator for the relationship between perceived financial benefits and attitude toward in-app ads?

RQ 7) Does self-efficacy moderate the relationship between students' intention to use in-app ads and perceived usefulness, perceived collaboration, and perceived financial benefits?

#### 1.4 Research Objectives

The following research objectives were proposed, corresponding to the study's research questions. For the first three research questions, one main research objective was proposed. This research objective was about direct relationships under investigation in the study. Hence, Eight sub-research objectives were formulated. They are as under:

- RO 1.1) To investigate the influence of attitude toward in-app ads on students' intention to use in-app ads.
- RO 1.2) To investigate the influence of perceived usefulness on students' intention to use in-app ads.
- RO 1.3) To investigate the influence of perceived collaboration on students' intention to use in-app ads.
- RO 1.4) To investigate the influence of perceived financial benefits on students' intention to use in-app ads.
- RO 1.5) To investigate the influence of perceived usefulness on attitude toward in-app ads.
- RO 1.6) To investigate the influence of perceived financial benefits on attitude toward in-app ads.
- RO 1.7) To investigate the influence of perceived collaboration on perceived

usefulness.

- RO 1.8) To investigate the influence of perceived financial benefits on perceived usefulness.

One research objective was proposed for the fourth to sixth research questions. This research objective investigated the mediating effect tested in the study. Hence, it had four sub-research objectives. They are as under:

- RO 2.1) To investigate the mediating effect of attitude toward in-app ads on the relationship between perceived usefulness and students' intention to use in-app ads.

- RO 2.2) To investigate the mediating effect of attitude toward in-app ads on the relationship between perceived financial benefits and students' intention to use in-app ads.

- RO 2.3) To investigate the mediating effect of perceived usefulness on the relationship between perceived financial benefits and students' intention to use in-app ads.

- RO 2.4) To investigate the mediating effect of perceived usefulness on the relationship between perceived financial benefits and attitude toward in-app ads.

For the seventh research question, one research objective was proposed. This objective investigated moderating effect. Hence, it had three sub-research objectives.

They are as under:

- RO 3.1) To investigate the moderating effect of self-efficacy on the relationship between perceived usefulness and students' intention to use in-app ads.

- RO 3.2) To investigate the moderating effect of self-efficacy on the relationship between perceived collaboration and students' intention to use in-app ads.
- RO 3.3) To investigate the moderating effect of self-efficacy on the relationship between perceive financial benefits and students' intention to use in-app ads.

### **1.5 Scope of the Study**

In-app ads are researched in this study. They have gained tremendous attention from advertisers in developing countries. The focus of this study is Pakistan. It is a good representative of developing countries. Very little research has been done in Pakistan on in-app ads. It has experienced tremendous growth in the cellular industry in recent years. Therefore, Pakistani consumers are an attractive market for in-app advertisers. University students are the heaviest users of smartphone apps (Raines, 2013). Therefore, this research is on university students.

Within Pakistan, Islamabad has been targeted. Islamabad is the capital city of Pakistan. Youth aspiring to move ahead in life come to Islamabad for education and livelihood. Pakistani government heavily spends on Islamabad in terms of infrastructure development and maintenance. The government charters numerous universities in Islamabad referred to as federally chartered universities. Funding by the government and other organizations makes them capable of offering many scholarships. Students from all over Pakistan enrol in these universities because of this reason. A favourable environment also attracts students who eventually desire to settle in Islamabad. Furthermore, most foreign companies introduce their services and

products in Islamabad. Due to the above reasons, Islamabad is an appropriate city to be targeted for this research.

## **1.6 Significance of the Study**

The findings of this research explain how students' intention to use in-app ads is influenced by attitude toward in-app ads, perceived usefulness, perceived collaboration, and perceived financial benefits. Mediating influence of attitude toward in-app ads and perceived usefulness will be understood. In addition, the moderating effect of self-efficacy will be identified. Two contributions in terms of theoretical and practical are applicable in this study. They are discussed in the following sub-sections.

### ***1.6.1 Theoretical Significance***

Previous research on in-app ads has focused mainly on the United States of America (USA), Europe, and developed countries (Li et al., 2018; Logan, 2017; Xu & Li, 2014). Research findings from western and developed countries are not always applicable in developing countries. Moreover, since these researches mostly tested factors relevant at that time, there is a need for further research focusing on current factors based on innovative technologies.

Considering the above gaps, this research extended the literature on the acceptance of in-app ads from a developing country's perspective. Furthermore, innovative factors due to app features were considered in terms of their influence on the acceptance of in-app ads.

This research has focused on Pakistan, a developing country. The study hoped to broaden the understanding of in-app ads' acceptance with the inclusion and adaption of relevant factors in available acceptance models. Among numerous factors, attitude

toward in-app ads, perceived usefulness, perceived collaboration, perceived financial benefits, and self-efficacy are considered appropriate in increasing the acceptance of in-app ads. This study extends the currently available theoretical models for accepting in-app ads.

Perceived usefulness is relevant in the case of in-app ads as users desire to take advantage in return for using in-app ads (Silva & Yan, 2017; Lin & Kim, 2016; Wang & Genc, 2019). Perceived collaboration resolves users' issues with advertising regarding authenticity, reliability, low financial benefit, and ease of availing (Smilansky, 2017; Yu et al., 2018). Collaboration also provides economic benefits in more versatile ways (Kapoor & Vij, 2018). However, perceivable usefulness and perceived collaboration have been barely tested in models measuring user acceptance of in-app ads. Therefore, measuring their influence on students' intention to use in-app ads will add knowledge to the literature.

Perceived financial benefits are considered a significant predictor of successful in-app ads (Wang et al., 2019). Attitude toward in-app ads covers important emotional factors proven to be determinants of acceptance of mobile ads (Raines, 2013). Attitude is an essential factor in the TAM model and other models focusing on technology and advertising (Ajzen, 1991; Davis, 1989; Fishbein & Ajzen, 1975). Attitude's continued influence on students' intention to use in-app ads is tested in this study. Research findings informed whether Attitude toward in-app ads is an essential determinant of acceptance of in-app ads. Research findings also tell whether attitude toward in-app ads and perceived usefulness act as mediators.

Self-efficacy has been incorporated into the model since not all students can use advanced app features. Utilizing advanced features of an app to enable more fruitful advertisements might not be possible for a student with a low level of self-efficacy. Therefore, students with varying self-efficacy levels will differently perceive the influence of usefulness, collaboration, and financial benefits on the intention to use in-app ads. Research findings will inform whether Self-Efficacy acts as a moderator.

This study will provide a modified form of the TAM model, which can measure the acceptance of in-app ads among students from developing countries.

### ***1.6.2 Practical Significance***

Results of the study will facilitate ad agencies to advertise to students through in-app ads effectively. Individual businesses will come to know how they can appropriately advertise through in-app ads. They will be aware of factors influencing the acceptance of in-app ads. Students will be better targeted with the findings of the study. App developers will learn about app features aiding in the acceptance of in-app ads. By considering these features, they can be assured to benefit from in-app ads as a revenue model.

Government, legal firms, and other stakeholders will come to know how in-app ads are viable in the light of current issues in terms of consumer safety, privacy, and the desire to gain more benefits. In the last decade, governments and cellular companies have come under increased pressure to take care of smartphone user/consumer rights. This research will help them know whether in-app ads can satisfy advertiser and app developer needs while taking care of students' rights. The influence of attitude toward in-app ads, perceived usefulness, perceived collaboration, and perceived financial

benefits on students' intention to use in-app ads will be understood. The mediating effect of perceived usefulness and attitude toward in-app ads will be explained. The moderating effect of self-efficacy will be understood. Results of the study will facilitate decision-makers to focus on essential factors.

### 1.7 Definitions of Key Terms

Table 1.1 lists the key terms used in the thesis. These terms have been defined according to their usage in this research.

Table 1.1  
*Definitions of Key Terms*

<b>Construct</b>	<b>Definition</b>	<b>Source</b>
Intention to use in-app ads	The intention is the chance a user will act in a particular manner towards in-app ads in the near future.	(Wu et al., 2011)
Attitude toward in-app ads	Attitude is the users' approving or disapproving response towards in-app ads.	(Lee et al., 2017)
Perceived usefulness	User view regarding the use of in-app ads in terms of performance.	(Ray Et Al., 2019)
Perceived collaboration	User view regarding formal relationships managed by an app to provide advertised content.	(Angella & Go, 2009)
Perceived financial benefits	User view regarding financial benefits received for using in-app ads.	(Richard & Meuli, 2013)
Self-efficacy	The users' confidence in their ability to use in-app ads.	(Compeau & Higgins, 1995b).

### 1.8 Organization of the Thesis

Chapter one included a discussion on the background of the study, problem statement, research questions, research objectives, the scope of the study, significance of the study, and definitions of key terms. Chapter two is about the literature review. First, a discussion on in-app ads is done. Then underpinning theory of the study is shared. Next, factors chosen for the conceptual framework of the study are discussed. The last part of chapter two covers the conceptual framework of the study. Chapter three is regarding methodology. First, operational definitions of key constructs and measurement of constructs are presented. Next, the sampling method and data collection procedures are discussed. Lastly, chapter three covers details on data

analysis techniques. Chapter four includes the results of the data analysis. Chapter five has a detailed discussion grounded on the findings of the data analysis results. It also includes a discussion on the study's contribution and directions for future research, considering the scope and limitations of the study.



## CHAPTER TWO LITERATURE REVIEW

### 2.1 Chapter Overview

In this chapter, first, an overview of in-app ads is presented. Then underpinning theory of the study is shared. Next, factors chosen for the conceptual framework are discussed. In the end, the conceptual framework is given.

### 2.2 In-App Ads

In-app ads extend mobile ads on smartphone apps (Hallgrimsson, 2016). They are defined as ads displayed through smartphone apps (Bhave et al., 2013). Since apps control them, apps receive a significant portion of the benefit in case of usage of in-app ads (Roma & Ragaglia, 2016).

Considering the substantial increase in the app market, in-app ads have become a popular way of advertising (Raines, 2013; Tongaonkar et al., 2013). For app developers, in-app ads are a great revenue model and a method to capture the market quickly by offering the app for free (Mhaidli et al., 2019).

In-app ads can be classified based on different viewpoints. As per Park et al. (2008), Bhave et al. (2013), and Valvi and West (2015), in-app ads can be classified based on communication type (push, pull), presentation type (text, image, video), business type (direct purchase, promotion, information transfer, brand imaging) and message type (pure ads, attached ads). In-app ads can be a distinct part of an app in terms of traditional ads or part of an app in terms of native ads (Bhave et al., 2013; Chen et al., 2018).

Native ads, by definition, are ads that appear as general information. They are presented as recommendations or relevant information by an app (Wojdynski &

Golan, 2016). They can take many forms, including text, image, and video. Furthermore, they can appear as a listing, blip, or news feed that smartphone users can easily access (Youn & Kim, 2019). Apps are increasingly considered the appropriate platform for native ads (Wojdynski & Golan, 2016).

For in-app ads to be fruitful, the critical thing is usage. In-app ads benefit users even if they simply watch them for a few seconds (Dehghani et al., 2016). For example, an ad allows users to access paid app features by watching in-app ads (Big Keyboard, 2019). Similarly, in-app ads enable users to achieve benefits such as virtual coins, making their app experience better (Joycity, 2019).

Smartphone users do not install after-market apps to handle essential cellular services such as SMS unless they deal with many SMSes (Balubaid & Manzoor, 2015). Although research is still being conducted on SMS ads, the usage of after-market apps to handle SMS is infrequent (Iqbal et al., 2017). Therefore, nowadays, research is more relevant for in-app ads.

The earliest research on in-app ads found extensive use of Bluetooth and Near field communication (NFC) technology rather than mobile internet (Aalto et al., 2004; Estel & Fischer, 2015). In-app ads can be contextualized based on numerous sensors present in smartphones and consumer data collected and managed by apps (Lee, 2017; Sabri, 2019). Recent research on in-app ads has focused on apps doing ads in native and traditional formats using the internet as the carrier of ads (Cicek et al., 2018).

Users expect to gain benefits by permitting in-app ads. The habit of using an app can ease reluctance to use ads (Alalwan, 2020). In the case of in-app ads, users perceive to interact with at least two brands. One is the app and the second is the advertised brand

(Dehghani et al., 2016). Apps are installed with a long-term usage perspective. So, users more easily relate to apps as brands (Ozkan & Solmaz, 2015). Users develop attitudes towards both the advertising app (as a brand) and the advertised brand (Chua et al., 2018).

Location contextuality can increase the relevance and cost advantage of using in-app ads (Lee, 2018). Culture has a significant moderating effect on accepting in-app ads (Sigurdsson et al., 2017). Fachryto and Achyar (2018) found that highly relevant and contextualized in-app ads increased creepiness. Creepiness leads to an increase in perceived threat.

As per statistics, most of the apps users use are in-app ads or in-app purchase supported (Roma & Ragaglia, 2016; Similarweb, 2021). Users understand in-app ads provide them access to free high-quality apps, so users generally agree to install apps containing in-app ads (Hsu & Yeh, 2018; Jang et al., 2019).

In-app ads are influenced by emotional factors identified in past research, such as Web Advertising Model (Brackett & Carr, 2001; Ducoffe, 1996). In-app ads overcome privacy concerns and trust issues (Stocchi et al., 2019). In the case of native ads, in-app ads can benefit from app layout and appear as part of app service or content (Pedersen & Nysveen, 2018; Youn & Kim, 2019).

### **2.3 TAM as the Underpinning Theory of the Study**

For developing the conceptual framework of the study, numerous theories and models were reviewed. The purpose of the study was kept in mind. The study aimed to create a model relevant to students' acceptance of in-app ads. It required adaptation

in a model in the form of the addition/substitution of factors based on app features and user characteristics.

A concise review of theories and models relevant to technology and advertising is given in Table 2.1. It is evident that some theories and models are irrelevant as they focus on implementing technology in alternate areas compared to our area of interest. For example, Social Cognitive Theory (SCT) is relevant to education and motivational studies. Furthermore, some theories and models are too old to be considered in the current era. Many of them are already too big to add new factors.

Based on the context of the study, Technology Acceptance Model 1 (TAM) was chosen as the underpinning theory of the study. TAM is simple yet high in determining power. No doubt, it is an old model dating back to the 1980s. However, it has been consistently adapted/ extended due to its small size. For the same reason, it will be utilized as the underpinning theory of the study. In addition, adaptations and additions will be made to the model to make it more relevant to the context of the study.

Table 2.1  
*Review of Technology and Advertising Theories and Models*

<b>Theories/Models</b>	<b>Issues</b>
Web Advertising Model	Little consideration for new technology-related aspects.
Extended Web Advertising Model	Little consideration for new technology-related aspects.
TRA	Old, relevant to the social psychology field. Very general.
TPB	Old, too small, limited prediction power.
DTPB	Too many factors so an extension is not feasible.
SCT	Relevancy to education and motivation studies.
Modified SCT	Old, relevant to the early computing era.
TAM	Old, too small.
TAM2	Too many factors so an extension is not feasible.
TAM3	Too many factors so an extension is not feasible.
UTAUT1	Too many factors so an extension is not feasible.
UTAUT2	Too many factors so an extension is not feasible.

Technology Acceptance Model 1 was the work of Fred Davis as a doctoral dissertation (Davis, 1986). It was later published as an article in 1989 and became widely used for numerous research studies (Davis, 1989). It was revised multiple times as Technology evolved. In 1996, TAM model 1 got its final shape (Davis & Venkatesh, 1996). It is simply referred to as the TAM model. It was modelled for consumer acceptance of technologies in an organizational context.

The TAM model is based on the Theory of reasoned action (TRA). TRA measured behaviour through intention. Following the same analogy, The TAM model measured user behaviour through intention. Perceived Usefulness and perceived ease of use were the main antecedents of the model. Perceived ease of use influenced Perceived Usefulness and Attitude. Perceived Usefulness influenced Attitude and intention. Attitude influenced intention. Attitude acted as a mediator. In the final version of the TAM model, the Attitude was removed, as shown in Figure 2.1.

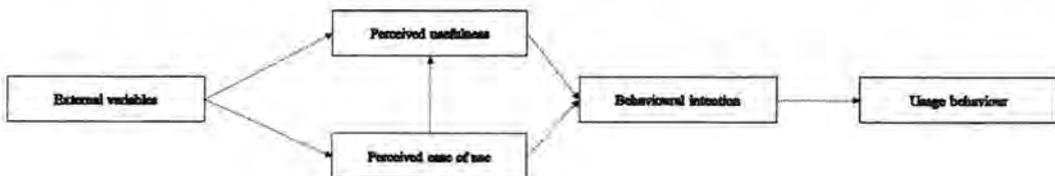


Figure 2.1  
*Technology Acceptance Model*  
 Source: Davis and Venkatesh (1996)

## 2.4 Students' Intention to use In-App Ads

The intention is the likelihood that a consumer/ smartphone user will act in a certain way in the near future (Wu et al., 2011). In the context of in-app ads, one needs to consider intention to use as the desire of the user to interact with ads accessible in apps so that intended action can be taken by smartphone users (Sigurdsson et al., 2017). In recent studies, the intention has been used to measure

smartphone users' behaviour towards in-app ads. Some of these in-app ads appeared as native ads (Li et al., 2018). For example, in-app ads in the Facebook app appear as newsfeed items referred to as sponsored material. Facebook pages are another way to present native ads on Facebook. The same happens in the case of Instagram. In case of Twitter, hashtags are used (Middellesch, 2017; Waheed et al., 2019). In the case of some apps, in-app ads are managed in terms of the service the app provides (Wang et al., 2016). However, most in-app ads are in traditional format (Aydin & Karamehmet, 2017; Lee & Shin, 2017).

Intention is one of the strongest predictors of actual behaviour (Akman & Mishra, 2017). Actual behaviour is also referred to as acceptance or use behaviour (Chua et al., 2018). In some studies, it has been referred to as conversion or actual purchase (Kapoor & Vij, 2018). In the case of in-app ads, intention to use in-app ads is a more appropriate term (Du, 2012). Use can be in terms of clicking on in-app ads, leading to further interaction leading to the actual purchase of the advertised item (Liu & Mattila, 2017). In-app ads can be for either a physical item or a digital item. In the case of apps such as games, digital items can be the app itself or an add-on for the app, such as a cue stick in an 8-Ball Pool game (Prada, 2016).

Intention to use in-app ads has been promoted through financial benefits (Wang et al., 2019). Economic benefits can be contextualized coupons (Souiden et al., 2019). Intention to use in-app ads can be increased by using virtual recognitions such as badges, as used in Google Maps and numerous other games (Hamari, 2017). Usage of in-app ads can lead to both in-app purchases and store purchases (Newman et al., 2018). Usage has been studied in terms of continuance usage since apps are intended to be used for a longer duration of time (Hsiao & Chang, 2014; Hsu & Lin, 2019; Li

& Fang, 2019). Repurchase intention due to usage of in-app ads has been considered in some studies (Fang, 2017).

Intention towards mobile ads has been measured in terms of how it has been done. Most studies are on SMS ads and mobile web ads (Iqbal et al., 2017). The apparent reason is that SMS and mobile web usage increased way before app usage (Verkijika, 2018). However, in-app ads have been researched considerably if location-based ads, and numerous studies on apps belonging to the social media category, retailing and online business are considered together as an extension of in-app ads (Bauer & Strauss, 2016; Kim et al., 2017; Phua & Kim, 2018; Sabri, 2019). Numerous studies on Bluetooth, virtual reality, and augmented reality are also related to in-app ads (Betzing, 2018; Javornik et al., 2016; Rese et al., 2017). Often the purpose is to advertise or promote events. For example, many augmented reality apps are meant to advertise and promote locations and events (Adhikari et al., 2015; Shea et al., 2017). Therefore, it cannot be said there is no literature on in-app ads. The above-related study areas can be reviewed to know factors that might influence the intention to use in-app ads.

Intention to use in-app ads has been measured through various factors, as shown in Table 2.2. In most studies, the most vital determinant has been Attitude (Sigurdsson et al., 2017; Yeo et al., 2017). However, many other factors have repeatedly come as significant. For example, satisfaction, Perceived Usefulness, perceived ease of use, app value, trust, entertainment, innovativeness, subjective norms, experience, perceived risk, benefit, privacy concern, and interactivity have been found as significant influencers of intention in numerous studies (Alalwan, 2020; Chalomba,

2016; Cho et al., 2019; Folting et al., 2017; Hsiao & Chang, 2014; Li et al., 2018; Sam & Chatwin, 2019; Shaheen et al., 2017; Wang & Genc, 2019).

Table 2.2  
*Studies on Intention*

Article Title	Year	Focus	Dependent Variable	Independent Variable
Consumer experiences, Attitude and behavioural intention toward online food delivery (OFD) services	2017	Online food delivery services	Intention	Attitude, Convenience motivation, Perceived Usefulness
Mobile food ordering apps: An empirical study of the factors affecting customer e-satisfaction and continued intention to reuse	2020	App reuse	Continuous intention	Performance expectancy, effort expectancy, social influence, facilitation conditions, price value, hedonic motivation, habit, online review, online rating, online tracking, e-satisfaction
The rise of SMS marketing: key drivers, acceptance, and intention to receive advertising SMS in Pakistan	2017	SMS marketing	Intention	Self-Efficacy, Attitude, subjective norms
Path to effective mobile advertising in Asian markets: Credibility, Entertainment and peer influence	2019	In-app ads	Intention	Incentives, privacy concerns, Attitude, subjective norms
Investigating of in-app advertising features' impact on effective clicks for different advertising formats	2018	In-app ads	intention	Entertainment, targeting, user control, incentive, ad formats (moderator)
The influences of ad Attitude and brand Attitude on purchase intention of smartphone advertising	2017	In-app ads	Intention	Advertising Attitude, brand Attitude, ad value, context awareness value, entertainment, information, irritation, personalization, activity, timing, location
Impact of culture, behaviour and gender on green purchase intention	2018	Purchase behaviour	Intention	Attitude, subjective norms, perceived behaviour control, collectivism, long-term orientation, man-nature orientation, gender (moderator)

Many factors have also lost their relevancy in recent years. Some have become a necessity. For example, all ads should be easy to access and reply (Lee, 2017). Similarly, they should be useful (Hsiao & Chang, 2014). Informativeness and entertainment are necessary (Alalwan, 2018; Li et al., 2018). Prior permission is a must (Demirel, 2010).

The consumer market determines which factors are more critical (Yang et al., 2010). Another reason is moderating effect of various factors. In numerous researches, gender, age, education, and culture have been found to act as moderators. In some studies, they were used as control variables (Fam et al., 2019; Smith et al., 2018; Yeh et al., 2017). Based on opposing results for various relationships with intention, it is imperative to research factors influencing intention to use in-app ads.

## **2.5 Attitude Toward In-App Ads**

Attitude toward in-app ads is defined as a consumer's favourable or unfavourable response to a particular ad (Khan et al., 2007; Shin & Lin, 2016). It is a strong predictor of actual behaviour, as shown in Table 2.3. In the case of traditional ads, Attitude is considered the main factor determining actual behaviour (Tsang et al., 2004). Attitude covers numerous advertising factors, such as emotional factors (Brackett & Carr, 2001; Tsang et al., 2004). These factors include entertainment (Sam & Chatwin, 2019; Souiden et al., 2019), informativeness (Lee, 2017; Sigurdsson et al., 2017), and irritation (Wang et al., 2019). It can vary based on ad type (Lee, 2017). Ad type can be based on ad capability in terms of the type of content or context (Xu et al., 2009). Therefore, the capability of advertising can influence attitudes towards a brand (Ketelaar et al., 2018).

Attitude has been measured towards incentive-based ads (Li et al., 2018; Sam & Chatwin, 2019). Results have revealed personalization, entertainment, benefit, and Perceived Usefulness positively influence Attitude. In addition, financial benefits were found to be more relevant to native ads as compared to traditional banner and pop-up ads.

Attitude is a well-analysed construct. Emotional factors have come as the most significant predictors of Attitude from advertising perspective. These include entertainment, informativeness, irritation, and credibility (Brackett & Carr, 2001; Ducoffe, 1996). They are often referred to as developers of the construct- advertising value. After them is the personalization value (Haq & Ghouri, 2017; Sigurdsson et al., 2017). For technology-related studies, emotional value is considered in terms of Perceived Usefulness and perceived ease of use (Shin & Lin, 2016; Souiden et al., 2019). From the advertising context, privacy concerns, subjective norms, satisfaction, trust, and timeliness have also been significant predictors of Attitude (Haq & Ghouri, 2017; Alalwan, 2019; Souiden et al., 2019; Wang et al., 2019). Attitude toward in-app ads is influenced by ad value, personalization, culture, and trust (Cheung & To, 2017; Sigurdsson et al., 2017).

Measuring Attitude again for in-app ads in terms of its dimensions is unnecessary as it is well researched. However, the use of Attitude as a determinant of intention can increase the strength of a model (Wang et al., 2019). Attitude towards mobile ads influences intention to use mobile ad, whether SMS, web, or app (Demirel, 2010).

Attitude towards technology has evolved over a long period. Consumers developed an attitude towards technology in the late 1980s. At that time, the Attitude toward technology was focused on computers. Those computers were mainly used by users in organizational setup (Davis, 1989). In the late 1990s, Attitude toward desktop computers was measured since the computers became feasible for home use (Wolin et al., 2002).

Table 2.3  
*Studies on Attitude*

Article Title	Year	Focus	Dependent Variable	Independent Variable
Understanding WeChat Users' Motivations, Attitudes, and Intention of Reading Promotional Material	2019	In-App Ads	Attitude	Benefit, Irritation, Personalization, Entertainment, Informativeness, Credibility, Perceived Usefulness, Perceived Ease of Use
Factors Affecting Attitudes and Behavioural Intentions Toward In-App Mobile Advertisements	2018	In-App Ads	Attitude	Personalization, Entertainment, Informativeness, Credibility, Irritation, Cultural Effect
Consumers' Attitude and Adoption of Location-Based Coupons: The Case of the Retail Fast Food Sector	2019	Mobile Ads	Attitude	Money Savings, Convenience, Hedonic Motivation, Trust, Control
Distinctive Characteristics of Mobile Advertising in Measuring Consumers' Attitude: An Empirical Study	2017	Mobile Ads	Attitude	Timeliness, Emotional Values, Localization, Personalization
The Influences of ad Attitude and Brand Attitude on Purchase Intention of Smartphone Advertising	2017	Mobile Ads	Attitude	Advertising Values, Context Awareness Value
An Exploratory Study on Consumers Attention Towards Social Media Advertising: An Electroencephalography Approach	2017	Mobile Ads	Attitude	Ad Type, Gender, Eeg: Baseline, Eeg: Watch Ad
Consumer Experiences, Attitude and Behavioural Intention Toward Online Food Delivery (OFD) Services	2017	Online Food Delivery Services	Attitude	Convenience Motivation, Post Usage Usefulness

In the early 2000s, measurement of attitude towards smartphone-based technologies became feasible. However, during this time, the attitude was measured primarily for cellular services, including cellular-service based ads. These services included SMS, MMS, EMS, and WAP (Haghirian et al., 2008; Scharl et al., 2005). By the year 2010, attitude was measured for QR code, Bluetooth, infrared, and other innovative technologies that enabled augmented reality features (Leek & Christodoulides, 2009; Snellman, 2009; Virulkar & Bhute, 2016). Attitude toward NFC technology and location-based ads was extensively researched after the year 2010 (Hokse, 2016; Morosan & DeFranco, 2016). Attitude has been measured mainly from an app

perspective which falls under different categories. The most well-known categories are social media, online business, and entertainment apps (Logan, 2017; Wang & Doong, 2017). Attitude has been measured in terms of their usage and advertising effectiveness through these apps. Attitude toward in-app ads is not an entirely new aspect. Instead, it is an evolution of the previous attitude towards mobile ads. SMS, mobile WEB, and in-app ads are much different, yet users perceive them the same.

### **2.5.1 Relationship between Attitude and Intention**

Attitude is a significant influencer of intention in numerous studies. Verstraten (2015) found in his research that Attitude positively influenced purchase intention. Kudeshia (2016) found Attitude towards the electronic social word of mouth (EWOM) positively influenced purchase intention towards brands. However, in their study on augmented reality-based advertising, Raska et al. (2017) found that Attitude towards a product does not influence purchase intention. The reason was the considerable uniqueness of augmented reality.

Yeo et al. (2017) found attitude towards native ads in food providing services positively influenced purchase intention. Sigurdsson et al. (2017) found that attitude positively influenced intention in their study on in-app ads. Culture moderated the relationship between attitude and intention. In their research on travel apps, Mehdizadeh et al. (2019) found user goals, attitude, and trust to be strong positive influencers of intention. Weng et al. (2017) found in their study on native ads for transport services that attitude, subjective norms and satisfaction positively influence intention.

Iqbal et al. (2017) found intention to accept SMS advertising was positively influenced by attitude towards SMS advertising. Other factors positively influencing intention were social norms and self-efficacy. These results were consistent with Moynihan et al. (2010) study. Both studies focused on SMS technology.

Based on the above discussion, to achieve the research objective 1.1 and answer research question 1, the following hypothesis is proposed:

H1: Attitude toward in-app ads positively influence students' intention to use in-app ads.

## **2.6 Perceived Usefulness**

Perceived usefulness strongly influences attitude and intention (Davis, 1989). Often attitude appears as a mediator between intention and perceived usefulness (Newman et al., 2018; Ray et al., 2019; Shaheen et al., 2017; Singh et al., 2018; Stocchi et al., 2019; Tak & Panwar, 2017; Yap & Tan, 2017). Among all the constructs influencing intention, perceived usefulness has been the strongest (Alalwan, 2018; Kiat & Samadi, 2017). Perceived usefulness in the case of advertising is highly influenced by information value and entertainment value (Kim et al., 2016; Sam & Chatwin, 2019; Wang et al., 2019). Repeatedly, these relationships were found valid in advertising studies. In recent years, involvement, co-creation, socialization, and interactivity have become important influencers of usefulness (Marino & Lo Presti, 2019; Wu & Hsiao, 2017).

A term used in a study on apps was post usage usefulness. It was defined as an improvement in user performance that happens over a long period of time after interaction with an object (Ray et al., 2019). In-app ads can be liked, shared and

commented on to get additional information. Apps can record all interactions a user does with in-app ads. Based on this information, in-app ads within an app in future can be more precise and relevant to a particular user.

Moreover, the user will consider in-app ads more favourable depending on their experience of past interaction with in-app ads. Android OS and Microsoft OS can use a unique ID for each user to perform targeted ads as well as share user profiles with apps. The concept of post usage usefulness isn't entirely new (Carter, 2012; Chou et al., 2012). It has been considered to know the actual difference in improvement. Post usage is used with pre usage (Farhan, 2018; Saremi & Montazemi, 2016). In some studies, post-adoption is considered with pre-adoption (Carter, 2012; Giri et al., 2015). In a study by Lu et al. (2017), post usage factors were referred to. Laing et al. (2018) study were conducted for an extended period, allowing users and the researcher to evaluate the post usage effect.

Post usage usefulness can lead to redesign, re-usage and recycling (Iran, 2018). Post usage effect can be in the form of the development of trends. For example, Twitter posts became so popular that they led to tweets as an activity (Emms & Jayapal, 2016). Post usage is common in the case of longitudinal studies (J. Lin et al., 2014). In a study by Farhan (2018), multistage behaviour change theory was utilized to understand the process of bike-sharing adoption.

Post usage usefulness influences smartphone users' perception regarding ease of use, entertainment, informativeness, socialization, interaction, and cost-saving aspects (Ray et al., 2019). It extends the Perceived Usefulness construct (Yeo et al., 2017). It

is based on experience. Its value is based on actual usage rather than assumptions (Bhattacharjee et al., 2008).

Post usage usefulness can be in terms of entertainment motivation, possession convenience, search convenience, evaluation convenience, transaction convenience and Post-purchase convenience (Hsu & Yeh, 2018; Ray et al., 2019; Yeo et al., 2017). Jin and Park (2016) considered post usage usefulness in terms of convenience to locate services. Hsu and Yeh (2018) referred to Post usage usefulness as easy doing, easy learning, simplicity, and flexibility. Post usage usefulness reflects the long-term belief of usefulness compared to Davis's (1989) Perceived Usefulness, which is just perception based on assumptions developed because of experience of related technologies (Bhattacharjee et al., 2008). It is considered that Post usage usefulness has more utility in the sense that it is more stable, as it will only occur after a user has adopted an innovation for an extended period, therefore having a more dominant effect. Since in-app ads are received in apps that remain on smartphone users for an extended period, the influence of post usage usefulness is applicable (Danaher et al., 2015).

The large majority of consumers globally have owned smartphones for over a decade (Newman et al., 2018). Although the apps have evolved, underlying aspects of apps have remained the same. Most smartphone users have experienced an evolution in apps first-hand. From simple forms such as audio/video apps, navigation apps and simple games to today's complex audio/video apps, navigation apps and highly advanced games (Chacos, 2014; Chopdar et al., 2018). These apps have the features and capabilities of numerous apps. For example, navigation apps such as Waze

provide the facility to see the speed in real-time along with the position on a virtual map (Noerkaisar et al., 2016).

