

## Investigation of social anxiety levels of pre-service teachers using social media by latent profile analysis

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### Highlights

- Research utilized latent profile analysis to evaluate social anxiety in pre-service teachers using social media.
- Identified two distinct social anxiety profiles: low anxiety (77%) and high anxiety (23%).
- Age, socio-economic status, and social media usage did not differentiate social anxiety profile memberships.
- Gender and residence location, notably metropolitan areas, significantly impacted levels of social media anxiety.

### Abstract

This research aims to determine the social anxiety levels of pre-service teachers who use social media using latent profile analysis (LPA) and to reveal whether the covariates (Gender, age, socio-economic status, place of residence, membership durations to social media sites, daily social media usage time, and the number of friends in social media environments) determined in the research are related to profiles. In the descriptive survey study, 249 pre-service teachers formed the study group. The data were obtained using the Social Anxiety Scale for Social Media Users. The social anxiety of pre-service teachers using social media was determined as two profiles: Profile-1 (n = 191; 77%: Low Anxiety) and Profile-2 (n = 58; 23%: High Anxiety). Multinomial logistic regression analysis was performed to determine how covariates differ in profile memberships. As a result of the analysis showed that age, socio-economic status, membership durations to social media sites, daily social media usage times, and the number of friends in social media environments did not differentiate profile memberships. On the other hand, according to gender, it is seen that males experience less social media anxiety than females. In addition, pre-service teachers living in metropolitan cities have less social media anxiety.

**Article Info:** Research Article

**Keywords:** *Latent profile analysis, pre-service teachers, social anxiety, social media*

## 1. Introduction

In an increasingly developing and complex society, professions require interpersonal communication expertise and require more interaction with other individuals while working (Hargie, 1997). The COVID-19 pandemic, which surfaced at the close of 2019, has swiftly and effectively altered our communication habits in line with these changes. Currently, the fact that teachers demonstrate their interpersonal communication skills in the classroom or online environments is an essential indicator of professional competence in terms of preparing students for future life (Olakulehin, 2007). Teachers within the constantly changing and developing information society culture can communicate with students and colleagues in various environments and using these environments correctly and effectively can positively contribute to their professional development (Carpenter & Kurutka, 2014). In educational sense, social networking sites

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are essential elements of online communication in motivating students, interacting with them, giving them feedback, and conducting collaborative online studies. For this reason, current teachers or teachers of the future should be able to recognise students who are increasingly interacting with social media and diversify their teaching activities for them (Hershkovitz & Forkosh-Baruch, 2017). Although numerous educators or researchers incorporate these platforms as supplementary educational tools (Tess, 2013), students in classrooms where these tools are utilized may cultivate a profound sense of social integration and positive perceptions towards their learning experiences (Hung & Yuen, 2010). Hence, social media (SM) plays a crucial role in fostering communication networks. SM also possesses the capacity to alleviate anxiety by yielding positive outcomes like high-quality interactions, social support, and a feeling of inclusion (Seabrook et al., 2016). However, issues that may cause concern, such as interacting with people while using SM, worrying about the access of personal information by others, or not liking the content shared (Alkis et al., 2017; Aktan, 2018), along with SM sharing concerns such as privacy and advertising issues (VanDoorn & Eklund, 2013), have been identified as an indicator of unwillingness to share on SM platforms (Shabahang et al., 2021). In addition, negative interaction and social comparisons in social networks are also associated with high levels of depression and anxiety (Seabrook et al., 2016). These situations can prevent the effective use of technology in education by limiting teachers' safe and efficient use of these environments. Again, using and sharing personal information by the contract sent by some SM sites or applications causes individuals to worry about using such environments. For this reason, the fact that teachers share their knowledge comfortably and trust these sites plays a vital role in their participation in SM activities (Bright et al., 2021).

With the spread of mobile applications and the increase in the possibilities offered by SM applications, individuals can quickly see and comment on their friends' posts (photos, videos, links, music, etc.) (Ellison & Boyd, 2013). In interactions in such environments, the shares of individuals can become permanent, allowing others to think more about these shares. In this respect, while expressions, shares, events, and friendships in face-to-face environments are less risky regarding registrability, SM's situation is becoming different. Individuals' behaviours in face-to-face interaction environments may differ from their SM communications (Keskin et al., 2020). This situation may raise the issue of social anxiety in individuals' use of SM. Weinstein (2018) reported that young people are concerned about conflicts based on miscommunication on SM platforms and how others interpret interactions on SM. On the other hand, online interaction and text-based communication are preferred virtual social phenomena because they have features that trigger social anxiety less and make individuals feel more comfortable (Reid & Reid, 2007; Yen et al., 2012). Online communication is a safety behaviour that socially anxious individuals use to interact more easily with others compared to face-to-face communication (Erwin et al., 2004). In addition, SM can be used as an effective medium for individuals with shame, irritability, reticence and non-interaction characteristics to avoid negative opinions of others about themselves (Avissina & Ayriza, 2019). Because in online environments, thanks to the controllability of social presence and social closeness, SM users can remain invisible while observing the interactions of others (Morahan-Martin & Schumacher, 2003). These individuals can mask physical manifestations of anxiety, such as sweating, shaking, or blushing, which they're concerned might draw attention. They also have an easier time managing aspects of communication like frequency, duration, and timing of responses (Carruthers et al., 2019). In this direction, very little is known about the relationship between SM use, which has an important place in online communication, with social anxiety (Carruthers et al., 2019).

