IJPHE International Journal of Private Higher Education

ISSN 2753-4901
Volume 1 | Issue 2 | Winter (Dec) 2022
www.ijphe.co.uk

# Social Media Advertising Persuasion on Mature Students' Buying Behaviour: A Neural Network Validation Approach

**Tayyaba Zia[1],**
**Dr Ruqaiya Javed[2],**
**Sarwar Khawaja[3],**
**Dr Fayyaz Hussain Qureshi[4],**
[1]Research Associate,
Oxford Business College (OBC),
65 George Street, Oxford, United Kingdom
[2]Research Associate,
Oxford Business College (OBC),
65 George Street, Oxford, United Kingdom
[3]Chairman Business Development,
Oxford Business College (OBC),
65 George Street, Oxford, United Kingdom
[4]Head of Research,
Oxford Business College (OBC),
65 George Street, Oxford, United Kingdom
PGR (Doctoral) Supervisor
University of Wales Trinity Saint David (UWTSD)
orcid.org/0000-0003-1305-9493

Correspondence: email Ruqaiya.javed@oxfordbusinesscollege.ac.uk
Copyright © The Author(s). All Rights Reserved. (Published on 23-12-22)

## Abstract

The primary purpose of this study was to examine social media advertising's persuasive power on mature students' purchasing behaviour.

Social Media (SM) has become an integral part of daily life as a source of inspiration, entertainment, shopping, news and information. SM has a profound impact on consumer behaviour. Furthermore, SM allows companies to communicate better with their consumers and strengthen their associations. The advertising world has not been spared by social media influence. Companies are now more careful with social media advertising, significantly predicting consumer responses and behaviour and avoiding unexpected blunders to prevent a viral consumer backlash on networking sites.

This quantitative study aimed to test two hypotheses regarding social media advertising persuasion on mature students' buying behaviour. First, an online survey was conducted using Google Forms to collect data from mature students studying in a private higher education institution in England. Second, we validated the regression results using an Artificial Neural Network (ANN) approach. Data were quantitatively analysed using Statistical Package for the Social Sciences (SPSS) version 26 and RStudio. The hypothesis testing results showed time spent on social media to be significantly associated with social media advertising persuasion. Furthermore, the neural network results confirmed the logistic model and suggested that mature students who found social media advertisements useful, persuasive and helpful in making decisions were more likely to purchase products online. In conclusion, social media advertising is one of the major driving forces behind user purchases of goods and services in the current environment.

Social media advertising was collectively analysed and did not consider the number of different social media types, which could be investigated individually. Furthermore, this investigation only considered mature students in the private higher education sector. However, other traditional students in the public higher education sector with their attitudes toward social media advertising persuasion and their purchase behaviour could also be examined.

**Keywords:** Social Media Advertising, Persuasion, Buying Behaviour, Mature Students

# 1 Introduction

Social Media (SM) has become an integral part of daily life as a source of inspiration, entertainment, shopping, news and information. It has also become one of the most effective digital marketing tools of the recent past, with more companies embracing the power of SM than ever before. Therefore, SM has a profound impact on consumer behaviour. Furthermore, SM allows companies to communicate better with their consumers and strengthen their associations. The advertising world has not been spared by social media influence. Companies are now more careful with social media advertising, significantly predicting consumer responses and behaviour and avoiding unexpected blunders to prevent a viral consumer backlash on networking sites.

In order to achieve business growth excellence for a brand now demands the active involvement of Social Media advertising. Social media advertising reached US$226.00bn in 2022. Furthermore, it is expected to show an annual growth rate (CAGR 2022-2027) of 11.24%, resulting in a projected market volume of US$384.90bn by 2027. In the Social Media Advertising segment, US$384.90bn of total ad spending will be generated through mobile in 2027. In the Social Media Advertising segment, the number of users is expected to amount to 5,851.53m by 2027 (Statistica, 2022). DataReportal (2022) revealed there were 4.62 billion social media users in January 2022 – equating to 58.4% of the global population. Consequently, the above facts indicate the benefits of social media advertising, such as brand awareness, greater return on investment (ROI), fast business growth, less advertising expenditures as compared to traditional advertising, targeted potential consumers, a direct link to purchase (disintermediary) and better image of the business. Last but not least, social media platforms, such as Facebook, YouTube, Twitter, Snapchat, and Instagram, offer considerable opportunities to reach millions of consumers daily.

For the understanding of a nonentity, social media advertising is a type of digital marketing promotion that utilises top prominent social media platforms such as Facebook, Instagram, YouTube, WhatsApp and Pinterest. Social media advertising, a type of paid digital marketing, affects people of all age groups in many different forms and can influence how they think or change their minds about something.

Students' age, experience, and knowledge may be helpful when managing such adverts. Nowadays, there is an immense increase in consumers profiting from digital advertisements; hence, the latter is at its peak and presently has the highest growth rates among all global advertising channels (Aydın, 2016).

Online advertisements come in various formats, such as pop-up windows that appear in front of the currently active screen and display advertisements, floating ads appearing over the webpage, expanding ads with or without hyperlinks, wallpaper ads and many more (Deshwal, 2016). In addition, there are various types of interactive ads on social media, such as counting Canvas Ads (Facebook), Messenger Ads (Facebook and Instagram), Stories Ads (Instagram and Snapchat), Conversational Ads (Twitter), Static Image Ads and Videos Ads, etc. that may serve as a quick and effective way to connect with the target audience, increase particular brand awareness and/or recognition, improve brand loyalty, increase the organic visibility of websites, has wider geographical reach, provide a good source of updated information and many more. In contrast, social media advertisements have their own drawbacks, for instance, the spread of misleading and false information, inundating spam emails and banner ads that may annoy internet users (Mcelfresh, 2003), people's addiction to unnecessary purchasing, etc.

The study is primarily based only on the following social network sites.

**Table 01: The Most popular Social Media Sites included in the Survey**

| Social Media Sites | Brief description |
|---|---|
| **Facebook** | Launched in 2004, become popular in late 2000s, most popular and widely and actively used for social media marketing. Most of the organisations have Facebook accounts. |
| **YouTube** | Launched in 2005, a video sharing platform to upload video and share with others. |
| **WhatsApp** | Realised in 2009 as a messenger, became popular in recent years and now more than 2 billion people in over 180 countries (WhatsApp, 2022) |
| **Instagram** | Launched in 2010, as a free mobile application for capturing and sharing the world's moments on the service |
| **Twitter** | Launched in 2006, to share brief or breaking news and public response to these news |

### 1.1 Social Media Usage In The UK

After the pandemic, UK consumers connected with social media ads even more frequently as social media has become an essential medium for advertisers to connect with online consumers (Johnson, 2022). Besides this, according to the report, since the Covid-19 outbreak began, 15% of UK citizens have boosted their engagement with in-feed social ads to conduct online shopping. In addition, 86% of UK consumers interacted with social media ads in the past 12 months by clicking its hyperlinks (Johnson, 2022).

In terms of individuals' intent to make online purchases, there have been claims that 33% of UK consumers purchase through social media compared to other countries, and 23% of UK consumers use social media to explore new products to buy, with 43% of those users being between the ages of 18 to 24 years, and 47% belongs to 25 to 34 years of age group (Paige, 2021).

Due to the widespread internet accessibility, the UK has 57.6 million active social media users as of February this year, or 84.3% of the country's total population, which is the highest rate of social media users across the globe (Statista, 2022). According to statistics, the number of internet users in the UK has increased to 66.99 million, and the average daily time spent on social media by UK citizens is 2.36 hours (Statistics, 2022).

Furthermore, according to recent research, men and women aged 25 to 34 made up 12.8% and 12.4%, respectively, of the UK's advertising audience, while those aged 45 to 54 made up the least amount of the audience (Dixon, 2022)

### 1.2 UK Mature Students And Social Media

There is no official definition of a 'mature student' (UK Parliament,2021). The term 'mature student' refers to anyone attending college or university after some time out of full-time education (Qureshi et al., 2020). Generally, this will mean students who are over 21 years of age at the beginning of their undergraduate studies or over 25 years of age at the beginning of their postgraduate studies (UCAS, 2020) and up to pensionable age (NUS, 2012). In 2019/20, there were around 254,000 mature undergraduate entrants at UK universities, 37% of all undergraduates. There were 202,000 mature postgraduate entrants in 2019/20, with 50% of postgraduate entrants.

Mature entrants to full-time undergraduate courses have increased to new record levels in 2018, 2019 and 2020. In addition, mature applicants for such courses starting in 2021 are up by 24% (UK Parliament,2021).