Saved coupons and information based on search history are possible only after a smartphone user has used an app for some duration. Post usage usefulness simply represents usefulness interpreted by smartphone users after interacting with in-app ads for an extended period. Post usage usefulness has been found to influence intention, as shown in Table 2.4. In this research, the usefulness construct is measured in terms of both perceived and post usage usefulness. For simplicity, it is referred to as Perceived Usefulness.

Table 2.4  
*Studies on Perceived Usefulness*

Article Title	Year	Focus	Dependent Variable	Independent Variable
Information technology continuance: A theoretic extension and empirical test	2008	Technology usage (document management system)	Intention	Post usage usefulness
Consumer experiences, Attitude and behavioural intention toward online food delivery (OFD) services	2017	App usage	Intention	Post usage usefulness
Bricks or clicks? Understanding consumer usage of retail mobile apps	2018	App usage	Intention	App connection, app ease of use, app usage frequency (mod)
The effect of product type on value linkages in the means-end chain implications for theory and method	2004		Intention	Post usage usefulness, hedonic, convenience

### 2.6.1 Relationship between Perceived Usefulness and Intention

In numerous studies, the Perceived usefulness construct has a strong positive relationship with intention. One of the earliest studies belonged to computer usage in organizational setup (Davis, 1989). This study is now referred to as Technology Acceptance Model. During the 1990s, this study got revisions considering the usage of computers in a home environment and for individual use (Venkatesh et al., 1996).

Nevertheless, results remained the same the Perceived Usefulness construct has a strong positive influence on intention.

With the widespread acceptance of computers in the late 1990s, studies started on accepting hardware, software, and internet-based technologies (Tiwana, 1998). In addition, research began on advertising in terms of mobile WEB and other technologies (Mehta, 2000; Obermiller & Spangenberg, 1998; Raman & Leckenby, 1998). In all these studies, Perceived Usefulness was a significant positive influencer of intention.

With the advancement in technology, research focused on smartphones and other innovative technologies such as augmented reality, GPS, virtual reality, and wearable gadgets (Ketelaar & Balen, 2018; Kim et al., 2017; Molitor et al., 2012). In most studies, the relationship was positive between Perceived Usefulness and intention. However, in a few studies, the results were non-significant (Hsu & Lin, 2019; Shaheen et al., 2017). The reason was the newness of technologies which were quite different from previous technologies.

Many studies have focused on smartphone users' intention to accept mobile ads. In most of these studies, Perceived Usefulness has come as a strong positive influencer (Belanche et al., 2012; Pietro et al., 2014). Mobile ads with the arrival of apps can be of multiple types (Goyal et al., 2018; Lee, 2018). In these types, Perceived Usefulness has been found to influence intention positively.

In recent studies on app services, Perceived Usefulness in terms of post usage usefulness was found to positively influence intention (Ganlari et al., 2016; Kourouthanassis et al., 2013; Yeo et al., 2017; Yun et al., 2013).

Based on the above discussion, to achieve the research objective 1.2 and answer research question 1, the following hypothesis is proposed:

H2: Perceived usefulness positively influences students' intention to use in-app ads.

### ***2.6.2 Relationship between Perceived Usefulness and Attitude***

Perceived Usefulness has been shown to positively influence attitude towards the use of services (Belanche et al., 2012; Pietro et al., 2014). Convenience motivation provides better performance on a system, thus allowing users to accomplish more tasks in a shorter period. A system that is easier to use will be perceived as a more useful system over time. Therefore, between two systems that offer the same functionality, users are more likely to choose the system that is easier to use, hence making it a more useful system.

Perceived Usefulness influences attitude towards SMS advertising and newer forms of ads (Belanche et al., 2012; Pietro et al., 2014). Muk and Chung (2015); Patat (2011), and Shin and Lin (2016) found Perceived Usefulness has a long-term influence on the smartphone users' view of mobile ads. Therefore, Perceived Usefulness is considered to positively influence both current motivation and long-term motivation in terms of attitude (Bagla & Khan, 2017).

Based on the above discussion, to achieve the research objective 1.5 and answer research question 2, the following hypothesis is proposed:

H5: Perceived usefulness positively influences attitude toward in-app ads.

### ***2.6.3 Mediating Effect of Attitude on the Relationship between Perceived Usefulness and Intention***

The decision to act in a particular manner in the near future is not based on complete information (Yu et al., 2019). Consumers develop an attitude to ease decision-making. Antecedents for attitudes toward ads have been researched since the dawn of advertising (Wang et al., 2019). Due to the presence of mobile ads for over 20 years, smartphone users already have a well-developed attitude towards mobile ads (Sharif, 2017). Numerous researchers have found a mediating effect of attitude on the relationship between Perceived Usefulness and intention. According to Baron and Kenny (1986), the mediation effect is based on the existence of three conditions. First, an independent factor and dependent factor should have a significant relationship. Second, the independent factor and mediating factor should have a significant relationship. Lastly, if the relationship between mediating factor and the dependent factor is significant and the relationship between the independent factor and the dependent factor is insignificant, then full mediation is obtained. Otherwise, it is partial or small mediation.

Jamil (2012) found attitude had a mediating effect on purchase behaviour in the Malaysian context. Mangin et al. (2012) found attitude had a mediating effect on the relationship between intention and use of online banking services. Friman (2010) found that attitude had a mediating effect on the relationship between intention towards mobile ads and the Perceived Usefulness of ads regarding informativeness and entertainment value. Kim et al. (2017) found attitude was a partial mediator between Perceived Usefulness and intention in a study on smart store enabled through a virtual mirror. The attitude had a full mediation effect on the entertainment and intention relationship. Drabdul and Awan (2015) found attitude fully mediated the

relationships between purchase behaviour and trust, informativeness and irritation. This study focused on SMS marketing acceptance in the Pakistani context. Entertainment and informativeness are constructs in the WEB advertising model which relate to Perceived Usefulness in technology acceptance models (Brackett & Carr, 2001; Ducoffe, 1996).

Based on the above discussion, to achieve the research objective 2.1 and answer research question 4, the following hypothesis is proposed:

H9: Attitude toward in-app ads has a mediating effect on the relationship between perceived usefulness and students' intention to use in-app ads.

## **2.7 Perceived Collaboration**

Kapoor and Vij (2018), while researching the success of apps providing food order and delivery services, found the collaboration feature of the app as a significant reason. Collaboration was measured in terms of the value it adds to service in terms of reliability, trust, efficiency, and cost. In this research, the focus was on service delivery rather than advertising. Service delivery started with information sharing, which in this case was native ads. Collaboration was an additional feature of the app. It quickly and easily delivered advertised information and provided more monetary incentives to app users by enabling collaboration between various parties involved in the entire business transaction.

Collaboration has been defined as formal institutionalized relationships among networks of institutions, interests, and stakeholders (Angella & Go, 2009). Smartphone users need to register with an account. Collaboration with a scope towards in-app ads is an alliance between multiple service providers (Cho et al.,

2019). The collaboration theory refers to it as an inter-organizational phenomenon to achieve benefits that no single company could otherwise attain (Wood, 1991).

The use of the collaboration construct in mobile advertising is very new. Research done on the use of collaboration for advertising is minimal, as shown in Table 2.5. It was introduced as a mobile app construct (Kapoor & Vij, 2018). However, collaboration as an aspect of the industry has been studied considerably. Unlike websites, apps can keep track of collaborated functions. These include, for instance, discounts and special promotions.

Physical enterprises such as restaurants and hotels do not collaborate with apps extensively. Most considered spending on Information Technology (IT) as a wastage. Even providing free access to the internet to the public was considered a wastage. Yu et al. (2018) studied point of interest (POI) based on collaboration between apps and venues (restaurants and cafés). They found the app charges the venue and tags the business as POI, which attracts users to visit the venue and generate a sale. The venue invests in IT infrastructure at the premises to promote app usage. Collaboration between apps and venues is still new, so obtaining actual market data is essential. Venues have been existing for a long time. However, only now apps are coming on the market, providing collaboration methods to promote venues (Vasserman et al., 2015). Apps do ads for the venue in the form of native ads by providing the information on a map. Some apps might initially display textual and pictorial information but later offer an option to see location on a virtual map. Consumers and other stakeholders can populate this information through collaboration. Collaboration can be developed with end smartphone users through badges (Hamari, 2017). These badges are a non-monetary benefit that are considered a sign of respect.

Scott et al. (2014) found collaboration is the opposite of competition. The collaboration combines multiple firms' resources to solve problems and overcome challenges (Hiltbrand & Burke, 2011). Gamification information systems supporting collaboration features can have an edge in the problem-solving process due to synergy effects and increased motivation. In addition, virtual gift-giving to collaborating members can promote selflessness (Hamari & Koivisto, 2013).

With the widespread presence of eCommerce, collaboration has gone beyond traditional physical organizations. Many eCommerce companies, such as Food Panda, collaborate with physical restaurants to provide solutions to smartphone users (Sabri, 2019; Yu et al., 2018). Grab, another company operating in Southeast Asia provides delivery and transport services through collaboration with restaurants and vehicle owners. Grab can handle all payments through its app to avoid issues for app users and service providers. Essentially, Grab is advertising a few companies and service providers collaboratively. However, Grab is said to provide service since it provides a complete solution (Najmah et al., 2019). A study studied consumer perception towards online food delivery services through collaboration between multiple firms (Kapoor and Vij, 2018). A closer look at the app service indicated it was performing in-app ads in native advertising format. The app provided service through collaboration with multiple stakeholders to a consumer.

Numerous gaming apps collaborate with other gaming apps to provide extra benefits to the consumer. For example, users first benefit from watching in-app ads in terms of free in-game add-ons. Then, if a user clicks on the ad and performs the intended task, such as installing the advertised app, the user receives an extra benefit in both the current app and the installed app (Prada, 2016).

Perceived Collaboration can have a significant influence on the acceptance of in-app ads. In addition, perceived Collaboration between advertisers and apps entails free apps for users and a reliable source of income for app developers (Roma & Ragaglia, 2016).

Collaboration is one of the app features determined by Kapoor and Vij (2018). Other app features were visual design, information design, and navigation design. Collaboration was found to have maximum influence on intention among these app features.

Table 2.5  
*Studies on Perceived Collaboration*

Article title	Year	Focus	Dependent variable	Independent Variable
Social Motivations to Use Gamification: An Empirical Study of Gamifying Exercise.	2013	Technology acceptance	Intention	Reciprocal benefit
Technology at the dinner table: Ordering food online through mobile apps	2018	App usage	Intention	Collaboration design
Revenue models, in-app purchase, and the app performance: Evidence from Apple's App Store and Google Play	2016	Revenue model	App acceptance	Collaboration
Market Your Venue with Mobile Applications: Collaboration of Online and Offline Businesses	2018	collaboration	Intention	Collaboration

### 2.7.1 Relationship between Perceived Collaboration and Intention

Kapoor and Vij (2018) found collaboration as a significant positive influencer of intention to accept service-based native ads. In their study, the focus was on actual response. The intention is the closest representative of the actual response (Li & Huang, 2009). As per the study of Kapoor and Vij (2018), collaboration influences psychological barriers a consumer has regarding availing a service. Therefore, collaboration is considered to ease consumer apprehension.

Perceived Collaboration influences intention in terms of Perceived Usefulness and perceived ease of use (Kamath, 2008). Intention to accept in-app ads increases due to

Perceived Collaboration since users consider their privacy is secured when dealing with in-app ads and services handled by an app they have themselves installed (Leontiadis et al., 2012). Therefore, Perceived Collaboration leads to increased engagement and involvement with in-app ads.

In many recent studies on apps collaborating with service delivery and payment handling companies, intention construct has been positively related to Perceived Collaboration (Jeon et al., 2019; Najmah et al., 2019; Sabri, 2019). For example, perceived Collaboration between gaming apps positively influenced intention (Prada, 2016). Apps have initiated collaboration with users to increase the interaction of in-app ads (Batty et al., 2010). Collaboration in such apps has increased user involvement and intention to use in-app ads (Cohen & Malloy, 2014). In a study by Qureshi et al. (2022), collaboration influenced intention.

Based on the above discussion, to achieve the research objective 1.3 and answer research question 1, the following hypothesis is proposed:

H3: Perceived collaboration positively influences students' intention to use in-app ads.

### ***2.7.2 Relationship between Perceived Collaboration and Perceived Usefulness***

Perceived Collaboration has been considered in terms of relative advantage (Taylor & Todd, 1995). Relative advantage is associated with Perceived Usefulness. Perceived Usefulness can be due to monetary/non-monetary benefits (Hamari, 2017). Perceived Usefulness can be in terms of perceived ease of use (Lai, 2017). According to the literature, Perceived Collaboration results in Perceived Usefulness in various

business areas. Efficiency in business results in increased business performance, which may, in turn, benefit the end consumer.

Based on the above discussion, to achieve the research objective 1.7 and answer the research question 3, the following hypothesis is proposed:

H7: Perceived collaboration positively influences perceived usefulness.

## **2.8 Perceived Financial Benefits**

By definition, perceived Financial Benefits are monetary benefits (Richard & Meuli, 2013). Numerous researchers have found that Perceived Financial Benefits strongly influence consumers to engage with ads, as shown in Table 2.6. Research has shown, Perceived Financial Benefits can overcome the negative effect of irritation and privacy invasion by ads (Ketelaar et al., 2018). Financial benefits have been used to attract smartphone users through mobile ads since the very beginning (Richard & Meuli, 2013). Even today, financial benefits come as significant influencers of consumer acceptance of mobile ads (Ang et al., 2019). The amount of incentive required is dependent on economic and mental costs to a consumer. In the case of contextual ads, a small amount of incentive is good enough (Souiden et al., 2019). It is because of the increased relevancy of ads (Beck & Toporowski, 2017).

The importance of Perceived Financial Benefits is dependent on the consumer market. Financial benefits can be very fruitful in a consumer market where financial issues are of major concern (Wang et al., 2019). Financial benefits generally have a short-term effect on consumer acceptance of an ad (Li et al., 2018). It gives a boost to an already developed mindset to use ads. Such in-app ads can be simple text, images, video or native ads. In the case of native ads, a consumer may save the incentive's offer in

terms of saved coupons (Molitor et al., 2012). In addition, financial benefits can be given for bulk purchases (Pozzi, 2013).

Financial benefits should be of short-term duration. They should not mean to decrease the price of a product/service as it will tend to lose the value of the product/service (Aterschoot & Bulte, 1992). Financial benefits in the case of in-app ads with collaboration with other firms can combine small financial benefits from multiple firms so that individual cost to a firm is low. Yet, the financial benefit to a consumer is large. E.g., in shopping apps, a consumer on certain events receives a seller discount as well as a shipping fee discount. Thus, app users go on a spending spree (Hao et al., 2017). The same happens in the case of game apps. Both the advertised app and the advertising app give financial benefits to app users for using in-app ads (Leontiadis et al., 2012; Roma & Ragaglia, 2016). Therefore, Khan et al. (2017) believed that financial benefits should be part of a campaign.

Youngsters are increasingly targeted through financial benefits (Muzellec et al., 2016). They have the habit of spending but desire better deals (Wang et al., 2015). Apps can implement reward systems to keep long-term relationships with app users (Brahma & Mishra, 2016). App users can be given financial benefits to receive and access ads (Brahma & Mishra, 2016). Financial benefits can be in the form of cash backs (Brahma & Mishra, 2016).

Table 2.6  
*Studies on Perceived Financial Benefits*

Article Title	Year	Focus	Dependent Variable	Independent Variable
Mobile shopping apps adoption and perceived risks: A cross-country perspective utilizing the Unified Theory of Acceptance and Use of Technology.	2018		Intention	Performance and effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, and habitual use
Where, when, and how long: Factors that influence the redemption of mobile phone coupons Examining factors influencing Jordanian customers' intentions and adoption of internet banking: Extending UTAUT2 with risk	2015	Mobile ads	Intention	Location, timing, expiry length, face value, product type  Performance Expectancy Effort Expectancy Social Influence Facilitating Conditions Hedonic Motivation Price Value Habit Perceived Risk Incentive
Path To Effective Mobile Advertising in Asian Markets: Credibility, Entertainment and Peer Influence Consumers' Attitude and Adoption of Location-Based Coupons: The Case of the Retail Fast Food Sector			Intention  Attitude	  Money Savings
Factors Influencing Consumers' Attitude, Intention and Behaviours Towards Short Message Service-Based Mobile Advertising	2017	Mobile Ads	Intention	Perceived Financial Benefits
Using UTAUT 2 Model to Predict Mobile App-Based Shopping: Evidences from India	2017	Mobile Shopping	Intention, Actual Usage	Deal Proneness, Price Value
Understanding WeChat users' motivations, Attitudes, and intention of reading promotional material	2019		Attitude	Perceived Financial Benefits
Travel app users continued use intentions: it's a matter of value and trust	2019		Intention	Perceived Financial Benefits

Non-monetary financial benefits also influence intention towards mobile ads (Komulainen et al., 2007). Non-monetary financial benefits in the form of infotainment are better than plain information (Hongyan & Zhankui, 2017). Incentive-based mobile advertising is more effective and has a significant impact on converting

app users' negative Attitudes to favourable Attitudes towards mobile advertising (Jung et al., 2013).

App users consider location-based advertising more valuable when they are incentive-based, and that advertising app has clearly explained the protection of their privacy (Kini & Suomi, 2018). They can share financial benefits in some apps, such as games and shopping apps. Group financial benefits are used to attract a group of related app users (Venkatesan & Farris, 2012). Financial benefits have been considered motivational tools, such as discount coupons (Majedul Huq, 2015). Information-based advertising gives financial rewards to smartphone users who agree to receive promotions and campaign information.

### ***2.8.1 Relationship between Perceived Financial Benefits and Intention***

Perceived Financial Benefits have been found as positive influencers of intention (Li et al., 2018; Souiden et al., 2019). However, in some studies, perceived financial benefits negatively influenced intention (Leontiadis et al., 2012). The reason was its linkage with fake advertising. This was especially true if the amount of financial benefit was very high.

In countries with poor economies, the Perceived Financial Benefits have a significant positive influence on the intention to use ads (Souiden et al., 2019; Wang & Genc, 2019). Considering the importance of Perceived Financial Benefits, incentive-based ads are considered a complete category. In Pakistan, ads are mostly incentives-based (Khan et al., 2017). Li et al. (2018) and Wang et al. (2019) found Perceived Financial Benefits had a strong positive influence on consumer intention to accept mobile ads. In a study by Qureshi et al. (2022), financial benefits influenced the intention to

interact with in-app ads. They may be contextualized to increase the financial benefit in terms of reduced cost to redeem a promotion or to increase relevancy. Perceived Financial Benefits are considered in terms of usefulness. Perceived Usefulness has been found to have a strong positive influence on intention (Xu et al., 2005). Therefore, there is a high likeliness that a relationship will exist between Perceived Financial Benefits and intention.

The relationship between Perceived Financial Benefits and intention is considered positive from the very beginning. Cho and Cheon (2004) stated smartphone users expect rewards for interacting with ads. This is even more important in the case of intrusive ads. Smartphone users are willing to share personal information to gain access to benefits (Frey et al., 2017; Huang et al., 2015). Therefore, the Perceived Financial Benefits are considered a significant influencer of intention to accept mobile ads.

Based on the above discussion, to achieve the research objective 1.4 and answer research question 1, the following hypothesis is proposed:

H4: Perceived financial benefits positively influence students' intention to use in-app ads.

### ***2.8.2 Relationship between Perceived Financial Benefits and Attitude***

Numerous studies suggest Perceived Financial Benefits influence Attitude (Drossos et al., 2007; Sam & Chatwin, 2019). In a 2013 study on location-based advertising, Perceived Financial Benefits significantly influenced Attitude (Jarnefelt, 2013). Influence is so strong that in the case of dishonoured discounts, Attitude is significantly negatively influenced (Waheed et al., 2019). Li et al. (2018) and Sam

and Chatwin (2019) found in their studies that when Perceived Financial Benefits are met, Attitude is significantly positively influenced. Perceived Financial Benefits have more relevance in the case of native ads. In a recent study on WeChat users, perceived financial benefits influenced attitude (Sam & Chatwin, 2019). In their research on mobile banking apps, Noh and Lee (2016) found that economic benefits positively influence attitude toward mobile banking apps. Souiden et al. (2019) found money savings have a significant positive influence on attitude toward location-based coupons. Based on the above discussion, to achieve the research objective 1.6 and answer research question 2, the following hypothesis is proposed:

H6: Perceived Financial Benefits positively influence Attitude toward in-app ads.

### ***2.8.3 Relationship between Perceived Financial Benefits and Perceived Usefulness***

In their study on online food delivery apps, Yeo et al. (2017) found that price-saving orientation had a significant positive influence on Perceived Usefulness. In addition, numerous other studies have found Perceived Financial Benefits in the form of monetary savings and coupons positively influence Perceived Usefulness (Xu et al., 2005).

Based on the above discussion, to achieve the research objective 1.8 and answer research question 3, the following hypothesis is proposed:

H8: Perceived financial benefits positively influence perceived usefulness.

### ***2.8.4 Mediating Effect of Attitude on the Relationship between Perceived Financial Benefits and Intention***

In numerous studies, perceived financial benefits have influenced attitude (Drossos et al., 2007; Jrnefelt, 2013; Li et al., 2018; Sam & Chatwin, 2019; Waheed

et al., 2019). Results vary as per the amount of influence on attitude. Often the influence is more on intention than attitude (Li et al., 2018; Souiden et al., 2019; Wang et al., 2019). Attitude influences intention (Kudeshia, 2016; Sigurdsson et al., 2018; Verstraten, 2015; Yeo et al., 2017). Souiden et al. (2019) found in their study on the adoption of location-based coupons that attitude fully mediated the relationship between money-saving orientation and intention.

Based on the above discussion, to achieve the research objective 2.2 and answer research question 4, the following hypothesis is proposed:

H10: Attitude toward in-app ads has a mediating effect on the relationship between perceived financial benefits and students' intention to use in-app ads.

#### ***2.8.5 Mediating Effect of Perceived Usefulness on the Relationship between Perceived Financial Benefits and Intention***

As per Muk (2007), Perceived usefulness is represented by perceived financial benefits. Perceived usefulness influences intention. Shimp and Kavas (1984) and Mittal (1994) have argued the existence of a causal path between monetary savings/ Perceived Usefulness evaluation and effect. The effect can be in the form of an increase in intention to use in-app ads (Davis, 1989).

In their study on online food delivery apps, Yeo et al. (2017) found that Perceived Usefulness mediated the relationship between price saving orientation and intention. In other studies, perceived usefulness has appeared as a mediator for the relationship between perceived financial benefits and intention (Xu et al., 2005).

Because past studies report perceived financial benefits significantly influence perceived usefulness. e.g. (Humbani & Wiese, 2019); (Yeo et al., 2017), and

considering hypothesis 4 (i.e., perceived financial benefits have a positive influence on intention to use in-app ads), it is rational to expect that perceived usefulness would play a mediating role between perceived financial benefits and intention to use in-app ads. Therefore, based on the above discussion, to achieve the research objective 2.3 and answer research question 5, the following hypothesis is proposed:

H11: Perceived usefulness has a mediating effect on the relationship between perceived financial benefits and students' intention to use in-app ads.

#### ***2.8.6 Mediating Effect of Perceived Usefulness on the Relationship between Perceived Financial Benefits and Attitude***

Perceived financial benefits influence perceived usefulness (Muk, 2007). Perceived usefulness influences attitude. Hedonic benefits significantly mediate the relationship between money-saving and attitude toward location-based coupons (Souiden et al., 2019). Shimp and Kavas (1984) and Mittal (1994) have argued the existence of a causal path between monetary savings, perceived usefulness evaluation and effect. The effect can be in the form of increased attitude along with intention (Davis, 1989).

Past studies have confirmed the influence of perceived financial benefits on perceived usefulness, and also based on the development of hypothesis 6 (i.e., perceived financial benefits have a positive influence on intention to use in-app ads), it is rational to expect that perceived usefulness would play a mediating role between perceived financial benefits and attitude toward in-app ads. Therefore, based on the above discussion, to achieve the research objective 2.4 and answer research question 6, the following hypothesis is proposed:

H12: Perceived usefulness has a mediating effect on the relationship between perceived financial benefits and attitude toward in-app ads.

## 2.9 Self-Efficacy

Self-efficacy is a well-researched construct, as shown in Table 2.7. By definition, it means the users' view regarding how capable they are in performing a sequence of steps to accomplish a task (Bandura, 1982). It is similar to perceived ease of use (Davis, 1989). According to TAM 3, Self-efficacy influences perceived ease of use. Based on Bandura's theory, Self-efficacy is different from outcome judgement. Outcome judgement is similar to perceived usefulness. Self-efficacy in literature has been considered in terms of mobile literacy (Yang & Park, 2019). Mobile literacy has been defined in terms of the users' ability to understand and use mobile media. Mobile literacy influences users' expectations of an application's perceived usefulness (Kim and Kim, 2011). Both these terms require acquiring of skill set to use different media (Potter, 2002). In firm-based studies, it has been referred to in terms of information technology capability (Eikebrokk & Olsen, 2007).

Literacy can be considered in terms of the technical ability of mobile users to use the app (Singh et al., 2018). Usage can be at multiple levels. The first level is basic usage. The second level is regarding advanced capabilities of the app, such as filtering, collecting, choosing, and editing desired information. An example of such tasks in traditional computing activities is blocking spam email (Yang & Park, 2019). Mobile literacy lowers stress and improves performance (Eastin & LaRose, 2000). It leads to confidence in using new technology. In the context of in-app ads, self-efficacy can be in terms of how easily and accurately a consumer can avail the in-app ads. Availing

in-app ads can be composed of multiple steps. It may require using in-app ads in a specific environment apart from location and time.

Table 2.7  
*Studies on Self-Efficacy*

Article title	Year	Focus	Dependent variable	Independent Variable
Information technology continuance: A theoretic extension and empirical test	2008	Technology usage (document management system)	Intention	Self-Efficacy
Acceptance of Mobile Health Apps for Disease Management Among People with Multiple Sclerosis: Web-Based Survey Study	2018	App acceptance	Intention	Self-Efficacy
The assessment and predictive generality of self-precepts of efficacy	1982	Technology acceptance	Intention	Self-Efficacy
A study of the acceptance and resistance of airline mobile application services: with an emphasis on user characteristics	2019	App acceptance	Intention	Self-Efficacy, Perceived Usefulness, perceived ease of use
Individual and human-assisted computer Self-Efficacy	2007	Technology acceptance	Intention	Self-Efficacy, Perceived Usefulness, perceived ease of use
New wave in mobile commerce adoption via mobile applications in Malaysian market: Investigating the relationship between consumer acceptance, trust, and Self-Efficacy	2018	Mobile commerce adoption	Intention	Self-Efficacy
Attitude towards Mobile Advertising and Mobile Web Information Acquisition Behaviour: Perspectives from the Advertising Value, Credibility and Self-Efficacy	2017	Mobile ads	Intention	Self-Efficacy
Empirical evaluation of the revised end-user computing acceptance model	2007	Technology acceptance	Intention	Self-Efficacy
Is My Failure Your Problem? Examining Carryover Effects of Prior Consumer Failure on Customer Satisfaction	2017	Customer Satisfaction	Intention	Self-Efficacy (mod)

Literacy can be considered in terms of the technical ability of mobile users to use the app (Singh et al., 2018). Usage can be at multiple levels. The first level is basic usage. The second level is regarding advanced capabilities of the app, such as filtering, collecting, choosing, and editing desired information. An example of such tasks in

traditional computing activities is blocking spam email (Yang & Park, 2019). Mobile literacy lowers stress and improves performance (Eastin & LaRose, 2000). It leads to confidence in using new technology. In the context of in-app ads, Self-Efficacy can be in terms of how easily and accurately a consumer can avail the in-app ads. Availing in-app ads can be composed of multiple steps. It may require using in-app ads in a specific environment apart from location and time.

Self-efficacy positively influences interest and involvement (Xie et al., 2008). High self-efficacy leads to higher involvement (Hall et al., 2017). It influences the decision to learn a new way of doing things (Hill et al., 1987). Self-Efficacy beliefs are situation-specific. Self-efficacy is not dependent on time spent on smartphones (Qin & Yan, 2017).

Self-efficacy appears to be similar to perceived behavioural control (Ajzen, 1988). However, there is a slight difference. Perceive behavioural control (PBC) means a user's perceived degree of control in performing some tasks. Self-Efficacy means the same. However, it also considers the circumstances in which a user is present and involved. In the case of in-app ads, users are already involved with an app to achieve the purpose for which they have installed an app. According to Taylor and Todd (1995), perceived behaviour control was composed of self-efficacy and resource facilitation conditions and technology facilitation conditions. Bandura (1989) found Self-efficacy influenced outcome expectations, goals and socio-structural factors. Compeau and Higgins (1995) found Self-efficacy was affected by prior performance and behavioural modelling. Therefore, self-efficacy influenced future performance and outcome expectations.

### ***2.9.1 Moderating Effect of Self-Efficacy on the Relationship between Perceived Usefulness and Intention***

Self-efficacy makes users confident in attempting lengthy procedures and complex tasks to gain extra benefits (Hagen et al., 2018). Users high in self- efficacy are capable of extended interaction with ads. They engage with difficult ads with an expectation of higher benefit (Gupta & Arora, 2017; Lu et al., 2015). Smartphone users with low Self- efficacy consider in-app ads less valuable due to their limitations (Hwang et al., 2018; Yang & Park, 2019). As a result, they experience anxiety (Compeau & Higgins, 1995).

In-app ads provide numerous advantages; however, they depend on user self- efficacy. For instance, users can find and save discount information in various apps. Users can collect game assets such as virtual coins by watching ads in gaming apps. However, they need to start in-app ads themselves (Hsiao & Chen, 2016). Only users high in self- efficacy can take full advantage of in-app ads. Even after using apps multiple times over a long period, some users simply don't develop the self- efficacy to take advantage of in-app ads. For them, in-app ads are marginally useful. Hence, it can be said self- efficacy acts as a moderator between intention and perceived usefulness.

Based on the above discussion, to achieve the research objective 3.1 and answer research question 7, the following hypothesis is proposed:

H13: Self-efficacy has a moderating effect on the relationship between perceived usefulness and students' intention to use in-app ads.

### ***2.9.2 Moderating Effect of Self-Efficacy on the Relationship between Perceived Collaboration and Intention***

Users high in self- efficacy are capable of doing things in their own way. They are not much impressed by automated and structured processes. They are often high in innovativeness (Boyle & Ruppel, 2006). To them, collaboration might be valuable if it provides higher incentives and options for later usage of coupons. The perceived collaboration feature of the app will not affect the intention to use in-app ads in case of high self- efficacy.

In the case of users with low Self- efficacy, the perceived collaboration feature of the app is expected to be more attractive. The reason for the success of many apps doing in-app native ads is the collaboration feature. Because of collaboration, users with little to moderate IT skills can utilize the app to gain additional functionality (Ahmed & Ahmed, 2018; Bagla & Khan, 2017; Min et al., 2019; Najmah et al., 2019). For instance, service apps belonging to food delivery, accommodation booking and ride-sharing apps are popular among both novice and expert IT users due to the collaboration feature of the app. The user is saved from going through the hassle of finding ways to avail the advertised item by interacting with numerous service providing intermediaries.

The collaboration feature should automate things. In the case of the Waze app, low Self-efficacy was found to negatively influence the relationship between collaboration and intention towards in-app ads since the ad was an extra aspect (Vasserman et al., 2015). As a result, users got irritated and distracted by in-app ads. Even if the ads were relevant and location-based, the user did not feel capable of appropriately re-routing to the advertised location while staying on the chosen course. So, the

determining factor in the case of the success of the collaboration is automation and simplicity.

Apps such as Facebook lets users get details of the ad within the app. Users simply need to enter quantity, home address and cell phone number to receive the advertised items. In addition, cash on delivery option is provided to minimize effort on the users' side (Qazi et al., 2017).

Hence, it can be said Self-efficacy has a moderating effect on the relationship between perceived collaboration and intention to use in-app ads. In the case of high Self-efficacy, the collaboration will have a negligible impact on the intention to use in-app ads. However, in the case of low Self-efficacy, the perceived collaboration will strongly influence the intention to use in-app ads.

Based on the above discussion, to achieve the research objective 3.2 and answer research question 7, the following hypothesis is proposed:

H14: Self-efficacy has a moderating effect on the relationship between perceived collaboration and students' intention to use in-app ads.

### ***2.9.3 Moderating Effect of Self-Efficacy on the Relationship between Perceived Financial Benefits and Intention***

Users low in self-efficacy desire more financial benefits for their effort. It is because they find it more cumbersome to avail in-app ads. Therefore, the most relevant benefit to users is a financial benefit (Shadkam, 2017; Wang et al., 2019).

Therefore, perceived financial benefits are more relevant in the case of users with low self-efficacy. In the case of users with high self-efficacy, perceived financial benefits are not that important (Banoglu et al., 2015). Users with high self-efficacy consider

using in-app ads easy. Moreover, they can attain long term benefits (Leontiadis et al., 2012). For example, in numerous apps, they learn to know how they can collect multiple benefits and use them later at appropriate times (Bagla & Khan, 2017). For them, an immediate financial benefit is of less value. Based on the above discussion, to achieve the research objective 3.3 and answer research question 7, the following hypothesis is proposed:

H15: Self-efficacy has a moderating effect on the relationship between perceived financial benefits and students' intention to use in-app ads.