Research has shown that social anxiety can have detrimental effects on both the quality of friendships and academic performance (Biggs et al., 2011; Majeed et al., 2022). Understanding the impact of social anxiety on friendship quality is essential because individuals with social anxiety often struggle to form and maintain meaningful connections with others, resulting in feelings of isolation, loneliness, and a diminished sense of belonging. Furthermore, social anxiety's negative consequences extend beyond social relationships. Demir et al. (2023) conducted a study revealing that social anxiety and participation styles significantly influence

active participation, which, in turn, notably impacts academic achievement. This finding aligns with other research suggesting that individuals with social anxiety face challenges in class discussions, presentations, and group work, ultimately hindering their overall academic performance. Given the profound implications for personal and academic well-being, there has been a growing interest in examining and quantifying social anxiety (Le Blanc et al., 2014). Researchers have dedicated considerable effort to studying and measuring this psychological phenomenon (Liebowitz, 1987; Heidenreich et al., 2011; Bunnell et al., 2013; Keskin et al., 2020). By deepening our understanding of this condition, we can develop effective interventions and strategies to support individuals with social anxiety, thereby enhancing their overall quality of life.

Although studies reveal the relationship between anxiety and SM use, there have been no studies on anxiety related to sharing SM or anxiety related to sharing online content (Shabahang et al., 2021). It is thought that research to be conducted with pre-service teachers of different levels of social anxiety about SM, which has become an essential tool for interacting and collaborating in education, may provide a critical perspective in determining the effective and efficient use of these tools. In this context, determining the social anxiety of pre-service teachers who use SM can increase their capacity to use information technologies effectively in education. Determining how the profile characteristics of pre-service teachers who use SM in terms of their social anxiety levels are distributed and which variables are effective in assigning these profiles can guide their use of ICT in education.

LPA is a statistical technique used to identify latent structures or profiles. This kind of analysis can help group users according to their different profiles in the context of the social anxiety levels of SM users. However, there is limited research in the current literature using LPA to study the social anxiety levels of SM users. While a few studies on social media anxiety have adopted a person-centered approach, as seen in the works of Stănculescu and Griffiths (2022), the majority of research on social anxiety among SM users has employed variable-centered methods. Given that LPA operates on a person-centered approach, it can be instrumental in identifying distinct user profiles and understanding their relationship with factors influencing SM behaviour. LPA allows for the identification of subgroups within social anxiety levels, reflecting the qualitative differences and varied psychological processes among individuals (Wang and Hanges, 2011). In this study, an LPA approach was adopted, which allows the social anxiety levels of pre-service teachers using SM to be examined in subsets of the study group and to be explained with other variables (Lanza & Rhoades, 2013; Asparouhov & Muthén, 2014).

This research aims to determine the profiles of pre-service teachers studying at the faculty of education of a state university and using SM according to their levels of social anxiety. In addition, this study examines the effects of covariates (Gender, age, socio-economic status, place of residence, membership period to SM sites, daily SM usage time, and the number of friends in SM environments) on profiles with different levels of social anxiety. Accordingly, the answers to the following sub-problems are being sought in the research:

1. How many latent profiles can be determined regarding the SM anxiety levels of pre-service teachers who use SM?
2. Do covariates (Gender, age, socio-economic status, place of residence, membership period to SM sites, daily SM usage time, and the number of friends in SM environments) make a difference in profile memberships?

## **2. Literature Review**

### *2.1. Social Media*

A social networking site is a platform where members have unique profiles. These profiles are determined by user-created content, content produced by other users, and system-level data. In addition, these sites contain public links that others can view and navigate. Users can use, produce, and interact with content streams thanks to the links they create (Ellison & Boyd, 2013). SM is used for sharing, content creation,

and information exchange within online communities (Vincent, 2016), and for building social relationships among people (Sadiku et al., 2019). In addition, these environments can provide excellent opportunities for creating new knowledge for individuals who share information (Assegaff, 2016); in this context, knowledge structuring processes based on social interaction can contribute to educational learning. Such opportunities can provide cooperative learning environments for social constructivist understanding. SM tools (e.g. Facebook) are popular platforms for individuals to establish or maintain relationships with each other (Shaw et al., 2015). These environments connect with other sites, resources and people for advertising or any other reason to provide convenience to users (Gürsakal, 2009; Hazar, 2011).