Digital technology, including social media, is now pervasive and ubiquitous in the lives of undergraduate students in the UK (Stirling, 2016). It is a common perception that almost all students in higher education UK use some kind of social media.

### 1.3 Artificial Neural Network (ANN)

Life without technology is almost frightening when imagined. The plethora of information and data in various forms is available digitally and is just a click away. Marketing businesses use Artificial Intelligence (AI) to promote their brands to the right audience and understand their preferences on social media platforms.

We witness advertisements every day on social media that are persuasive enough to meet our requirements of exploring and buying things. This is accomplished via AI, fuelled by machine learning and deep learning algorithms that base their predictions on vast data sets.

An Artificial Neural Network (ANN) is a type of computer network based on the natural neural networks that make up the architecture of the human brain featuring interconnected neurons (nodes) spread over numerous levels (Kalita, 2022). It simulates the basic functions of biological neurons. Speech recognition, hashtag culture phenomenon, online customer service, recommendation engines, voice assistance on smartphones, and product recommendations are a few examples of AI. Social media platforms such as Facebook, YouTube, Instagram, Netflix, WhatsApp and many more are AI-powered tools as these platforms collect data and subsequently use image and face recognition algorithms to feature relevant products or brands. Social media networking has advanced too much. From a "virtual location" for making new friends and keeping in touch with old ones, social media has become an essential and powerful tool for marketing and promotion (Prévot, 2021).

> *Artificial Neural Network (ANN) is "a computational model that consists of several processing elements that receive inputs and deliver outputs based on their predefined activation functions."*
>
> *(Eshragh et al., 2015).*

AI regulates pop-up ads on social media related to product marketing which appear, with or without hyperlinks, when we visit different social networking sites. This may have a subliminal effect on prompting students to either search for or make certain purchases as consumers. This online persuasion of social media ads towards students' behaviour regarding buying decisions must be studied profoundly.

Therefore, the purpose of the present study is to determine the persuasive power of social media advertisements among non-traditional (mature) students' purchase behaviour. Furthermore, this study aims to assess the efficiency of social media advertisements and other factors in promoting future buying decisions through mature students' perspectives and validate its predicting power through ANN analysis.

### 1.4 Research Aims And Objectives

The study aims to assess the efficiency of social media advertisements and other factors in promoting future buying decisions through mature students' perspectives and validate its predicting power through ANN analysis.

- To assess the demographic factors and their impact on the perceived efficiency of social media advertisements among mature students.
- To assess the prospective online purchasing/buying as a result of social media advertisement persuasion.

### 1.5 Research Questions

**Q1.** *Do demographic factors (age, gender, study year, and time spent on social media platforms) have an impact on the perceived efficiency of social media advertisements among mature students?*

**Q2.** *Would mature students participate in the prospective online purchasing/buying as a result of social media advertisement persuasion?*

### 1.6 Research Gap

Limited research has been conducted regarding mature students' (consumers) psychology, perception, attitude and persuasion toward social media advertising and buying behaviour, which has produced a research gap; therefore, it is worth studying.

## 2 Literature Review

The academic community remains divided over a universally accepted definition of social media (Šola .and Zia, 2021). Bryer and Zavatarro offered the first definition:

> *"Social media are technologies that facilitate social interaction, make possible collaboration, and enable deliberation across stakeholders"* (2001, p. 327).

One of the broad definitions is:

> *"a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and allow the creation and exchange of user-generated content."* (Kaplan and Haenlein 2010, p. 61)

Many variations and types of social media exist. For example, *"any technology that facilitates the dissemination and sharing of information over the Internet"* (Robbins and Singer, 2014, p. 387). Marketing and communication experts have also described social media as "*a wide range of new generation internet applications*" (Constantinides & Stagno, 2012, p. 44) or, more specifically, *"a web-based service that allows the member to construct a profile and connect with other members*" (Chaffey et al., 2009, p. 11).

It is a type of electronic communication that allows users to create online communities where ideas, information and opinions can be shared among members with common interests (Jobber & Ellis-Chadwick, 2012, Edosomwan et al., 2011, Tuten, 2008) and act as a conversational media (Safko and Brake 2009). This definition best describes the idea of online conversation and interaction between people (Strauss & Frost, 2011) and includes creating and exchanging user-generated content based on any technological systems related to collaboration and community (Joosten, 2012). Consumers increasingly turn to social media to gain knowledge about products and companies (Ahearne and Rapp, 2010; Crittenden, Peterson, and Albaum, 2010; Bocconcelli et al., 2018). Therefore, companies have started to reach out to them through social media.

### 2.1 Social Media Advertisement

Social media usage has increased surprisingly over the past decade, and Facebook has dominated the social media market: almost all organisations, irrespective of their sizes, now use SM platforms for marketing and communication purposes (Šola and Zia, 2021).

Social media advertising appears as an attractive vehicle for augmenting advertising effectiveness. In recent years, the increasingly widespread use of social networking sites has gradually shifted the advertisement platform used by business firms from traditional media to social media.

Social media advertising is a form of digital marketing that involves sending sponsored advertisements to the target audience through social networks like Facebook, Twitter, and Instagram. Ads on social media quickly and efficiently reach the target audience and expand marketing initiatives.

Taylor, Lewin, and Strutton (2011) defined *social media advertising* as "a general term capturing all forms of advertising-whether explicit (e.g., banner advertising and commercial videos) or implicit (e.g., fan pages or firm-related "tweets")-that are delivered through social networking sites."

It is not inaccurate to say that the benefits of social media advertisements outweigh any negatives to some extent. Online advertising is far less expensive than traditional advertising, has a considerably more vast audience, and almost certainly generates more revenue (Deshwal, 2016). Social media platforms, the most crucial area for social media ads (Cabigting et al., 2022), eventually have become one of the most accessible virtual platforms for consumer usage in various forms, such as a marketing tool for small and large businesses. However, it has been reported that the influence of traditional word of mouth still regulates consumer response more positively than social media platforms (Alalwan et al., 2016). It has been stipulated that social media advertising has attracted much attention and evolved into a potent form of business communication as a result of the increased accessibility to the internet (Cabigting et al., 2022).

## 2.2 Social Media Advertisement Persuasion And Engagement

Social media advertising allows marketers to select social networking sites to reach potential customers and predict customers' attitudes toward buying. Hence, marketing practitioners actively explore persuasive messages to change customers' attitudes in social media. The most commonly used dictionaries (Oxford, Cambridge, Merriam-webster) define persuasion as the action or process of persuading someone or of being persuaded to do or believe something, a kind of influence. Persuasion is typically defined as "human communication that is designed to influence others by modifying their beliefs, values, or attitudes" (Simons, 1976, p. 21).

Before marketing products online, it is critical to comprehend the viewpoint and demands of the buyer as their attitudes may depend upon the types of digital advertising. Therefore, researchers have assessed various forms of digital ads and found mixed results. For example, Internet users have been negatively impacted by new types of email marketing, mobile advertisements, and banner adverts, whereas several studies have discovered positive sentiments about new forms of digital advertising (Barutçu, 2007; Ünal et al., 2011).

The type of social media ads and how they are presented virtually may have different impacts on the consumers to persuade or dissuade them in different ways. For instance, consumers are drawn to web-based advertising messages, known as pull ads. On the other hand, campaigns, and advertisements through emails, magazines, radio, etc., push the content to the consumer and are considered push-type messages (Schlosser et al., 1999).

Digital Marketers exuberantly integrate social media into their advertising campaigns to propel digital engagement. For example, stating, "digital engagement is key to us," sports brand Adidas recently announced it would focus its marketing efforts exclusively on digital and social channels (McCarthy 2017). The effectiveness of such digital engagement campaigns with social media is monitored through Key Performance Indicators (KPIs), such as the number of likes, shares, comments, opens, views, followers, or clicks, as indicators of the level of engagement or valence of engagement (positive or negative comments). Therefore, digital marketers use various KPIs to select Social Media Influencers (SMIs) and measure the outcomes (Fay & Larkin, 2017; Peters et al., 2013).

Researchers and practitioners have been endeavouring to understand, define, and build customer engagement. Consequently, a consensus definition is "an intimate long-term relationship with the customer" (EIU, 2007a, b, c, d). The interactive nature of social media allows sellers to share and exchange information about their brands with customers and allows customers to share and exchange information with them. Using social media, companies can develop relationships with existing and new customers.

Social Media engagement is very context-specific and consists of varied experiences on each social media platform, allowing for a distinctive user experience. Additionally, the experiences associated with advertising evaluations vary depending on the platform.

It is further demonstrated that the relationship between social media participation and advertising assessments depends heavily on one's interaction with social media advertising (Voorveld et al., 2018).