## **2.10 Conceptual Framework**

In this study, the study's conceptual framework is designed with TAM 1 as the underpinning theory. The conceptual framework of the study is causal and associative. All the relationships are positively stated. There is one dependent factor. There are two mediators and one moderator in the model. It is a mediated and moderated analysis.

The first construct of the study is intention. Next, the influence of constructs — attitude, perceived usefulness, perceived collaboration and perceived financial benefits are tested on the construct — students' intention to use in-app ads. Moderating influence of self-efficacy on the relationship between intention and its three predictors — perceived usefulness, perceived collaboration and perceived financial benefits are measured.

The second construct of the study is attitude. According to the earliest version of the TAM model, the attitude was considered to have a strong relationship with intention. In the final version of TAM, attitude was dropped. However, in numerous theories

and models such as TRA, TPB, and decomposed TPB, the attitude was considered an influential determinant of intention. In fact, according to many advertising theories and models, such as Web Advertising Model and the extended Web advertising model, the attitude was the primary determinant of consumer behaviour towards ads.

Furthermore, numerous studies on advertising, whether based on SMS, Bluetooth, websites, or apps, have found attitude is directly related to intention (Sigurdsson et al., 2017; Wang & Genc, 2019; Yeo et al., 2017). In most of these studies, the relationship has come as strong and positive. Therefore, in this study, attitude is considered to have a relationship with intention.

The third construct of the study is perceived usefulness. In numerous theories and models such as TAM and UTAUT, Perceived Usefulness has been considered to have a relationship with intention. In these studies, it has been referred to as Perceived Usefulness as at the time of development of these theories and models; technology was very new. Users could only perceive the usefulness of technology. Now that technology has been present for over three decades, users have experienced its usefulness. Instead of intention, the focus is on continuance intention (Alsyouf & Majid, 2017; Yeo et al., 2017). In most of the studies on advertising and technology acceptance, Perceived Usefulness has been found to have a relationship with intention (Hsiao & Chang, 2014; Shaheen et al., 2017; Yeo et al., 2017). In a few recent studies, the relationship is negative or insignificant (Shaheen et al., 2017). However, in most studies, the relationship has been found significant and positive.

In many theories such as TRA, TPB and DTPB, Perceived Usefulness has been related to attitude. In recent studies on technology adoption and technology-dependent

services such as advertising, perceived usefulness has been found to have a relationship with attitude (Shin & Lin, 2016; Yang et al., 2013; Yeo et al., 2017). The relationship is mostly positive. In many theories and models, attitude mediates the relationship between perceived usefulness and intention (Taylor & Todd, 1995). Studies on advertising and technology acceptance have also considered attitude as a mediator (Friman, 2010; Kim et al., 2017). In most studies, results have confirmed that attitude mediates the relationship between perceived usefulness and intention. Based on the above studies, perceived usefulness is considered to have a relationship with attitude. Attitude is also considered to mediate the relationship between perceived usefulness and intention.

The fourth construct of the study is perceived collaboration. It is a novel construct used from a service perspective in a study on online food delivery apps (Kapoor & Vij, 2018). A native ad initiated the service. Since the apps provide a complete solution, the native ad was considered more of a message which resulted in complete service. In the study, perceived collaboration was believed to have a relationship with intention. perceived collaboration as a construct dealing with organizational context has been extensively studied (Calabretta & Kleinsmann, 2017; Hew, 2017). It has been considered in terms of increasing convenience, trust, and Perceived Usefulness (Kapoor & Vij, 2018). In the TAM model, convenience was found to influence perceived usefulness. Numerous studies have found convenience and trust to have a relationship with perceived usefulness (Muk, 2007). Therefore, it can be said perceived collaboration may have a relationship with perceived usefulness.

Perceived financial benefits are is fifth construct of the study. Perceived financial benefits have been extensively found to have a relationship with intention, attitude

and perceived usefulness (Humbani & Wiese, 2019; Noh & Lee, 2016; Souiden et al., 2019; Yeo et al., 2017). Based on these studies, perceived financial benefits are proposed to have a relationship with intention, attitude, and perceived usefulness.

In several studies, the attitude has been tested as a mediator for the relationship between perceived financial benefits and intention (Souiden et al., 2019). Few studies found perceived usefulness has a mediation effect on the relationship between perceived financial benefits and intention (Kim et al., 2008). Perceived usefulness has also been tested as a mediator for the relationship between perceived financial benefits and attitude (Martins et al., 2019). Therefore, in this study, attitude is considered a mediator for the relationship between intention — perceived usefulness and intention — perceived financial benefits. Perceived usefulness is considered as a mediator for the relationship between intention - perceived financial benefits and attitude — perceived financial benefits.

Self-efficacy is the sixth construct of the study. As per TAM, TPB, DTPB, SCT, and modified SCT, self-efficacy influences perceived usefulness, performance, perceived ease of use and intention. In recent studies, self-efficacy has been tested as a moderator for the relationship between intention and its predictors, such as perceived usefulness, convenience and perceived financial benefits (Jaradat et al., 2018; Roh & Park, 2019; Tao et al., 2018). According to Roh and Park (2019) increase in self-efficacy leads to an increase in convenience and perceived usefulness, which ultimately influences intention. Therefore, in this study, self-efficacy is proposed as a moderator for the relationship between intention and its predictors (perceived usefulness, perceived collaboration and perceived financial benefits). The conceptual framework of the study is given in Figure 2.2.



Figure 2.2  
Conceptual Framework of the Study

## 2.11 Chapter Summary

In this chapter, the literature review was presented. The review started with in-app ads. Then underpinning theory of the study was shared. Next, review was made of the constructs considered in the study. Relationships in hypothesis format were also mentioned after a discussion of the constructs. In the end, the conceptual framework of the study was presented.

## **CHAPTER THREE METHODOLOGY**

### **3.1 Chapter Overview**

In this chapter, the methodology applied in the thesis is discussed. First, the research paradigm and research design are covered. Next, operational definitions, measurement scales, and study instruments are discussed. Further, there is a discussion on the sampling method and the data collection procedure. The method of data analysis is covered in multiple sections. First, there is a discussion on the prerequisites of a data analysis. Then techniques of a data analysis are discussed. Finally, statistical techniques used in the study and applications used to apply statistical methods are covered in detail.

Considering the study aims to examine relationships among factors influencing students' intention to use in-app ads with moderation and mediation mechanisms, a quantitative approach was used to test the study's hypotheses. First, the relationships between the factors were described using statistical techniques. Demographic/descriptive analysis was conducted with the help of MS Excel and SPSS applications. Finally, the PLS-SEM technique was used to examine the relationships depicted in the proposed model.

### **3.2 Research Paradigm**

Research needs to be based on a philosophical paradigm or justification. The entire research process is based on the guidelines presented by the worldview research paradigm (Creswell, 2009). The Post-positivist worldview paradigm drives all the decisions in this research.

Distinguishing features of the post-positivist worldview paradigm specific to guiding quantitative study are addressed in Table 3.1. First, the post-positivist worldview holds a deterministic paradigm based on cause-and-effect orientation (Sukamolson, 2007). This research applies the same philosophy. Factors influencing students' intentions to use in-app ads were studied. The second feature of the post-positivist worldview paradigm is reductionism, which intends to reduce a big idea into a small set of ideas that can be tested independently (Creswell & Creswell, 2017). The basic assumption is that problems are better handled if reduced to the simplest possible elements (Noordin, 2016). This thesis applies the same philosophy. Relationships between multiple constructs were examined while focusing on limited but prominent constructs. Objective measurement and observation are the basis for knowledge creation following the post-positivist worldview paradigm. In this study, relationships between constructs were posited in terms of hypotheses. Then a questionnaire was used to assess the objectives of the study. Collected data were analysed, and results were used to suggest recommendations. Based on the similarity of characteristics of the post-positivist worldview paradigm and this study, it has been used in this study.

Table 3.1  
*Features of Post-Positivist World View*

<b>Features</b>	<b>Application to this Study</b>
Determinism (cause and effect-oriented, based on pre-determined theory)	Focus on the influence of determinants on Intention. Use of theory to relate factors.
Reductionism	Focus on a few dimensions in determining constructs.
Measurement	Stress on empirical data collection. Usage of the survey method for data collection.
Theory verification	A framework developed from theory.

Source: Adapted from Creswell and Creswell (2017)

### **3.3 Research Design**

Research design elaborates on scientifically conducting research following a specific guideline, as shown in Figure 3.1. It provides a list of steps in procedural

format to get all the required information to achieve the research objectives. Research design includes the identification of a problem, which is the starting process of research. Then literature review is conducted to define the problem properly. A systematic literature review is one of the recommended ways. Various software can be utilized to have a thorough literature review (Bazeley & Jackson, 2013). Next, a conceptual framework is developed, which follows the development of hypotheses. Finally, data is collected and analysed to confirm hypothesized relationships. Data is collected through various methods.

Before collecting data for the main study, a pilot study is conducted to verify the validity and reliability of the instrument/questionnaire. The aim of the pilot study is improvement in items/questions. Then data is collected for the main research based on retained items. Data analysis often comprises descriptive statistics and inferential statistics. For descriptive statistics, SPSS and Microsoft Excel applications are commonly used. CB-SEM and PLS-SEM can be used for inferential statistics depending on the type of analysis conducted (Norušis, 2006; Wong, 2013).

The First step in inferential statistics is measurement model analyses for construct validity and reliability. Then the structural model is analysed. Based on the analyses of the structural model and relevant procedures, hypothesized direct, mediating and moderating relationships are tested. Depending on the results, a discussion is made along with providing implications to solve the problem and identify future research avenues. In the end, a conclusion is provided.

Instrument development includes deciding the type of survey method and who will respond to it. Data for this study were collected by using an online survey method.

The online survey method was ideal because it can generalize the population within a short time and, at the same time, allow coverage of a wide geographic area. In addition, this method enables the data collection from many respondents at a lower cost. It also helps avoid space-time constraints as respondents can reply to the survey instrument anytime, anywhere (Noordin, 2016).

Studies can be classified as exploratory, descriptive and hypothesis testing (Sukamolson, 2007). This study has descriptive, and hypotheses testing features since the study's aims were twofold. Firstly, to describe the characteristics of the respondents. Secondly, to explain the relationships of constructs stated in hypothesis format. Hypotheses were formulated based on existing models and past studies.

Data was collected at one instance of time. Its analysis is hence called cross-sectional analysis. It was collected and analysed through a quantitative approach to address the problem statement, research questions, research objectives, and the study's hypotheses.

Quantitative analysis is defined as “the numerical representation and manipulation of observation for describing and explaining the phenomena that those observations reflect” (Babbie & Rubin, 2010). This technique presents data in a numerical form suitable for statistical analyses. The quantitative approach interprets data in numeric quantification. It deals with what, where, and why questions specific to explaining the independent constructs to predict the dependent constructs (Sukamolson, 2007).

The quantitative approach also brings some weaknesses as it fails to reflect an intertwined human thought process and lacks the flexibility to modify the research design (Babbie & Rubin, 2010). However, this approach is suitable in the case of

hypotheses testing, especially when a theory or a model is being extended/adapted. The quantitative approach uses large sample data to confirm hypotheses developed based on already established theories and models. Furthermore, it verifies the cause and effect in general research procedures to adhere precisely to the data collected with maximum objectivity for generalization (Babbie & Rubin, 2010).

Various previous studies based on the TAM model as the underpinning theory have used the survey method (Ntsafack et al., 2018; Rafique et al., 2020). Therefore, the survey method is the appropriate method for this study.

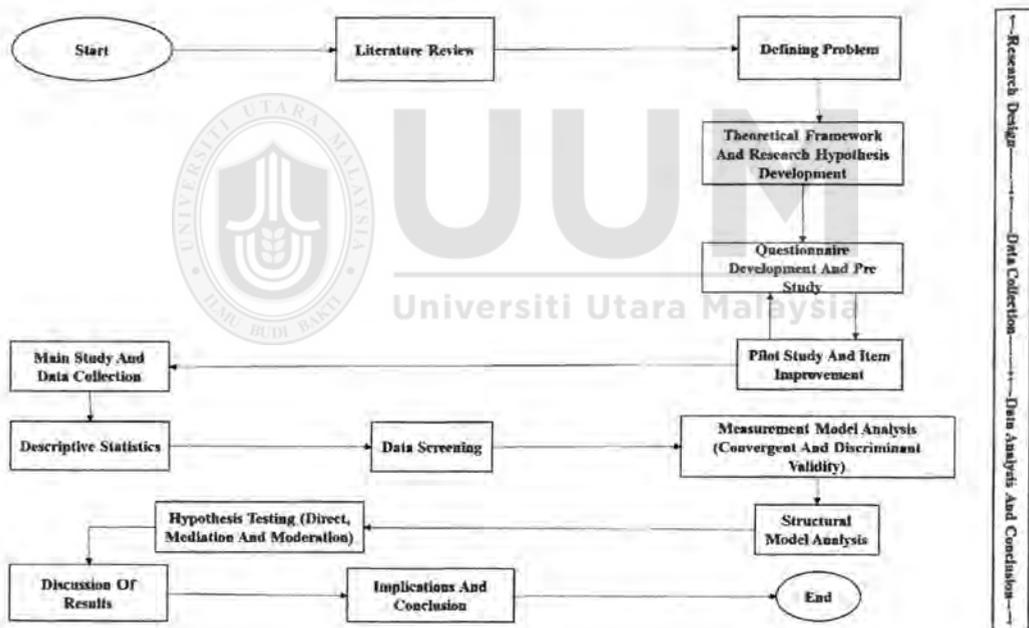


Figure 3.1  
 Research Design Flow Diagram  
 Source: Adapted from Teoh (2015)

### 3.4 Operational Definitions

An operational definition is defined as the indicators used to determine a particular construct (Babbie & Rubin, 2010). Operational definitions reflect the meaning of a construct. Operational definitions transform all the constructs in a study

into perceived or perceivable. Cooper et al. (2006) stated that operational definition is explained as a term of criteria used for specific measurements. All the terms for testing must be standardized. To state operational definitions, researchers must determine how to choose the measurement based on the purpose of the study because it is critical to treat abstract ideas to provide more understanding of the concepts of measurements. Besides, it is used to define the relationship found within theories and their hypotheses. An operational definition reflects more on nominal than real. Nominal specifies how the term is simply assigned to a concept without any interpretation or claim. A nominal usually represents more consensus (Babbie & Rubin, 2010). So, operational definition achieves maximum clarity regarding what a concept means in the context of a given study. Consequently, operational definitions are assigned to learn precisely how a concept is to be measured. The operational definitions of constructs in this study are shown in Table 3.2. Constructs can be measured as single or multiple dimensions. These dimensions are further measured through one or multiple items. Constructs are, for this reason often referred to as latent constructs. Operationalization depends on the context of the study. In this study, latent constructs were utilized. They were operationalized as single dimension constructs which were measured through multiple items. All the constructs were perceived except for usefulness. Although usefulness was stated as perceived, perceivable usefulness of in-app ads based on experience was also accounted for.

Table 3.2  
Operational Definitions

Variable	Definition	Source
Intention to use in-app ads	An individual's subjective probability of acting in a specific manner.	(Ajzen & Fishbein, 1980)
Attitude toward in-app ads	An individual's learned predisposition to act consistently towards an object.	(MacKenzie & Lutz, 1989)
Perceived Usefulness	Perceived and post usage advantage.	(Yeo et al., 2017)
Perceived Collaboration	The alliance between multiple stakeholders.	(Cho et al., 2019)
Perceived Financial Benefits	Expected Financial benefit.	(Richard & Meuli, 2013)
Self-Efficacy	An individuals' perception of one's ability to perform a specific task.	(Bandura, 1986; Compeau & Higgins, 1995b)

### 3.5 Measurement Scales

The measurement of constructs in a quantitative method is designed precisely. Four levels of measurement can be considered to know the degree of precision for all the constructs that are being measured. They are nominal, ordinal, interval, and ratio (Yegidis et al., 2012).

Table 3.3 describes the comparison between the four measurement scales along with examples. The nominal scale, ordinal scale, and ratio scale are more appropriate to measure constructs in this study. The nominal scale is used to measure a nominal construct, defined as a construct whose attributes have characteristics of exhaustiveness and mutual exclusiveness because all possibilities are considered (Babbie & Rubin, 2010). For example, the attribute composing the nominal construct in this study was the gender that consists of male or female. On the ordinal scale, the attributes are more logically ranked. The ordinal scale is also referred to as the Likert scale (Babbie & Rubin, 2010). For example, the attribute composing the ordinal construct in this study was education level. The construct comprising the ratio scale needs to have a zero-base point. For example, the attribute composing the ratio construct in this study was age.

Table 3.3  
*Description of the 4 Measurement Scales*

Level	Nominal	Ordinal	Interval	Ratio
Gender	Yes			
Age				Yes
Operating System	Yes			
Smartphone size		Yes		
Education level		Yes		
The institution currently enrolled in	Yes			
City	Yes			

### 3.6 Instruments of the Study

An instrument with items adapted from prior studies was prepared to conduct the survey after relating it to the current framework and its hypotheses. The instrument format is important in terms of wording and sequence because any misunderstanding of the items can lead to unintended responses affecting the data collection process and results. Therefore, instrument guidelines in terms of being easy for the respondents to understand were followed. Besides, the instrument was reviewed in terms of length. It was also assured several items were not squeezed into a single item, as it makes responding to individual items impossible if they have opposite responses. Furthermore, abbreviated items were not utilized as, in some situations, respondents misinterpreted them.

It is essential not to make respondents spend too much time and focus on the first page of the questionnaire to have the respondent's profile. Instead, it is necessary to quickly get responses for the essential items, representing all the constructs used in the framework (Babbie & Rubin, 2010).

The questionnaire is given in Appendix 1. The questionnaire was prepared in English since English is the language of instruction in all higher educational institutions in Pakistan. The first section gave the introduction of the researcher and the aim of the

study. The second section of the questionnaire was regarding the profile of the respondents in terms of their personal information, which included name, gender, age, education level, city, and additional items relevant to in-app ads and the use of a smartphone.

Section three (linked with section twelve) gave brief literature and examples of in-app ads. Section four introduced respondents to the main items related to the constructs in the model. The fifth to tenth sections included items for the constructs of the study. Section five is regarding Students' intention to use in-app ads as the dependent construct, measured by five items. The sixth section measured attitude toward in-app ads by four items. The seventh section measured perceived usefulness by four items. The eighth section measured perceived financial benefits by five items. The ninth section measured perceived collaboration by six items. The tenth section measured self-efficacy by six items. The instrument ended with section eleven, in which the respondent's permission was sought to contact in future. Respondents were given the option to provide feedback on the instrument or in-app ads.

The total number of items in the instrument was 45. There were 30 items regarding latent constructs of the study. For the respondent's responses to the main items, a five-point Likert scale was used. On the Likert scale, respondents were required to supply their level of agreement on each item as the intensity of their feeling.

In this study, Google forms were utilized to prepare the online instrument. Google forms is a free service of Google (Chaiyo & Nokham, 2017). Google form is highly secure yet easily sharable. Data collected through a Google form is readily processed. Google forms App/Web interface itself provides numerous features to view the

description of collected data in multiple formats. Google forms can be easily shared with many respondents using various channels.

All the items used in the instrument were anchored using a five-point Likert scale ranging from 1, which indicated “strongly disagree”, to 5, which meant “strongly agree”. This scale has been used extensively in social sciences research (Refai, 2015). Five-point Likert scale is simple to answer instead of the seven-point Likert scale. The difference between very strongly agree and strongly agree can be confusing to respond to when there are numerous items (Cooper et al., 2006). All the constructs, including the moderating construct, were continuous and reflectively measured. The moderating construct was kept continuous since converting it into a categorical construct could result in the emergence of type I and type II errors (Ro, 2012).

Examples of in-app ads were given to help respondents understand and differentiate between in-app ads and traditional mobile ads. Examples of in-app ads in popular apps were presented so that respondents could relate to them. In addition, visual examples were given, considering high-speed mobile internet is out of reach of most university students in Pakistan.

### ***3.6.1 Measures of Students' Intention to Use In-App Ads***

Items for the construct students' intention to use in-app ads were adapted from Waheed et al. (2015). They reported the reliability of the items measuring the intention construct in terms of Cronbach's alpha as 0.88. All the other constructs in the study had Cronbach's alpha value above 0.70. Hence, the items were reliable for measuring intention as reliability was above the 0.70 benchmark value (Byrne, 2013).

The items to measure students' intention to use in-app ads are shown in Table 3.4.

Table 3.4  
*Items to Measure Students' Intention to Use In-App Ads*

S. No	Items
1	I intend to use in-app ads
2	I am interested to use in-app ads
3	I want to experience in-app ads
4	I prefer to use in-app ads rather than traditional mobile ads such as mobile Web advertisements, emails, or SMS/voice call advertisements
5	I intend to use in-app ads regularly in future

Source: Adapted from Waheed et al. (2015)

### 3.6.2 Measures of Attitude Toward In-App Ads

Items for the construct attitude toward in-app ads were adapted from Raines (2013). They reported the reliability of the items in terms of Cronbach's alpha as 0.91. All the other constructs in the study had Cronbach's alpha value above 0.70. Hence, items were reliable for measuring attitude as reliability was above the 0.70 benchmark value (Byrne, 2013). The items to measure attitude toward in-app ads are shown in Table 3.5.

Table 3.5  
*Items to Measure Attitude Toward In-App Ads*

S. No	Items
1	I am favourable towards in-app ads.
2	I like in-app ads.
3	I am satisfied with in-app ads.
4	Overall, I have a positive view of in-app ads.

Source: Adapted from Raines (2013)

### 3.6.3 Measures of Perceived Usefulness

Perceived usefulness was measured using items based on the Yeo et al. (2017) study. They reported the reliability of the items measuring perceived usefulness in terms of Cronbach's alpha as 0.81. All the other constructs in the study had Cronbach's alpha value above 0.70. Hence, items were reliable for measuring perceived usefulness as reliability was above the 0.70 benchmark value (Byrne, 2013). The items to measure perceived usefulness are shown in Table 3.6.

Table 3.6  
*Items to Measure Perceived Usefulness*

S. No	Items
1	Using in-app ads would enable me to accomplish tasks more quickly than using traditional approaches
2	Using in-app ads would enhance my effectiveness in shopping or information seeking
3	I find in-app ads useful
4	In-app ad transactions are advantageous to consumers

Source: Adapted from Yeo et al. (2017)

### 3.6.4 Measures of Perceived Collaboration

Perceived collaboration was measured based on items from the study by Kapoor and Vij (2018). They reported the reliability of the items in terms of Cronbach's alpha value as 0.88. All the other constructs in the study had Cronbach's alpha value above the 0.70 benchmark value (Byrne, 2013). Hence, items were reliable for measuring perceived collaboration (Byrne, 2013). The items to measure perceived collaboration are shown in Table 3.7.

Table 3.7  
*Items to Measure Perceived Collaboration*

S. No	Items
1	In-app ads provide me with beneficial cashback options.
2	Mobile apps showing in-app ads have tie-ups with multiple brands which are beneficial.
3	Mobile apps showing in-app ads have tie-ups with other e-commerce players which are beneficial.
4	Mobile apps showing in-app ads provide incentives every time interaction is made with them.
5	In-app ads provide me with coupons, that I can use at a later stage.
6	I enjoy loyalty discounts for availing in-app ads.

Source: Adapted from Kapoor and Vij (2018)

### 3.6.5 Measures of Perceived Financial Benefits

To measure perceived financial benefits, items were adapted from Kuppelwieser et al. (2019). These items have been used in numerous studies (Darke & Chung, 2005; Lichtenstein & Bearden, 1989). As per Lichtenstein and Bearden (1989), items had a Cronbach alpha value of 0.8. In addition, all the other constructs in the study had Cronbach's alpha value above the 0.70 benchmark value (Byrne, 2013). Hence, items were reliable for measuring perceived financial benefits (Byrne, 2013). The items to measure perceived financial benefits are shown in Table 3.8.

Table 3.8  
*Items to Measure Perceived Financial Benefits*

S. No	Items
1	Value of in-app ad offer in terms of appeal? Very unattractive/very attractive
2	Value of in-app ad offer in terms of buying decision? Very bad buy/very good buy
3	Value of in-app ad offer in terms of cost savings? No savings at all/very large savings
4	Value of in-app ad offer in terms of fairness of price? Very unfair price/very fair price
5	Value of in-app ad offer in terms of monetary value? Not a very good value/very good value

Source: Adapted from Kuppelwieser et al. (2019)

### 3.6.6 Measures of Self-Efficacy

Items for self-efficacy were based on the items adapted from Compeau and Higgins (1995). They used ten items to measure self-efficacy as a single-dimension construct. Many of the items were interrelated. Therefore, only six items were selected to measure self-efficacy in this study. Items had composite reliability of 0.95. All the other constructs in the study had composite reliability above 0.70. Hence, items were reliable for measuring self-efficacy as reliability was above the 0.70 benchmark value (Byrne, 2013). The items to measure self-efficacy are shown in Table 3.9.

Table 3.9  
*Items to Measure Self-Efficacy*

S. No	Items
1	I expect that I can manage in-app ads even if nobody is around to tell me what to do.
2	I expect that I can manage in-app ads even if I have never interacted with such ads before.
3	I expect to manage in-app ads if I have a simple manual for reference.
4	I expect that I can manage in-app ads if I could contact someone for help if I get stuck.
5	I expect that I can manage in-app ads if someone else would help me get started.
6	I expect that I can manage in-app ads if someone shows me how to do it first.

Source: Adapted from Compeau and Higgins (1995)

### 3.6.7 Summary of the Items

All the latent constructs in the study were measured as a single dimension. Multiple items were used to measure each latent construct. All the constructs were reflective and continuous. The entire model was reflective. Items were adapted to be relevant and easy to comprehend by respondents in the context of in-app ads' acceptance. The Likert scale was used to elicit responses against items measuring latent constructs. A summary of items is presented in Table 3.10.

Table 3.10  
*Summary of Instruments Used to Measure Latent Constructs*

<b>Latent construct</b>	<b>Total Number Of Items</b>	<b>Source</b>
Intention to use in-app ads	5	(Waheed et al., 2015)
Attitude toward in-app ads	4	(Raines, 2013)
Perceived Usefulness	4	(Yeo et al., 2017)
Perceived Collaboration	6	(Kapoor & Vij, 2018)
Perceived Financial Benefit	5	(Kuppelwieser et al., 2019)
Self-Efficacy	6	(Compeau & Higgins, 1995)

### **3.7 Sampling**

#### **3.7.1 Population**

The population is defined as the interest group that needs to be studied due to their appropriateness. Referring to this study, any smartphone user seems to be part of the population. However, not everyone uses in-app ads. Most smartphone users below the age of 15 years are still not allowed to order things online in Pakistan. They are mostly not in possession of a debit card/credit card to make online purchases.

Similarly, most smartphone users above the age of 60 do not conduct online transactions in Pakistan. Therefore, based on the literature, targeting the extensive users of smartphones was appropriate for this study. In addition, they should have considerable exposure to innovative technologies (Horrigan, 2003). Hence, the target population of this research were youngsters and middle-aged consumers. Among them, university students of major cities were relevant. They should have both education and openness towards innovative services such as in-app ads. They should also desire to receive advertisements in return for some benefit. Considering these facts, the population of this study was university students of the capital city of Pakistan, Islamabad. A similar approach has been utilized in previous studies on computing technologies, such as by Waheed et al. (2015).

### **3.7.2 Unit of Analysis**

Unit of analysis is related to the type of unit used in data measurement and the type of analysis carried out in the study. Based on the study's objective, the unit of analysis was a university student exposed to in-app ads (Jung et al., 2012).

### **3.7.3 Sample**

There were more than 600000 students enrolled in federal universities in Pakistan (Shah et al., 2021). Due to time and cost constraints, the entire population cannot be surveyed. Therefore, a sample was chosen to represent the population. An appropriate sample represents the mass majority of the population (Neuman, 2016).

### **3.7.4 Sampling Frame**

The number of students enrolled in federal universities was searched for the sampling frame. The enrolment record of these universities was considered. A sampling frame was identified based on the total enrolled students in these universities. Not all universities share an up-to-date record of enrolled students on their websites. Therefore, the Higher Education Commission [HEC] website and other websites and related studies with information about the enrolment of students in Pakistani universities in recent years were reviewed (Higher education commission, 2019; Shah et al., 2021; Talib, 2017). Based on these studies, it was deduced that 600,000+ students were enrolled in universities operating in Islamabad in 2021. There were 25 federal universities in 2021 (HEC, 2021). Among these, 17 were public, and eight were private. Considering the study's objective to focus on students who desired cost-beneficial ads while knowing advertising field both academically and practically, the sample was further delimited to public universities. Among public universities, four were highly related to Management. Hence sample was chosen from these

universities. Within these universities, all the students of the Management Science department were approached through their Head of Department (HOD). An equal number of responses from each university were attained. The sampling technique used in the study was the probability proportional stratified sampling technique. The sampling frame is shown in Table 3.11.

Table 3.11  
*Sampling Frame*

Category	No. of Universities
Federal universities (Private + Public)	25
Private	8
Public (General+ non-general)	17
General (Management+ other specializations)	12
Non-general	5
Management studies	4

### 3.7.5 *Sample Size Requirement*

The sample size requirement of a study depends on the model. According to Hulland (1999), the minimum sample size should be ten times the number of structural paths pointing at one latent construct in the structural model. Feiner (2002) suggested sample size should be greater than 15 times the number of predictors. Hair et al. (2014) believed that data and models should be considered for determining sample size.

Cohen (1992) provided a way to calculate sample size through power analysis. It required analysis of the required significance level, the desired statistical power, and the population effect size desired to be detected (Faul et al., 2009).

G\*power 3.1 software was used to calculate the sample size following steps by Erdfelder et al. (1996). First, the significance level of 0.05 (95%) and medium effect size (0.15) were chosen. The analysis indicated that to achieve the statistical power of 80%, a minimum of 92 samples were required, as shown in Figure 3.2.

Krejcie and Morgan's (1970) earlier provided Equation 3.1 to identify the appropriate sample size in the case of a known population. Based on the equation, the sample should be at least 384.

Equation 3.1

$$S = \frac{X^2 NP(1-P)}{d^2(N-1) + X^2 P(1-P)}$$

Where S= the required sample size

$X^2$ = The table value of chi-square for 1 degree of freedom at the desired confidence level (3.841)

N= population size

P= population proportion (assumed to be .50 since this would provide the maximum sample size).

d= the degree of accuracy expressed as a proportion (.05)

Based on recent related studies by Farooq (2017), Hameed et al. (2016) and Waheed et al. (2015), an average response rate of 60-80% was expected. Since the online survey method was being utilized, receiving a minimum of 400 responses was appropriate for the main study.

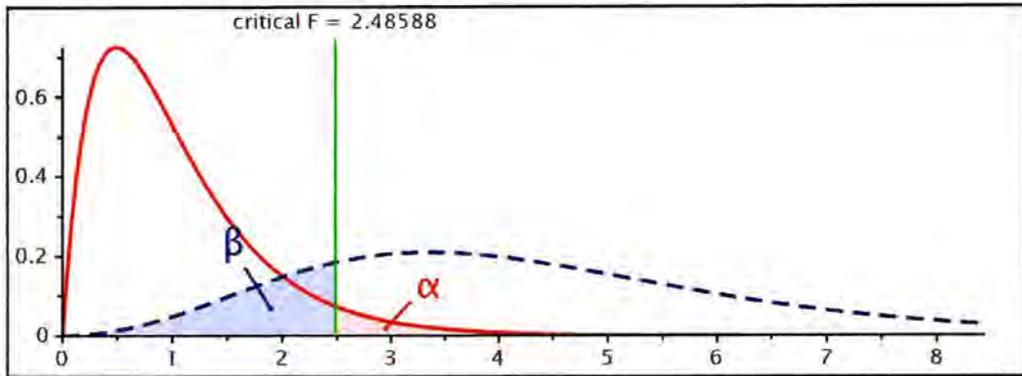


Figure 3.2  
*The output of Power Analysis*  
 Source: G\*power 3.1

### 3.8 Data and Data Type

Data is defined as “the facts presented to a researcher from the study’s environment” (Cooper et al., 2006). Many methods can be used to collect data, such as surveys, interviews, and observations (Fairol, 2012). However, Cooper et al. (2006) stated that the researcher needs to consider four data characteristics before gathering them.

Firstly, the data should be characterized by abstractness, where the data are symbolic rather than actual because occasionally, the data that needs to be investigated can be hard to access. For example, if the study needs to get the data related to the “cause”, only its effect may be recorded. Secondly, the data is processed by the senses. Data is related to sensory experiences that consistently produce the same result. Therefore, consistent data is verified as trustworthy. Thirdly, elusiveness is captured for the data because it can be complicated by the speed at which the events occur and the time-bound nature of observation. Opinions, preferences, and attitudes may vary over time. Lastly, data must reflect the closeness and truthfulness of the phenomenon under investigation.

Primary data is used as a source in this study. Primary data is first-hand data directly acquired from the source (Cooper et al., 2006). In addition, more socioeconomic constructs can be included in the instrument by utilizing the survey method.