## 2.2. *Social Anxiety*

Social anxiety disorder, as the most prevalent form of anxiety disorder, often takes root at an early stage (Stein & Stein, 2008) with a chronic course, generally starting at adolescence (Solyom et al., 1986). It describes the discomfort and unease individuals feel when they believe they are unable to leave a favourable impression on others (Schlenker & Leary, 1982). Negative appraisals by others in social contexts or most social settings involving interaction can cause individuals to feel upset or irritable (Kashdan, 2007). To evade such unfavourable judgments, individuals might choose to withdraw from real-life social interactions (Alkis et al., 2017). Consequently, social anxiety disorder, a concealed yet enduring disability, emerges, significantly impeding learning and overall well-being (Russell & Topham, 2012). Moreover, social anxiety is understood as a response to perceived threats to one's social standing or reputation (Nesse, 1998). Social anxiety is when an individual experiences a unique and permanent fear. This fear is related to the fact that the person with various social statuses feels that others are critically observing him. In addition, the individual experiences an irrational fear that his behaviour will be subjected to criticism and rejection by other people (Stein & Stein, 2008). This condition is characterised by the fact that a person constantly thinks and perceives that he will be criticised and rejected. Avoidance of these social and performance situations generally affects the individual negatively in professional and social environments, leading to their behaviours deterioration (Murphy & Tasker, 2011). It has been revealed that these individuals experience social anxiety due to the fear of receiving a negative evaluation in their relations with others, and individuals prefer online interaction rather than face-to-face communication (Carruthers et al., 2019). In Kocovski and Endler's (2000) study on social anxiety, it was found that individuals with high social anxiety levels had lower expectations of achieving goals, lower self-esteem, and engaged in less self-reinforcement. The study suggested that negative self-evaluation leads to the belief that others also hold negative views, which contributes to anxiety in social situations. Consequently, individuals with social anxiety are more inclined to prefer online interactions over face-to-face communication.

## 2.3. *Social Anxiety in Social Media Users*

Effective use of ICT in online environments offers economic, educational, and social opportunities. SM plays a crucial role in designing, developing, and evaluating online products. It particularly benefits educational settings by supporting collaborative studies and fostering a social constructivist learning approach. However, if social anxiety processes that hinder face-to-face communication also occur online, individuals may miss out on the potential advantages of online communication. It is important to address and overcome these barriers to fully utilize the benefits of online communication (Carruthers et al., 2019). The emergence of anxiety symptoms and distressing experiences associated with intense SM use, including SM anxiety that may arise especially in individuals (McCord et al., 2014), and how the person is perceived on these virtual platforms will reduce the efficiency and effectiveness of these environments. Of course, the frequent use of these environments outside their intended purpose can also negatively affect learning as a psychological factor. For example, spending too much time in SM environments and passively following SM have been associated with symptoms of social anxiety (Shaw et al., 2015; Vannucci et al., 2017; Silmi et al., 2020). Another research indicates a positive correlation between anxiety on social media (SM) platforms and social anxiety (McCord et al., 2014). Furthermore, it's suggested that a lower level of trust in interpersonal relationships, increased apprehension of adverse judgments, and heightened susceptibility to

emotional injury are linked with the anxiety experienced when sharing content on SM platforms (Shabahang et al., 2021). Mackson et al. (2019) state that one of the most prominent risk factors associating SM use with anxiety and depression is “frequent social comparison”. According to this, it is seen that intense SM use, comparisons in these environments, and unfavourable evaluations are factors related to social anxiety in individuals using SM. To these explanations, research examining the social concerns of SM users indicates that the intensity of SM use has a positive relationship with the level of social anxiety. Still, it is emphasised that factors such as content shared on SM, privacy, interaction, and evaluation are related to social concerns in these individuals (Alkis et al., 2017).