Social media advertising is a powerful marketing strategy for spreading the word about goods/products, and services. In this situation, social media advertisements are preferable to online advertisements for a brand's visibility. However, many people have doubts regarding the effectiveness of advertising. They think advertisements are bothersome and would prefer to bypass them without hesitation (Sociallybuzz, 2022).

User engagement is significantly impacted by social media advertising, which is more interactive and captivating than traditional advertising. Social media users can interact with adverts by liking, sharing, and commenting. It has been reported that 49% of internet users think they are inclined to buy from companies they see adverts, according to Global Web Index (GWI) (Sociallybuzz, 2022).

In addition, social media is prevalent among younger demographics, and internet users in fast-growing economies are often younger than most established economies. The GWI confirmed that the Philippines is the leading country in the world that spends the most time on social media globally. This spent time record was four hours higher than 44 other countries in the world, followed by Brazil, with an average of three hours and 45 minutes, whereas digital consumers spend only an average of two hours and 23 minutes per day on social networks and messaging. From a high of 4 hours in the Philippines to far lower rates of roughly 1 hour 15 minutes in several European countries, this explains why the toplines figures for daily time spent on social media vary significantly among countries.

Social media advertising allows marketers to select social networking sites to reach potential customers and predict customers' attitudes toward buying. Hence, marketing practitioners actively explore persuasive messages to change customers' attitudes in social media.

### 2.3 Online Buying Behaviour Of Students

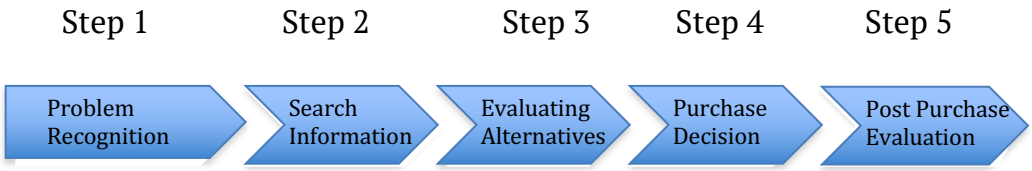
Consumer buying decision-making has long been of interest to researchers. The contemporary definition of the consumer behaviour:

> "consumer behaviour..... is the study of the processes involved when individuals or groups select, purchase, use or dispose of products, services, ideas or experiences to satisfy needs and desires." (Solomon, et al. 2006, p6).

Social media has become one of the essential tools for businesses to connect with customers. Social media is vital for many reasons. First, it allows people to connect with others who share their interests and passions. Second, it also allows businesses to reach out to potential customers. In broad terms, the decision-making process comprises three stages, i.e., awareness, consideration, and conversion.

From buying to consumption, consumers pass through different stages that form the consumer's purchasing decision-making process (Belch and Belch, 2003).

*Figure 1. The 5-Stage Decision Making Model*




Source: (Silverman2001). Authors simplified the model

Problem recognition arises when consumers recognise that they have an unfulfilled need (Hoyer & MacInnis, 2010) or a desire for something new and eventually activate the decision process (Solomon, Bamossy and Askegaard 2006). Internal or external stimuli might cause needs. Social, cultural, reference groups and environmental factors affect problem recognition (Hawkins & Mothersbaugh, 2010). After the problem is recognised, consumers start seeking information.

Two types of information sources are available – internal and external (Belch & Belch, 2003). The decision-making process section is exciting, and the last section converts consumers into loyal customers if they are happy with the product or service they used; if not, they leave the company. Social media is essential to the decision-making process (Weinberg, 2009; Zarrella, 2010).

E-commerce has gone mainstream after a decrease in physical shopping in stores (Paige, 2021) during and after the coronavirus pandemic. Nowadays, practically every age group of customers uses internet shopping as a popular and fascinating payment method. This contemporary method of purchasing not only meets consumer needs but also offers advertisers a sizable market to boost sales. Advertisements of the company's products on social media platforms are viewed and used as a mode of purchase, which benefits consumers and businesses (Yeo et al., 2020).

A link between social media marketing and purchase intentions has been found, confirming that perceptual social media online advertisements significantly influence purchase decisions (Cabigting et al., 2022). The advertising indicates the product's key features to persuade customers to buy the product. Such social media advertising elements positively affect customer purchase intentions and increase the potency of advertisement appeals to consumers (Latifa & Calicioglub, 2020).

Online shopping, a type of e-commerce that enables the customer to buy products directly from a seller worldwide, has become the utmost revolution in the modern internet age (Tzeng et al., 2020). Factors such as perceived usability, perceived security, perceived privacy, perceived after-sales support, etc., were studied formally. Previous Research studies found a significant association between perceived marketing mix, a combination of price, product, promotion and place to promote products in the market, and perceived reputation and their positive influence on consumers' attitudes toward supporting digital shopping (Jun & Jaafar, 2011). In contrast, financial and non-delivery factors were found to negatively impact consumers' online purchase attitudes (Moshrefjavadi et al., 2012).

In contrast, many studies on students' behaviour towards online shopping showed other factors such as perceived ease of use and perceived enjoyment (Cheema et al., 2013), perceived trust, convenience, perceived website quality, and subjective norm to be significantly influencing their intent to purchase goods digitally (Asheq et al., 2022). On the other hand, information seeking and price consciousness are the two kinds of purchase behaviours found among adolescents (Lester et al., 2005). Moreover, online shopping seems more convenient for students because they do not always have time to go to actual stores due to their busy schedules of studying, working, and socialising. Past studies have attempted to identify purchased products and discover influencing factors of buying behaviour among the student population and found functionality, privacy, trust, company reputation, and perceived value to be the main determinants of their purchasing behaviour. Most online students' purchases include computer, electrical and mobile products (Bashir et al., 2018).

## 2.4 Conceptual Framework

Based on the theoretical structural context and review of literature, the present research work considers demographic variables such as age, gender, year of study and time spent on social media to be the independent variables (IVs) and perceived social media advertising persuasion as dependent variable (DV) as shown in Figure 2.

Moreover, the probability of future online buying behaviour of mature students will be predicted in terms of perceived social media advertising persuasion and other relevant demographic factors. For validation purposes, a simple ANN (single neuron model) will be used to confirm the significant predictors from logistic regression analysis. All predictors will be taken as the ANN model's input neuron followed by single-layered processing elements, and the potential purchase behaviour will serve as the outcome.

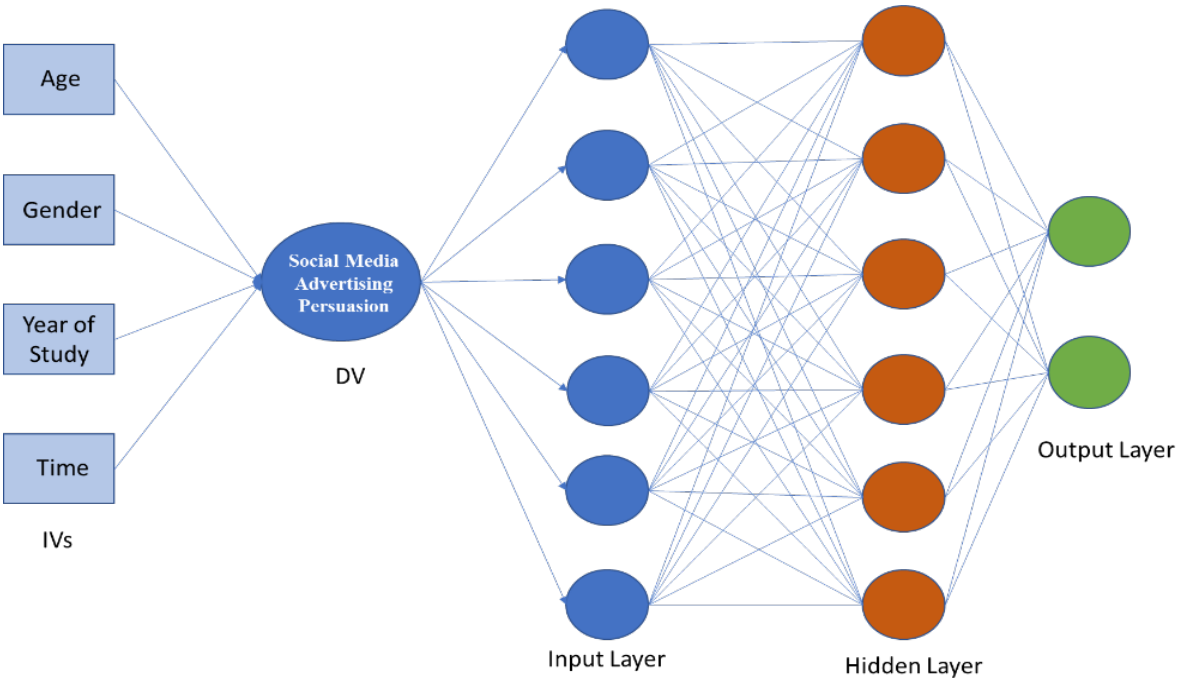



*Figure 2. Conceptual framework of Hypothesis Testing and Multi-Layer Perceptron (MLP) ANN*

### 2.5 Hypotheses

***Ha1.*** *There will be a significant effect of age, gender, year of study and time spent on social media on the perceived efficiency of social media advertisements among mature students.*

***Ha2.*** *The regression coefficients (probability model) to predict the future online buying behaviour of mature students will differ significantly from the null or zero.*

## 3 Methods

In order to attain the objectives of this study, the quantitative research methods were considered appropriate for this study. According to Saunders et al. (2009), quantitative research's primary purpose is quantifying data and measuring the construct of each variable, comparing responses and highlighting correlation.