Data gathered in the current study is related to constructs under investigation. A cross-sectional study was the most appropriate method for data collection for this study. It is because this research has elements of both descriptive and hypotheses testing. Besides, this research addresses the problem of using snapshot time to make generalizations in a social study (Babbie & Rubin, 2010). In a cross-sectional study, the researcher makes observations at one point, and all constructs are measured simultaneously (Yegidis et al., 2012). A cross-sectional study finds the relationship existing in significant value (Babbie & Rubin, 2010). It explains the relationship between variations in one construct corresponding to variations in one or more constructs based on correlation coefficients (Isaac & Michael, 1995).

### **3.9 Sampling Method and Data Collection Procedure**

The sampling method applied in this research is the probability proportional stratified sampling technique. After shortlisting of universities from which data collection was desired, all the current students enrolled in Management Sciences Department were contacted through the departmental head. They are often referred to as the Head of Department (HOD). They were contacted through their official email address. HODs' were sent cover letters that included the link to the online questionnaire, as shown in Appendix 2. Cover letters were accompanied by a letter of recommendation provided by Universiti Utara Malaysia, as shown in Appendix 3. HODs' were requested to have the questionnaires filled by their respective departmental students.

### **3.10 Pre-Requisites of Data Analysis**

Once data has been collected, it is refined for data analysis. Original first-hand data always have a few issues. Resolving these issues is referred to as data screening.

#### **3.10.1 Data Screening**

Data screening refers to using various methods to assure collected data's reliability, usability, and trustworthiness. It is common for first-hand data collected by a researcher to have a variety of problems, such as multiple submissions, missing values, pattern values, and outliers. These problems can lead to reliability issues. For this reason, data for this study was been screened.

The first screening test was to find whether there were multiple submissions by respondents. Google forms are prone to electronic data submission errors such as multiple submissions, even if a respondent has only given one response. Another issue, especially about the online survey method, is a response with pattern values. Such responses also need to be identified and removed.

Missing data is one of the major problems in data analysis (Tabachnick et al., 2007). It happens when a respondent fails to answer a survey (Hair et al., 2016). Generally, items belonging to the latent constructs are considered compulsory. Taking advantage of the electronic survey method, necessary checks can be put in place to ensure all mandatory items are answered to overcome the issue of missing values. For non-compulsory demographic items, missing values can be replaced with "none" or appropriate terms such as "other".

Outliers need to be removed before data analysis. Mahalanobis distance approach can be used to identify and remove outliers from data. SPSS can be used to apply the

procedure. An advantage of this approach is that outliers can be highlighted/sorted and easily removed.

### **3.10.2 Reliability and Validity of the Instruments**

The instrument's reliability and validity are assured by conducting pre and pilot studies. The feedback is used to make necessary adjustments to the content and sequence of the items in the instrument. The fundamental reasons for pre and pilot study are as under:

- Assess the reliability and validity of the instruments.
- Foresee any challenges during the main study data collection.
- Familiarize with the research environment before collecting data for the main study.

The reliability and validity of the instrument are also checked at the main study stage. However, at the main study stage, the purpose of measuring reliability and validity is to ensure that the instrument is responded correctly and that data analysis is performed on reliable and valid data. Improvement in the instrument is only applicable at the end of the pilot study.

#### **3.10.2.1 Reliability.**

Reliability is defined as the consistency of the measurement or the degree of similar results the instrument reproduces if the same conditions are repeated (Sekaran, 2003; Zikmund & Carr, 2000). Items that distort the instrument's reliability are removed to increase the consistency and reliability of the constructs, hence leading to more accurate results.

There are three types of reliability tests (Zikmund & Carr, 2000).

**Test-retest method:** This method requires administering the exact instrument to the same respondents at two different times.

**Equivalent forms or alternate form method:** This method requires two different yet similar forms to be administered to the same respondent at the same time.

**Split half method:** In this method, the instrument's internal consistency is measured by dividing it into two halves and then checking the consistency of the results.

Criticism regarding the test-retest method is that respondents may be influenced by the first test when answering the second test (Zikmund & Carr, 2000). Moreover, there will be a change in the attitude if the time between administering the first and the second test is too long. The equivalent method has been criticized for being time-consuming and costly since the researcher needs to prepare two equivalent forms of the instrument that need to have the same measurement of content and the number of items and almost similar size of mean and standard error.

The split-half method is the most feasible option. Cronbach alpha values are assessed to measure internal consistency. Cronbach alpha values are acquired by performing steps to get construct validity. The score of Cronbach alpha values around 0.6 is considered average reliability standard, whereas 0.7 indicates high reliability (Sekaran, 2003).

### **3.10.2.2 Validity.**

Validity refers to how well an instrument measures an intended concept. Validity is measured by two methods: content validity and construct validity.

### **3.10.2.2.1 Content Validity.**

Content validity is a method of validating whether an instrument measures the intended concept. First, past literature needs to be referred to in developing an instrument for content validity. Secondly, face validity needs to be performed.

Literature was reviewed to know what sections should be included in the instrument. Apart from sections, the sequence was also examined. The review was done of both instruments utilized for collecting data from respondents in Pakistan and respondents in other countries. Instruments targeting university students were specifically checked (Raza et al., 2018; Waheed et al., 2015). Based on the review of previous instruments, an initial instrument was developed.

Face validity was performed on the initial instrument by taking comments and opinions of experts in the relevant field. This step is also referred to as pre-study. Academic and industry experts were contacted for comments on the instrument. Academicians are more capable of giving expert opinions on the suitability of constructs, sentence structure, and the extent to which the concepts measure the intended concept. Industry experts are better at providing feedback from the industry perspective. The instrument was shared with two Professors of UUM, Malaysia and a Professor of Air University, Pakistan, for review from an academic perspective. The questionnaire was also shared with two industry experts who had looked after advertising campaigns in multinational companies operating in Pakistan. These reviewers commented on the items' clarity, understanding, bias, and ambiguity level. They also commented on the wording, sequence and time required to answer the instrument. They reviewed the instruments to ensure they were easy to understand by

the target respondents. Pre-study results revealed some necessary changes, such as modification in sequence and wording.

#### **3.10.2.2.2 Construct Validity.**

Construct validity refers to how the measured construct confirms the relationship of the hypothesis generated from the theory based on a concept (Zikmund & Carr, 2000). A high degree of construct validity was assured by defining constructs based on a theory at the conceptual stage. Then, constructs were operationalized, and hypotheses were developed to examine the relationships among them. Construct validity comprises convergent validity and discriminant validity.

Convergent validity is a validation method applicable in the case of multiple items being used to measure a construct. Such constructs are referred to as latent constructs. As suggested by Hair et al. (2010), convergent validity is assessed by analysing values of item loadings/weights (loadings in case of a reflective model), composite reliability, and average variance extracted (Dolan et al., 2008).

According to Fornell and Larcker (1981), item loadings should exceed 0.7. According to Hair et al. (2014), in the case of item loading below 0.7 but above 0.4, the item should be removed if its removal increases reliability and AVE. For exploratory research, the composite reliability of each item should exceed 0.6 (Hair et al., 2010). The last aspect to examine is the Average Variance Extracted (AVE) to establish convergent validity. The AVE measures the amount of variance captured by the construct relative to the variance due to measurement errors (Fornell & Larcker, 1981). The AVE value must be above the 0.5 benchmark value. The value of 0.5 indicates that half of the variance in indicators of a construct is explained by the construct. This is the minimum value for adequate convergence in measuring a

particular construct (Barclay et al., 1995). Otherwise, the convergent validity of a construct is questionable.

Discriminant validity refers to whether constructs are correlated with other constructs in the study (Hair et al., 2014). For reflective models, discriminant validity is based on three aspects. They are cross-loadings, Fornell-Larcker criterion, and Heterotrait-Monotrait Ratio (HTMT).

To assess discriminant validity, item loadings of each construct are summarized into a pattern that explains the correlation from the smallest to the largest value between items that measure a construct. This method is referred to as a comparison of cross-loadings. Values of item loadings reflect the strength of the relationship between items of a particular construct. The main requirement for discriminant validity is that the shared variance between the construct and its indicators is larger than the variance shared with other constructs.

In the case of using the Fornell-Larcker criterion, discriminant validity is achieved when the square root of the AVE is greater than the correlations between the constructs (Fornell & Larcker, 1981; Hair et al., 2014). Despite the frequent use of the Fornell-Larcker method for more than three decades, it is still characterized by weak sensitivity in terms of discriminant validity evaluation, which calls for an alternative approach (Henseler et al., 2015). The major drawback of the Fornell-Larcker method is the lack of further theoretical explanations, regardless of the strong correlation of specific items that should be achieved with its construct and weak correlations with other constructs. In addition, this approach provides a criterion value and not a statistical value (Henseler et al., 2015). Thus, the heterotrait-monotrait (HTMT) ratio

has been developed to estimate the correlation between constructs (Henseler et al., 2015). There are two steps involved when applying the HTMT ratio to evaluate discriminant validity. Firstly, it is used as a criterion by comparing it with a predetermined threshold. If the HTMT value is higher than the predetermined threshold, one can assume a lack of discriminant validity for the compared latent constructs. The exact predetermined threshold is a debatable matter, where some researchers have proposed a value of 0.85 (Clark & Watson, 1995; Henseler et al., 2015). It has also been suggested to be 0.90 (Henseler et al., 2015).

Secondly, the HTMT ratio can be used as a statistical test to assess discriminant validity by testing the null hypothesis ( $H_0: HTMT \geq 1$ ) versus the alternative hypothesis ( $H_1: HTMT < 1$ ). In other words, if the confidence interval of HTMT contains the value 'one' (i.e.,  $H_0$  accepted), it denotes a lack of discriminant validity. On the contrary, if the value 'one' falls outside the confidence interval of HTMT, this denotes that the two evaluated constructs are discrete, and discriminant validity is assured (Henseler et al., 2015).

### **3.11 Techniques of Data Analysis**

Data is analysed using various statistical methods. First, for descriptive analysis, MS Excel or SPSS application is often used. Then CBSEM or PLS-SEM technique is used for inferential analysis.

#### **3.11.1 Descriptive Analysis**

Descriptive Analysis describes sample data in terms of mean, standard deviation, and percentages. Descriptive analysis describes data in statistical terms. It is done for both demographic profiles of respondents and responses to the constructs. The purpose of descriptive analysis is not to infer from statistics but rather to

summarize the sample responses. In simple words, probability theory is not the basis for descriptive statistics development. That is why descriptive analysis is always accompanied by inferential analysis to draw conclusions in a research.

In descriptive statistics, the characteristics of the entire sample responses are summed up in terms of brief descriptive coefficients. Examples of descriptive statistics are measures of central tendency and measures of dispersion. Mean, median, and mod are examples of central tendency. Standard deviation (or variance), minimum and maximum value of variables, kurtosis and skewedness, are examples of dispersion. SPSS and MS Excel are primarily used for descriptive statistics. Some software such as SmartPLS also informs about descriptive statistics right on import of data file, which is much easier to acquire and interpret.

### **3.11.2 Inferential Analysis**

Data collected in a study can be analysed using multiple techniques. The two most common techniques are PLS-SEM and CBSEM. For PLS-SEM, the SmartPLS application is most commonly used. For CBSEM, the AMOS application is quite often used.

CBSEM is used when a model is made from theory. PLS-SEM is used if a model is not entirely based on a theory. CBSEM require at least 200 samples to run. PLS-SEM can be executed on smaller samples. CBSEM is applied for analysis in case of confirming theoretically assumed relationships. PLS-SEM is used for research in case prediction, and identification of relationships between constructs is required. CBSEM is possible only in case at least five indicators measure each construct. For PLS-SEM, even one indicator is enough. CBSEM is difficult to apply in the case of large models

in which 100+ indicators are present. PLS-SEM can be used easily on large models (Hair et al., 2011).

PLS-SEM is a second-generation data analysis tool. PLS-SEM is used to model causal relationships between hypothesised constructs that may have some involvement in a study (Byrne, 2010). This approach is helpful in behavioural studies when many constructs are unobservable (Sharma, 1996). It allows the assessment of uni-dimensionality, reliability, and validity of the construct of the study. A significant advantage of PLS-SEM is that it offers a simultaneous overall test of model fit and individual parameter estimation (Hair et al., 1998; Kline, 2005). It enables simultaneous testing and investigation of the hypothesized relationships between constructs (Byrne, 2001). It avoids parameter estimation biases common in regression analysis (Calantone et al., 1998). Furthermore, it offers more meaningful and valid results, while other analysis methods often result in less clear conclusions and require several analyses (Bollen, 1989).

The terminology used for constructs in PLS-SEM is slightly different from other methods. The independent constructs are referred to as exogenous. Dependent constructs are referred to as endogenous. Mediator and moderator are also referred to as exogenous constructs (Ramayah et al., 2018).

Many previous studies have conducted investigations using PLS-SEM. For example, Sheikh et al. (2017) applied the PLS-SEM technique using SmartPLS. The focus of their research was E-Marketing in the Business-to-Business Industry. Souiden et al. (2019) applied the PLS-SEM technique using SmartPLS in their study, focusing on consumer attitudes toward location-based coupons.

### **3.12 Criteria to Decide Usage of PLS-SEM**

The selection of PLS-SEM in a study is based on the fulfilment of specific criteria. These criteria were given by Hair et al. (2016). The first criterion is particular to the research goal. PLS-SEM is appropriate if the research targets key predicting constructs or identify critical drivers. The second criterion is dependent on the nature of the research. PLS-SEM is suitable in case of exploratory study or extension of existing theory. The third criterion is the measurement model specification. PLS-SEM works best on a reflective model. With the consistent PLS algorithm, formative models can also be tested using PLS-SEM. However, data needs to meet strict criteria. Consistent PLS algorithm replicates CB-SEM. The fourth criterion is related to model complexity. PLS-SEM is appropriate when dealing with complex models, such as those having multiple mediators and moderators.

All four criteria were met in this study. First, the research goal of the study was to know the influence of critical predicting constructs. Second, the nature of the study was an extension/adaption of a theory. Third, all the constructs involved in the study were reflective. Finally, the study model was complex, as it had both moderating and mediating relationships. Therefore, PLS-SEM was appropriate for this study.

### **3.13 Assumptions of PLS-SEM**

#### ***3.13.1 The Assumption of Normality***

Traditionally, data needs to be normal before it can be analysed. PLS-SEM is much more relaxed towards the normality of data. Unlike other SEM techniques, PLS-SEM does not require any normality assumption and handles non-normal data rather well. Only extremely non-normal data is of concern when utilizing the PLS-SEM technique (Hair et al., 2010).

Two aspects can be checked to know whether data is normal for applying PLS-SEM. First is assuring no item should have a skewness value above 1. The second is that the PLS algorithm converges in less than 300 iterations. If data is exceptionally non-normal, it must be corrected before proceeding to the next stage.

### ***3.13.2 Test of Linearity***

The test of linearity is an essential step in regression analysis. One of the underlying assumptions of this test is that the relationship between exogenous constructs and endogenous constructs is linear. Positive values indicate the relationship is in the same direction. In the existence of a non-linear relationship, the test of linearity will be ignored as this will underestimate the actual strength of the relationship (Tabachnick & Fidell, 2007).

The linearity test is conducted to predict the values of each independent construct on the dependent construct via scatter plot and ANOVA. Then, as per the calculated deviation, it is concluded whether the relationships are linear and positive.

### ***3.13.3 The Assumption of Homoscedasticity***

According to Hair et al. (2010), homoscedasticity is the assumption that an endogenous construct shows an equal level of variance across the range of predictor constructs. A Scatter plot diagram is utilized to identify homoscedasticity among the set of independent constructs and the variance of the dependent constructs.

### ***3.13.4 Multi Collinearity Test***

Multi collinearity test is performed to know whether two or more independent constructs may be highly correlated, thus destroying the effect of multiple regression (Cooper et al., 2006). Therefore, a multicollinearity test among constructs is highly

recommended before testing a model (Hair et al., 2010). Multicollinearity exists when the correlation value exceeds 0.90. The multicollinearity test is facilitated by examining the variance inflation factor (VIF) and the tolerance value. VIF is the amount of variability in a selected independent constructs explained by other independent constructs, whereas tolerance is the inverse of VIF (Hair et al., 2010). The VIF and tolerance value cut-off points are 10 and 0.10, respectively, which indicates that a VIF closer to 1.00 represents little or no multicollinearity.

The variance inflation factor (VIF) needs to be detected to get valid data regardless of the multicollinearity problem. Its value should be between 0 and 1 for each predictor. If the value of VIF for each predictor is 0, it is an excellent correlation. However, if the value of VIF for each predictor is 1, each predictor does not correlate with other predictors (Hair Junior et al., 1998). In Smart-PLS, the PLS algorithm provides information about VIF. The coefficients table can also be checked in SPSS to confirm that VIF values are below the cut off value of 10.

### **3.14 Steps of PLS-SEM Analysis Using SmartPLS**

#### **3.14.1 Preparing Project**

PLS-SEM analyses are conducted in two phases. Before data analysis, data needs to be imported. Imported file is often of comma-delimited (CSV) format. Then, the research model needs to be designed in SmartPLS.

#### **3.14.2 Measurement Model Analysis**

Once the model is made, and all the relationships are accurately set, the first phase of PLS-SEM analysis is executed. This requires the calculation of the PLS algorithm. For path model analyses, the weighting scheme of the path is chosen. Maximum iterations of a large number are suggested (e.g., 300). It is known as

measurement model analysis or outer model analysis. It is referred to as measurement model analysis as items are used to measure latent constructs which are of primary interest to the researcher. If a construct only acts as a moderator, measurement model assessment is done twice. First, for direct and mediating relationships. Then for moderating relationship in which moderating construct is also added.

In the case of the pilot study, only measurement model analysis is performed, and the second step is not performed. Furthermore, the model with moderating construct is analysed in the pilot study since the purpose is to verify the construct validity of all the items in the instrument. Once the redundant items are removed, the main study's data is collected based on retained items. Hence, the purpose of performing step 1 in the pilot study is to enhance the instrument.

There is still a chance of redundant items at the main study stage. Therefore, step 1 is again performed. Only after construct validity is assured, other statistics are checked.

### ***3.14.3 Structural Model Analyses***

Once measurement model analysis is analysed, step two is performed, also known as structural model analysis or inner model analysis. In the case of PLS-SEM, bootstrapping technique is utilized in which multiple sub-samples are generated based on the original sample. A subsample of 5000 is recommended and generally used for final results. Moreover, complete bootstrapping is utilized for the final results. A large number is used for maximum iterations (e.g., 1000). Lastly, the weighting scheme of Path is chosen.

### 3.14.3.1 Direct Paths.

For direct relationships, beta coefficients and t values are utilized to decide whether direct hypotheses are accepted. The cut-off value for the t statistic is 1.96. If the t value of the result is above cut off values, a direct relationship is considered to exist.

### 3.14.3.2 Mediating Paths.

To measure the mediation effect, SmartPLS eases calculations. However, manual calculations should also be done. VAF value should be utilized to know the amount/type of mediation. VAF formula should be used to find the amount of mediation effect in statistical terms. VAF is calculated by Equation 3.2.

Equation 3.2

$$\text{VAF} = (\text{Path a} \times \text{path b}) / (\text{Path a} \times \text{Path b} + \text{Path c}'')$$

SmartPLS provides path a, path b and path c'' values and informs whether mediation happens or not in terms of P-value. However, it does not tell the amount of mediation.

For that, Equation 3.2 is used to calculate the VAF value. The path is represented by beta coefficient values for the relationship between two constructs.

Briefly, this formula can be explained in this manner.

$$\text{Path a} = \text{iv-med}$$

$$\text{Path b} = \text{med-dv}$$

$$\text{Path c}'' = \text{iv-dv}$$

VAF values are interpreted accordingly:

<20 - Small

20 to 80 - Partial

>80 - Full

### 3.14.3.3 Moderating Paths.

While applying the PLS-SEM technique for moderation analysis, moderating effect is calculated by creating interaction terms. Three approaches make the interaction term. The most common is the product-indicator approach, in which each indicator of the exogenous construct is multiplied by each indicator of the moderator. Product indicators are indicators of the interaction term. The other two approaches are the two-stage and orthogonalizing approaches. If all constructs (independent and moderators) are reflective and continuous, the product indicator approach is the best (Hair et al., 2014; Ramayah et al., 2018). The product indicator approach has better prediction capability than the two-stage approach. However, it has a significantly weak statistical power (issue on type 1 and type 2 errors) compared to the other two approaches due to collinearity issues when creating interaction terms (Henseler & Chin, 2010). The use of indicator standardization does not reduce collinearity levels. Therefore, there will always be inflated standard errors or biased path coefficient estimates. Henseler and Chin (2010) pointed out that path coefficients of the interaction terms should not be used to quantify the strength of the moderating effect.

To calculate the moderation effect, the researcher needs to add the moderator variable into the model and run the measurement model to assure construct validity. This model is called the main effect model.  $R^2$  is noted before introducing the interaction terms. After introducing interaction terms, the measurement model is again calculated using the PLS algorithm. Change in  $R^2$  is noted. This  $R^2$  is referred to as  $R^2$  included.

Previous  $R^2$  is referred to as  $R^2$  excluded. Change in  $R^2$  indicates the effect of introducing interaction terms.  $F^2$  is calculated to interpret the moderation effect. According to Chin et al. (2003), if the  $F^2$  value indicates a low effect size, it does not necessarily imply that the moderating effect is negligible. In some extreme cases, if the change in beta values is meaningful, moderation is considered applicable. To confirm whether beta values are statistically significant or not, t-values are calculated by testing interaction effects using the bootstrapping procedure. Only basic bootstrapping is done as t-values are provided with it. From the bootstrap result, only the interaction term needs to be interpreted. The cut-off values for this test are 1.645 ( $\alpha = 0.05$ ) and 2.33 ( $\alpha = 0.01$ ). If the t-value of results is above cut off values, moderation is considered to happen. However, the results don't indicate the difference in a group (high Self-Efficacy vs low Self-Efficacy). The size and exact nature of the moderation effect are not easy to judge from examining the coefficients alone. This becomes even more difficult if one or more coefficients are either positive or negative or when standard deviations of the constructs are extremely diverse (Dawson, 2014). According to Dawson (2014), significant interaction results based on coefficients should be followed up with a drawing of interaction plots. SmartPLS eases this process, unlike manual steps required while using other statistical tools such as SPSS. In SPSS, the researcher is needed to run the descriptives for the exogenous construct and the moderator to get a value to split the construct into high/low before plotting. SmartPLS provides simple slope analysis results. A simple slope analysis plot by SmartPLS shows three lines. The middle line represents the relationship for an average level of the moderator variables. The other two lines are relevant in the case of interpreting a continuous moderator as a moderator effect between the relationship

of exogenous constructs and endogenous constructs in terms of Self-Efficacy at +1SD (Self-Efficacy= high) and Self-Efficacy at -1SD (Self-Efficacy= low).

### 3.15 Prediction Quality of the Model

The model's prediction quality is explained by effect size, predictive relevance and the model's overall goodness of fit.

#### 3.15.1 Effect Size

Effect size explains the meaningfulness of a relationship. Even if the relationship between the two constructs is statistically significant, the relationship may not be meaningful. SmartPLS provides  $F^2$  values readily on the execution of bootstrapping routine. However,  $F^2$  values can be calculated manually by finding  $R^2$  excluded for each exogenous construct by removing it from the model in sequence. The formula to be utilized to get the  $F^2$  value is represented by Equation 3.2.

Equation 3.3

$$F^2 = (R^2_{AB} - R^2_A) / (1 - R^2_{AB})$$

Where  $R^2_{AB}$  means  $R^2$  inclusive of both A and B constructs.  $R^2_A$  means  $R^2$  inclusive of A but exclusive of B construct. Standard values for interpreting  $F^2$  value below 0.02 is low, 0.02 – 0.15 is medium, and 0.15 – 0.35 is large (Hair et al., 2014).

#### 3.15.2 Predictive Relevance

$R^2$  values and Stone-geisser  $Q^2$  values are utilized to know the predictive relevance of a Model. Stone-geisser  $Q^2$  values are calculated by running the blindfolding algorithm in SmartPLS. Omission distance of 5 to 12 is taken for blindfolding. Value of  $Q^2$  generated by the most common method, cross-validated redundancy and cross-validated communality are analysed to decide the predictive relevance of a structural model.

### 3.15.3 Model's Overall Goodness of Fit

Unlike CB-SEM, the PLS-SEM technique has no global measure of goodness for model fitness. Traditionally, this is considered the main drawback of using PLS-SEM (Hair et al., 2011). But it is necessary to realize that the meaning of the term 'fit' differs between CB-SEM and PLS-SEM. Where the fit logic for CB-SEM depends on the covariance matrix that emerges from the contradiction between the real (empirical) and theoretical models, PLS-SEM concentrates on the contradiction between the predicted values by the model in question and the observed values or approximated values of the endogenous construct (Hair et al., 2014).

In this study, the GoF value was estimated to reinforce the validity of the PLS model.

Accordingly, the GoF value was measured based on the formula given in Equation

3.3.

Equation 3.4

$$GOF = \sqrt{(R^2 \times AVE)}$$

The GoF baseline value is considered small when it is 0.1, medium if it is 0.25 and large if it is 0.36.

### 3.16 Chapter Summary

In chapter three, a discussion was made on the study's methodology and justification. An overview of suitable research methodology aligned with the study's research objectives was given. This chapter also included research design, instrument development and measurement of constructs, sampling, and data collection. The method of data analysis was discussed in detail for direct, mediating and moderating relationships. The prediction quality of the model was also discussed.

## **CHAPTER FOUR DATA ANALYSIS AND RESULTS**

### **4.1 Chapter Overview**

The results of data analysis procedures are presented in this chapter. They include demographic profiling of respondents, descriptive analysis, screening of data, results confirming satisfaction of assumptions of PLS-SEM, reliability and validity of the instrument, inferential analysis and prediction quality of the model. Before analysing the main data, a pilot study was conducted.

### **4.2 Pilot Study**

A pilot study was done to ensure all items representing latent constructs have an acceptable level of construct validity. A professor of Air University was requested to distribute the link to the online instrument to his students. Before filling the instrument, respondents were asked to go through literature on in-app ads provided with the instrument. One hundred students responded to the online questionnaire. After screening data for multiple submissions, pattern values, missing values, and outliers, the pilot data set reduced to 82 responses.

Since the purpose of the pilot study was validation of instruments, therefore, all the items of the study were tested. The model containing moderating construct was analysed. The model was created in SmartPLS, as explained in section 3.14. Then, all the latent constructs were labelled, and relationships between them were drawn. Labels/abbreviations for latent constructs and the items are given in Table 4.1.

On executing the PLS algorithm, items int4, sef2, sef3, sef4 and sef5 had loadings below 0.7 but above 0.4. AVE was below 0.5 for Self-Efficacy. Therefore, item sef2 measuring self-efficacy was removed, and construct reliability and validity were again

calculated. Now items int4, sef4 and sef5 had loadings below 0.7 but above 0.4. AVE was above 0.5 for all the constructs, including self-efficacy. The composite reliability of all the constructs exceeded 0.6. Cronbach's Alpha values were above 0.7 for all the constructs. Since the sample size was small, removing the items with loadings above 0.4 was considered unnecessary. Hence, one item measuring the latent constructs was removed before collecting the data for the main study. The final model's construct reliability and validity based on pilot study results are shown in Table 4.2. Item loadings of the final model based on pilot study results are shown in Table 4.3. PLS algorithm results of the final model based on pilot study results are shown in Figure 4.1.

Table 4.1  
*Latent Constructs Labels/Abbreviations*

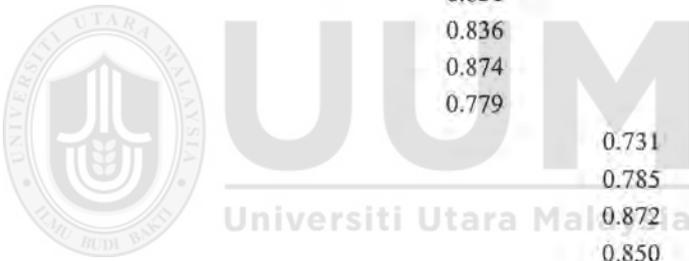
Latent Construct	Label
Students' intention to use in-app ads	Int
Attitude toward in-app ads	Att
Perceived usefulness	Pu
Perceived collaboration	Pc
Perceived financial benefits	Pfb
Self-efficacy	Sef

Table 4.2  
*Construct Reliability and Validity of the Final Model, Pilot Study*

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Att	0.936	0.938	0.954	0.838
Int	0.891	0.911	0.920	0.698
Pc	0.859	0.864	0.895	0.586
Pfb	0.878	0.883	0.912	0.674
Pu	0.827	0.854	0.885	0.658
Sef	0.844	0.886	0.862	0.561

Table 4.3  
*Item Loadings of the Final Model, Pilot Study*

	<b>Att</b>	<b>Int</b>	<b>Pc</b>	<b>Pfb</b>	<b>Pu</b>	<b>Sef</b>
att1	0.904					
att2	0.934					
att3	0.921					
att4	0.903					
int1		0.841				
int2		0.900				
int3		0.883				
int4		0.686				
int5		0.851				
pc1			0.779			
pc2			0.783			
pc3			0.735			
pc4			0.723			
pc5			0.773			
pc6			0.798			
pfb1				0.758		
pfb2				0.851		
pfb3				0.836		
pfb4				0.874		
pfb5				0.779		
pu1					0.731	
pu2					0.785	
pu3					0.872	
pu4					0.850	
sef1						0.869
sef3						0.728
sef4						0.582
sef5						0.660
sef6						0.865



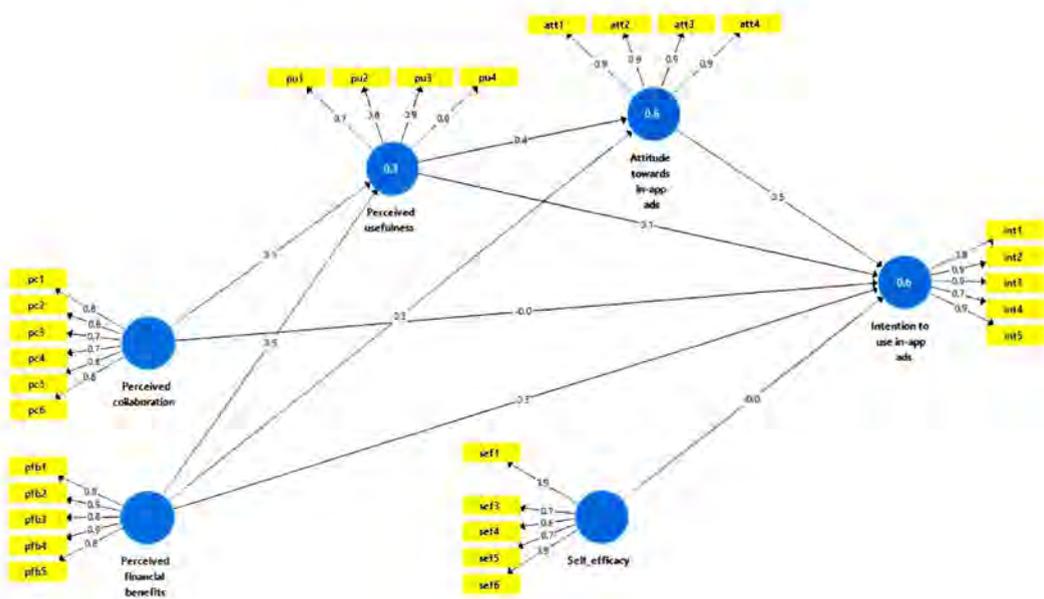


Figure 4.1  
 PLS Algorithm Results of the Final Model, Pilot Study

### 4.3 Response Rate

The survey for the main study was conducted for approximately two months, beginning in early May 2020 and ending in the last week of June 2020. A total of 400 online responses were received for the main study. There were no missing values in the responses since checks were in place to avoid incomplete responses. However, there were some pattern and extreme responses. After removing patterns and extreme responses, the sample turned out to be 367. After removing outliers, only 84% (336) responses could be utilized for data analysis. The dataset used for inferential analysis is given in Appendix 7. Hair et al. (2010) suggested that the minimum sample size for PLS-SEM analysis be 200 responses. As per Cohen's power analyses method, the minimum sample required for this study was 92. Hence, the sample size of 336 was considered adequate for statistical analysis. The response rate is shown in Table 4.4.

Table 4.4  
*Response Rate*

	Frequency	Percentage %
Retained questionnaires	336	84%
Rejected questionnaires	65	16%
Returned questionnaires	400	100%

#### 4.4 Descriptive Analysis of Demographic Profile of Respondents

The sample consisted of students enrolled in universities operating in the federal capital of Pakistan, Islamabad. Therefore, the profile of the sample appropriately represented the population. The respondents' profile was described according to their demographic, smartphone and ad orientation like age, gender and OS orientation.

The respondents' profile details are presented in Table 4.5. The respondent's age was divided into three categories. Respondents between the age of 18 and 25 years constituted 76% (254). Respondents between the ages of 26 and 33 comprised 13% (45). Responses between 34 and 41 years included 11% (37). Most respondents belonged to the youngest age group. This is as per expectation, as most students enrolled in universities are young.

Regarding education, respondents at the undergraduate level were 61% (204). Respondents at the graduate level were 23% (76). Finally, respondents at the postgraduate level were 16% (56). These results are as expected, as most university students are enrolled on entry-level programs.