Chen's (2017) research on social networking sites revealed that privacy concerns can reduce positive self-disclosure online. However, this study did not establish a direct relationship between social anxiety and online self-disclosure. In a laboratory study conducted by Carruthers et al. (2019) involving undergraduate students with social anxiety, it was observed that individuals who experienced social anxiety in face-to-face interactions also exhibited significant social anxiety in online communication, impacting cognitive and behavioral processes. A study conducted by Fernandez et al. (2012), examined the potential of Facebook profiles to predict social anxiety levels. According to the study results, Facebook profiles successfully predicted social anxiety levels to a certain extent. The profiles of individuals with high social anxiety showed different characteristics from those with low social anxiety. It has been determined that individuals with high social anxiety tend to interact less socially and be less open through SM. Yildirim et al. (2011) conducted a study examining social anxiety among trainee teachers, and discovered that female students exhibited higher levels of social anxiety than their male counterparts. Moreover, trainee teachers in their first year showed significantly elevated levels of social anxiety compared to those in their fourth year. Despite these findings, no notable differences were observed in the levels of social anxiety based on the kind of education or the specific departments or programs in which the trainee teachers were enrolled.

### 2.3.1. *Shared Content Anxiety (SCA)*

Information sharing is ubiquitous in human societies and significantly impacts individual and group decision-making. The content of the information people shares and how they do it are shaped by social purposes such as gaining influence or showing membership in the group (Zaatri et al., 2021). Shared content includes many types in the form of blogs, wall posts, instant messages, tweets, file sharing, video sharing, photo sharing, and podcasts. These posts can provide an environment and focus for more interaction (Drone & Anderson, 2014). SM platforms that support instant messaging or adopt different sharing strategies offer connections that allow individuals to communicate within themselves and with other SM platforms. These interactions are supported by various communication-oriented features (Ellison & Boyd, 2013). The content shared on SM can be easily accessed by other people who are allowed. SCA refers to the social anxiety caused by content shared by individuals themselves or by other people related to them on SM platforms (Alkis et al., 2017). Eriksson et al. (2020) showed that some features of SM use (for example, the type of content shared and the platforms used) are related to social anxiety in a study in which they examined the relationships between social anxiety and different types of SM use.

### 2.3.2. *Privacy Concern (PC)*

The worry stemming from the potential exposure and dissemination of personal details on social media platforms pertains to privacy concerns. Currently, actions like technology misuse, insufficient privacy safeguards, over-sharing of information, and the distribution of untrue information about oneself or others on the internet pose serious threats to privacy (O’Keeffe & Clarke-Pearson, 2011). Although social and online privacy anxiety is conceptually different fears, both can be activated by internet-based social contexts. Within this framework, the worry about online privacy is primarily geared towards hindering others from unauthorizedly accessing private personal data (Shaughnessy et al., 2017). Specific privacy issues associated with online social networks encompass unintentional release of private information, harm to personal reputation due to spread of false information, unwanted communications and instances of

harassment or stalking, concealed monitoring facilitated by reverse tracking features, exploitation of personal data by external entities, and risks of computer hacking and identity fraud (Boyd & Ellison, 2008).

A study conducted by Yao et al. (2007) examined the factors aimed at predicting the concerns of internet users about online privacy. The study found that individuals who are more sensitive about privacy, less experienced internet users, and certain demographic groups (such as females, younger users, and less educated users) are more likely to have heightened concerns about online privacy. Paine et al.'s research in 2007 scrutinized the perceptions of internet users regarding online privacy apprehensions and their associated responses. The results indicated a substantial level of privacy concerns among users, leading to the deployment of diverse strategies to mitigate them. It was found that users with heightened levels of privacy anxieties typically adopt more comprehensive measures to safeguard their online privacy. Demographic factors such as age, education, and gender also play a role, with older users expressing greater privacy concerns and educated users taking more precautions. Overall, the study highlights the relationship between privacy concerns, privacy-related actions, and demographic factors among internet users.

Upon investigating Facebook users' understanding of privacy matters, along with their perceived advantages and drawbacks of Facebook usage, researchers found that Facebook is heavily ingrained in the everyday lives of its users. The study uncovered that users profess awareness of privacy concerns, yet continue to disclose significant personal details on social media. It was noted that users tend to assign privacy risks to others rather than recognizing these risks for themselves (Debatin et al., 2009). Bright et al. (2021), in the research that examined the effects of consumers' privacy concerns related to SM use on SM interaction, participation and advertising preferences, emphasised that individuals' privacy concerns can reduce SM interaction and participation. However, they also reported that privacy concerns do not prevent individuals from disclosing their personal information online when using SM.

#### 2.3.4. *Interaction Anxiety (IA)*

This dimension encompasses the phenomenon of social anxiety precipitated by engagement and communication, especially with newly acquainted individuals on social media platforms (Alkis et al., 2017). The term 'social activity anxiety' encapsulates the pervasive apprehension encountered in the course of social activities, such as establishing and maintaining dialogues with others (Mattick & Clarke, 1998). The manifestation of social interaction anxiety can often be discerned in an individual's typical cognitive, emotional, or behavioural responses to a variety of contexts necessitating social interaction within groups, such as attending social events, engaging in conversation with a potentially attractive individual of the opposite sex, or articulating personal sentiments (Heimberg et al., 1992). Social interaction anxiety is characterized by the unease felt during encounters and conversations with others, irrespective of their gender, familiarity, or friendship status. Central worries encompass fears of appearing unintelligible, boring, or foolish, uncertainty about conversational content or reactions during social exchanges, and apprehensions of being overlooked (Mattick & Clarke, 1998).