Furthermore, to assess the demographic factors (age, gender, study year, and time spent on social media platforms) and their impact on the perceived efficiency of social media advertisements and social media advertising persuasion on mature students to buy.

### 3.1 Research Population Sampling And Sample Size

Creswell (2008) defines *the research population* as "the large set of people having similar characteristics". This research study's population is mature students studying in a large multi-campus private higher education institution in England. Saunders, Lewis and Thornhill (2009) define a research sample as "the part of the research population that is broken down in a small section for the given study but which can be generalised to the total population". The research sample of this study was selected through the convenience sampling technique. As Saunders, Lewis and Thornhill (2009) define; convenience sampling is the sampling technique that helps approach the respondents within reach of a researcher. As the researchers are associated with the institution, it was convenient for them to approach respondents easily. The selected sample was comprised of three hundred and ninety mature students.

### 3.2 Survey

The survey Questionnaire was composed of the following sections

1. Purpose and brief introduction of the study
2. Demographic Questions
3. Questions on the use of social media, specifically, Facebook, YouTube, WhatsApp, Instagram, and Twitter.
4. Devices used for social media
5. Categories of Online Shopping-Fashion, Health, Education, Tourism, Transportation, Grocery and Other

Participants were (N=390) mature undergraduate UK students aged 21 years and above. Primary data was collected through online mode using Google forms. In addition, the researchers used a short self-report measuring the impact of social media advertisement for the survey, a demographic sheet, and a few binary questions regarding the online purchase.

### 3.3 Data Analysis

A quantitative research paradigm was used to analyse the data using Statistical Package for the Social Sciences (SPSS) version 26 and RStudio. Descriptive (mean, frequencies and percentages), inferential statistics (t-Test, ANOVA and Binary Regression), and ANN were used to draw inferences and validate results, respectively.

### 3.4 Research Ethics

The participants were assured that their information would be kept confidential and used for research purposes only. The literature was cited correctly with all proper references of work done by researchers.

## 4 Results And Interpretation

### 4.1 Descriptive Analysis

**Table 2.** ***Descriptive Statistics: Age and Gender (N=390)***

| Variables | Categories | F | P (%age) |
|---|---|---|---|
| Age (in years) | 21-30 | 91 | 23.5 |
| | 31-40 | 178 | 45.9 |
| | 41-50 | 98 | 25.3 |
| | 51 and above | 21 | 5.4 |
| Gender | Males | 193 | 49.7 |
| | Females | 195 | 50.3 |

The sample's demographic details showed that the maximum proportion of students were classified as mature students (45.9%) between the ages of 31-40. Additionally, the older group aged 51 years and above was relatively less in number. In our sample, there were more females (50.3%) than males (49.7%), but this difference was not very large (Table 2).

**Table 3. Descriptive Statistics: Year of Study and Time Spent on Social-Media (N=390)**

| Variables | Categories | F | P (%age) |
|---|---|---|---|
| Year of Study | 1st year | 87 | 22.4 |
| | 2nd year | 81 | 20.9 |
| | 3rd year | 186 | 47.9 |
| | 4th year | 34 | 8.8 |
| Time Spent | <1hour | 58 | 14.9 |
| | 1-2hours | 194 | 50.0 |
| | 3-4hours | 97 | 25.0 |
| | >5hours | 39 | 10.1 |

The participants in the sample were selected from different year groups, and the result of descriptive analysis showed that the maximum number of participants belonged to 3rd year of college (47.9). Moreover, the student's maximum time on social media was 1-2 hours every day (50.0%). Only 10% of the participants used social media for more than 5 hours daily.

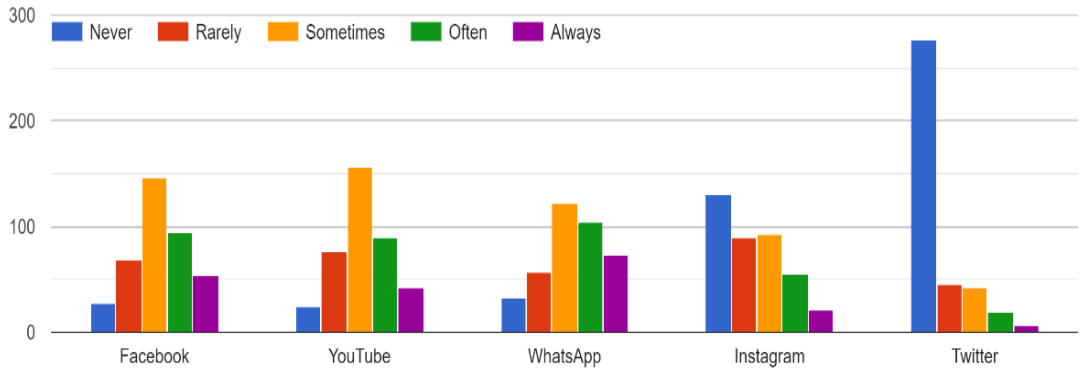



*Figure 3. Weekly Use of Social Media Sites*

The participants were asked about their weekly usage of different social media websites and found WhatsApp to be highly used by most students *(N=73)*, followed by Facebook *(N=54)* and YouTube *(N=42)*. Instagram users were fewer *(N=22)* than those who preferred not to use it *(N=130)*. Twitter was the least used by students *(N=277)* as a social media platform.

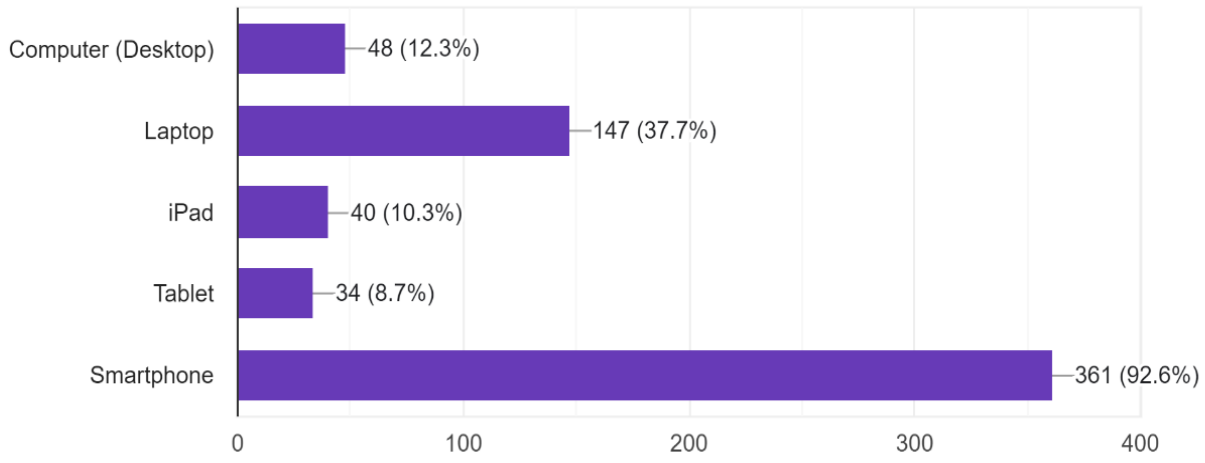



*Figure 4. Devices Used to Connect to Social-Media*

Students preferred smartphones (92.6%) over other devices to visit social media websites. The second most preferred device was found to be a laptop (37.7%). Tablet (8.7%) and iPad (10.3%) were the least preferred devices among the cohort under study.