In terms of gender distribution, male respondents were more than female respondents. Male were 61% (205) while females were 38% (127). There were 1% of respondents who did not share their gender information. These results are as per expectation. Females are still not provided with an opportunity for higher education in Pakistan.

Table 4.5  
*Respondents' Demographic Information*

Demographic Variable	Category	Frequency (n=336)	Percentage %
Age	18-25	254	0.76
	26-33	45	0.13
	34-41	37	0.11
Gender	Female	127	38
	Male	205	61
	Prefer not to share	4	1
Educational level	Undergraduate (Bachelors in progress)	204	61
	Graduate (Above Bachelors)	76	23
	Post graduate (MPhil, PhD)	56	16
Hometown	Islamabad	115	34.23
	Rawalpindi	53	15.77
	Other	168	50
Smartphone size	Extra-large (6 to 7 inches)	64	19.05
	Large (5 to 6 inches)	184	54.76
	Medium (4 to 5 inches)	84	25.00
	Small (3 to 4 inches)	4	1.19
OS orientation	Android	281	84
	Apple IOS	55	16
Orientation towards in-app ads	In-app ads	146	43
	Trial version	22	7
	In-app purchase	19	6
	Only paid apps	10	3
Popular apps	WhatsApp	125	37
	Instagram	97	29
	Facebook	83	25
	YouTube	33	10
Most common apps identified as presenting in-app ads	Facebook	85	25
	YouTube	69	21
	Instagram	51	15

As per the home town association, respondents belonged to various cities in Pakistan. Approximately 34% (115) of respondents belonged to Islamabad or its neighbouring city Rawalpindi, 16% (53). From other cities, representation was 50%. Therefore, it can be said, 50% of responses were received from respondents whose hometown was either Islamabad or Rawalpindi.

Smartphone size orientation indicated that 55% (184) of respondents used a large-sized smartphone. Respondents using a medium-sized smartphone were 25% (84). Respondents using an extra-large smartphone were 19% (64). Only 1% (4) of

respondents used a small smartphone. Therefore, it can be said smartphone with a big screen was preferred by respondents.

As per smartphone OS orientation, respondents using an Android OS based smartphone were 84% (279). On the other hand, respondents using an Apple OS based smartphone were 16% (55). This result was expected since Apple smartphones are more expensive and inaccessible for most university students in Pakistan.

Regarding orientation towards in-app ads, 79% (264) respondents were OK with in-app ads if they could use the app for free in return for permitting in-app ads. Respondents only using in-app ads supported apps were 43% (146). Respondents using trial version apps that did not show any in-app ads were 7% (22). Respondents using only in-app purchase supported apps were 6% (19). These apps showed in-app ads with an option to get rid of in-app ads by making an in-app purchase. Lastly, respondents preferring solely paid apps without any chance of receiving in-app ads were 3% (9).

A non-compulsory item was included to know popular apps among the respondents. Popular apps among the respondents were WhatsApp 37% (125), Instagram 29% (97), Facebook 25% (83) and YouTube 10% (33). All these apps were free to use. Except for WhatsApp, all these apps used in-app ads as a revenue model. As expected, most respondents preferred communication, media, and entertainment apps.

Another non-compulsory item was regarding the most common apps that presented in-app ads. Responses were Facebook 25% (85), YouTube 21% (69), and Instagram 15% (51). Interestingly, these apps are the most popular among respondents, as stated above.

To summarize, the profile of respondents in this study depicted the validity of each response in evaluating influential factors regarding the constructs considered in the study. Having confirmed the validity of the data source, the data set collected for the study was deemed acceptable for further analysis.

#### 4.5 Descriptive Analysis Of Latent Constructs

To obtain the data summary, descriptive statistics were used to have a general overview of the study’s latent constructs: students’ intention to use in-app ads, attitude toward in-app ads, perceived usefulness, perceived collaboration, perceived financial benefits, and self-efficacy. Accordingly, the mean, maximum, minimum and standard deviation of the constructs were determined as shown in Table 4.6.

Table 4.6  
*Descriptive Analysis of Latent Constructs*

<b>Variables</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Minimum</b>	<b>Maximum</b>
Int	2.8808	1.237	1	5
Att	2.83425	1.2955	1	5
Pu	3.20675	1.16125	1	5
Pc	2.94783	1.2465	1	5
Pfb	3.0478	1.0562	1	5
Sef	3.445	1.211333	1	5

All the constructs had a mean above average. The mean of students’ intention to use in-app ads was 2.8, with a standard deviation of 1.2. For attitude toward in-app ads, the mean was 2.8 with a standard deviation of 1.3. Perceived usefulness had a mean of 3.2 with a standard deviation of 1.2. Perceived collaboration had a mean of 2.9 and a standard deviation of 1.24. Perceived financial benefits had a mean of 3 with a standard deviation of 1.1. Finally, self-efficacy had a mean of 3.5 with a standard deviation of 1.2.

## 4.6 Measurement Model Analysis

The PLS-SEM measurement model analysis was carried out after data screening was completed. First, validation of the measurement model was done. It was done without including the moderator (self-efficacy) as it was not hypothesized to directly influence endogenous variables (students' intention to use in-app ads). Next, an assessment of the measurement model was done to ensure the reliability and validity of the instrument. Criteria for construct validity were utilized to test the goodness of measures.

Two types of validity tests were carried out to obtain construct validity. They were convergent and discriminant validity (Hair et al., 2011).

### 4.6.1 Convergent Validity

Convergent validity was tested at both the pilot study and main study stage. If there existed some items which negatively influenced convergent validity, it was better to remove them rather than collect large sample data with unnecessary or even negatively impacting items. PLS algorithm was executed in SmartPLS to get values of item loadings, composite reliability, AVE and cronbach alpha which indicated construct validity and reliability.

At the main study stage, on the execution of the PLS algorithm, item loadings were above 0.60 for all the constructs. The AVE for the perceived collaboration construct was 0.48. Therefore, item col4 was removed. After the removal of col4, convergent validity was again tested. Item loadings were above 0.60 for all the constructs. The average variance extracted was also above 0.5 for all constructs. The composite reliability of all items exceeded 0.6. Considering that all items were pretested and

AVE and composite reliability requirements were met, further removal of items above 0.6 was unnecessary.

Hence, one item measuring the latent constructs was removed from the main study data. Outer loadings of the final model are shown in Table 4.7. The convergent validity of the final model is shown in Table 4.8. The PLS algorithm results of the final model are shown in Figure 4.2.

Table 4.7  
*Outer Loadings of the Final Model*

	<b>Att</b>	<b>Int</b>	<b>Pc</b>	<b>Pfb</b>	<b>Pu</b>
att1	0.878				
att2	0.900				
att3	0.892				
att4	0.871				
int1		0.852			
int2		0.864			
int3		0.823			
int4		0.742			
int5		0.823			
pc1			0.685		
pc2			0.752		
pc3			0.721		
pc5			0.695		
pc6			0.740		
pfb1				0.670	
pfb2				0.751	
pfb3				0.767	
pfb4				0.759	
pfb5				0.805	
pu1					0.807
pu2					0.772
pu3					0.826
pu4					0.775

Table 4.8  
*Convergent Validity of the Final Model*

	<b>Cronbach's Alpha</b>	<b>rho_A</b>	<b>Composite Reliability</b>	<b>Average Variance Extracted (AVE)</b>
Att	0.908	0.908	0.935	0.784
Int	0.879	0.884	0.912	0.676
Pc	0.767	0.770	0.842	0.517
Pfb	0.806	0.807	0.866	0.565
Pu	0.807	0.815	0.873	0.632

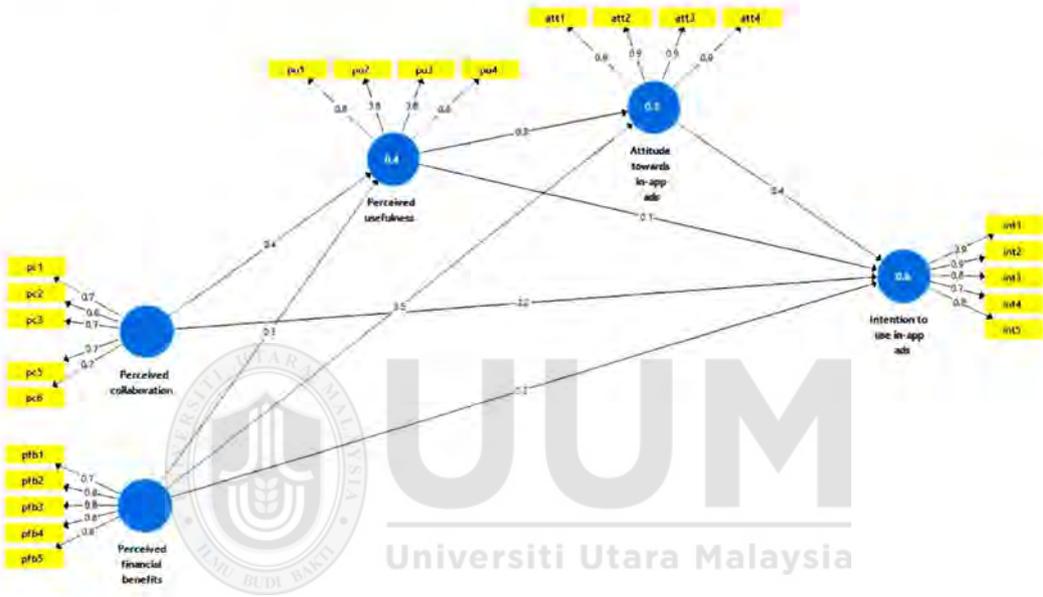


Figure 4.2  
*PLS Algorithm Results of the Final Model*

#### 4.6.2 Discriminant Validity

The three requirements for discriminant validity were met. The summary of the Fornell & Larcker criterion is presented in Table 4.9. Table 4.10 illustrates that all the investigated variables have an acceptable level of HTMT confidence intervals since all the acquired values were less than one, which leads to accepting H<sub>1</sub> and rejecting H<sub>0</sub>.

Details of the cross-loadings are presented in Table 4.11. All values met benchmark values, reflecting an acceptable level of HTMT as a criterion to assess discriminant validity.

Table 4.9  
*Fornell & Larcker Criterion*

	<b>Att</b>	<b>Int</b>	<b>Pc</b>	<b>Pfb</b>	<b>Pu</b>
Att	0.885				
Int	0.736	0.822			
Pc	0.563	0.601	0.719		
Pfb	0.647	0.653	0.583	0.752	
Pu	0.567	0.589	0.592	0.555	0.795

Table 4.10  
*Heterotrait-Monotrait (HTMT) Confidence Intervals*

	<b>Original Sample (O)</b>	<b>Low (2.50%)</b>	<b>High (97.50%)</b>
Pu -> Att	0.656	0.561	0.741
Pu -> Pfb	0.685	0.561	0.799
Pc -> Att	0.672	0.574	0.761
Pu -> Int	0.69	0.588	0.782
Pu -> Pc	0.745	0.64	0.839
Int -> Pc	0.725	0.643	0.797
Pfb -> Pc	0.742	0.651	0.82
Pfb -> Att	0.754	0.673	0.823
Int -> Pfb	0.772	0.692	0.845
Int -> Att	0.822	0.762	0.875

Table 4.11  
*Cross-Loadings*

	<b>Att</b>	<b>Pc</b>	<b>Pfb</b>	<b>Int</b>	<b>Pu</b>
att1	0.878	0.514	0.576	0.668	0.497
att2	0.900	0.479	0.544	0.661	0.519
att3	0.892	0.492	0.585	0.636	0.492
att4	0.871	0.506	0.586	0.639	0.501
pc1	0.340	0.685	0.407	0.382	0.342
pc2	0.418	0.752	0.418	0.458	0.455
pc3	0.389	0.721	0.371	0.452	0.433
pc5	0.434	0.695	0.449	0.403	0.436
pc6	0.433	0.740	0.454	0.457	0.449
pfb1	0.516	0.420	0.670	0.499	0.413
pfb2	0.500	0.458	0.751	0.485	0.409
pfb3	0.466	0.421	0.767	0.461	0.425
pfb4	0.436	0.418	0.759	0.456	0.390
pfb5	0.502	0.469	0.805	0.541	0.442
int1	0.607	0.512	0.560	0.852	0.506
int2	0.643	0.539	0.548	0.864	0.477
int3	0.606	0.490	0.540	0.823	0.507
int4	0.533	0.374	0.469	0.742	0.410
int5	0.627	0.539	0.562	0.823	0.513
pu1	0.403	0.502	0.445	0.445	0.807
pu2	0.414	0.421	0.408	0.412	0.772
pu3	0.542	0.514	0.477	0.559	0.826
pu4	0.429	0.438	0.431	0.438	0.775

#### 4.7 Assessing the Validity of Assumptions of PLS-SEM

##### 4.7.1 Assumption of Normality

Based on the data file analysis, no item had a skewness value above one, as shown in Table 4.12. Moreover, the PLS algorithm converged in less than seven iterations, thus indicating data was normal for analysis using the PLS-SEM technique. P-P residuals were also plotted in SPSS to check the normality of data, as shown in Appendix 4. As per the diagrams, little circles followed the normality line. Therefore, it can be said data was normal.

Table 4.12  
*Data File Analysis for Skewness*

Item	Skewness
int1	-0.028
int2	-0.084
int3	-0.126
int4	-0.212
int5	-0.113
att1	-0.088
att2	0.192
att3	0.077
att4	-0.018
pu1	-0.209
pu2	-0.375
pu3	-0.265
pu4	-0.209
pfb1	-0.192
pfb2	-0.335
pfb3	-0.014
pfb4	-0.09
pfb5	-0.116
pc1	0.24
pc2	-0.294
pc3	-0.27
pc4	-0.027
pc5	0.202
pc6	0.044
sef1	-0.504
sef3	-0.49
sef4	-0.566
sef5	-0.327
sef6	-0.554

#### 4.7.2 Test of Linearity

In this study, a linearity test was conducted to predict the values of each independent variable on the dependent variable via scatter plot residual diagrams and ANOVA. Scatter plot residual diagrams are shown in Appendix 5. ANOVA output table is shown in Appendix 6. Based on the table, deviation from linearity for each relationship between independent and dependent variables was calculated. As per the

calculated deviation, all the relationships were linear and positive. Hence, it can be interpreted that all relationships were in the same direction.

#### 4.7.3 *The Assumption of Homoscedasticity*

Based on the scatter plot outcome from SPSS, as shown in Appendix 5, it is evident that there is homoscedasticity among the set of independent variables and the variance of the dependent variable which have been selected in the study. Hence, the assumption of homoscedasticity was not violated. The plot does not have an obvious pattern. There are points equally distributed above and below zero on the X-axis and to the left and right of zero on the Y-axis.

#### 4.7.4 *Multi Collinearity Test*

As per the analysis of the correlation table, as shown in Table 4.13, the strength of all correlations is below 0.90, thus, indicating no serious multicollinearity. Additionally, as shown in Table 4.14 and Table 4.15, VIF values range between 1 and 3.1, whereas tolerance values range between 0.351 and 0.687. The results confirmed that there was no violation of the multicollinearity assumption.

Table 4.13  
*Correlation Table*

	<b>Original sample (o)</b>	<b>Standard deviation (stdev)</b>	<b>T statistics (o/stdev)</b>	<b>P values</b>
Pc -> Att	0.563	0.041	13.631	0.000
Pfb -> Att	0.647	0.035	18.666	0.000
Pfb -> Pc	0.583	0.037	15.573	0.000
Int -> Att	0.736	0.028	26.235	0.000
Int -> Pc	0.601	0.034	17.442	0.000
Int -> Pfb	0.653	0.035	18.544	0.000
Pu -> Att	0.567	0.040	14.233	0.000
Pu -> Pc	0.592	0.040	14.731	0.000
Pu -> Pfb	0.555	0.049	11.323	0.000
Pu -> Int	0.589	0.041	14.223	0.000

Table 4.14  
Outer VIF Values

Item	VIF
att1	2.568
att2	3.051
att3	2.879
att4	2.468
int1	2.915
int2	3.119
int3	2.058
int4	1.800
int5	2.110
pc1	1.395
pc2	1.591
pc3	1.518
pc5	1.402
pc6	1.489
pfb1	1.287
pfb2	1.557
pfb3	1.679
pfb4	1.651
pfb5	1.849
pu1	1.733
pu2	1.610
pu3	1.670
pu4	1.571

Table 4.15  
Inner VIF Values

	Att	Int	Pc	Pfb	Pu
Att		2.003			
Int					
Pc		1.871			1.516
Pfb	1.446	2.027			1.516
Pu	1.446	1.820			

The coefficients table was checked in SPSS to confirm VIF values are below the cut off value of 10, as shown in Table 4.6. Therefore, the VIF assumption was met.

Table 4.16  
Coefficients Table

Model	Unstandardized Coefficients		Standardized Coefficients		Collinearity Statistics		
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1 (Constant)	0.004	0.164		.023	.982		
Pfb	0.271	0.063	0.212	4.315	.000	.462	2.166
Pc	0.151	0.055	0.130	2.736	.007	.493	2.028
Att	0.402	0.042	0.448	9.462	.000	.498	2.009
Pu	0.158	0.053	0.143	3.008	.003	.496	2.018
Sef	-0.011	0.047	-0.009	-0.225	.822	.703	1.423

Dependent Variable: Int

#### 4.8 Structural Model Analysis

After analysing the validity of the measurement model, the next step was to assess the structural model. This step was meant for hypotheses testing. The research model consisted of five constructs: students' intention to use in-app ads, attitude toward in-app ads (mediator), perceived usefulness (mediator), perceived collaboration, and perceived financial benefits.

The estimation values for the relationships in the structural model were obtained after running the PLS-SEM algorithm with bootstrapping routine. Bootstrapping results of the final model are presented in Figure 4.3.

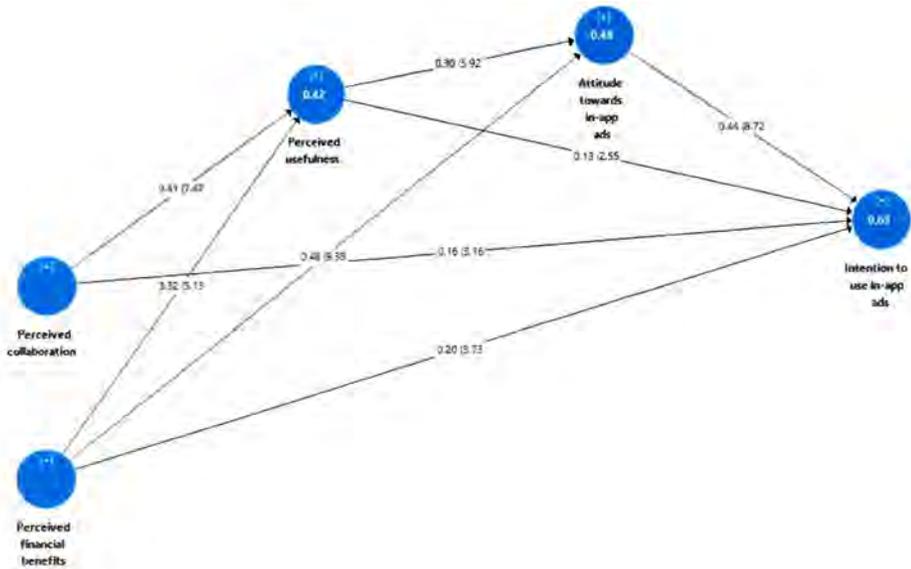


Figure 4.3  
*Bootstrapping Results of the Final Model*

#### 4.8.1 Direct Effect Analysis

Hypothesized direct relationships of the constructs were accepted based on the beta and t values, as shown in Table 4.17.

Hypothesis 1 proposed that attitude toward in-app ads positively influence students' intention to use in-app ads. This hypothesis attempted to test whether attitude toward in-app ads positively affect students' intention to use in-app ads. The results showed that the relationship between attitude toward in-app ads and students' intention to use in-app ads is at  $p < 0.05$ , t value equals 8.7, and beta value equals 0.4. This result indicated attitude toward in-app ads is related to students' intention to use in-app ads. Furthermore, the relationship is positive based on the linearity test. Hence hypothesis 1 is accepted.

Hypothesis 2 proposed that perceived usefulness positively influences students' intention to use in-app ads. Therefore, this hypothesis attempted to test whether perceived usefulness affects students' intention to use in-app ads. The results showed that the relationship between perceived usefulness and students' intention to use in-app ads is at  $p < 0.05$ , t value equals 2.5, and beta value equals 0.13. This result indicates perceived usefulness is related to students' intention to use in-app ads. Furthermore, the relationship is positive based on the linearity test. Hence hypothesis 2 is accepted.

Table 4.17  
Path Coefficients

	Original Sample (O)	Standard Deviation (STDEV)	T Statistics ( O/STDEV )	P Values
Att -> Int	0.441	0.051	8.721	0.000
Pc -> Int	0.155	0.049	3.163	0.002
Pc -> Pu	0.407	0.054	7.469	0.000
Pfb -> Att	0.480	0.051	9.377	0.000
Pfb -> Int	0.203	0.054	3.731	0.000
Pfb -> Pu	0.318	0.062	5.126	0.000
Pu -> Att	0.301	0.051	5.924	0.000
Pu -> Int	0.134	0.053	2.549	0.011

Hypothesis 3 proposed that perceived collaboration positively influences students' intention to use in-app ads. This hypothesis attempted to test whether perceived collaboration affects students' intention to use in-app ads. The results showed that the relation between perceived collaboration and students' intention to use in-app ads is at  $p < 0.05$ , t value equals 3.16, and beta value equals 0.155. This result indicated perceived collaboration is related to students' intention to use in-app ads. Furthermore, the relationship is positive based on the linearity test. Hence hypothesis 3 is accepted.

Hypothesis 4 proposed that perceived financial benefits positively influence students' intention to use in-app ads. This hypothesis attempted to test whether perceived

financial benefits affect students' intention to use in-app ads. The results showed that the relationship between perceived financial benefits and students' intention to use in-app ads is at  $p < 0.05$ ,  $t$  value equals 3.73, and beta value equals 0.203. This result indicated that perceived financial benefits are related to students' intention to use in-app ads. Furthermore, the relationship is positive based on the linearity. Hence hypothesis 4 is accepted.

Hypothesis 5 proposed that perceived usefulness positively influences attitude toward in-app ads. Therefore, this hypothesis attempted to test whether perceived usefulness affects attitude toward in-app ads. The results showed that the relationship between perceived usefulness and attitude toward in-app ads is at  $p < 0.05$ ,  $t$  value equals 5.9, and beta value equals 0.3. This result indicated perceived usefulness is related to attitude toward in-app ads. Furthermore, the relationship is positive based on the linearity test. Hence hypothesis 5 is accepted.

Hypothesis 6 proposed that perceived financial benefits positively influence attitude toward in-app ads. This hypothesis attempted to test whether the perceived financial benefits affect attitude toward in-app ads. The results showed that the relationship between perceived financial benefits and attitude is at  $p < 0.05$ ,  $t$  value equals 9.37 and beta value equals 0.48. This result indicated perceived financial benefits are related to attitude toward in-app ads. Furthermore, the relationship is positive based on the linearity test. Hence hypothesis 6 is accepted.

Hypothesis 7 proposed that perceived collaboration has a positive influence on perceived usefulness. This hypothesis attempted to test whether perceived collaboration affects perceived usefulness. The results showed that the relationship

between perceived collaboration and perceived usefulness is at  $p < 0.05$ , t value equal to 7.4, and a beta value equal to 0.4. This result indicated perceived collaboration is related to perceived usefulness. Furthermore, the relationship is positive based on the linearity test. Hence hypothesis 7 is accepted.

Hypothesis 8 proposed that perceived financial benefits positively influence perceived usefulness. This hypothesis attempted to test whether the perceived financial benefits affect perceived usefulness. The results showed that the relationship between perceived financial benefits and perceived usefulness is at  $p < 0.05$ , t value equals 5.13, and beta value equals 0.318. This result indicated perceived financial benefits are related to perceived usefulness. Furthermore, the relationship is positive based on the linearity test. Hence hypothesis 8 is accepted.

**4.8.2 Mediation Effect Analysis**

Hypothesized mediating relationships of the model were tested based on beta values of the specific indirect effects, as shown in Table 4.18. In addition, for the type of mediation, VAF values were considered. VAF value calculations are shown in Table 4.19.

Table 4.18  
*Specific Indirect Effects*

	<b>Original Sample (O)</b>	<b>Standard Deviation (STDEV)</b>	<b>T Statistics ( O/STDEV )</b>	<b>P Values</b>
Pfb -> Pu -> Att	0.096	0.024	4.018	0
Pfb -> Pu -> Int	0.043	0.018	2.33	0.02
Pu -> Att -> Int	0.133	0.027	4.928	0
Pfb -> Att -> Int	0.211	0.035	6.118	0

Table 4.19

*VAF Value Calculations*

Mediating Path	Path A = Iv-Med	Path B = Med-Dv	Path C' = Iv-Dv	Path A X B	Path A X B + Path C'	VAF= (Path A X B) / (Path A X B + Path C')
Pfb-> Pu -> Att	0.318	0.301	0.48	0.0957	0.57571	0.17
Pfb-> Pu -> Int	0.318	0.134	0.203	0.0426	0.24561	0.17
Pu -> Att -> Int	0.301	0.441	0.134	0.1327	0.26674	0.50
Pfb-> Att -> Int	0.48	0.441	0.203	0.2116	0.41468	0.51

Hypothesis 9 proposed that perceived usefulness is related to students' intention to use in-app ads, with mediating influence of attitude toward in-app ads. The results showed that perceived usefulness indirectly influenced students' intention to use in-app ads with mediating influence of attitude toward in-app ads as  $p < 0.05$ ,  $t$  value equals 4.9, and beta value equals 0.133. This result indicated perceived usefulness is related to students' intention to use in-app ads with mediating influence of attitude toward in-app ads. Regarding the type of mediation effect, mediation was identified as partial based on the VAF value of 0.50 (50%). Hence hypothesis 9 is accepted.

Hypothesis 10 proposed that perceived financial benefits are related to students' intention to use in-app ads, with mediating influence of attitude toward in-app ads. The results showed that perceived financial benefits indirectly influenced students' intention to use in-app ads with mediating influence of attitude toward in-app ads as  $p < 0.05$ ,  $t$  value equals 6.1, and beta value equals 0.21. This result indicated perceived financial benefits are related to students' intention to use in-app ads with mediating influence of attitude toward in-app ads. Regarding the type of mediation effect, mediation was identified as partial based on the VAF value of 0.51 (51%). Hence hypothesis 10 is accepted.

Hypothesis 11 proposed perceived financial benefits are related to students' intention to use in-app ads, with mediating influence of perceived usefulness. The results showed that perceived financial benefits indirectly influenced students' intention to use in-app ads with mediating influence of perceived usefulness as  $p < 0.05$ ,  $t$  value equals 2.2, and beta value equals 0.043. This result indicated perceived financial benefits are positively related to students' intention to use in-app ads, with mediating influence of perceived usefulness. Regarding the type of mediation effect, mediation was identified as small based on the VAF value of 0.17 (17%). Hence hypothesis 11 is accepted.

Hypothesis 12 proposed that perceived financial benefits are positively related to attitude toward in-app ads, with mediating influence of perceived usefulness. The results showed that perceived financial benefits indirectly influenced attitude toward in-app ads with mediating influence of perceived usefulness as  $p < 0.05$ ,  $t$  value equals 4.0, and beta value equals 0.096. This result indicated perceived financial benefits are related to attitude toward in-app ads, with mediating influence of perceived usefulness. However, mediation was small based on the VAF value of 0.17 (17%). Hence hypothesis 12 is accepted.

#### **4.8.3 Moderating Effect Analysis**

For moderation analysis, guidelines by Hair et al. (2013); Hair Jr et al. (2021); and Ramayah et al. (2018) were utilized. The moderating variable was added, and item loadings, AVE, and CR were assured to be meeting benchmark values. The  $R^2$  value was noted down once convergent validity was confirmed. It was noted down since  $F^2$  values need to be calculated to interpret moderation effect size.

### 4.8.3.1 Convergent Validity.

On executing the PLS algorithm, item loadings were above 0.4 for all the constructs. AVE was above 0.50 for all the constructs. The composite reliability of all the constructs exceeded 0.6. since all the items were pretested, and AVE and composite reliability requirements were met. Therefore, further removal of the items above 0.4 was considered unnecessary.  $R^2$  value before the addition of interaction terms was noted down. It was 0.63. Construct reliability and validity of the final model with moderating construct are shown in Table 4.20. Outer loadings of the final model with moderating construct are shown in Table 4.21.

Table 4.20  
*Convergent Validity of the Final Model with Moderator*

	<b>Cronbach's alpha</b>	<b>Rho_a</b>	<b>Composite reliability</b>	<b>Average variance extracted</b>
Att	0.908	0.908	0.935	0.784
Int	0.879	0.884	0.912	0.676
Pc	0.767	0.770	0.842	0.517
Pfb	0.806	0.807	0.866	0.565
Pu	0.807	0.815	0.873	0.632
Sef	0.760	0.784	0.839	0.517

Next, each interaction term was added in sequence, and its moderation effect was analysed. Since moderation is only on a single endogenous construct, only the moderator and the exogenous construct names were used to name the interaction term. After analysing the influence of adding an interaction term, it was removed before adding a new interaction term.

Table 4.21  
*Outer Loadings of the Final Model with Moderator*

	Att	Int	Pc	Pfb	Pu	Sef
att1	0.878					
att2	0.900					
att3	0.892					
att4	0.871					
int1		0.852				
int2		0.864				
int3		0.823				
int4		0.742				
int5		0.823				
pc1			0.685			
pc2			0.752			
pc3			0.721			
pc5			0.695			
pc6			0.740			
pfb1				0.670		
pfb2				0.751		
pfb3				0.767		
pfb4				0.759		
pfb5				0.805		
pu1					0.807	
pu2					0.772	
pu3					0.826	
pu4					0.775	
sef1						0.512
sef3						0.658
sef4						0.788
sef5						0.785
sef6						0.808



**4.8.3.2 Moderation Effect of Self-Efficacy on the Relationship between Perceived Usefulness and Intention.**

The interaction term based on self-efficacy and perceived usefulness (Sef\*Pu) was added as per steps by Ramayah et al. (2018). Then PLS algorithm was executed to get  $R^2$  included value.  $R^2$  included value with the interaction term (Sef\*Pu) was 0.63. The main effect model had  $R^2$  of 0.63.  $R^2$  change of 0 indicated that with the addition of the interaction term (Sef\*Pu),  $R^2$  had changed 0% (additional variance). Next,  $F^2$  was calculated, as shown in Table 4.22.

As per Cohen (1988), if  $F^2$  value is 0, it should be considered low. However, a low effect size does not necessarily imply that the underlying moderating effect is negligible (Chin et al., 2003). The beta coefficient for the interaction term (Sef\*Pu) was 0.01, as shown in Table 4.23. Still, whether the beta is statistically significant or not is impossible to confirm. For this purpose, the bootstrapping procedure is utilized, which generates the t-values. As per the t-values, as shown in Table 4.23, the interaction term (Sef\*Pu) has an insignificant effect (t-value=0.233).

Based on the results, hypothesis 13, which proposed self-efficacy has a moderating influence on the relationship between perceived usefulness and students' intention to use in-app ads, is rejected.

#### **4.8.3.3 Moderation Effect of Self-Efficacy on the Relationship between Perceived Collaboration and Intention.**

First, the interaction term was added based on self-efficacy and perceived collaboration (Sef\*Pc). Next, the PLS algorithm was executed to get  $R^2$  included value.  $R^2$  included value with the interaction term (Sef\*Pc) value was 0.63. The main effect model had  $R^2$  of 0.63.  $R^2$  change of 0 indicated that with the addition of the interaction term (Sef\*Pc),  $R^2$  had changed 0% (additional variance). Next,  $F^2$  was calculated, as shown in Table 4.22.

As per Cohen (1988), if  $F^2$  value is 0, it should be considered low. Henseler and Chin (2010) stated low effect size does not necessarily imply that the underlying moderating effect is negligible. The beta coefficient for the interaction term (Sef\* Pc) was -0.002, as shown in Table 4.23. Still, whether the beta is statistically significant or not is impossible to confirm. For this purpose, the bootstrapping procedure is

utilized, which generates the t-values. As per the t-values, as shown in Table 4.23, the interaction term (Sef\* Pc) has an insignificant effect (t-value=0.05).

Based on the results, hypothesis 14, which proposed self-efficacy has a moderating influence on the relationship between perceived collaboration and students' intention to use in-app ads, is rejected.

#### **4.8.3.4 Moderation Effect of Self-Efficacy on the Relationship between Perceived Financial Benefits and Intention.**

The interaction term was added based on self-efficacy and perceived financial benefits (Sef\*Pfb). Then PLS algorithm was executed to get  $R^2$  included value.  $R^2$  included value with the interaction term (Sef\* Pfb) was 0.63. The main effect model had  $R^2$  of 0.63.  $R^2$  change of 0 indicated that with the addition of the interaction term (Sef\* Pfb),  $R^2$  had changed 0% (additional variance). Next,  $F^2$  was calculated, as shown in Table 4.22.