Hung and Yuen (2010) examined the role of social networks in creating practice communities for university students. They found that most participants develop solid social commitment and positive feelings about their learning experience in classrooms where social networking sites are complementary tools. Additionally, Erwin et al. (2004) discovered that while participants acknowledged increased convenience in online interactions, they also expressed heightened awareness around passively witnessing internet communications. They harbored fears of negative evaluations of their online discourse and experienced discomfort when being observed during internet discussions.

#### 2.3.5. *Self-Evaluation Anxiety (SEA)*

This dimension refers to the social anxiety that arises from evaluating and seeing oneself because of what a person thinks about them on SM platforms (Alkis et al., 2017). Socially anxious individuals differ in their expectations of negative evaluation from the online environment compared to face-to-face environments

(Caplan, 2007). Individuals with social anxiety fear embarrassment and negative evaluation (Berman & Schneier, 2004).

#### 2.4. Latent Profile Analysis

Latent Profile Analysis (LPA) is an analytical methodology that categorizes respondents (for instance, individuals with social media anxiety) based on latent attributes that aren't immediately observable, leading to the creation of groups that are homogeneous internally but heterogeneous externally. LPA initiates with a single-profile model and incrementally adds two, three, four, and eventually,  $n$  distinct classes until the statistically optimal model fitting the data is identified (Magidson & Vermunt, 2004). A notable departure from conventional clustering techniques (such as k-means clustering) is that LPA is underpinned by a testable statistical model (Magidson & Vermunt, 2002). This implies that when ascertaining the quantity of latent profiles, we can rely on the fit indices yielded by the LPA analysis, as opposed to arbitrarily determining the number of clusters as in the K-Means method.

### 3. Methodology

#### 3.1. Research Model

The study employed a descriptive survey study, a type of quantitative research method. These kinds of studies scrutinize groups, organizations, techniques, and resources in order to identify, compare, categorize, evaluate, and interpret the components and occurrences that make up various research dimensions (Cohen et al., 2018). In this study, the cross-sectional research design, one of the survey studies, was used. In this type of research, data from a particular subgroup of the population at a particular time is examined. This method collects and analyses data simultaneously (Fraenkel et al., 2012; Creswell, 2012). Cross-sectional studies determine the relationship between variables and can help researchers get a quick idea of the research topic. This research has a cross-sectional design. A survey study was conducted to examine the relationship between SM use and social anxiety.

#### 3.2. Study group

The participants in this study were pre-service teachers enrolled in the education faculty of a public university during the autumn term of the 2018-2019 academic year. From among these pre-service teachers, a sample of 249 social media users was selected using the simple random sampling method. The demographic details of the participating pre-service teachers are provided in Table 1.

**Table 1.**

Demographic characteristics of pre-service teachers using SM

Covariates	Features	n	%	Min.	Max.	SD
Gender	Female	157	63.1			
	Male	92	36.9			
Age				17	38	3.53
Socio-Economic Level	Low	35	14.1			
	Intermediate	205	82.3			
	High	9	3.6			
Membership durations to SM sites	Less than 1 year	22	9.3			
	1-2 years	36	15.2			
	3-4 years	74	31.2			
	5-6 years	31	13.1			
	More than 6 years	74	31.2			
Daily SM usage time	Less than 1 hour	40	16.5			
	1-2 years	102	42.1			
	3-4 years	70	28.9			
	5-6 years	17	7.0			
	More than 6 years	13	5.4			
	Less than 50	36	15.3			

The number of friends in SM environments	Between 50-100	54	23.0
	Between 101-200	56	23.8
	Between 201-400	62	26.4
	401 and more	27	11.5
Place of residence	Big city	162	65.1
	Provincial centre	23	9.2
	District centre	37	14.9
	Village	27	10.8

According to Table 1, when the demographic characteristics of the study participants are examined, it is seen that most pre-service teachers, according to their gender, are females (63.1%), the lowest in terms of age is 17, and the highest is 38 years old. When the membership durations to SM sites were examined, it was found that the participants who used SM for more than six years and 3-4 years were at the same rate (31.2%). The participants who used it for less than one year (9.3%) were less than others. When looking at the daily SM usage periods, it is understood that most participants spent time in these environments for 1-2 and 3-4 hours (42.1% and 28.9%). When looking at the number of friends on SM, it is seen that the proportions are close to each other. However, the number of those with 401 and more friends is 11.5%, and those with fewer than 50 friends is 15.3% less than other groups.