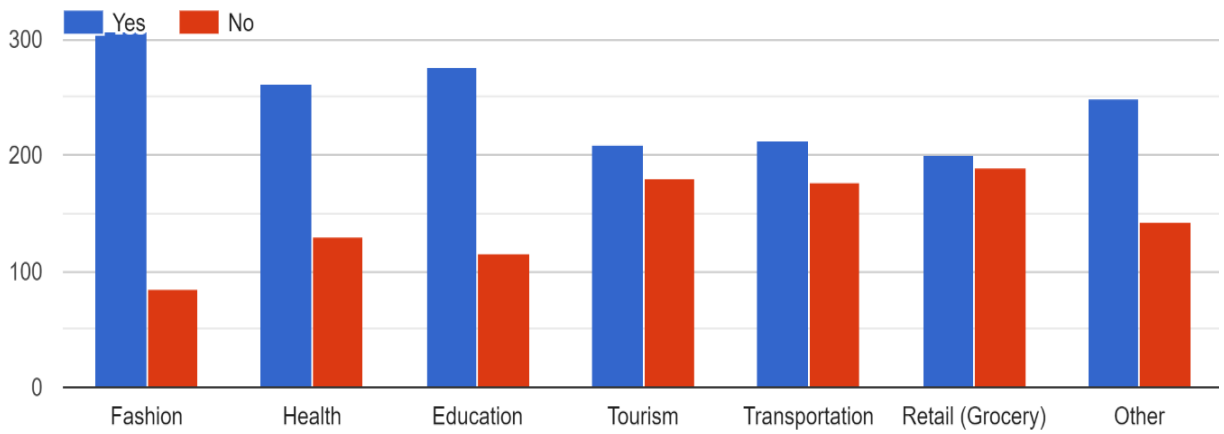



*Figure 5. Online purchase from different industry*

Students were also asked about their preferences related to different industries, and results showed that most students made their purchases from the fashion industry *(N=306)*, followed by education *(N=275)* and other commercial trading business *(N=248)*.

### 4.2 t-Test Results

The t-test results showed that there was no significant difference between the mean scores of male (M=34.24, SD=7.289) and female students (M=34.98, SD=5.834) on social media advertisement persuasion, t (386) =1.106, p = 0.269.

### 4.3 ANOVA Results

The one-way ANOVA results showed no significant differences in age and year of study on social media persuasion. However, a significant effect of time spent on social media on social media persuasion has been found among students, *F (3,384) =4.702, p=0.003*. In addition, the post-hoc analysis indicated a significant difference in mean scores of students who spent less than one hour (*M*=32.24, *SD*=7.047) and more than five hours (*M*=37.05, *SD*=7.940) on social media.

### 4.4 Regression Results

A binary regression (maximum likelihood estimation) was carried out to predict online purchase behaviour among mature students through social media advertisement persuasion.
The data was divided into an analysis sample (60%) and a validation sample (40%). The -2LL (Log Likelihood) significantly decreased to 251.768 after 5 iterations, and Omnibus Test confirmed its significance, $p<0.05$. The Hosmer test was also significant, $p>0.05$, indicating no difference between observed and expected frequencies of future buying behaviours.

**Table 4.** ***Binary Regression Model***

| Variables | β | SE | Wald | df | Sig | Exp(B) |
|---|---|---|---|---|---|---|
| ***Useful*** | .819 | .320 | 6.556 | 1 | .010 | 2.267 |
| ***Decisions*** | .865 | .268 | 10.435 | 1 | .001 | 2.374 |
| ***Constant*** | -3.408 | .937 | 13.244 | 1 | .000 | 0.033 |

**Table 5. Classification Table: Predicting Online Purchase Behaviour**

| Observed | | Predicted | | | | | |
|---|---|---|---|---|---|---|---|
| | | Analysis Sample | | | Validation Sample | | |
| | | *No* | *Yes* | *Percentage Correct* | *No* | *Yes* | *Percentage Correct* |
| **Future Buying** | ***No*** | 37 | 45 | 45.1 | 16 | 33 | 32.7 |
| | ***Yes*** | 12 | 138 | 92.0 | 6 | 101 | 94.4 |
| **Overall Percentage** | | | | **75.4** | | | **75.0** |

The regression results showed that purchase decisions made through social media advertisements and their usefulness were two significant predictors of future buying behaviour among mature students. The logistic regression model was statistically significant for both predictors, $\beta = (0.819)$, $SE=0.320$, $Wald=6.556$, $p<0.05$ and $\beta = (0.865)$, $SE=0.268$, $Wald=10.435$, $p<0.05$. Furthermore, the estimated odd ratio for the usefulness of social media advertisements favoured an increase of future buying behaviour twice than not buying *[Exp(B)=2.267, 95% CI (1.212, 4.243)]* for every one unit increase in social media persuasion perceived as applicable; on the other hand, the estimated odd ratio for decisions made based on social media advertisements also favoured an increase of future buying behaviour twice than not buying *[Exp(B)=2.374, 95% CI (1.405, 4.012)]* for every one unit increase in social media persuasion perceived as helpful in making decisions (Table 4).

The model explained roughly 26.5% (Pseudo Nagelkerke R2) of the variance in future buying behaviour among mature students and correctly classified and predicted 75.4% and 75.0% of cases, respectively (Table 5).

### 4.5 Neural Network Validation

We worked on a set of non-linear data modelling tools called a computational neural network comprised of input and output layers as well as one or more hidden layers (unobservable network units/nodes).

Artificial Neural Network (ANN) is not considered to be a statistical tool; instead, it served as an additional mechanism in our analysis to verify the precision of our regression predictions. The connections between neurons in each layer had associated synaptic weights (analogous to regression weights), which were iteratively adjusted by the training algorithm and simultaneously minimised the residuals to provide maximum accurate predictions.

The primary justification for utilising ANN is that this method invalidates any violation of significant assumptions of parametric statistical techniques, such as the assumption of normality and linearity, and besides this, it is robust against outliers and small sample sizes. Secondly, the model's errors can be reduced through numerous learning rotations in ANN, and prediction accuracy can be further increased.

In order for the network to learn the hidden patterns in the input data that are represented in the model as the weights of the connections, it must first be trained (Eshragh et al., 2015). Therefore, in our analysis, we repeated the learning process 10 times using Multi-Layer Perceptron (MLP) procedure to get maximised precisions of results. Although this estimation algorithm is slow and time-taking, its accuracy is unmatched. MLP is a supervised learning technique that uses feedforward architectures wherein data mobility is unidirectional (from input nodes through hidden layer of nodes to output nodes). The model's input layer is equivalent to its predictors (metric and non-metric) and output layer is equivalent to its dependent variables (non-metric). The hidden layer's neuron count has an impact on the prediction, accuracy, and execution time of network training. Moreover, to prevent over-fitting and lessen the computational load caused by the model's excessive number of hidden layers, we restricted the inputs to a minimum. Previous researches suggested that trial-and-error (Chong, 2012; Chong et al., 2012), and rules-of-thumb (Blum, 1992) are appropriate to determine the number of hidden nodes in the model. The training set of data (90%) was used to estimate the network parameters, and the testing set of data (10%) was used to prevent overtraining. We did not use any holdout dataset in our analysis which is used to evaluate the final network independently before it is applied to the full dataset as well as any new data.

The neural network results showed a higher error rate for training and testing data. However, these errors can be overlooked since ANN was run 10 times to increase the efficiency of the model (Table 6). The sensitivity analysis showed the normalised importance of each predictor variable. The results indicated that variable 9 (Social media advertisements help make purchase decisions) is ranked 1 among all, with a normalised importance of 94.1%. The second important factor is usefulness (Social media advertisements are useful), and third is persuasive (Social media advertisements are persuasive) (Table 7). The results validated our regression prediction.