As per Cohen (1988), if  $F^2$  value is 0, it should be considered low. Henseler and Chin (2010) found low effect size does not necessarily imply that the underlying moderating effect is negligible. The beta coefficient for the interaction term (Sef\* Pfb) was 0.009, as shown in Table 4.23. Still, whether the beta is statistically significant or not is impossible to confirm. For this purpose, the bootstrapping procedure is utilized, which generates the t-values. As per the t-values, as shown in Table 4.23, the interaction term (Sef\* Pfb) has an insignificant effect (t-value=0.156).

Based on the results, hypothesis 15, which proposed self-efficacy has a moderating influence on the relationship between perceived financial benefits and students' intention to use in-app ads, is rejected.

Table 4.22  
*Calculation of Effect Size*

	<b>R-Squared Included R<sup>2</sup>AB</b>	<b>R-Squared Excluded R<sup>2</sup>A</b>	<b>F-Squared (R<sup>2</sup>AB - R<sup>2</sup>A)/(1- R<sup>2</sup>AB)</b>	<b>Effect Size</b>
Sef Pu -> Int	0.63	0.63	0	low
Sef Pc -> Int	0.63	0.63	0	low
Sef Pfb-> Int	0.63	0.63	0	low

Table 4.23  
*Path Coefficients of the Moderating Relationships*

	<b>Original Sample (O)</b>	<b>Standard Deviation (STDEV)</b>	<b>T Statistics ( O/STDEV )</b>	<b>P Values</b>
Sef Pu -> Int	0.01	0.042	0.233	0.816
Sef Pc -> Int	-0.002	0.048	0.05	0.96
Sef Pfb-> Int	0.009	0.058	0.156	0.876

#### 4.8.4 Summary of Analysis

As per the path coefficients and linearity test, the positive influence of attitude toward in-app ads, perceived usefulness, perceived collaboration and perceived financial benefits on students' intention to use in-app ads was accepted (H1, H2, H3, H4). The positive influence of perceived usefulness and perceived financial benefits on attitude toward in-app ads was also accepted (H5, H6). The positive influence of perceived collaboration and perceived financial benefits on perceived usefulness was also accepted (H7, H8). As shown in Table 4.18, mediation hypotheses (H9 - H12) were accepted as per the specific indirect effects. In terms of the type of mediation based on VAF values, there was a partial mediation effect of attitude toward in-app ads on the relationship between perceived usefulness – students' intention to use in-app ads (H9) and perceived financial benefits - students' intention to use in-app ads (H10). The mediation effect of perceived usefulness on the relationship between perceived financial benefits - students' intention (H11) and perceived financial benefits - attitude toward in-app ads (H12) was small. None of the moderating hypotheses were accepted (H13-H15). There was no moderating effect of self-efficacy on the relationship between perceived usefulness - students' intention to use

in-app ads (H13), perceived collaboration - students' intention to use in-app ads (H14) and perceived financial benefits - students' intention to use in-app ads (H15).

It can be said hypotheses 1 to 12 were accepted. Although hypotheses 11 and 12 were accepted; however, mediation was identified as small in terms of meaningful effect. Accepted hypotheses included direct and mediating relationships. Hypothesis 13 to 15 were rejected. The rejected hypotheses included moderating relationships.

#### 4.9 Prediction Quality of the Model

##### 4.9.1 Effect Size

The effect size of the relationships between constructs is shown in Table 4.24.

Table 4.24  
Effect Size of the Relationships between Constructs

Constructs		R squared inc	R squared exc	Beta	Effect size
Att	Pfb	0.481	0.32	0.306	Large
Int	Att	0.632	0.54	0.255	Large
Pu	Pc	0.417	0.31	0.187	Medium
Att	Pu	0.481	0.42	0.119	Medium
Pu	Pfb	0.417	0.35	0.113	Medium
Int	Pfb	0.632	0.61	0.06	Medium
Int	Pc	0.632	0.62	0.041	Medium
Int	Pu	0.632	0.62	0.03	Medium

Considering standard values for interpreting F<sup>2</sup> values, the following conclusions can be made regarding the effect size.

Attitude toward in-app ads is the only factor having a large effect on the students' intention to use in-app ads. The other three factors have a medium effect on the students' intention to use in-app ads. Perceived financial benefits have a large effect on attitude toward in-app ads. Perceived usefulness has a medium effect on attitude toward in-app ads. Both perceived collaboration and perceived financial benefits have a medium effect on perceived usefulness.

#### 4.9.2 Predictive Relevance

An omission distance of 9 was taken for the blindfolding test. Results are shown in Table 4.25. The  $R^2$  value for students' intention to use in-app ads was 0.63, with cross-validated communality of 0.491 and cross-validated redundancy of 0.420. For attitude toward in-app ads,  $R^2$  value was 0.481, with cross-validated communality of 0.578 and cross-validated redundancy of 0.374. Lastly, for perceived usefulness,  $R^2$  value was 0.417, with cross-validated communality of 0.363 and cross-validated redundancy of 0.256.

Table 4.25  
Construct  $R^2$  Value and Cross-Validated Redundancy

Construct	R square	Cross-validated redundancy	Cross-validated communality
Attitude toward in-app ads	0.481	0.374	0.578
Students' Intention to use in-app ads	0.63	0.420	0.491
Perceived Usefulness	0.417	0.256	0.363

The  $R^2$  value of 0.63 indicated model measured students' intention to use in-app ads 63% by attitude toward in-app ads, perceived usefulness, perceived collaboration and perceived financial benefits. The  $R^2$  value of 0.481 indicated model measured attitude toward in-app ads 48% by perceived usefulness and perceived financial benefits. The  $R^2$  value of 0.417 indicated model measured perceived usefulness 41% by perceived collaboration and perceived financial benefits. Therefore, it can be said the model has a moderate capability in measuring student students' intention to use in-app ads.  $Q^2$  values for the students' intention to use in-app ads and attitude toward in-app ads construct were interpreted as a high degree of predictive relevance.  $Q^2$  value for perceived usefulness was interpreted as a medium degree of predictive relevance.

### 4.9.3 *Model's Overall Goodness of Fit*

In this study, the GOF value was 0.57 based on equation 4.1.

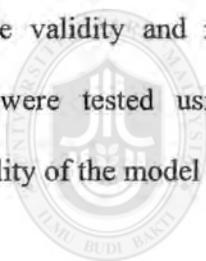
Equation 4.1

$$\text{GOF} = \sqrt{0.509 \times 0.635} = 0.57$$

A value of 0.57 is interpreted as large, indicating sufficient PLS-SEM model validity.

## 4.10 Chapter Summary

This chapter started with the pilot study. Next response rate for the main survey along with demographic profiles and descriptive statistics of the sample, were shared. Then results of the assessment of the validity of assumptions of PLS\_SEM were given. Next, the validity of the measurement model was established. After confirming the validity and reliability of the measurement model, hypothesized relationships were tested using inferential statistics. In addition, the model's predictive quality of the model was given.



Universiti Utara Malaysia

## **CHAPTER FIVE DISCUSSION AND CONCLUSION**

### **5.1 Chapter Overview**

In the previous chapter, the results of the study were presented. This chapter summarises the study's findings, followed by a discussion. Then the study's contribution, limitations, and directions for future research are given. Finally, the chapter ends with the conclusion of the study.

### **5.2 Recapitulation of the Study Findings**

In this study, acceptance of in-app ads was explored. The focus was on in-app ads received inside and through apps. Determinants of students' intention to use in-app ads were of primary interest. This research was conducted to achieve three research objectives. The first research objective (RO 1) had eight sub research objectives. They are regarding the direct relationships proposed in the study.

The second research objective (RO 2) was to understand the mediating effect of attitude toward in-app ads and perceived usefulness in the proposed model. The second research objective had four sub research objectives. The first two sub research objectives (RO 2.1, RO2.2) were regarding the mediating influence of attitude towards in-app ads on the relationship between students' intention to use in-app ads and its predictors proposed in the model. The third sub research objective (RO 2.3) was regarding the mediating impact of perceived usefulness on the relationship between perceived financial benefits and students' intention to use in-app ads. The fourth sub research objective (RO 2.4) was regarding the mediating impact of perceived usefulness on the relationship between perceived financial benefits and attitude toward in-app ads.

Finally, the third research objective (RO 3) was to understand the moderating impact of self-efficacy on the relationship between students' intention to use in-app ads and its predictors as proposed in the proposed model. It had three sub research objectives.

Research objectives were poised to seek answers to related research questions. There were seven related research questions. The first research question was regarding the influence of independent constructs on the dependent construct, the variable of interest. The second and third research questions were regarding the impact of predictor constructs on mediating construct of the study. Research objective one corresponded to research questions one to three.

The fourth to sixth research questions were regarding mediating relationships of the study. Research objective two corresponded to research questions fourth to sixth. Finally, the seventh research question was regarding moderating relationships of the study. Research objective three corresponded to research question seven.

For the first research question, four hypotheses (H1-H4) were postulated. Next, four hypotheses (H5, H6 and H7, H8) were proposed for the second and third research questions. Then, two hypotheses (H9, H10) were postulated for the fourth research question. Next, two hypotheses (H11, H12) were postulated for the fifth and sixth research questions. Finally, three hypotheses (H13-H15) were proposed for the sixth research question.

Data was gathered from university students studying in the capital city of Pakistan, Islamabad. Before data analysis of the main study, a pilot study was conducted on 100 responses. The validity of the items representing latent constructs of the study

was assured. Redundant items were removed. Then data for the main study was collected based on retained items.

A total of 400 online responses were received for the main study. After screening the data, 336 responses were used for the analysis purpose. Data analysis started with the assurance of the validity of the items representing latent constructs. For data analysis, the PLS-SEM technique with the bootstrapping procedure was utilized. The 95% (0.05) significance level and t-value of 1.96 were used as the critical level for decision-making regarding hypothesis acceptance.

Responding to the first research question on the influence of independent constructs on the dependent construct, this study found all the independent constructs influenced the dependent construct. The  $R^2$  value of 63% explained the explanatory power of the four independent variables in predicting the dependent variable (students' intention to use in-app ads). Responding to the second research question, the study found that (a) perceived usefulness and (b) perceived financial benefits had a positive influence on attitude toward in-app ads. An  $R^2$  value of 48% explained the explanatory power of the two variables in predicting attitude toward in-app ads. As for the third research question, the study found that (a) perceived collaboration and (b) perceived financial benefits influenced perceived usefulness. An  $R^2$  value of 42% explained the explanatory power of the two variables in predicting perceived usefulness. Thus, all the hypotheses regarding the relationships between independent variables and dependent variables were accepted. Additionally, as proposed in the corresponding hypotheses, all the relationships were positive and in the same direction based on the linearity test.

While answering the fourth, fifth and sixth research questions, simple mediation analysis revealed there was a positive mediating effect of attitude toward in-app ads on the relationship between (a) perceived usefulness and students' intention to use in-app ads and (b) perceived financial benefits and students' intention to use in-app ads. Furthermore, simple mediation analysis also revealed a positive mediating effect of perceived usefulness on the relationship between (c) perceived financial benefits and students' intention to use in-app ads and (d) perceived financial benefits and attitude toward in-app ads. Thus, all the hypotheses regarding the mediating relationships were accepted.

The mediating influence of attitude toward in-app ads was partial in the two relationships based on VAF values. These relationships were between (a) students' intention to use in-app ads and perceived usefulness (50%) and (b) students' intention to use in-app ads and perceived financial benefits (51%). The mediating influence of perceived usefulness was small on the two relationships based on VAF values. These relationships were between (a) students' intention to use in-app ads and perceived financial benefits (17%) and (b) attitude toward in-app ads and perceived financial benefits (17%).

As for the seventh research question referring to moderation analysis, there was no moderating effect of self-efficacy on the relationship between (a) perceived usefulness and students' intention to use in-app ads, (b) perceived collaboration and students' intention to use in-app ads, and (c) perceived financial benefits and students' intention to use in-app ads. Therefore, the three hypotheses on moderating effect of self-efficacy were rejected.

### 5.3 Discussion

This study was conducted to answer seven research questions. Three corresponding research objectives were proposed. Each research objective had sub objectives. The first research question was regarding factors influencing students' intention to use in-app ads. Four factors, namely attitude toward in-app ads, perceived usefulness, perceived collaboration and perceived financial benefits, were hypothesized (H1-H4) to influence students' intention to use in-app ads. These hypotheses corresponded to research objectives 1.1 to 1.4. The study findings indicate these factors indeed influenced students' intention to use in-app ads. Therefore, hypotheses 1 to 4 were accepted, and research question one was answered.

Attitude toward in-app ads had the most substantial influence on students' intention to use in-app ads. This result was in line with previous studies on mobile ad acceptance, such as by Sigurdsson et al. (2017) and Verstraten (2015). The reason for this result is that attitude toward in-app ads covers the influence of multiple factors such as informativeness, entertainment, and irritation (Brackett & Carr, 2001; Ducoffe, 1996). These results also confirm the applicability of TRA, TPB, and TAM (Ajzen, 1991; Davis, 1989; Fishbein & Ajzen, 1975). These researchers identified a significant influence of attitude toward in-app ads on intention to use in-app ads.

Perceived usefulness influenced students' intention to use in-app ads. It is in line with the study by Yeo et al. (2017). In addition, study results align with various theories, such as TAM and UTAUT, which suggest that perceived usefulness influences intention (Venkatesh et al., 2003, 2012; Venkatesh & Davis, 2000). However, there is a slight difference in terms of the amount of influence, the reason being, in this study, apps are general and are not meant to provide advertisements as a core service.

Perceived collaboration also influenced students' intention to use in-app ads. This result is in line with Kapoor and Vij (2018) and Qureshi et al. (2022). But, again, there is a difference in the amount of influence on students' intention to use in-app ads. The difference is because Kapoor and Vij's (2018) study focused on an app providing native ads. This study's focus was not on any specific app or native ads. So, respondents didn't reply regarding a particular app or native ads. Furthermore, perceived collaboration was operationalized in terms of perceived usefulness. To a small extent, it was operationalized to increase perceived ease of use and loyalty. Hence, the results were as per expectations. However, this study has the same results as that of Qureshi et al. (2022). In their research, collaboration influenced intention. However, it was less than incentives.

Perceived financial benefits had a strong influence on students' intention to use in-app ads. This result aligns with Li et al. (2018); Wang and Genc (2019) and Qureshi et al. (2022). This result confirms theories such as UTAUT 2 (Venkatesh et al., 2012). The reason for the strong influence of perceived financial benefits on students' intention to use in-app ads is that, in most cases, consumers need to be enticed with some benefit since consumers generally don't aim to use in-app ads. This is especially relevant in the case of apps that are not meant for interaction with in-app ads.

The second research question was regarding factors influencing attitude toward in-app ads. Two factors, namely perceived usefulness and perceived financial benefits, were hypothesized (H5, H6) to affect attitude toward in-app ads. These hypotheses corresponded to research objectives 1.5 and 1.6. Study results confirmed both factors influenced attitude toward in-app ads. In addition, perceived usefulness strongly influenced attitude toward in-app ads. This result is in line with previous studies such

as Muk and Chung (2015) and Shin and Lin (2016). Therefore, hypotheses 5 and 6 were accepted, and research question two was answered.

Perceived usefulness influences attitude toward in-app ads in numerous ways, as many researchers have pointed out (Bagla & Khan, 2017; Y. Liu & Yang, 2018). Perceived Financial benefits had an even more substantial influence on attitude toward in-app ads than perceived usefulness. This is in line with previous studies such as Sam and Chatwin (2019). In addition, these results are in line with Taylor and Todd's (1995) and Ducoffe's (1996) theories.

The third research question was regarding factors influencing perceived usefulness. Two factors, namely perceived collaboration and perceived financial benefits, were hypothesized (H7, H8) to influence perceived usefulness. These hypotheses corresponded to research objectives 1.7 and 1.8. Study results confirmed both factors influenced perceived usefulness. Therefore, hypotheses 7 and 8 were accepted, and research question three was answered.

Perceived collaboration had a strong influence on perceived usefulness. This result coincides with the results found by Huotari and Hamari (2017). Perceived financial benefits had a substantial impact on perceived usefulness. However, it was less than perceived collaboration. This result is in line with Yeo et al. (2017). The perceived collaboration covers financial and non-financial benefits, so results are as per expectation.

The fourth research question was regarding mediating influence of attitude on the relationship between students' intention to use in-app ads and its predictors. Two hypotheses (H9, H10) were proposed in this regard. These hypotheses corresponded

to research objectives 2.1 and 2.2. Both the hypotheses were accepted. Therefore, hypotheses 9 and 10 were accepted, and research question four was answered.

Attitude toward in-app ads had a mediating effect on the relationship between perceived usefulness and students' intention to use in-app ads. This result was in line with Kim et al. (2017). Mediation was not full since perceived usefulness also influenced students' intention to use in-app ads. Based on the VAL value, mediation was partial.

Attitude toward in-app ads had a mediating effect on the relationship between perceived financial benefits and students' intention to use in-app ads. This result was in line with Souiden et al. (2019). Mediation was not full since perceived financial benefits also influenced students' intention to use in-app ads. Based on the VAL value, mediation was partial.

The fifth research question was regarding mediating influence of perceived usefulness on the relationship between perceived financial benefits and students' intention to use in-app ads. One hypothesis (H11) was proposed in this regard. This hypothesis corresponded to research objective 2.3. As per the results, it was accepted. Therefore, hypothesis 11 was accepted, and research question five was answered. Perceived usefulness had a mediating effect on the relationship between perceived financial benefits and students' intention to use in-app ads. This result was in line with Souiden et al. (2019). However, mediation was not full since perceived financial benefits also influenced students' intention to use in-app ads. Based on the VAL value, mediation was small.

The sixth research question was regarding the mediating influence of perceived usefulness on the relationship between perceived financial benefits and attitude toward in-app ads. One hypothesis (H12) was proposed in this regard. This hypothesis corresponded to research objective 2.4. As per the results, it was accepted. Therefore, hypothesis 12 was accepted, and research question six was answered. Perceived usefulness had a mediating effect on the relationship between perceived financial benefits and attitude toward in-app ads. This result was in line with Souiden et al. (2019). Mediation was not full since perceived financial benefits also influenced attitude toward in-app ads. Based on the VAL value, mediation was small.

As per the above results, attitude must be considered a mediator. In addition, perceived usefulness may be regarded as a mediator, as the mediation is small in both the proposed hypotheses.

The seventh research question was regarding moderating influence of self-efficacy on the relationship between students' intention to use in-app ads and its predictors, namely perceived usefulness, perceived collaboration and perceived financial benefits. Three hypotheses (H13-H15) were proposed in this regard. These hypotheses corresponded to research objectives 3.1 to 3.3. As per the results, self-efficacy had no moderating influence on any of the three relationships. Therefore, hypotheses 13-15 were rejected, and research question seven was answered. These results coincide with the study by Qureshi et al. (2022). In their research on in-app ads, self-efficacy had neither any relationship with intention to interact with in-app ads nor any moderating influence on the relationship between (a) incentives and intention and (b) collaboration and intention.

On the other hand, in the research conducted by Jaradat et al. (2018), self-efficacy appeared as a significant moderator between perceived ease of use and intention. In this study, perceived usefulness, perceived collaboration and perceived financial benefits are operationalized as usefulness constructs. Hence, the insignificant effect is reasonable. Another reason self-efficacy might not have any moderating effect on any of the relationships with students' intention to use in-app ads is that usage of in-app ads is made effortless since usage is the main aim of any advertisements. Furthermore, the study sample was educated respondents between the age of 18 and 41 who have been using smartphone apps since their first appearance. Therefore, they are generally capable of interacting with in-app ads.

Based on the results of the data analysis, all the research questions have been answered. While answering research questions one to three, it can be stated the direct relationships proposed in the model are accepted. For the research questions four to six pertaining to mediated relationships, it can be concluded attitude toward in-app ads, and perceived usefulness does act as mediators as proposed in the model. For research question seven which concerns moderating relationships in the model, it can be concluded self-efficacy does not act as a moderator.

## **5.4 Contributions of the Study**

The research results of the study have significant contributions to theoretical and practical areas.

### **5.4.1 Theoretical Contributions**

This research has extended the literature on the usage of in-app ads. Previous research on in-app ads has focused on analysing traditional factors influencing in-app ads in the USA and European environments (Li et al., 2018; Logan, 2017; Xu & Li,

2014). Applying western-developed research findings is not universally applicable (Lai et al., 2009; Refai, 2015). These countries are generally developed and have different environments from developing and underdeveloped countries.

This research has extended the literature on in-app ads from a developing country's perspective. Specifically, literature is added in the context of Pakistan. Local aspects of Pakistan are considered. As a result, perceived financial benefits have been considered a predicting variable. Self-efficacy has been considered a moderating variable. Smartphone users already have established a negative attitude toward SMS and Web advertising. Therefore, the focus of this study is on in-app ads. However, there is still a chance students' intention to use in-app ads can be increased if they are done according to their needs. Attitude toward in-app ads is considered a predictor variable, considering its importance in the domain of advertising. Considering the importance of apps, factors specific to apps are considered in the model developed in the study. The first factor based on app features is perceived collaboration. The second factor is perceived usefulness. Consumer perception regarding collaboration between advertisers and other service providers to offer better services in terms of long-term benefit is considered.

Study results have confirmed that perceived usefulness and perceived collaboration have a significant influence on students' intention to use in-app ads. These results have demonstrated the importance of considering app features when developing a model for acceptance of in-app ads. Study results have also confirmed local aspects should be considered. Perceived financial benefits significantly influenced both attitudes toward in-app ads and students' intention to use in-app ads. However, self-efficacy was found to have no moderating influence. This result also has implications.

Self-efficacy is more towards using technology to gain a benefit specified by the app. In this study, the focus is on in-app ads received in general apps belonging to broad categories. Generally, students do not desire to put effort into these apps to use in-app ads. Hence the influence of self-efficacy is non-significant.

On the other hand, perceived financial benefits had a significant influence on both attitudes toward in-app ads and students' intention to use in-app ads. Perceived collaboration is less critical than perceived financial benefits because consumers are not interested in how benefits are provided. Their primary interest is in benefit.

This study has adapted the TAM model and tested its validity and applicability in the context of in-app ads' acceptance in a developing country, Pakistan. This study determined the influence of attitude toward in-app ads, perceived usefulness, perceived collaboration and perceived financial benefits on the students' intention to use in-app ads. Self-efficacy was considered a moderating factor. Study results have confirmed factors based on local conditions are essential (attitude toward in-app ads, perceived financial benefits). In addition, app-specific factors are also relevant (perceived usefulness, and perceived collaboration).

Based on the study results, a revised model is proposed in Figure 5.1. Students' intention to use in-app ads is influenced by attitude toward in-app ads, Perceived usefulness, perceived collaboration and perceived financial benefits. All the relationships are in the same direction. Attitude toward in-app ads and perceived usefulness act as mediators.

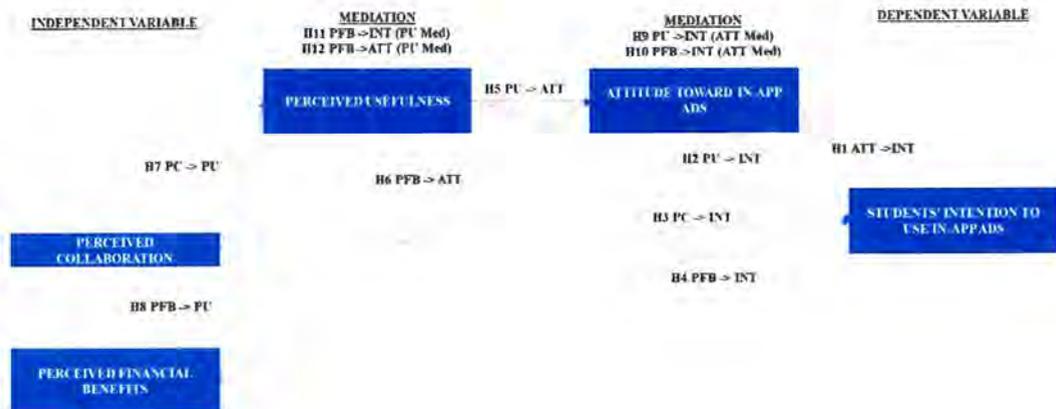


Figure 5.1  
Final Model Based On the Study Results

#### 5.4.2 Practical Contributions

Practical contributions are focused on the industry. There are numerous industry players. Commercial entities, government, and non-government organizations (NGOs) are essential categories among these players. Many further sub-categories are present within them. This research is influencing these categories in multiple ways.

Advertisers can plan more student-centric strategies by focusing on factors determining students' intention to use in-app ads. As stated earlier, students' intention to use in-app ads is negative in Pakistan (Zaheer & Kline, 2018). In-app ads are an evolving field. These days, apps are much more capable than a decade back. Therefore, there is a chance for the success of in-app ads if features provided by today's apps are appropriately utilised. This study tested one of the app features (collaboration). Results have confirmed this feature is perceived positively by students. Therefore, advertisers should consider collaborating with relevant parties. They may include app developers, advertised brands, payment handlers, and delivery

partners. In addition, advertisers should collaborate with apps, and other parties students extensively use.

Collaboration leads to increased usefulness. Among the usefulness aspects, an increase in financial benefit is highly appropriate since perceived financial benefits are an influential determinant of students' intention to use in-app ads. Therefore, advertisers should focus on providing attractive financial benefits. Increased financial benefits should be offered both directly and indirectly by utilizing the collaboration feature of apps. Similarly, targeting an appropriate market with a positive attitude toward in-app ads is beneficial. Advertisers cannot modify students' attitudes toward in-app ads quickly. However, they can choose markets wisely. Selecting an appropriate market is critical since students with the right attitude toward in-app ads have both direct and mediated influence on Intention. Therefore, advertisers should consider the utilization and enhancement of perceived usefulness since it has both direct and mediated effects on the students' intention to use in-app ads.

In practical problems stated in chapter one, the perceived usefulness of mobile ads was negligible among the students. Hence, there was a need to increase the usefulness of in-app ads. Results suggest perceived usefulness is influenced by perceived financial benefits and perceived collaboration. Perceived financial benefits for a long time have been found to increase perceived usefulness. However, massive financial benefits offered by a single company alone lead to trust issues.

Moreover, it is not feasible for merchants to honour considerable benefits eventually. A massive financial benefit over a long time by a single company is not fruitful anyway, as they tend to reduce the price of a product. An increase in the financial

benefit through collaboration is a good solution. Collaboration does not cause a decrease in trust with an increase in the amount of financial benefit. Collaboration also overcomes the issue with a perceived decrease in the price of a product since, for consumers, an increase in the amount of financial benefits is the result of interacting with in-app ads in an app over a long time as well as taking advantage of the collaboration feature implemented by the app. Merchants can honour discounts since individual amounts of discounts cost them little.

Consumers can stack financial benefits due to the collaboration feature of an app and avail stacked financial benefits at a later stage. Although it would mean a delay in the actual sale, it would also mean app users will keep interacting with in-app ads. So, it will be more beneficial for advertisers and app developers in the long run.

App developers will benefit from utilising the collaboration feature of an app since increased interaction resulting from collaboration means increased revenue for app developers. In Pakistan, where students don't prefer paid apps, in-app ads are the best method to monetize apps. Therefore, focusing on the usage of collaboration is beneficial for app developers.

App developers should consider that apps are installed for long-term usage purposes. Considering perceived usefulness has both direct and mediated influence on students' intention to use in-app ads, app developers should ensure in-app ads are linked with apps, which should benefit students as the app is used over a longer duration.

Merchants/service providers can advertise through in-app ads (directly or indirectly through ad agencies). Other than that, many merchants/service providers can collaborate with apps to deliver and continue providing services for brands advertised

to students through in-app ads. Payment handlers, insurance companies, delivery service providers and repair and maintenance firms can facilitate students whenever they order an advertised product/service. They will benefit in terms of increased business and become part of a business cycle that goes beyond one transaction. With collaboration, small firms can benefit by capturing a niche.

As per the results, perceived collaboration and perceived financial benefits influence students' intention to use in-app ads. Therefore, as mentioned above, advertisers and merchants/service providers should collaborate and provide financial benefits to students for increased business activity. In addition, legal firms need to provide a legal framework to collaborate between various parties in an organized, legal and lawful manner. Finally, students' rights groups should consider how they can protect the rights of students.

Collaboration can go beyond a single geographic zone. Hence, multiple governments are involved in online transactions, which essentially stem from in-app ads. Governments need to engage with each other to promote online business for all. It can be said governments have a high responsibility. As per the results, attitude toward in-app ads is a significant factor in the success of in-app ads. Government is the central entity that provides consistent and long-term support so that students develop and retain a positive attitude toward in-app ads. This is possible by taking steps such as implementing a framework so that students' safety and privacy concerns are taken care of. With 5G technology already being implemented in some parts of the world, governments worldwide need to develop their nations to utilize the benefit of 5G technology effectively. For the Pakistani government, it means deciding on numerous matters of concern. Collaboration in the era of 5G entails increased risk and benefit.

As the study results suggest, perceived collaboration is positively associated with students' intention to use in-app ads. However, for the government, it also requires implementing strategies so that collaboration is done in a manner that does not cause a problem for students. With collaboration, data is shared with collaborating partners. With 5G implementation, it will be instant and automatic. Therefore, governments need to think through all possible outcomes before allowing collaboration in the 5G era.

As the study results suggest, self-efficacy has an insignificant moderating influence on the relationship between Students' Intention to use in-app ads and its predictors. Therefore, the government should focus less on developing the IT capability of their nation. Instead, it should focus on creating a framework for the effective implementation of 5G technology and the protection of students' rights and privacy. It should also focus on how in-app ads should be appropriately engaged. Furthermore, the government should provide an overall framework for the stakeholders involved. Organizations at the government level such as the PTA, Pakistan Bureau of Statistics (PBS) and Ministry of Science and Technology (MOST) should collectively formulate fact-based strategies.

### **5.5 Limitations and Directions for Future Research**

The focus of the study was university students in the federal capital of Pakistan, Islamabad. The hometowns of most of these students were various cities, towns, and villages of Pakistan. However, in a true sense, this study applies only to Islamabad. Its results can be compared with studies done in capital cities of other developing countries. To know the impact of the economy, the study should be replicated in developed and underdeveloped countries. A comparative study focusing

on different regions of Pakistan can also be done to know the difference between various regions.

The sample was limited in terms of students. Instead of students as a sample, other types of respondents should be considered, such as office workers. Data can be collected from uneducated consumers. The mall intercept method can be utilised instead of the online survey method for an uneducated sample. In the case of an uneducated sample, translation of the questionnaire into the local language will be necessary as uneducated people in Pakistan cannot read and write the English language very well. Urdu will be the feasible language as it is Pakistan's national language.

There was no use of a control variable. Data should be controlled based on gender, age, income level and other aspects. There is a chance that the moderator of the study, Self-Efficacy, might appear relevant in case-control variables such as age or gender are utilized. Future studies should consider the use of control variables while testing this model.

The model is relatively parsimonious. There was only one moderator and two mediators. There were no control variables. The number of predictors was few. The model should be extended with the addition of more predictors, moderators, mediators, and control variables.

The study is not focused on any particular type of in-app ads nor apps. The model should be tested and adapted with relevant factors for apps doing in-app ads using augmented reality, virtual reality and mixed reality. In addition, the model should be tested and adapted with relevant factors for various types of in-app ads, such as

contextual, location-based, personalised, native and on-demand ads. The impact of well-known apps should be considered as moderating or control variable while testing this model. Well-known apps are considered brands. Therefore, a brand may act as a moderator.

Qualitative studies should be pursued to understand Perceived Collaboration and Usefulness constructs in in-app ads in greater detail. Their impact on the Students' Intention to use in-app ads will be better understood with qualitative studies. Mixed method research should extend the model with more relevant constructs. Finally, the effect of a moderator may be understood better with longitudinal studies.

## 5.6 Conclusion

It can be concluded students' intention to use in-app ads is significantly influenced by their attitude toward in-app ads. Another factor substantially affecting students' intention to use in-app ads is perceived financial benefits since it also has mediated influence on intention. Perceived usefulness is also an essential determinant of intention, as it also has a mediation effect. Perceived collaboration also influences students' intention to use in-app ads. Self-efficacy has no moderating effect on the relationship between (a) perceived usefulness and students' intention to use in-app ads, (b) perceived collaboration and students' intention to use in-app ads and (c) perceived financial benefits and students' intention to use in-app ads. The study results are summarized in Table 5.1. It is evident TAM model is applicable in the case of acceptance of in-app ads. However, it should be further extended with relevant factors, as attempted in this study. Furthermore, industry players involved with in-app ads should consider constructs analysed in the study as they significantly influence students' intention to use in-app ads.