### 3.3. Data Collecting Tools

In this study, the Social Anxiety Scale for Social Media Users developed by Alkis et al. (2017) was used. This scale consists of 21 items and four dimensions. "I feel nervous when making new friends on SM." It is a five-point Likert-type scale consisting of "never" and "always" items based on participants' self-reports. The scale consists of four sub-dimensions: shared content anxiety (SCA), privacy concern anxiety (PCA), interaction anxiety (IA), and self-evaluation anxiety (SEA).

In this study, the Cronbach Alpha internal consistency coefficient of the scale; SCA: .90, PCA: .89, IA: .93, SEA: .84, and total .92. Alkis et al. (2017) also reported a high internal consistency for all dimensions (0.92 for SCA, 0.84 for PCA, 0.88 for IA, and 0.80 for SEA, respectively).

The distribution of responses to the social anxiety scale for SM was examined in the study. The mean and standard deviations of the responses given according to the four dimensions are given in Table 2.

**Table 2.**

Descriptive statistics for social anxiety scale sub-dimensions for SM users

Sub Dimensions	M	SD
Interaction Anxiety	3.07	1.22
Shared Content Anxiety	1.92	0.91
Privacy Concern Anxiety	3.63	1.11
Self-Evaluation Anxiety	2.02	1.10
Total	2.67	0.80

When considering the overall average of responses to the scale as a criterion, and evaluating the answers provided in Table 2, it is observed that the mean scores for Privacy Concern Anxiety and Interaction Anxiety are high. Conversely, the mean scores for Shared Content Anxiety and Self-Evaluation Anxiety are found to be low.

### 3.4. Data Analysis

To determine pre-service teachers' demographic characteristics and social anxiety levels using SM, distribution statistics such as frequency, percentage, lowest and highest values, arithmetic mean, and standard deviation were used for descriptive analysis. LPA was used to determine the latent profiles of pre-



service teachers who use SM regarding their SM anxiety levels. We used the MPLUS program for LPA analysis. Again, multinomial logistic regression analysis was used to determine whether participants' gender, age, socio-economic status, place of residence, membership durations to SM sites, daily SM usage times and the number of friends in SM environments make a difference in their profile memberships.

LPA is a powerful alternative suitable for use under conditions where the observed and latent variables are discontinuous or at the continuous scaling level (Vermunt & Magidson, 2002) and assumptions such as normal distribution, homogeneity, and one-dimensionality are violated. LPA is a probabilistic or model-based technique that is a variation of traditional clustering analysis (Stein et al., 2013). In particular, the observed sample is a mixture of individuals from different latent classes; individuals belonging to the same class are like each other on the assumption that their observed scores on several indicators come from identical probability distributions (Vermunt & Magidson, 2002).

## 4. Findings

### 4.1. The number of profiles of pre-service teachers using SM according to their social anxiety levels

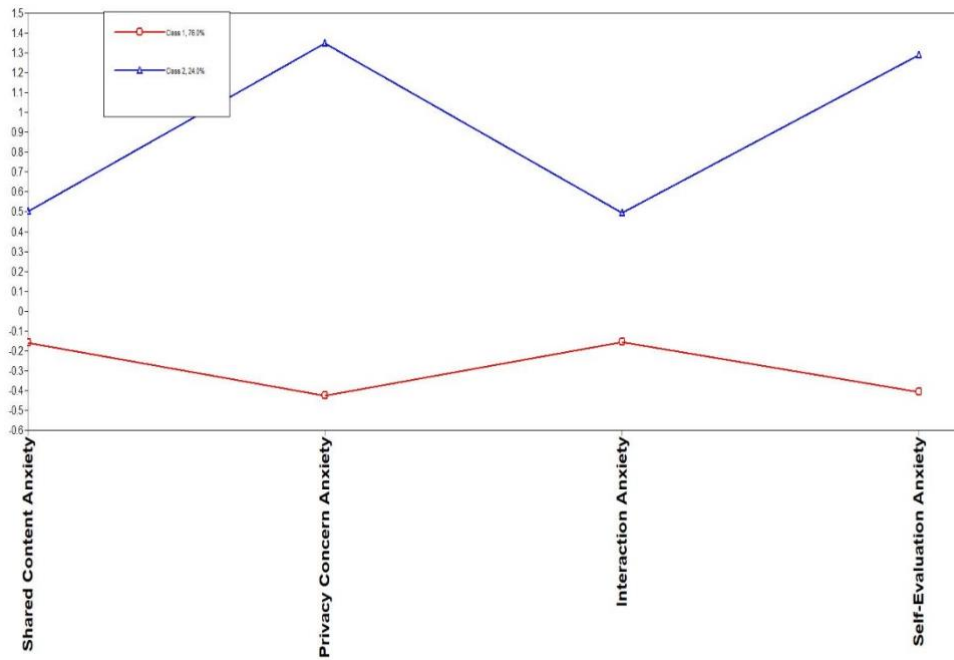
In this study, the following fit indices were scrutinized to ascertain the most suitable model: Akaike Information Criteria (AIC), Bayesian Information Criterion (BIC), Adjusted BIC, Lo-Mendell-Rubin Adjusted Likelihood Ratio Test (LMRT), and Bootstrapped Likelihood Ratio Test (BLRT) (Akaike, 1974; Arminger et al., 1999; Lo et al., 2001; Schwarz, 1978). Besides these fit indices, the theoretical relevance of the classes and the portion of participants embodied in these classes were also factored in (Hipp & Bauer, 2006; Nylund et al., 2007). Lastly, the Entropy value was employed. Entropy, which measures the quality of classification for models encompassing more than one class, can vary from 0 to 1. Values nearing 1 signify superior classification precision (Pastor et al., 2007; Wang et al., 2017).