**Table 6.** ***ANN: RMSE Values (N= 388)***

| Training | | | Testing | | |
|---|---|---|---|---|---|
| ***N*** | ***SSE*** | ***RMSE*** | ***N*** | ***SSE*** | ***RMSE*** |
| 346 | 181.041 | 0.723 | 42 | 17.883 | 0.653 |
| 343 | 183.772 | 0.732 | 45 | 28.867 | 0.801 |
| 350 | 178.721 | 0.715 | 38 | 12.859 | 0.582 |
| 346 | 190.551 | 0.742 | 42 | 21.552 | 0.716 |
| 356 | 205.958 | 0.761 | 32 | 10.13 | 0.563 |
| 353 | 153.007 | 0.658 | 35 | 13.775 | 0.627 |
| 339 | 185.326 | 0.739 | 49 | 21.879 | 0.668 |
| 347 | 169.749 | 0.699 | 41 | 16.863 | 0.641 |
| 344 | 160.64 | 0.683 | 44 | 21.056 | 0.692 |
| 348 | 190.916 | 0.741 | 40 | 19.504 | 0.698 |
| ***Mean*** | 179.968 | 0.719 | ***Mean*** | 18.437 | 0.664 |
| ***SD*** | 14.690 | 0.029 | ***SD*** | 5.128 | 0.065 |

**Note: SSE=Sum Square of Errors, RMSE=Root Mean Square of Errors**

**Table 7.** ***Sensitivity Analysis***

| **Neural Network (NN)** | **Social Media Advertising Persuasion** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | ***S1*** | ***S2*** | ***S3*** | ***S4*** | ***S5*** | ***S6*** | ***S7*** | ***S8*** | ***S9*** | ***S10*** |
| *NN (1)* | 0.087 | 0.077 | 0.020 | 0.067 | 0.125 | 0.126 | 0.120 | 0.047 | 0.253 | 0.078 |
| *NN (2)* | 0.073 | 0.073 | 0.056 | 0.176 | 0.130 | 0.057 | 0.052 | 0.049 | 0.280 | 0.052 |
| *NN (3)* | 0.052 | 0.026 | 0.102 | 0.143 | 0.177 | 0.121 | 0.076 | 0.030 | 0.198 | 0.074 |
| *NN (4)* | 0.067 | 0.133 | 0.028 | 0.052 | 0.112 | 0.228 | 0.013 | 0.063 | 0.231 | 0.073 |
| *NN (5)* | 0.095 | 0.027 | 0.084 | 0.047 | 0.184 | 0.117 | 0.186 | 0.079 | 0.112 | 0.069 |
| *NN (6)* | 0.078 | 0.089 | 0.093 | 0.113 | 0.141 | 0.126 | 0.077 | 0.052 | 0.170 | 0.062 |
| *NN (7)* | 0.116 | 0.070 | 0.034 | 0.053 | 0.191 | 0.092 | 0.093 | 0.060 | 0.246 | 0.044 |
| *NN (8)* | 0.086 | 0.030 | 0.088 | 0.086 | 0.094 | 0.102 | 0.117 | 0.096 | 0.173 | 0.127 |
| *NN (9)* | 0.083 | 0.078 | 0.090 | 0.122 | 0.110 | 0.091 | 0.106 | 0.073 | 0.168 | 0.078 |
| *NN (10)* | 0.044 | 0.092 | 0.043 | 0.058 | 0.214 | 0.075 | 0.150 | 0.116 | 0.173 | 0.035 |
| **NI (%)** | **38.0** | **33.0** | **33.0** | **44.6** | **71.3** | **55.2** | **49.4** | **32.9** | **94.1** | **34.6** |
| **Ranks** | **-** | **-** | **-** | **-** | **2** | **3** | **4** | **-** | **1** | **-** |

***S1-Attention, S2-Informative, S3-Reliable, S4-Interesting, S5-Useful, S6-Persuasive, S7-Desirable, S8-Product Information, S9-Purchase Decision, S10-Positive Effects on Economy; NI-Normalised Importance***

### 4.6 Hypotheses Testing Results

The study's first objective was to assess the demographic factors and their impact on the perceived efficiency of social media advertisements among mature students.

***Ha1.*** *There will be a significant effect of age, gender, year of study and time spent on social media on the perceived efficiency of social media advertisements among mature students.*

The results of hypothesis testing were partly fulfilled. The first hypothesis was to examine the effects of demographics (age, gender, year of study, and time spent) on social media advertisements among mature students. The ANOVA results were significant and showed an association between time spent on social media platforms and its impact on social media advertising persuasion. Hence, these results support hypothesis Ha1. On the other hand, the second objective was to assess the prospective online purchasing/buying as a result of social media advertisement persuasion.

***Ha2.*** *The regression coefficients (probability model) to predict the future online buying behaviour of mature students will differ significantly from the null or zero.*

The logistic regression results confirmed that future online purchase behaviour is highly impacted by the perceived usefulness of social media advertisements and also the fact that such advertisements help in making better decisions among mature students. These results support Ha2 partly.

## 5 Discussion

We can say that social media advertising persuades users to buy particular products based on the results of this study. This is because social media advertising highlights the best features and discounts of the products, which act as persuasion and make them distinct from other products. Such attractive features of the product persuade the consumer to skip many steps in the decision-making process and rapidly create a purchase intention (Sriram et al. 2021).

The contemporary studies also suggested that perceived informativeness and perceived entertainment are directly associated with the consumers positive attitudes towards digital advertisements (Aydın, 2016; Bauer et al., 2005; Choi et al., 2008; Tsang et al., 2004), and the style of message delivery is different for different social media platforms (Aydın, 2016), which may have an impact on consumers attitude and their purchasing decisions.

Moreover, it is crucial to deliver reliable information timely that is pertinent to its recipient in order to build value and foster favourable attitudes toward advertisements (Milne & Gordon, 1993; Siau & Shen, 2003). Large businesses apply tactics based on the products and its type of services. To some extent, social media advertising product-related information is a primary source of information in all stages of mature students buying decision-making.

The strategies that the companies use depend on the products and services that they offer. Digital advertising is directed to attract consumers' attention to a specific product brand, which ultimately encourages them to make a purchase (Maria et al., 2019). The sellers use various tactical thinking according to the products and services that they supply as any wrong content or misinformation about the brand advertisement can negatively impact the mindset of consumers leading to heavy loss to the seller's company (Cabigting et al., 2022). Therefore, it is important to increase the product brand awareness in the correct way to improve the purchase desire of consumers (Alim et al., 2020). Also, it has been reported that social media usage and demographics are significantly correlated with consumers' impressions of how social media affects brand perception (Jokinen, 2016).

According to a poll comparing online purchases made by different age groups, those 65 years of age and above made the fewest purchases overall which signifies that unlike younger age group (25 to 34 years), people belonging to older the age group have less online buying behaviour (Coppola, 2021).

The literature regarding social media advertisement as one of the influencing factors is still limited with reference to adult learners or mature students' behaviours. Thus, it is important to study the various kinds of social media platforms used and the cognitive impact of such advertisements that persuade non-traditional students to make prospective buying decisions and make them think positively about it as consumers.

This study has successfully verified the effects of social media advertisement persuasion on mature students' purchase behaviour through artificial neural networks, a type of artificial intelligence that can learn from, develop, and adapt to changing situations (Taylor, 2006). We used ANN to verify our results as it is more reliable and capable of making predictions with greater accuracy than linear models (Lai Ying et al., 2013).

In addition, we have also incorporated the demographic variables of gender, age, time spent on social media, year of study, weekly usage of social media, etc. and found that time spent on social media has significant effects on buying behaviour among mature students. Moreover, WhatsApp, Facebook and YouTube have been the widely used platforms among students. These results support Global Web Index (GWI) reports, which suggest on average, 28% of internet users discovered new products as a result of seeing social media advertisements, and 49% of internet users are inclined to purchase from a company they see on social media (Sociallybuzz, 2022). Also, it has been reported that the average score for respondents who were aware of social media commercials, such as those on YouTube, is more than the average score for traditional advertisements (Mercybai & Sahayaselvi, 2020).

The regression results suggested that students who found social media advertisements useful, persuasive and helpful in making decisions were more likely to purchase products online. Past studies supported this result. Several elements, including social influence, self-efficacy, perceived credibility, performance expectancy, effort expectancy, website design, social media, and product delivery, impact consumers' online shopping behaviour (Pandey & Parmar, 2019). On the contrary, researchers studied the effects of customer demographics on variables related to online shopping, such as consumer satisfaction, likelihood of making future purchases, frequency of online shopping, total amount spent, and number of things purchased and found that demographic parameters including age, gender, marital status, family size, and income have a substantial impact on internet purchasing in the east (Nagra & Gopal, 2013)

## 6 Conclusion

Our results also showed that the Fashion industry was mostly used to purchase products by the majority of students. Therefore, branding is the primary element in the Fashion industry. These results were in line with a past study which suggested that Users' attitudes toward social media advertising were found to be influenced by brand consciousness, which in turn affected their behavioural responses to social media advertising and, as a result, their purchase intentions for high-end goods (Chu et al., 2013).

Advertising is one of the major driving forces behind user purchases of goods and services in the current environment. Without advertising, businesses cannot raise awareness of their products and services among the target markets.

Furthermore, it is also found that social media marketing positively influences respondents' purchasing decisions (Mercybai & Sahayaselvi, 2020). We know that advertisements are made attractive to gain the attention of internet users. On the likelihood that a customer would make a purchase, attention-getting details, celebrity endorsements, and emotional appeal all play a significant role. The development of efficient social media marketing and increased customer purchasing intent would benefit from emphasising the characteristics above (Sriram et al., 2021). Therefore, we conclude that our quantitative data demonstrated a strong influence of social media advertising persuasion and its effect on online shopping among older students.