Table 5.1  
*Snapshot of Research Results*

Research Questions	Research Objectives	Hypothesis and Result
1) Does Attitude toward in-app ads, Perceived Usefulness, Perceived Collaboration, and Perceived Financial Benefits influence Students' Intention to use in-app ads?	RO 1 Direct relationships 1.1) To investigate the influence of Attitude toward in-app ads on Students' Intention to use in-app ads. 1.2) To investigate the influence of Perceived Usefulness on Students' Intention to use in-app ads. 1.3) To investigate the influence of Perceived Collaboration on Students' Intention to use in-app ads.	H1 Accepted H2 Accepted H3 Accepted H4 Accepted
2) Do Perceived Usefulness and Perceived Financial Benefits influence Attitude toward in-app ads?	1.4) To investigate the influence of Perceived Financial Benefits on Students' Intention to use in-app ads. 1.5) To investigate the influence of Perceived Usefulness on Attitude toward in-app ads. 1.6) To investigate the influence of Perceived Financial Benefits on Attitude toward in-app ads.	H5 Accepted H6 Accepted
3) Do Perceived Collaboration and Perceived Financial Benefits influence Perceived Usefulness?	1.7) To investigate the influence of Perceived Collaboration on Perceived Usefulness. 1.8) To investigate the influence of Perceived Financial Benefits on Perceived Usefulness.	H7 Accepted H8 Accepted
4) Does Attitude toward in-app ads act as a mediator for the relationship between Students' Intention to use in-app ads and its predictors?	RO 2 Mediating relationships 2.1) To investigate the mediating effect of Attitude toward in-app ads on the relationship between Perceived Usefulness and Students' Intention to use in-app ads. 2.2) To investigate the mediating effect of Attitude toward in-app ads on the relationship between Perceived Financial Benefits and Students' Intention to use in-app ads.	H9 Accepted H10 Accepted
5) Does Perceived Usefulness act as a mediator for the relationship between Perceived Financial Benefits and Students' Intention to use in-app ads?	2.3) To investigate the mediating effect of Perceived Usefulness on the relationship between Perceived Financial Benefits and Students' Intention to use in-app ads. 2.4) To investigate the mediating effect of Perceived Usefulness on the relationship between Perceived Financial Benefits and Attitude toward in-app ads.	H11 Accepted
6) Does Perceived Usefulness act as a mediator for the relationship between Perceived Financial Benefits and Attitude?		H12 Accepted
7) Do Self-Efficacy moderate the relationship between Students' Intention to use in-app ads and Perceived Usefulness, Perceived Collaboration, and Perceived Financial Benefits?	RO 3 Moderating relationships 3.1) To investigate the moderating effect of Self-Efficacy on the relationship between Perceived Usefulness and Students' Intention to use in-app ads. 3.2) To investigate the moderating effect of Self-Efficacy on the relationship between Perceived Collaboration and Students' Intention to use in-app ads. 3.3) To investigate the moderating effect of Self-Efficacy on the relationship between Perceived Financial Benefits and Students' Intention to use in-app ads.	H13 Rejected H14 Rejected H15 Rejected

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## APPENDIX 1 QUESTIONNAIRE

Section 1 of 12

### STUDENTS' INTENTION TO USE IN-APP ADVERTISEMENTS IN PAKISTAN

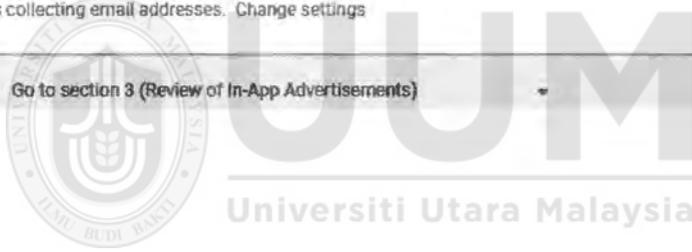
Thank you for taking out time to participate in this survey. This questionnaire is part of research undertaken by PHD candidate Qasim Ali Qureshi, a student at Universiti Utara Malaysia, Malaysia. Objective of this survey is to gather consumer insight so that an in-app advertisement acceptance model can be developed that can be adopted by practitioners. This model will benefit both practitioners and consumers in terms of increasing relevancy and acceptability of in-app advertisements. All information gathered in this survey will be kept confidential and only used for research purposes. Total questions in survey are 42. It will take approximately 10-15 minutes to fill questionnaire. Kindly fill questionnaire carefully as entire research depends on your input. Your cooperation is of extreme importance. Please click next at the bottom of each page to continue with survey.

Email \*

Valid email address

This form is collecting email addresses. [Change settings](#)

After section 1 [Go to section 3 \(Review of In-App Advertisements\)](#)



## Preliminary Questions



Note: In this section, please choose relevant options applicable to you.

Name (optional)

Short-answer text

Hometown \*

- Islamabad
- Rawalpindi
- Other...

Gender? \*

- Male
- Female
- Prefer not to share



**UUM**  
Universiti Utara Malaysia

Age? \*

- 18-25
- 26-33
- 34-41
- Other...

Smartphone Operating System? \*

- Android
- Apple iOS
- Other...

Apps mostly used by you (Choose all relevant options)? \*

- Free (in-app advertisement supported)
- Free (in-app purchase supported)
- Free (trial version)
- Free (affiliate supported)
- Paid (life time payment)
- Paid (subscription payment)
- Other...

Mention one or two apps that you use regularly? (Optional)

Short-answer text

Mention one or two apps that comes in your mind which may have presented advertisements to you? (Optional)

Short-answer text

Smartphone size in use? \*

- Small (3 to 4 inch)
- Medium (4 to 5 inch)
- Large (5 to 6 inch)
- Extra-large (6 to 7 inch)
- Other...

Education level? \*

- Under graduate (Bachelors in progress)
- Graduate (Above Bachelors)
- Post graduate (Mhil, PhD)
- Other...

Institution currently enrolled in? \*

- Air University
- Bahria University
- COMSATS University
- Quaid-i-Azam University

After section 2 Go to section 4 (Main Questions)

Section 3 of 12

## Review of In-App Advertisements

Note: In this section you are given the option to read basic literature on in-app advertisements.

Do you want to clarify / reconfirm difference between in-app advertisements and other forms of mobile advertisements? \*

- Yes
- No

After section 3 Continue to next section

Section 4 of 12

## Main Questions

Note: All of the questions appearing next are regarding your experience with in-app advertisements which may or may not have led to actual purchase. Each section is about a particular research term. Each term is first briefly explained for your understanding. Then questions are asked. For each question, rank your experience with in-app advertisements on a scale of 1 to 5. 1 being closest to negative response and 5 being closest to positive response.

After section 4 Go to section 9 (Collaboration)

Section 5 of 12

## Intention

Definition: Intention is a strongly developed idea that a person plans to carry out.

I intend to use in-app advertisements. \*

1 2 3 4 5

Strongly disagree      Strongly agree

---

I am interested to use in-app advertisements. \*

1 2 3 4 5

Strongly disagree      Strongly agree

---

I want to experience in-app advertisements. \*

1 2 3 4 5

Strongly disagree      Strongly agree

---

I prefer to use in-app advertisements rather than traditional mobile advertisements such as mobile web advertisements, emails advertisements or SMS/ voice call advertisements. \*

1 2 3 4 5

Strongly disagree      Strongly agree

---

I intend to use in-app advertisements regularly in future. \*

1 2 3 4 5

Strongly disagree      Strongly agree

---

After section 5 Go to section 11 (Respondent Details) ▼

**Section 6 of 12**

## Attitude ✕ ⋮

Definition: Attitude is a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor.

I am favorable towards in-app ads. \*

	1	2	3	4	5	
Strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

I like in-app ads. \*

	1	2	3	4	5	
Strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

I am satisfied with in-app ads. \*

	1	2	3	4	5	
Strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

Overall I have positive view of in-app ads. \*

	1	2	3	4	5	
Strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

After section 6 Go to section 8 (Financial Benefit)

Section 7 of 12

## Usefulness

Definition: in-app advertisements provide information with persuasiveness to emphasize usefulness of a specific brand. eg advertisement of Clash of clans gaming app in 8 ball pool gaming app.

Using in-app advertisements enable me to accomplish tasks more quickly than using traditional approaches.

	1	2	3	4	5	
Strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

Using in-app advertisements enhance my effectiveness in shopping or information seeking. \*

1      2      3      4      5

Strongly disagree                        Strongly agree

I find in-app advertisements useful. \*

1      2      3      4      5

Strongly disagree                        Strongly agree

In-app advertisement transactions are advantageous to consumers. \*

1      2      3      4      5

Strongly disagree                        Strongly agree

After section 7    Go to section 6 (Attitude) 

**Section 8 of 12**

**Financial Benefit**    Universiti Utara Malaysia  

Definition: Financial / non financial reward redeemable within an app for interacting with in-app advertisements. eg Discount coupon offered by Food Panda app redeemable only in Food Panda app.

Value of in-app advertisement offer in-terms of appeal? \*

1      2      3      4      5

Unattractive                        Attractive

Value of in-app advertisement offer in-terms of buying decision?

1      2      3      4      5

Bad buy                        Excellent buy

Value of in-app advertisement offer in-terms of cost savings?

	1	2	3	4	5	
No savings at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extremely large savings

Value of in-app advertisement offer in-terms of fairness of price? \*

	1	2	3	4	5	
Extremely unfair price	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extremely fair price

Value of in-app advertisement offer in-terms of monetary value? \*

	1	2	3	4	5	
Not a good value	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extremely good value

After section B Go to section 3 (intention)

Section 9 of 12

## Collaboration

Universiti Utara Malaysia

Definition: Some apps collaborate with advertisers and other service providers or apps to offer complete solution or enhanced benefit to consumers. eg Discount coupon offered by Food Panda app redeemable in Grab app.

In-app advertisements provide me with cash back options which are beneficial. \*

	1	2	3	4	5	
Strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

Mobile apps showing in-app advertisements have tie-ups with multiple brands which are beneficial. \*

	1	2	3	4	5	
Strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

Mobile apps showing in-app advertisements have tie-ups with other e-commerce players which are beneficial. \*

1      2      3      4      5

Strongly disagree                        Strongly agree

Mobile apps showing in-app advertisements provide incentive every time interaction is made with them. \*

1      2      3      4      5

Strongly disagree                        Strongly agree

In-app advertisements provides me with coupons, that I can use at later stage. \*

1      2      3      4      5

Strongly disagree                        Strongly agree

I enjoy loyalty discounts, for availing in-app advertisements. \*

1      2      3      4      5

Strongly disagree                        Strongly agree

After section 9    Go to section 10 (Self-Efficacy)    ▾

Section 10 of 12

## Self-Efficacy

Definition: Self-efficacy is a person's judgment of his capabilities to interact with a technology to attain possible benefits.

I expect that I can manage in-app advertisements even if I have never interacted with such advertisements before. \*

1      2      3      4      5

Strongly disagree                        Strongly agree

I expect that I can manage in-app advertisements even if nobody is around to tell me what to do. \*

	1	2	3	4	5	
Strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

I expect that I can manage in-app advertisements if I have a simple manual for reference. \*

	1	2	3	4	5	
Strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

I expect that I can manage in-app advertisements if I could contact someone for help when I get stuck. \*

	1	2	3	4	5	
Strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

I expect that I can manage in-app advertisements if someone else would help me get started. \*

	1	2	3	4	5	
Strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

I expect that I can manage in-app advertisements if someone would show me how to do it first. \*

	1	2	3	4	5	
Strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

After section 10 Go to section 7 (Usefulness) 

Section 11 of 12

## Respondent Details



Note: This section is optional and request your input regarding survey questionnaire

I would love to get in contact with you to share detailed results of the study. Can I contact you through your email address? (Yes/ No)

Short-answer text

In the end, I would once again like to thank you for taking out time to answer this survey. Your input is of immense importance for this research. If you want to suggest any thing regarding in-app ads or this survey, you are most welcome. (Optional)

Long-answer text

After section 11 Submit form

Section 12 of 12

## Difference and Examples of In-App Advertisements

Most apps available on official App stores such as Google Play Store utilize advertisements (in-app ads). Unlike traditional mobile advertisements such as SMS and web advertisements, in-apps advertisements are permission based since apps clearly mention in App store as well as at the time of installation that they will present advertisements. Secondly, in-app advertisement revenue is shared with apps presenting it. Therefore apps intentionally present in-app ads. Apps also provide services by utilizing in-app advertisement revenue model. Apps in case of being free of use as well as without advertisement, affiliate with advertisers to sell consumer data. For example Google share consumer data with advertisement agencies/ bots. Examples of in-app advertisements are given below. Please click next at the bottom of the page to go to actual questionnaire after reviewing examples of in-app ads.

In-app advertisement in Twitter app



Follow

Sleep under the stars in this see-through tent  
[goo.gl/MleR7D](http://goo.gl/MleR7D)



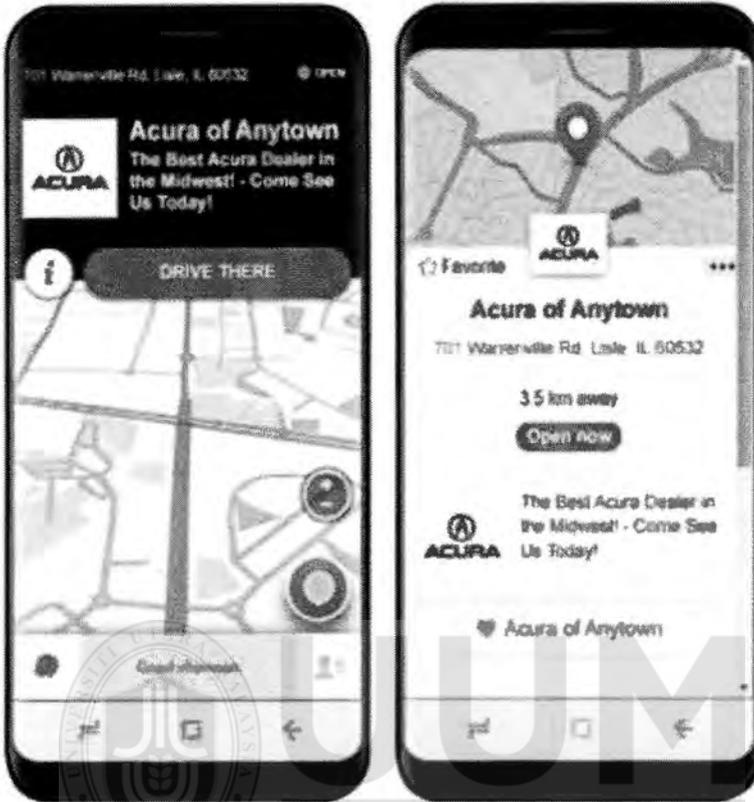
### In-app advertisement in Facebook app



### In-app advertisement in 8 Ball Pool app



In-app advertisement in Waze app



Universiti Utara Malaysia

In-app advertisement in Food Panda app



## APPENDIX 2 COVER LETTERS

Dear Sir,

I am a PhD scholar at University Utara Malaysia, Malaysia. I am researching "In-app advertisements' acceptance". For this reason, I have prepared a questionnaire that needs to be filled out by university students. I am focusing on Islamabad, considering it is the capital city of Pakistan. I am collecting data from the 4 Management universities located in Islamabad. In this regard, I need your assistance. Due to the COVID-19 pandemic and subsequent restrictions on travel, I am not visiting universities physically. Therefore, I'll be highly obliged if you can ask your departmental students to fill out the questionnaire. It will benefit them academically as I have included a section in which in-app ads are reviewed with examples.

The link to the online questionnaire is:

<https://forms.gle/YFSNspSXOnBrQjEW9>

My university's recommendation letter is attached herewith if required by you.

Thanks, and Regards

Qasim Ali Qureshi

PhD candidate, Universiti Utara Malaysia, Malaysia

03348628213

**APPENDIX 3  
LETTERS OF RECOMMENDATION**



**OTHMAN YEOP ABDULLAH GRADUATE SCHOOL OF BUSINESS**  
Universiti Utara Malaysia  
06010 UUM SINTOK  
KEDAH DARUL AMAN  
MALAYSIA



Tel: 604-828 7101/7113/7130  
Faks (Fax): 604 828 7160  
Laman Web (Web): [www.oayagsb.uum.edu.my](http://www.oayagsb.uum.edu.my)

UUM/OYAGSB/R-4/4/1  
.12 March 2020

**TO WHOM IT MAY CONCERN**

Dear Sir/Madam,

**LETTER OF RECOMMENDATION FOR DATA COLLECTION AND RESEARCH WORK**

This is to certify that **QASIM ALI QURESHI (Matric No: 902264)** is a student of Othman Yeop Abdullah Graduate School of Business, Universiti Utara Malaysia pursuing his Doctor of Philosophy (PhD). He is conducting a research entitled "**In\_App Advertisement Acceptance: A Case of Pakistan**" under the supervision of Prof. Dr. Nor Azila Bt Mohd Noor and Prof. Dr. Shahizan Hassan.

In this regard, we hope that you could kindly provide assistance and cooperation for him to successfully complete the research. All the information gathered will be strictly used for academic purposes only.

Your cooperation and assistance is very much appreciated.

Thank you.

**"SERVING THE NATION"  
"KEDAH AMAN MAKMUR – HARAPAN BERSAMA MAKMURKAN KEDAH"  
"KNOWLEDGE VIRTUE SERVICE"**

Yours faithfully

  
**ROZITA BINTI RAMLI**  
Assistant Registrar  
for Dean  
Othman Yeop Abdullah Graduate School of Business

c.c - Supervisor  
- Student's File (902264)

Universiti Pengurusan Terengganu  
The Eminent Management University





**OTHMAN YEOP ABDULLAH GRADUATE SCHOOL OF BUSINESS**  
 Universiti Utara Malaysia  
 06010 UUM SINTOK  
 KEDAH DARUL AMAN  
 MALAYSIA



Tel: 604-928 7101/7113/7130  
 Faks (Fax): 604 928 7180  
 Laman Web (Web): www.oyagsb.uum.edu.my

UUM/OYAGSB/R-4/1/1  
 12 March 2020

COMSATs Institute of Information Technology, Islamabad

Dear Sir/Madam,

**LETTER OF RECOMMENDATION FOR DATA COLLECTION AND RESEARCH WORK**

This is to certify that **QASIM ALI QURESHI** (Matric No: 902264) is a student of Othman Yeop Abdullah Graduate School of Business, Universiti Utara Malaysia pursuing his Doctor of Philosophy (PhD). He is conducting a research entitled "**In App Advertisement Acceptance: A Case of Pakistan**" under the supervision of Prof. Dr. Nor Azila Bi Mohd Noor and Prof. Dr. Shahizan Hassan,

In this regard, we hope that you could kindly provide assistance and cooperation for him to successfully complete the research. All the information gathered will be strictly used for academic purposes only.

Your cooperation and assistance is very much appreciated.

Thank you,

**"SERVING THE NATION"**  
**"KEDAH AMAN MAKMUR – HARAPAN BERSAMA MAKMURKAN KEDAH"**  
**"KNOWLEDGE VIRTUE SERVICE"**

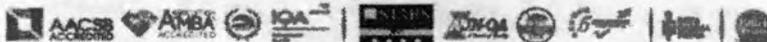
Yours faithfully

Universiti Utara Malaysia

**NURUL NADIAH RUSLE**  
 Assistant Registrar  
 for Dean  
 Othman Yeop Abdullah Graduate School of Business

- c.c - Supervisor
- Student's File (902264)

Universiti Pengurusan Terkemuka  
 The Eminent Management University





OTHMAN YEOP ABDULLAH GRADUATE SCHOOL OF BUSINESS  
 Universiti Utara Malaysia  
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 MALAYSIA



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 Faks (Fax): 004 828 7188  
 Laman Web (Web): www.ygab.uum.edu.my

UUM/OYAGSS/R-4/4/1  
 12 March 2020

Quaid-I-Azam University

Dear Sir/Madam,

**LETTER OF RECOMMENDATION FOR DATA COLLECTION AND RESEARCH WORK**

This is to certify that **QASIM ALI QURESHI** (Matrik No: 902264) is a student of Othman Yeop Abdullah Graduate School of Business, Universiti Utara Malaysia pursuing his Doctor of Philosophy (PhD). He is conducting a research entitled "**In-App Advertisement Acceptance: A Case of Pakistan**" under the supervision of Prof. Dr. Nor Azila Bt Mohd Noor and Prof. Dr. Shahizan Hassan.

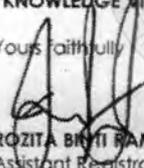
In this regard, we hope that you could kindly provide assistance and cooperation for him to successfully complete the research. All the information gathered will be strictly used for academic purposes only.

Your cooperation and assistance is very much appreciated.

Thank you.

"SERVING THE NATION"  
 "KEDAH AMAN MAKMUR - HARAPAN BERSAMA MAKMURKAN KEDAH"  
 "KNOWLEDGE VIRTUE SERVICE"

Yours faithfully

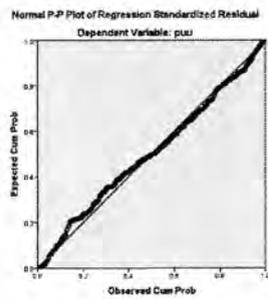
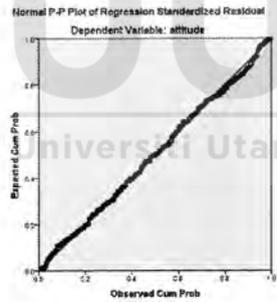
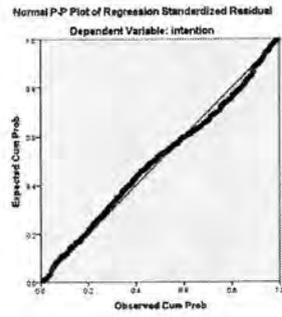
  
**ROZITA BINTI RAMLI**  
 Assistant Registrar  
 for Dean  
 Othman Yeop Abdullah Graduate School of Business

c.c - Supervisor  
 - Student's File (902264)

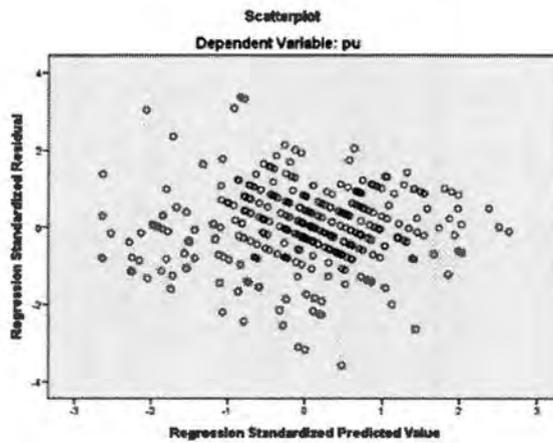
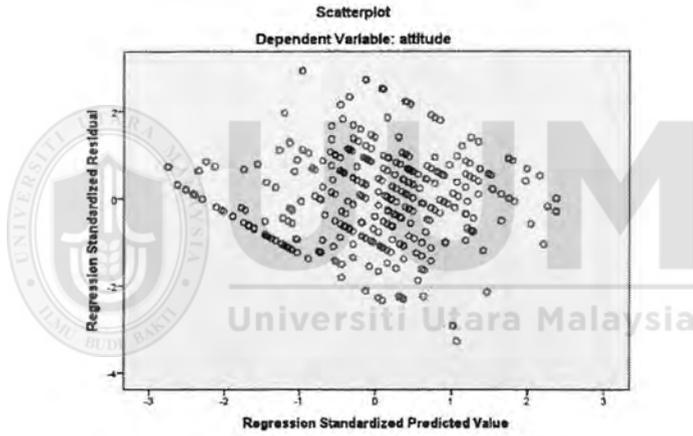
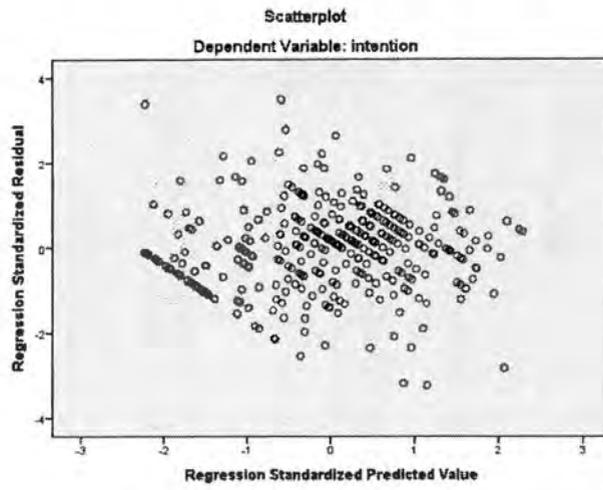
Universiti Pengurusan Terhormat  
 The Eminent Management University



## APPENDIX 4 P-P PLOT RESIDUALS



## APPENDIX 5 SCATTER PLOT RESIDUALS



**APPENDIX 6**  
**ANOVA OUTPUT TABLE**

*ANOVA Output Table*

			Sum of squares	Dff	Mean square	F	Sig.
Int*att	Between Groups	(combined)	203.2	16	12.7	26.86	.000
		Linearity	193.3	1	193.3	408.8	.000
		Deviation from Linearity	9.9	15	0.6	1.39	.145
Within Groups Total			150.3	318	.4		
			353.6	334			
Int*pu	Between Groups	(combined)	142.5	16	8.9	13.43	.000
		Linearity	129.5	1	129.5	195.1	.000
		Deviation from Linearity	13.1	15	.9	1.31	.193
Within Groups Total			211.0	318	.7		
			253.6	334			
Int*pc	Between Groups	(combined)	141.4	23	6.2	9.018	.000
		Linearity	122.3	1	122.3	179.3	.000
		Deviation from Linearity	19.2	22	.9	1.27	.184
Within Groups Total			212.1	311	.7		
			353.6	334			
Int*pfb	Between Groups	(combined)	167.5	20	8.4	14.12	.000
		Linearity	155.6	1	155.6	262.4	.000
		Deviation from Linearity	12	19	.6	1.06	.393
Within Groups Total			186.1	314	.6		
			353.6	334			
Int*sef	Between Groups	(combined)	58.8	23	2.6	2.7	.000
		Linearity	43.3	1	43.3	45.7	.000
		Deviation from Linearity	15.5	22	.7	.74	.795
Within Groups Total			295	311	.95		
			354	334			
Att*pu	Between Groups	(combined)	157.5	16	9.8	11.08	.000
		Linearity	150.2	1	150.2	169.1	.000
		Deviation from Linearity	7.2	15	.5	.542	.916
Within Groups Total			282.4	318	.9		
			439.9	334			
Att* pfb	Between Groups	(combined)	203.1	20	10.16	13.47	.000
		Linearity	186.5	1	186.5	247.4	.000
		Deviation from Linearity	16.6	19	.9	1.15	.292
Within Groups Total			236.7	314	.75		
			439.9	334			

*ANOVA Output Table (Continued)*

			<b>Sum Of Squares</b>	<b>Dff</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
Pu*pc	Between Groups	(combined)	123.8	23	5.4	10.12	.000
		Linearity	106.5	1	106.5	200.1	.000
		Deviation from Linearity	17.3	22	.9	1.48	.078
	Within Groups		165.4	311	.5		
	Total		189.2	334			
Pu* pfb	Between Groups	(combined)	110.0	20	5.5	9.64	.000
		Linearity	101	1	100.9	176.9	.000
		Deviation from Linearity	9.1	19	.48	.84	.658
	Within Groups		179.1	314	.57		
	Total		289.2	334			



**UUM**  
Universiti Utara Malaysia

## APPENDIX 7 MAIN STUDY SCREENED RESPONSES

Main Study Screened Responses for the Items measuring latent Constructs

Int					Att					Pu					Pfb					Pc					Sef				
1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	6	1	3	4	5	6				
3	4	4	3	3	3	2	1	1	3	3	5	3	3	3	4	3	1	3	2	2	4	3	1	3	4	3	3		
4	4	5	4	2	5	5	3	3	5	5	5	4	4	5	1	3	3	3	5	4	4	4	2	5	4	3	4	5	
3	2	3	4	3	3	2	3	4	2	4	3	4	3	4	3	2	2	3	3	4	3	2	2	4	4	2	2	2	
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1	1	1	1	1	1	1	1	1	2	3	3	2	1	2	2	2	2	1	3	2	2	1	1	4	4	4	2	2	

Main Study Screened Responses for the Items measuring latent Constructs (Continued)

Int	Att				Pu				Pfb				Pc				Sef												
1	2	3	4	5	1	2	3	4	1	2	3	4	1	2	3	4	5	1	2	3	4	5	6	1	3	4	5	6	
1	1	2	1	1	2	2	2	1	1	3	2	2	3	3	2	2	2	1	3	2	3	2	3	5	5	3	2	1	
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2	2	2	2	2	2	2	2	2	2	3	2	2	4	3	1	2	2	2	2	1	2	2	2	2	3	3	2	3	
3	2	2	4	1	2	3	3	2	2	2	3	4	4	2	2	3	2	1	2	2	4	2	2	4	4	4	2	4	
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2	2	3	2	3	2	2	2	2	3	4	3	3	2	2	2	4	3	1	3	3	4	3	1	3	3	3	3	4	
1	1	1	1	3	2	1	1	1	2	2	2	2	1	2	1	2	2	3	1	2	1	1	1	2	2	2	2	2	
4	3	1	4	4	1	1	1	1	2	3	1	1	3	4	2	2	3	3	2	3	3	2	4	3	3	3	3	4	
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1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	2	1	1	4	3	2	5	2	2	2	2	
1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	3	3	2	2	
4	3	5	5	4	3	3	2	1	3	2	4	3	4	5	3	3	4	3	5	4	3	1	1	5	4	4	4	5	
3	3	4	5	3	4	3	3	3	3	3	2	3	4	3	3	4	4	4	4	5	5	1	5	4	5	5	5	5	
3	2	4	2	3	1	1	4	2	2	4	3	4	2	3	3	3	3	3	3	4	4	1	5	3	3	4	3	3	
3	2	5	3	2	4	2	3	3	3	3	4	3	3	2	2	4	3	3	4	4	3	3	3	2	3	3	3	3	
1	1	3	3	3	2	2	3	3	4	4	3	3	4	4	5	2	3	2	4	3	4	4	4	3	4	4	4	4	
3	4	3	2	3	3	1	2	3	4	4	4	3	4	4	4	3	3	5	5	5	5	3	3	4	5	4	2	2	
4	3	3	4	3	3	3	3	3	3	3	3	3	4	4	4	2	3	5	3	3	3	3	3	3	3	3	3	4	4
4	4	2	4	4	4	2	4	2	4	2	1	4	4	2	1	3	4	1	5	4	2	5	5	4	4	4	2	1	
4	4	3	4	2	3	2	2	2	5	5	5	5	2	2	1	2	2	3	4	4	4	2	1	5	4	3	5	5	
4	3	4	4	4	4	2	3	4	4	5	3	3	4	4	3	4	3	1	2	2	4	1	3	5	3	5	5	5	
4	4	4	4	4	5	5	4	3	5	5	5	5	3	4	5	4	5	5	5	3	5	5	5	5	5	5	1	1	1
4	4	3	5	5	5	5	5	5	5	5	4	4	5	1	3	3	2	1	4	5	5	1	2	3	5	5	4	4	
2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1
1	1	1	3	3	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	4	1	1	1	2	3	1	1	1	
1	1	1	5	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1	4	4	5	1	1	1	3	1	2	4	
4	4	2	4	4	1	1	4	3	4	5	4	4	4	3	5	4	5	5	4	3	5	3	4	4	3	4	2	3	
1	1	1	3	1	1	1	1	1	4	3	3	3	1	1	1	1	1	3	3	3	3	4	4	5	5	5	5	5	
4	3	3	3	3	3	3	3	3	2	4	4	3	4	3	3	3	3	1	3	4	3	3	4	4	2	3	3	5	
5	4	3	2	1	3	3	3	1	3	3	3	3	5	1	5	1	5	5	4	3	3	3	3	3	3	3	3	3	
3	3	5	3	3	5	3	3	4	3	3	4	4	4	3	2	5	5	5	5	5	5	5	5	5	4	5	5	5	
3	1	1	1	1	1	1	1	1	3	2	3	2	2	2	2	2	2	3	1	4	2	3	1	3	4	2	4	5	
2	4	3	4	3	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	

Main Study Screened Responses for the Items measuring latent Constructs (Continued)