**Table 3.**

Model fit indices

Number of profiles	AIC	BIC	Adjusted BIC	Entropy	LMRT p-value	BLRT p-value
1	2869.734	2897.970	2872.608	-	-	-
<b>2</b>	<b>2658.737</b>	<b>2704.619</b>	<b>2663.407</b>	<b>0.873</b>	<b>0.0007</b>	<b>0.0000</b>
3	2581.550	2645.079	2588.017	0.788	0.0754	0.0000
4	2523.396	2604.573	2531.659	0.819	0.0201	<b>0.0000</b>
5	2502.613	2601.437	2512.673	0.848	0.0662	0.0000
6	2478.785	2595.256	2490.641	0.865	0.1111	0.0400
7	2426.338	2560.457	2439.991	0.875	0.6844	0.0000

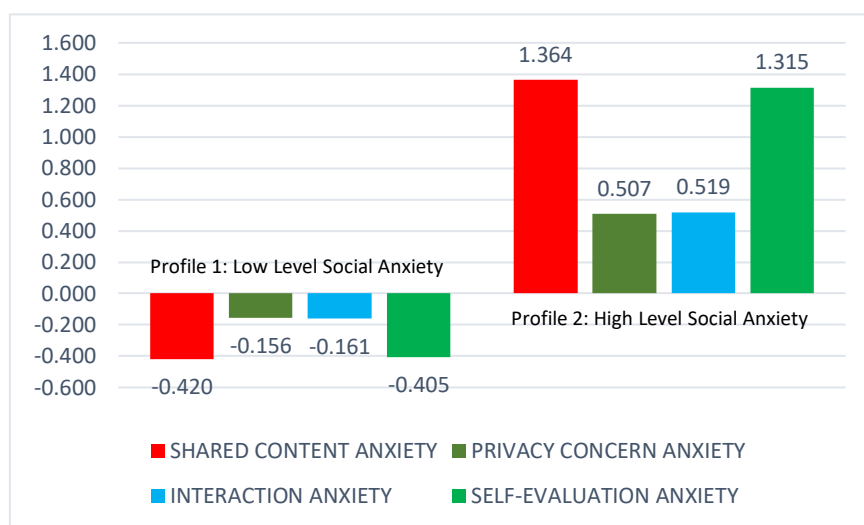
When Table 3 is examined, it is seen that LPA models up to 1-7 have been created. It has been determined that the AIC, BIC, and Adjusted BIC values decrease as the number of profiles increases. However, since the 3rd profile, the LMRT value has lost its meaning ( $p > 0.01$ ), so a 2-profile model was preferred in the study.



**Fig. 1.** Item response probabilities of the factors that make up the profiles

Profile-1 (n=194;77%: Low Anxiety Profile): most pre-service teachers were assigned to this profile. The mean profile values were: SCA: Shared Content Anxiety (M=-0.420), PCA: Privacy Concern Anxiety (M=-0.156); IA: Interaction Anxiety (M= -0.161); SEA: Self-Evaluation Anxiety (M= -0.405). According to the averages, the participants in this profile are most concerned about SCA and SEA, at least in the Privacy Concerns Anxiety and IA dimensions.

Profile-2 (n = 58; 23%: High Anxiety Profile). It is the profile with the smallest sample, and there are pre-service teachers with the highest anxiety in this profile. The mean of the indicators included in this profile: SCA: Shared Content Anxiety (M= 1.364), PCA: Privacy Anxiety (M=0.507); IA: Interaction Anxiety (M= 0.519); SEA: Self-Evaluation Anxiety (M= 1.315).