**Funding Statement**
This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

**Declaration of Conflicting Interests**
The authors declare no potential conflicts of interest concerning the research, authorship, and/or publication of this article.

**About the Authors**

**Tayyaba Zia,** Research Associate and Business Lecturer, BA (Psychology and Sociology) EDSML, MSc (Marketing) FHEA (PhD Scholar), Oxford Business College (OBC) 65 George Street, Oxford, United Kingdom.

**Dr Ruqaiya Javed,** Research Associate at Oxford Business College (Psychology) Post-Doctoral Fellow (PDF), Psychology, Indian Council of Social Science Research (ICSSR), PhD. (Psychology), M.A. (Psychology), BA Hons. (Psychology).

**Sarwar Khawaja,** Chairman Business Development, MBA, LLM; Chairman Business Development, Oxford Business College, 65 George Street, Oxford, United Kingdom.

**Dr Fayyaz Hussain Qureshi,** Head of Research, BA, (Economics and Journalism), BSc (Botany, Zoology and Chemistry), MA (English Literature), MBA (Marketing), MBA (Finance), MSc (Internet Technologies), Doctorate in Marketing, PGD (Organisations Knowledge), Oxford Business College, 65 George Street, Oxford, United Kingdom.
PGR (Doctoral) Supervisor, University of Wales Trinity Saint David (UWTSD)

## References

Ahearne, M., & Rapp, A. (2010). The role of technology at the interface between salespeople and consumers. *Journal of Personal Selling & Sales Management, 30*(2), 111–120

Alalwan, A. A., Rana, N. P., Algharabat, R., & Tarhini, A. (2016). A Systematic Review of Extant Literature in Social Media in the Marketing Perspective. In Y. K. Dwivedi, M. Mäntymäki, M. N. Ravishankar, M. Janssen, M. Clement, E. L. Slade, N. P. Rana, S. Al-Sharhan, & A. C. Simintiras, Social Media: The Good, the Bad, and the Ugly Cham.

Alim, M. A., Ara, M., Alam, R., & Ghosh, T. (2020). Does Social Media Advertising Enhance Consumers' Purchase Intention?

Asheq, A., Tanchi, K., Akhter, S., Kamruzzaman Didar, M., & Islam, K. M. (2022). Examining university students' behaviors towards online shopping: An empirical investigation in an emerging market. Innovative Marketing,

Aydın, G. (2016). Attitudes towards digital advertisements: Testing differences between social media ads and mobile ads. International Journal of Research, 1.

Barutçu, S. (2007). Attitudes towards mobile marketing tools: A study of Turkish consumers. Journal of Targeting, Measurement and Analysis for Marketing, 16(1), 26-38.

Bashir, J., Farah, G., Ahmad, M., Ali, J., & Bashir, S. (2018). Online Shopping Behaviours among university Students. 228-242.

Bauer, H. H., Barnes, S. J., Reichardt, T., & Neumann, M. (2005). Driving consumer acceptance of mobile marketing: a theoretical framework and empirical study. Journal of Electronic Commerce Research, 6, 181-192.

Belch, G.E. and Belch, M.A. (2003). Advertising and promotion: an integrated marketing communications perspective. 6th edition Berkshire, England: McGraw-Hill.

Blum, A. (1992). Neural Networks in C++: An Object-Oriented Framework for Building Connectionist Systems. John Wiley & Sons, Inc.

Bocconcelli, R., Cioppi, M., & Pagano, A. (2017). Social Media as a Resource in SMEs' Sales Process. Journal of Business & Industrial Marketing, 32(5), 693-709.

Bryer and Zavatarro (2001). Social media are technologies that facilitate social interaction, make possible collaboration, and enable deliberation across stakeholders (p. 327).

Cabigting, X. C., Marallag, A. D., Mariano, B. P., & Grimaldo, J. R. (2022). The Impact of Online Advertisement on Building a Brand and on Purchase Intention. Journal of Business and Management Studies.

Chaffey, D., Ellis-Chadwick, F., Mayer, R., & Johnston, K. (2009). Internet Marketing. Strategy, Implementation and Practice (4 ed.). Harlow, Essex, England: Pearson Education Limited.

Cheema, U., Rizwan, M. S., Jalal, R., Durrani, F., & Sohail, N. (2013). The Trend of Online Shopping in 21st Century: Impact of Enjoyment in Tam Model. Asian Journal of Empirical Research, 3, 131-141.

Choi, Y. K., Hwang, J.-S., & McMillan, S. J. (2008). Gearing up for mobile advertising: A cross-cultural examination of key factors that drive mobile messages home to consumers. Psychology & Marketing, 25, 756-768.

Chong, A. (2012). Predicting m-commerce adoption determinants: A neural network approach. Expert Systems with Applications, 40.

Chong, A. Y.-L., Chan, F. T. S., & Ooi, K.-B. (2012). Predicting consumer decisions to adopt mobile commerce: Cross country empirical examination between China and Malaysia. Decision Support Systems, 53(1), 34-43.

Chu, S.-C., Kamal, S., & Kim, Y. (2013). Understanding consumers' responses toward social media advertising and purchase intention toward luxury products. Journal of Global Fashion Marketing, 4(3), 158-174.

Constantinides, E. & Stagno, M. C. Z. (2012). Higher education marketing: A study on the impact of social media on study selection and university choice. International journal of technology and educational marketing (IJTEM), 2, 41-58.

Coppola, D. (2021). Online purchasing penetration in Great Britain 2012-2020, by age, Retrieved from: https://www.statista.com/statistics/275972/online-purchasing-penetration-in-great-britain-by-age/

Creswell, J. W. (2008). Research design: Qualitative, quantitative, and mixed methods approaches. Sage.

Crittenden, V. L., Peterson, R. A., & Albaum, G. (2010). Technology and business-to-consumer selling: Contemplating research and practice. Journal of Personal Selling and Sales Management, 30(2), 103–110.

DataReportal (2022) Digital 2022: Global Overview Report' Retrieved from: https://datareportal.com/reports/digital-2022-global-overview-report

Deshwal, P. (2016). Online advertising and its impact on consumer behavior. International journal of applied research, 2, 200-204.

Dixon, S. (2022), Social media audiences in the United Kingdom (UK) 2021, by age and gender. Retrieved from : https://www.statista.com/statistics/507417/share-of-facebook-users-in-the-united-kingdom-uk-by-age-and-gender/#:~:text=Social%20media%20audiences%20in%20the

Economist Intelligence Unit (EIU) (2007a), "Beyond loyalty: meeting the challenge of customer engagement, part 1", Retrieved from: www.adobe.com/engagement/pdfs/partI.pdf

Economist Intelligence Unit (EIU) (2007b), "Beyond loyalty: meeting the challenge of customer engagement, part 2", Retrieved from: www.adobe.com/engagement/pdfs/partII.pdf

Economist Intelligence Unit (EIU) (2007c), "The engaged constituent: meeting the challenge of engagement in the public sector, part 1", Retrieved from: www.adobe.com/engagement/pdfs/execsumadobe1.pdf

Economist Intelligence Unit (EIU) (2007d), "The engaged constituent: meeting the challenge of engagement in the public sector, part 2", www.adobe.com/engagement/pdfs/adobeengage1.pdf

Edosomwan, S., Prakasan, S.K., Kouame, D.J., Watson, J., Seymour, T. (2011) The history of social media and its impact on business, Journal of Applied Management and Entrepreneurship, 16 (3), pp. 79-91

Eshragh, F., Pooyandeh, M., & Marceau, D. J. (2015). Automated negotiation in environmental resource management: Review and assessment. Journal of Environmental Management, 162, 148-157

Fay, B., & Larkin, R. (2017). Why online word-of-mouth measures cannot predict brand outcomes offline. Journal of Advertising Research, 57, 132–143.

Hawkins, D.I., & Mothersbaugh, D. (2010). Consumer behavior: building marketing strategy McGraw-Hill Irwin, Boston

Hoyer, W.D. and MacInnis, D.J. (2010) Consumer behavior.5th edn. London: South-Western Cengage Learning.

Jobber, D., Ellis-Chadwick, F. (2012). Principles and practice of marketing. London: McGraw-Hill Higher Education.

Johnson, M. (2022). 86% of UK consumers engage with ads on social media, Media Shotz UK, Retrieved from: https://mediashotz.co.uk/86-of-uk-consumers-engage-with-ads-on-social-media/

Jokinen, T. (2016). Branding in Social Media and the Impact of Social Media on Brand Image.