Int	Att					Pu					Pfb					Pc					Sef								
1	2	3	4	5	1	2	3	4	1	2	3	4	1	2	3	4	5	1	2	3	4	5	6	1	3	4	5	6	
1	1	1	1	1	1	1	1	1	1	3	1	1	2	3	1	3	1	5	3	5	5	2	1	5	5	4	3	5	
3	3	4	3	3	3	3	3	4	5	5	5	4	3	4	3	4	4	5	4	4	4	4	5	3	4	4	4	4	
3	4	3	3	4	3	3	2	3	3	4	2	3	3	3	2	3	4	3	3	2	3	3	2	3	4	5	4	3	
3	3	3	3	3	2	2	2	2	3	3	3	3	2	2	2	3	4	3	3	3	3	3	3	3	3	4	3	4	3
3	3	3	1	3	3	2	3	5	2	3	1	5	4	4	2	4	5	5	3	3	3	5	2	4	3	1	2	1	
1	1	1	1	1	3	1	1	1	2	2	1	3	2	3	3	2	2	1	2	2	1	1	1	2	2	2	2	2	
4	4	3	4	3	2	3	4	3	5	5	4	4	4	4	4	4	4	3	3	4	4	4	3	4	3	4	4	3	
2	3	1	3	1	1	2	3	1	1	2	1	1	1	3	1	2	1	1	1	1	1	1	1	2	1	3	1	1	
5	4	4	5	5	4	5	4	5	5	5	5	5	5	3	3	4	5	4	3	3	4	4	3	2	4	4	4	3	5
4	4	4	4	4	5	5	5	5	4	3	4	3	4	4	3	4	4	5	5	5	5	5	5	1	4	4	3	4	
4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	4	4	4	4	4	4	4	2	4	5	5	4	5	4
1	1	1	2	1	1	1	3	1	2	3	3	2	3	3	3	3	3	2	2	2	3	2	2	2	4	4	4	4	4
1	1	1	1	1	1	1	2	2	3	3	3	3	2	3	3	3	3	1	3	3	4	1	3	2	3	3	3	3	3
1	1	1	1	1	1	1	1	1	2	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	5	3	3	1	1
1	1	1	2	2	4	3	3	3	2	2	3	3	3	3	2	3	3	3	4	3	2	2	2	4	4	4	2	2	
3	2	3	1	1	1	3	3	2	1	1	1	1	3	4	2	5	3	1	1	1	1	1	1	1	1	1	1	1	1
4	3	4	4	4	4	4	4	4	3	4	4	4	4	4	4	4	4	1	3	4	3	1	1	5	5	4	3	4	
2	2	2	2	2	1	1	1	1	2	4	3	3	3	3	3	3	3	1	3	3	2	2	2	4	3	4	3	3	
3	3	3	4	5	2	2	3	3	3	3	4	3	3	3	3	3	4	4	3	2	3	3	4	4	4	4	4	4	
4	4	4	1	1	4	2	3	4	3	4	4	4	4	3	3	3	3	4	4	2	3	5	4	4	5	5	5	5	
2	1	1	1	1	1	1	1	1	4	2	2	1	1	2	2	2	3	1	3	3	2	1	1	1	1	1	1	1	1
3	3	4	4	3	3	2	3	3	4	5	4	5	3	4	2	4	4	4	4	4	4	4	4	4	4	5	4	4	
3	3	3	3	3	3	3	3	3	3	3	3	3	5	2	3	3	3	2	3	3	3	3	3	2	2	3	3	3	
3	3	3	4	4	5	3	4	4	1	4	2	1	3	4	3	3	3	3	3	2	4	2	4	4	4	4	3	5	
1	1	1	1	1	1	1	1	1	1	1	1	3	1	2	2	2	3	1	2	2	3	1	1	5	3	5	5	5	
5	5	4	5	5	4	4	4	5	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	4	4	4	2	3	4
3	4	3	3	4	1	3	2	2	3	4	3	4	3	5	3	5	2	5	5	5	4	3	5	3	5	2	4	2	
3	3	1	1	3	1	3	1	3	5	3	3	4	4	2	4	3	1	4	3	3	3	5	1	5	5	1	5	1	
4	4	4	4	4	5	5	5	5	4	4	4	2	4	4	4	4	4	3	3	4	3	2	1	5	4	4	5	4	5
4	4	4	4	4	5	4	5	3	4	5	4	4	4	3	3	4	4	4	3	4	4	2	4	2	5	4	4	4	
3	3	3	3	3	2	2	2	2	4	4	4	3	3	3	3	3	3	1	3	4	2	3	3	4	4	2	2	2	
1	2	2	3	2	2	1	1	1	1	2	1	3	4	4	3	2	2	3	4	4	2	4	2	3	5	4	5	5	
3	3	3	2	2	3	2	2	2	4	4	3	3	3	3	2	3	3	5	4	4	4	3	3	1	1	3	3	3	
4	4	4	3	4	4	4	4	4	5	5	5	5	3	3	4	3	3	5	4	4	3	3	3	4	4	4	2	1	
3	3	3	3	1	3	2	2	3	3	5	3	3	4	4	1	3	3	3	3	3	3	1	1	4	5	3	3	4	
3	3	2	2	4	3	3	4	4	4	4	3	3	3	4	2	2	3	2	3	3	2	2	2	2	1	3	3	3	
3	4	4	4	4	4	4	3	3	3	4	4	4	4	4	4	3	4	4	4	3	3	5	5	4	4	3	3	3	
2	2	3	3	3	2	2	2	2	3	4	3	3	3	4	3	3	3	3	4	3	2	1	3	2	2	4	4	4	
4	3	4	4	4	2	4	4	3	3	4	3	4	4	4	3	3	4	1	2	2	3	4	3	4	4	4	3	4	
4	5	4	4	4	4	4	4	4	4	3	3	3	3	3	4	4	4	1	4	5	5	3	3	4	3	3	3	4	

Main Study Screened Responses for the Items measuring latent Constructs (Continued)

Int	Att					Pu					Pfb					Pc					Sef								
1	2	3	4	5	1	2	3	4	1	2	3	4	1	2	3	4	5	1	2	3	4	5	6	1	3	4	5	6	
4	4	4	4	4	4	3	2	2	4	5	4	5	5	3	3	3	3	4	5	5	4	4	4	3	3	4	4	5	
3	1	2	1	1	4	3	4	3	4	4	3	3	4	4	5	5	4	3	1	4	4	2	5	5	4	2	1	1	
2	4	4	2	2	2	1	1	1	1	2	1	1	3	2	2	2	3	4	3	4	2	2	4	5	5	4	1	4	
2	2	2	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	3	5	3	2	3	2	2	2	2	2	2	
2	2	2	1	2	1	2	2	2	3	3	2	2	2	2	3	3	3	5	1	2	2	3	3	1	1	3	3	4	
4	4	5	5	3	3	3	3	2	3	2	2	3	2	3	2	2	2	1	3	3	4	2	2	4	4	5	5	5	
3	3	3	3	3	3	3	3	3	4	5	5	3	3	3	3	4	3	1	3	4	3	3	4	4	4	3	2	3	
3	3	4	5	4	2	2	1	2	2	4	3	3	3	3	2	3	3	2	4	3	2	3	5	4	4	5	4	5	
2	3	2	3	2	3	3	3	3	2	3	1	1	4	3	2	3	2	3	3	3	5	3	4	2	2	4	4	4	
4	4	4	4	4	4	3	3	4	4	4	4	4	4	4	4	3	4	3	1	4	3	2	3	4	5	5	5	5	
3	4	4	4	4	3	3	3	3	2	2	5	3	2	2	2	2	2	1	5	4	4	2	1	3	2	2	2	3	
1	1	2	1	1	2	2	1	2	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	3	2	2
1	1	1	1	1	1	2	1	1	5	3	2	4	1	1	3	3	2	2	4	3	2	2	3	5	4	3	3	4	
1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	3	3	3	1	1	1	1	1	1	1	5	5	5	3	4
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1	1	1	1	1	1	1	1	1	1	3	2	2	2	1	1	1	1	1	4	4	3	2	1	5	5	1	1	1	
2	2	4	3	3	5	5	3	3	5	5	4	5	5	3	3	3	3	5	4	5	5	5	4	5	5	2	4	4	
1	1	1	5	3	5	5	5	1	5	3	5	3	3	3	3	3	1	1	1	1	1	1	3	3	3	5	5		
4	2	3	4	2	5	3	2	2	4	2	4	1	2	4	2	3	4	1	1	2	3	3	3	3	3	4	1	3	
1	1	1	1	1	1	1	1	1	2	2	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
2	2	4	3	3	4	2	2	3	4	3	3	3	3	3	4	3	3	1	3	3	4	3	1	4	1	2	3	2	
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	5	4	4	5	4	2	3
2	2	2	1	2	5	5	4	4	2	4	3	3	2	2	2	2	2	2	4	4	2	4	3	4	4	4	4	3	
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3	4	4	4	3	4	3	4	3	2	4	4	4	4	4	3	4	3	3	3	4	4	4	4	4	4	4	4	4	
1	1	1	1	1	3	3	3	3	3	3	3	3	3	3	3	1	1	1	3	3	3	3	3	3	3	3	3	3	
4	4	4	4	4	4	4	4	4	3	3	5	4	4	4	4	4	4	3	4	3	1	1	4	3	2	4	4	4	
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2	2	2	1	1	2	2	2	2	2	3	2	2	2	2	3	2	3	3	2	3	3	1	4	2	2	3	2	3	
3	4	5	4	4	5	5	5	5	3	5	4	5	3	3	3	3	3	3	5	5	4	3	3	5	3	3	4	4	
3	3	5	2	3	3	1	3	5	3	3	3	3	1	3	3	3	3	2	3	2	3	2	3	2	3	2	4	4	
4	4	5	5	5	4	3	3	5	5	5	5	5	4	4	4	4	4	5	5	5	5	5	5	5	5	5	3	5	
2	4	4	4	3	3	2	2	3	3	2	3	2	2	3	2	3	4	3	2	4	2	2	2	2	3	2	4	2	
4	4	5	4	3	5	5	4	5	3	3	4	4	4	4	4	4	5	4	1	4	4	3	1	1	2	4	4	4	
1	1	1	1	1	1	1	1	1	5	4	3	4	1	1	1	1	2	3	2	2	1	1	1	5	4	5	5	4	
5	5	5	5	5	5	5	5	5	3	3	3	2	4	4	4	3	2	5	5	5	4	4	2	4	4	4	4	4	
2	2	3	3	3	2	2	2	2	3	4	3	3	3	2	3	4	2	3	3	3	3	3	4	4	4	3	4	4	
2	2	2	2	2	2	2	2	2	4	4	4	2	4	3	2	3	3	1	3	3	3	3	3	3	4	4	3	2	2
1	1	1	2	1	1	1	2	1	3	4	2	2	1	3	2	4	2	1	2	3	4	1	1	5	4	5	2	4	
3	4	3	3	3	3	3	3	3	3	3	3	3	3	4	4	3	4	3	4	1	3	2	3	4	2	3	3	4	3

Main Study Screened Responses for the Items measuring latent Constructs (Continued)

Int	Att					Pu					Pfb					Pc					Sef								
1	2	3	4	5	1	2	3	4	1	2	3	4	1	2	3	4	5	1	2	3	4	5	6	1	3	4	5	6	
4	2	3	2	3	4	4	3	4	3	4	3	4	3	4	2	2	3	2	2	3	4	1	2	3	3	3	3	3	
2	2	1	4	1	2	1	2	1	2	2	2	1	2	2	3	2	3	2	3	2	3	3	2	5	5	5	5	5	
1	1	1	1	1	1	1	1	1	2	1	2	1	3	1	2	1	1	1	2	2	2	2	1	1	2	1	2	1	
5	5	5	5	5	4	3	4	3	5	5	5	4	4	3	4	2	4	3	4	5	3	5	5	5	5	1	1	5	
4	4	4	4	4	5	5	5	5	3	4	4	4	3	4	4	4	3	4	3	4	4	3	5	5	4	3	5	5	
1	1	1	3	3	1	2	1	1	5	5	5	5	1	3	1	1	1	1	2	3	5	1	1	3	3	5	5	3	
5	5	5	4	4	4	4	4	4	3	5	4	4	5	4	3	3	2	1	3	4	1	1	2	4	4	2	1	1	
1	1	1	2	2	1	1	2	1	2	3	1	1	2	3	3	2	3	2	2	4	3	2	2	3	2	3	2	3	
1	3	2	3	3	1	1	1	1	2	2	2	2	2	1	2	2	2	1	1	3	2	1	1	3	1	3	3	2	
3	3	4	4	4	3	3	4	4	3	4	4	3	4	4	4	4	4	3	3	3	3	2	4	4	2	4	4	4	
4	3	4	4	4	4	3	3	2	4	4	4	4	4	3	2	4	4	4	4	3	4	4	3	3	4	1	3	2	
4	4	4	4	3	3	3	2	3	2	3	3	3	4	4	2	3	3	3	4	3	2	3	1	5	4	5	5	5	
3	3	3	3	3	5	5	5	5	3	3	3	3	3	3	3	3	3	3	3	4	4	4	4	3	5	5	1	1	1
2	2	3	2	4	2	3	2	2	3	3	3	3	2	4	2	2	1	3	3	3	3	4	2	4	3	3	2	3	
3	3	2	4	2	1	2	2	3	3	2	4	3	3	3	2	4	2	3	2	3	2	3	4	3	3	2	4	3	
2	2	4	5	5	2	4	2	5	3	2	4	4	2	4	4	4	4	3	4	4	4	3	2	2	3	5	5	5	
1	1	1	5	3	1	1	2	1	1	4	4	1	5	1	3	2	2	3	1	5	5	1	1	5	1	1	1	1	
5	5	5	5	5	5	5	4	5	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	2	5	5	5	3	
1	1	2	4	1	1	1	1	1	1	1	1	1	2	5	5	5	5	3	4	3	2	1	1	3	3	5	5	5	
2	2	2	2	2	2	3	3	3	4	4	2	3	4	3	2	4	4	1	3	3	4	3	4	3	4	4	4	4	
3	3	3	1	1	3	1	1	2	3	3	4	3	3	3	4	3	3	3	3	3	3	3	3	4	4	4	4	4	
2	2	2	3	3	3	4	3	3	1	3	1	3	4	4	2	3	2	1	3	2	4	5	5	1	1	5	5	5	
2	3	4	3	2	3	2	2	3	2	3	3	4	2	3	3	3	3	3	4	2	3	2	3	4	2	3	3	4	
4	4	3	5	4	4	3	3	3	3	3	3	3	4	3	3	3	3	3	4	4	5	2	3	5	5	5	5	5	
3	3	2	4	3	4	4	2	4	2	2	3	3	2	2	2	2	2	2	2	2	2	2	1	1	5	4	3	2	2
4	4	5	2	2	2	1	5	2	4	2	2	4	2	2	2	3	4	2	2	4	4	4	2	2	4	4	4	4	
4	4	3	3	3	2	2	3	3	3	2	2	3	3	3	3	3	3	2	3	4	3	2	3	3	2	4	4	4	
4	3	3	2	5	4	4	3	3	3	5	3	4	4	2	2	3	2	4	2	3	5	3	5	3	4	4	3	5	
4	4	3	4	4	5	3	4	4	2	3	2	2	4	4	3	5	4	4	5	4	5	5	2	4	3	3	5	3	
2	1	1	5	1	1	2	3	5	4	3	4	5	3	1	5	2	4	2	1	1	5	3	2	3	2	2	5	3	
4	4	4	3	3	4	3	3	3	4	5	5	4	3	4	4	4	4	5	5	4	3	2	2	3	2	5	4	5	
3	2	4	4	4	5	1	1	1	1	1	1	1	3	4	4	2	3	3	1	1	1	2	1	3	4	4	3	4	4
3	3	4	3	2	2	2	3	3	3	4	4	3	3	3	4	4	3	3	2	3	3	2	3	2	4	4	3	4	4
3	4	4	3	3	4	4	3	4	4	3	4	2	2	4	4	4	3	3	5	5	3	2	4	3	3	4	4	4	
3	3	2	2	2	3	3	3	3	1	2	3	2	3	3	4	3	3	3	4	4	4	1	1	3	3	2	3	3	
5	5	5	5	5	5	5	5	5	3	4	4	4	5	3	3	3	2	4	4	3	3	3	5	3	5	3	5	4	
1	1	3	3	2	1	1	3	4	1	1	1	4	4	4	3	1	3	4	1	2	5	3	5	5	5	3	1	1	
1	1	3	5	1	1	1	3	4	5	3	3	2	3	1	2	4	4	1	4	2	2	5	5	5	3	3	1	3	
3	3	3	3	3	3	1	2	3	2	2	5	5	2	2	2	3	3	5	3	1	4	3	5	4	2	3	4	2	
2	3	2	3	2	2	2	2	3	3	3	2	4	4	3	4	4	3	3	3	4	2	2	4	5	4	4	3	4	

Main Study Screened Responses for the Items measuring latent Constructs (Continued)

Int	Att					Pu					Pfb					Pc					Sef									
1	2	3	4	5	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	5	6	1	3	4	5	6			
3	4	4	4	4	4	4	4	3	4	4	4	4	2	4	2	3	3	3	3	3	3	3	3	4	4	4	4	4		
4	4	4	4	4	5	3	3	3	4	5	3	4	4	4	4	4	3	3	4	3	3	4	3	4	3	4	4	4		
1	1	1	2	2	2	1	1	1	3	4	2	3	3	4	4	4	3	2	2	2	3	4	3	2	3	4	3	4		
1	1	1	1	1	2	2	2	2	3	5	2	3	3	3	3	3	1	1	3	3	5	1	1	5	3	5	5	5		
3	2	2	3	4	4	3	3	3	3	5	4	2	2	4	4	3	3	2	4	4	4	1	5	4	2	4	4	5		
1	2	5	5	3	3	3	4	1	1	5	5	3	1	3	4	3	5	1	3	4	1	3	1	5	5	5	5	5		
3	3	2	1	2	2	3	2	3	3	4	3	3	3	3	3	3	3	2	2	3	2	1	1	3	3	3	3	4		
4	2	3	5	3	2	1	2	3	3	4	2	3	3	3	4	4	4	3	2	2	3	2	4	5	4	4	1	1		
4	4	3	4	5	4	5	5	4	4	4	4	3	4	4	5	4	3	4	4	3	4	5	4	3	4	3	4	3		
1	1	1	1	1	3	3	2	3	1	1	4	2	2	2	3	2	2	1	1	1	1	1	1	1	1	1	1	2	3	
5	4	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	5	5	4	3	4	4	3	5	4	4	4	4	
1	1	1	4	2	1	1	1	2	2	2	2	4	2	2	2	2	3	1	2	2	3	2	2	4	2	4	4	4	4	
1	2	4	1	1	4	4	4	4	4	3	3	5	5	5	3	4	3	2	5	4	4	5	3	5	4	4	5	5	5	
3	4	3	3	3	3	4	3	4	4	4	3	3	3	3	3	3	3	2	2	2	2	2	2	4	3	4	4	4	4	
4	5	4	3	3	5	1	5	3	3	3	5	2	4	4	3	2	5	3	3	4	2	4	3	3	2	4	2	4	4	
4	4	3	4	3	4	5	5	5	4	4	5	4	4	4	4	3	4	4	3	5	5	3	3	4	4	4	3	5	5	
3	2	4	4	4	4	4	3	4	4	4	4	4	3	4	4	4	4	2	3	4	3	4	4	3	4	5	5	4	4	
1	1	3	4	3	2	1	1	4	3	4	2	2	3	4	3	2	2	1	1	1	3	2	3	3	3	3	2	3	3	
3	4	3	4	3	3	3	4	4	2	3	3	3	3	4	2	3	4	1	3	4	3	2	3	4	5	4	3	3	3	
4	3	4	4	4	4	3	4	4	5	5	5	4	5	5	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
4	4	3	1	3	3	3	1	1	4	3	3	2	3	4	2	4	2	3	3	4	3	2	4	2	3	4	3	4	4	
4	4	3	1	3	3	3	1	1	4	3	3	2	3	4	2	4	2	3	3	4	3	2	4	2	3	4	3	4	4	
2	2	3	3	3	3	3	3	4	4	4	4	3	3	4	2	3	3	3	5	4	2	1	3	5	5	3	4	5	5	
5	4	4	4	5	5	5	3	5	4	4	5	3	5	4	4	5	4	5	5	3	5	5	5	5	5	3	5	5	4	
1	1	1	1	1	1	1	1	1	2	2	2	2	4	1	1	2	1	3	2	2	2	4	2	4	4	2	2	2	2	
3	4	3	3	4	4	4	3	2	4	3	4	4	3	5	3	3	4	3	3	3	4	3	3	4	3	3	4	3	4	4
5	5	4	5	4	3	2	2	3	1	1	1	1	3	3	3	3	3	3	5	4	4	1	1	5	4	1	1	1	1	
4	4	3	4	4	3	5	5	4	5	5	3	2	5	3	5	4	4	4	3	3	1	4	4	4	4	3	3	4	4	
2	2	2	2	1	1	1	1	2	3	4	4	4	3	3	2	2	1	1	5	3	3	3	2	4	4	4	4	3	4	4
3	4	2	4	3	4	2	5	3	3	4	2	2	2	5	3	4	4	2	3	5	3	5	3	2	4	4	4	4	3	
4	5	4	3	3	3	2	4	3	4	2	4	3	3	4	3	2	4	2	3	4	4	4	5	4	4	3	1	2	2	
1	1	1	4	2	2	1	2	2	3	3	3	3	3	3	3	2	2	3	4	4	5	1	3	1	2	5	4	4	4	
3	2	4	4	3	2	2	2	2	3	3	2	2	2	3	3	3	3	3	4	3	3	4	3	3	3	3	4	4	4	4
1	1	1	1	1	1	1	1	1	3	2	1	3	3	2	2	2	2	1	1	1	1	1	1	1	1	4	4	5	5	5
4	4	3	4	4	4	3	3	4	2	3	4	4	3	2	3	3	2	3	2	3	2	3	2	3	3	3	1	2	2	3
3	3	4	4	4	4	2	4	3	5	4	4	3	4	4	2	3	2	3	4	4	3	2	3	3	4	4	4	4	4	4
4	3	5	3	5	5	4	3	1	5	4	4	5	5	4	4	3	3	3	3	4	3	4	3	4	3	4	5	3	4	3
2	2	2	3	2	4	4	4	4	4	4	4	4	3	4	3	3	4	4	1	3	4	3	5	5	4	4	3	2	4	4
4	3	4	4	4	4	4	4	4	4	4	4	3	4	4	4	4	3	4	4	3	5	3	4	3	3	4	5	5	4	4
2	4	2	2	5	2	4	2	5	1	5	2	3	2	3	2	4	4	3	3	3	4	1	5	5	1	5	1	4	4	4

Main Study Screened Responses for the Items measuring latent Constructs (Continued)

Int					Att				Pu				Pfb				Pc						Sef								
1	2	3	4	5	1	2	3	4	1	2	3	4	1	2	3	4	5	1	2	3	4	5	6	1	3	4	5	6			
4	3	3	4	3	4	4	3	3	4	4	1	3	3	4	3	4	4	2	3	4	2	2	3	4	4	4	3	4			
1	1	2	1	2	1	1	2	2	4	4	5	4	3	3	3	3	4	4	5	2	5	3	2	4	4	1	3	1			
3	4	4	4	3	4	3	3	3	4	4	4	4	3	3	4	4	4	3	3	3	3	4	4	4	4	4	4	5	5		
3	3	1	3	1	3	1	1	3	1	3	3	3	3	3	3	3	4	4	2	1	3	2	2	1	1	1	3	2	1		
3	4	4	1	4	4	2	1	4	4	2	4	3	5	3	2	5	4	3	4	1	4	5	3	4	2	3	2	5			
3	4	4	4	4	4	3	4	3	5	4	3	4	5	4	3	4	4	3	3	3	3	3	3	4	4	4	4	4	4		
4	3	3	5	5	4	5	2	4	4	3	5	5	3	5	1	3	3	5	4	2	5	3	5	3	5	4	3	3			
2	1	4	4	4	3	2	1	3	5	3	3	3	3	3	4	2	5	4	1	3	1	4	4	3	3	2	1	5	4		
3	3	3	3	3	5	5	5	5	3	3	3	3	3	3	3	3	3	3	3	4	4	2	4	2	3	3	4	3	3		
4	2	2	3	3	1	4	3	4	1	3	3	3	3	1	3	3	3	3	3	3	3	3	3	3	3	3	3	4	2		
3	4	3	3	3	3	4	4	3	3	2	2	2	3	3	4	4	2	2	3	2	2	3	4	3	3	4	3	3	3		
5	5	5	2	1	5	4	3	2	3	5	1	1	5	1	2	2	5	2	4	2	2	5	1	3	5	1	4	3			
3	3	3	3	3	3	3	4	3	1	3	3	3	3	3	2	3	3	2	1	1	3	4	1	1	2	3	3	3	3		
1	3	3	3	3	4	3	5	5	3	1	4	2	4	5	4	3	3	4	4	2	3	3	2	4	2	5	1	3			
4	4	4	4	4	3	3	4	4	3	4	4	4	4	3	4	4	4	2	3	2	3	4	4	4	3	4	4	4	3		
2	2	4	5	5	5	4	4	5	4	5	5	5	4	5	3	3	4	4	4	5	3	5	5	3	4	5	5	5	5		
3	3	4	4	4	4	4	3	4	3	3	4	3	3	3	4	4	3	3	4	3	3	3	3	2	2	4	4	5	5		
4	3	2	5	2	4	2	3	3	3	5	4	2	4	2	4	5	1	3	3	4	2	5	2	3	2	4	3	2	4	3	
2	3	2	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4	1	5	4	3	2	4	5	3	5	5	5	5	5	
2	4	4	3	2	5	4	4	3	2	2	4	2	3	3	3	3	4	1	1	1	1	1	1	1	1	1	1	1	1	1	
3	3	3	4	3	3	4	4	4	3	4	4	3	4	3	2	2	2	2	3	3	2	2	2	3	3	3	3	3	3	3	
2	2	4	5	5	5	4	4	5	4	5	5	5	4	5	3	3	4	4	4	5	3	5	5	3	4	5	5	5	5	5	
3	4	4	4	5	4	3	4	4	2	3	3	4	3	2	4	1	4	4	3	5	1	3	4	4	4	4	5	5	4	4	
4	2	3	2	3	4	2	3	3	4	3	3	4	4	2	4	5	2	3	4	3	3	3	5	5	4	4	4	4	5	5	
4	3	4	4	4	5	3	4	3	5	4	5	5	3	5	4	3	3	2	2	5	5	5	5	3	3	3	3	3	3	3	
1	1	5	5	4	5	4	3	5	1	5	3	3	4	2	3	2	2	3	2	1	3	2	3	2	3	1	1	1	1	1	
1	1	1	1	1	1	1	1	1	2	2	1	3	1	2	1	1	1	2	2	2	2	1	2	5	4	3	3	1	1	1	
4	4	4	4	4	2	3	2	2	3	2	4	3	2	3	5	4	4	3	3	3	4	3	4	2	3	3	3	2	2	2	
3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	2	3	1	1	1	1	1	1	1	1	1	1
3	4	3	3	4	5	2	3	5	2	2	2	5	5	4	3	4	3	3	2	3	2	4	4	3	3	3	3	3	2	2	
1	5	1	1	5	5	4	3	5	4	3	5	2	4	4	5	5	1	5	3	1	5	4	3	5	3	3	5	2	2	2	
3	4	1	2	4	5	5	5	5	5	4	4	5	4	5	4	4	5	5	5	5	3	5	5	4	5	5	5	5	5	5	
4	5	4	5	5	5	5	4	5	4	3	5	5	5	4	5	5	5	3	2	4	5	5	4	4	4	4	4	5	5	5	
2	3	3	2	1	1	1	2	1	3	4	4	5	2	4	3	3	3	2	4	4	3	5	1	4	3	4	4	4	4	4	
3	3	3	4	2	4	4	3	3	3	3	4	3	2	4	3	4	3	3	4	3	2	2	2	2	3	2	4	3	3	3	
3	3	3	3	3	3	3	3	3	2	3	4	3	2	4	2	4	2	4	2	3	5	4	4	1	5	3	3	2	4	3	3
3	4	4	5	3	2	4	4	4	1	3	5	3	2	3	4	3	3	4	3	3	5	3	3	3	3	3	4	3	5	5	
3	3	3	4	3	4	4	3	4	4	5	3	2	4	4	3	2	4	1	5	5	1	2	1	5	5	5	5	5	5	5	
5	4	4	5	4	4	4	5	5	5	4	4	5	5	5	5	5	5	4	5	4	3	2	5	3	5	3	2	5	5	5	
3	4	2	3	2	5	5	4	4	3	2	5	3	3	4	2	1	3	2	4	2	4	5	3	1	3	3	2	4	4	4	

Main Study Screened Responses for the Items measuring latent Constructs (Continued)

Int	Att					Pu				Pfb				Pc					Sef											
1	2	3	4	5	1	2	3	4	1	2	3	4	1	2	3	4	5	1	2	3	4	5	6	1	3	4	5	6		
2	2	3	3	4	2	2	2	3	3	4	3	3	4	4	3	3	3	3	4	4	3	4	3	4	3	3	4	4	4	
3	4	4	5	5	3	4	3	4	4	4	4	4	3	2	2	2	3	4	4	4	2	4	2	4	3	4	4	4	4	
2	2	2	2	3	1	1	1	1	4	4	3	4	4	4	4	4	4	3	4	3	3	2	2	2	5	5	5	5	5	
4	4	4	5	4	5	4	4	5	4	3	5	4	4	4	4	4	4	5	5	5	5	5	5	4	4	4	5	4	4	
3	4	4	4	4	2	4	3	4	3	4	3	4	3	4	5	5	5	3	2	3	2	4	1	5	5	5	5	5	4	
2	2	2	2	3	3	4	4	3	2	4	3	2	2	3	2	3	3	3	3	2	3	3	2	3	3	3	3	3	3	
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3	3	5	5	4	5	3	3	4	2	3	4	4	3	3	4	3	3	3	4	3	1	5	4	5	4	5	4	2	2	
3	3	3	3	3	1	1	2	2	3	2	2	2	2	3	2	2	2	2	2	4	4	2	3	4	4	3	3	4	4	
3	3	4	2	4	4	4	3	3	5	5	5	4	3	3	3	2	2	1	1	3	2	3	2	2	3	3	3	2	2	
2	2	2	4	4	2	2	2	2	3	2	2	4	4	4	3	3	3	3	4	4	4	2	3	4	4	2	4	4	4	
3	3	3	4	3	4	4	4	4	3	3	4	3	4	4	4	4	4	4	3	4	4	2	3	5	5	5	5	5	5	
2	3	4	2	3	3	2	2	2	4	4	3	2	3	2	4	3	2	3	4	4	2	1	5	3	3	3	3	3	3	
3	4	5	4	3	4	3	4	4	4	3	3	4	3	4	3	3	4	2	3	4	4	5	4	4	3	5	4	5	4	
3	2	3	4	3	5	5	5	3	4	3	2	4	3	4	4	2	3	3	4	3	4	4	1	2	3	4	2	3	2	
3	1	1	2	3	1	1	1	1	1	1	1	1	2	3	3	3	3	1	3	2	3	2	1	4	3	2	2	2	2	
3	3	4	4	3	4	3	4	4	4	3	2	4	3	4	3	3	5	1	4	3	4	1	1	4	4	4	3	3	3	
3	3	3	3	4	4	3	2	2	4	4	5	4	3	3	4	2	3	5	5	3	4	2	5	4	3	4	3	3	3	
1	1	1	1	2	3	1	2	2	1	1	1	3	3	1	2	2	4	3	4	5	1	5	4	3	5	4	4	4	4	
2	4	3	5	4	4	2	3	2	4	5	3	4	3	3	2	3	3	2	4	3	3	1	2	1	5	4	3	5	5	
3	3	3	3	3	3	3	2	4	3	3	3	3	4	4	4	4	4	3	3	2	3	3	3	3	3	4	4	5	4	
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1	1	1	3	3	2	1	1	3	3	3	3	3	3	5	1	1	1	1	2	3	3	3	3	2	3	2	3	4	3	
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4	5	5	5	3	3	3	4	5	4	4	5	5	5	4	3	3	3	1	4	2	3	1	3	3	4	4	2	2	2	
5	4	4	4	5	5	5	5	5	5	4	4	4	5	5	5	4	4	5	4	4	5	4	4	5	4	4	5	4	5	4

Main Study Screened Responses for the Items measuring latent Constructs (Continued)

Int	Att					Pu					Pfb					Pc					Sef								
1	2	3	4	5	1	2	3	4	1	2	3	4	1	2	3	4	5	1	2	3	4	5	6	1	3	4	5	6	
3	3	4	1	2	1	1	1	1	4	5	3	3	2	2	3	1	3	5	3	3	2	2	4	5	5	5	4	5	
1	4	4	4	3	4	3	3	4	3	4	3	4	3	4	3	3	4	1	4	4	4	4	5	3	4	5	5	5	
2	2	2	2	3	3	3	3	4	4	2	2	2	3	3	3	3	2	4	3	3	2	5	5	5	4	4	4	5	
1	1	2	3	1	3	1	1	2	3	5	2	5	3	4	2	5	3	1	3	4	5	4	1	5	3	2	2	4	
4	5	3	3	5	3	3	2	5	4	2	5	3	2	4	4	4	5	4	5	5	2	5	5	5	4	4	4	5	
2	2	2	5	5	2	2	2	2	2	1	3	4	2	4	5	5	5	5	5	5	3	1	2	2	2	5	5	5	
3	3	2	2	3	3	3	1	1	4	3	3	4	2	3	3	3	3	4	2	4	4	3	3	3	4	4	2	3	
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2	4	3	4	3	4	4	4	4	4	2	4	4	3	4	4	2	4	1	4	4	4	4	4	4	4	2	4	4	
2	2	2	2	3	2	2	2	2	3	4	2	3	3	3	4	4	3	3	4	2	3	3	3	3	2	2	3	4	
3	2	3	5	4	5	3	3	4	1	3	3	5	4	3	2	3	3	2	4	2	3	1	3	3	4	4	2	3	
5	5	5	4	3	5	5	5	5	4	4	3	5	2	4	4	3	5	1	5	5	3	5	5	4	4	5	1	5	
5	5	5	5	4	4	4	4	4	5	4	4	5	3	5	5	4	3	4	3	3	5	5	3	5	5	4	5	4	3
3	3	1	4	5	5	3	3	5	3	5	3	1	4	2	3	3	2	3	5	1	3	2	4	3	1	5	4	5	
2	1	2	2	2	1	1	2	2	2	2	3	3	3	2	3	2	3	3	4	3	1	1	2	2	3	4	4	4	
5	5	5	5	3	3	3	2	3	5	5	4	4	5	1	2	3	2	2	4	4	3	2	3	5	5	4	3	2	
1	1	1	1	1	1	1	1	1	5	3	1	1	4	1	3	1	2	1	3	1	5	1	1	5	5	5	5	5	