Joosten, T. 2012. Social Media for Educators: Strategies and Best Practices. San Francisco: Jossey-Bass.

Jun, G., & Jaafar, N. I. (2011). A Study on Consumers' Attitude towards Online Shopping in China.

Kalita, D. (2022). An Overview and Applications of Artificial Neural Networks. Analytics Vidhya

Kaplan, Andreas M., and Michael Haenlein (2010), "Users of the World, Unite! The Challenges and Opportunities of Social Media," Business Horizons, 53 (1), 59–68.

Lai Ying, L., Hew, T.-S., Tan, G., & Ooi, K.-B. (2013). Predicting the determinants of the NFC-enabled mobile credit card acceptance: A neural networks approach. Expert Systems

Latifa, S., & Calicioglub, C. (2020). Impact of Social Media Advertisement on Consumer Purchase Intention with the Intermediary Effect of Brand Attitude.

Lester, D. H., Forman, A. M., & Loyd, D. (2005). Internet Shopping and Buying Behavior of College Students. Services Marketing Quarterly, 27(2), 123-138.

Maria, S., Pusriadi, T., Hakim, Y. P., & Darma, D. C. (2019). The Effect Of Social Media Marketing, Word Of Mouth, And Effectiveness Of Advertising On Brand Awareness And Intention To Buy. Jurnal Manajement Indonesia (2), 107-122%V 119.

McCarthy, John (2017), "Adidas Chief Casts Doubt on TV Ads: 'Digital Engagement Is Key for Us,'" The Drum, March 17, Retrieved from: http://www.thedrum.com/news/2017/03/17/adidas-chief-casts-doubt-tv-ads-digital-engagement-key-us

Mcelfresh, C. S. M., CA, US), Mineiro, Paul (Los Angeles, CA, US), Radford, Michael (Los Angeles, CA, US) (2003). Method and system for optimum placement of advertisements on a webpage (United States Patent No. Retrieved from: https://www.freepatentsonline.com/y2003/0149937.html

Mercybai, J., & Sahayaselvi, S. (2020). Social Media Advertisements: An Effective Platform for Purchasing Decision.

Milne, G. R., & Gordon, M. E. (1993). Direct Mail Privacy-Efficiency Trade-offs within an Implied Social Contract Framework. Journal of Public Policy & Marketing, 12, 206 - 215.

Moshrefjavadi, M. H., Dolatabadi, H. R., Nourbakhsh, M., Poursaeedi, A., & Asadollahi, A. (2012). An Analysis of Factors Affecting on Online Shopping Behavior of Consumers. International Journal of Marketing Studies, 4, 81.

Nagra, G. K., & Gopal, D. R. (2013). An study of Factors Affecting on Online Shopping Behavior of Consumers International Journal of Scientific and Research Publications, Volume 3, Issue 6

NUS (2012). Never Too Late To Learn Mature students in higher education, Retrieved ffrom:https://www.researchgate.net/publication/301683614_Never_Too_Late_To_Learn_Mature_students_in_higher_education

Paige, J. (2021). *UK shoppers turn to social media to discover and buy new products,Retrieved from:*https://www.retail-insight-network.com/analysis/uk-shoppers-turn-to-social-media-to-discover-and-buy-new-products/.

Pandey, A., & Parmar, J. (2019). A Study of factors affecting consumer's online shopping behavior and their impact on Behavioral Intention. Effulgence-A Management Journal, 17, 101

Peters, K., Chen, Y., Kaplan, A. M., Ognibeni, B., & Pauwels, K. (2013). Social media metrics—A framework and guidelines for managing social media. Journal of Interactive Marketing, 27, 281–298.

Prévot, E. (2021). How AI is revolutionising social media marketing, UCL Finance & Technology Review (FTR), Retrieved from: https://www.uclftr.com/post/how-ai-is-revolutionising-social-media-marketing

Qureshi, F., Khawaja, S., Zia, T. (2020) Mature Undergraduate Students' Satisfaction With Online Teaching During The Covid-19, European Journal of Education Studies, Volume 7, Issue 12

Qureshi, F., Khawaja, S. (2021) Is Covid-19 Transitioning Cash Cows International Students Into Cats?, European Journal of Education Studies, Volume 8, Issue 7

Robbins, S. P., Singer, J. B. (2014). From the Editor—The medium is the message: Integrating social media and social work education. Journal of Social Work Education 50(3): 387–390.

Safko, L., & Brake, D. K. (2009). The social media bible: tactics, tools, and strategies for business success. Hoboken, N.J., John Wiley & Sons.

Saunders, M., Lewis, P. and Thornhill, A. (2009). Research Methods for Business Students. Pearson Education Limited, pp.1-614

Schlosser, A. E., Shavitt, S., & Kanfer, A. (1999). Survey of Internet users' attitudes toward Internet advertising. Journal of Interactive Marketing, 13(3), 34-54.

Siau, K. L., & Shen, Z. (2003). Building customer trust in mobile commerce. Commun. ACM, 46, 91-94.

Silverman, B. G., Bachann, M., Akharas, K. A (2001): Implications of Buyer Decision Theory for Design of Ecommerce Websites, International Journal of Human-Computer Studies, 55.

Silverman, B. G., Bachann, M., Akharas, K. A. (2001), Implications of Buyer Decision Theory

Simons, H., W. (1976), Persuasion: understanding, practice, and analysis, Addison-Wesley Publishing Company

Sociallybuzz. (2022). The Effectiveness of Social Media Advertising in 2022. Retrieved from: https://www.sociallybuzz.com/the-effectiveness-of-social-media-advertising/

Šola, H., M., Zia, T. (2021) Social Media And Students' Choice Of Higher Education Institution, European Journal of Education Studies, Volume 6, Issue 4

Solomon, M., Bamossy, G. J., Askegaard, S., & Hogg, M. K. (2006). Consumer Behaviour: A European Perspective (3rd Edition). Prentice Hall.

Sriram K V, Namitha KP & Giridhar B Kamath | Teresa Villace (Reviewing editor) (2021) Social media advertisements and their influence on consumer purchase intention, Cogent Business & Management, 8:1

Statista, (2022) Social Media Advertising – Worldwide, Retrieved from: https://www.statista.com/outlook/dmo/digital-advertising/social-media-advertising/worldwide

Strauss, J; Frost, R (2011), E-marketing, Boston: Prentice Hall.

Stirling, E. (2016), Technology, time and transition in higher education–two different realities of everyday Facebook use in the first year of university in the UK, journal of Learning, Media and Technology, 2016Vol. 41, No. 1, 100–118

Taylor, B. (2006). Methods and Procedures for the Verification and Validation of Artificial Neural Networks.

Taylor, D. G., Lewin, J. E., & Strutton, D. (2011). Friends, Fans, and Followers: Do Ads Work on Social Networks? How Gender and Age Shape Receptivity. Journal of Advertising Research, 51, 258-275.

Tsang, M. M., Ho, S., & Liang, T.-P. (2004). Consumer Attitudes Toward Mobile Advertising: An Empirical Study. International Journal of Electronic Commerce, 8, 65 - 78.

Tuten, T.L. (2008). Advertising 2.0: Social Media Marketing in a Web 2.0. America: Praeger Publishers.

Tzeng, S.-y., Ertz, M., Jo, M.-S., & Sarigollu, E. (2020). Factors Affecting Customer Satisfaction on Online Shopping Holiday. Marketing Intelligence & Planning.

UCAS (2020). Retrieved from: https://www.ucas.com/undergraduate/studentlife/mature-undergraduate-students

UK Parliament Briefing Report (2021) Mature Students in England, Retried from: https://commonslibrary.parliament.uk/research-briefings/cbp-8809/

Ünal, S., Erciş, A., & Keser, E. (2011). Attitudes towards Mobile Advertising – A Research to Determine the Differences between the Attitudes of Youth and Adults. Procedia - Social and Behavioral Sciences, 24, 361-377. Social and Behavioral Sciences, 24, 361-377.

Voorveld, H. A. M., van Noort, G., Muntinga, D. G., & Bronner, F. (2018). Engagement with social media and Social Media Advertising: The Differentiating Role of Platform Type.

Weinberg, T. (2009) "The new community rules: Marketing on the social web." O'Reilly Media, Sebastopol, CA

WhatsApp (2022), Retrieved from: https://www.whatsapp.com

Yeo, S. F., Tan, C. L., Lim, K. B., & Leong, I. (2020). Effects of Social Media Advertising on Consumers' Online Purchase Intentions. Global Business and Management Research: An International Journal, 12, 89-106.

Zarella, D. (2010), The Social Media Marketing Book, Publisher: O'Reilly ISBN: 978-0-596-80660-6