**Fig. 2.** Mean of the subscales that make up the profiles

It is seen that among the pre-service teachers who use SM, those with a high social anxiety profile have the most shared content and self-evaluation concerns (See Fig. 2). When both profiles are evaluated, it is understood that those in the low and high anxiety groups differ in shared content and SEA.

#### 4.2. Relationship between profile memberships and covariates

The second sub-problem of the research is whether gender, age, social and economic status, duration of membership to SM sites, daily SM usage time and the number of friends in SM environments make a difference in assigning pre-service teachers to profile memberships. The multinomial logistic regression analysis determined the relationship between covariates and profile memberships (Hosmer et al., 2013).

After determining the optimal profile, a 3-step approach was referred to using the R3STEP procedure (Asparouhov & Muthén, 2014) to determine how covariates affect profile characteristics without changing the profile structure. With this approach, the effect of gender, age, socio-economic status, place of residence, how many years he has been using SM, the duration of daily use of SM and the number of friends on SM on latent profiles were investigated. For this purpose, multinomial logistic regression was performed (See Table 4).

**Table 1.**

The results of the multinomial logistic regression analysis performed for covariates

	<b>Profile-1</b>	
Gender (Male ref)	<b>0.384</b>	<b>0.887</b>
Age	1.083	1.157
Socio-Economic Level		
Low	1.382	6.246
Intermediate	2.072	8.359
High (ref)	-	-
Membership durations to SM sites	1.525	2.285
Daily SM usage time	0.872	1.183
The number of friends in SM environments		
Less than 50	1.422	16.860
Between 50-100	1.272	12.732
Between 101-200	1.890	20.000
Between 201-400	2.063	20.735
401 and more(ref)	-	-
Place of residence		
Big city	<b>0.381</b>	<b>1.470</b>
Provincial centre	0.396	2.304
District centre	0.804	3.678
Village(ref)	-	-

*Covariates shown in bold  $p < 0.05$*

When Profile-2 is referenced, females (OR=0.384) are less likely to be in Profile-1 than males. According to the location, those who live in a metropolitan city (OR=0.381) are less likely to be in profile 1.

## 5. Discussion

Social anxiety levels among pre-service teachers using social media (SM) may vary based on their ability to communicate, share materials, and collaborate with students and colleagues. Age, gender, SM usage duration, membership, and friend count should be considered to understand how these variables impact social anxiety and affect teachers' interactions and relationships. Using LPA, revealing the different profiles of pre-service teachers regarding social anxiety levels and determining the covariates affecting these profiles can be a guide for using SM in education. This analysis is crucial in formulating strategies for the practical and proficient employment of social media in education, as it aids in a more profound comprehension of the correlation between levels of social anxiety and the usage of social media.

According to the findings of this research, two profiles of pre-service teachers who use SM have been determined. The fact that 23% of these profiles are pre-service teachers with high anxiety levels shows that nearly a quarter of pre-service teachers have social anxiety when using SM. Social anxiety is a common condition among pre-service teachers as university students (Karaşar, 2014). University students who use SM are concerned about SCA, privacy anxiety and self-evaluation concerns (Aktan, 2018). In this regard, the negative experiences of pre-service teachers in social networks (Seabrook et al., 2016) or the cultural context in which they lived may have revealed this result. Low interpersonal trust, high fear of negative evaluations, and increased emotional sensitivity among pre-service teachers affect the anxiety level experienced in SM posts (Shabahang et al., 2021) and may cause pre-service teachers to exhibit a high anxiety profile. Studying these factors can contribute to developing pre-service teachers' effective communication skills in SM.

Research suggests that individuals experiencing social anxiety during in-person interactions tend to have diminished goal-attainment expectations, decreased self-esteem, and less frequent self-reinforcement (Kocovski & Endler, 2000). They reported that their social anxiety was more prominent regarding cognitive and behavioural processes in the online communication environment (Carruthers et al., 2019). Individuals with high social anxiety tend to engage in less social interaction and be less open through SM (Fernandez et al., 2012). In the light of these studies, it can be thought that high social anxiety levels of pre-service teachers may cause similar difficulties in face-to-face and online interactions. This requires pre-service teachers to reduce their social anxiety to use SM and general communication skills more effectively.

In this study, when the scores of the pre-service teachers in both high and low anxiety profiles in the sub-dimensions are examined, it is seen that those in the low and high anxiety groups differ in the dimensions of SCA and SEA. SCA, which is the most effective dimension in low and high profiles of pre-service teachers in terms of social anxiety, reveals pre-service teachers' concerns about being exposed to social evaluations, such as being disliked or criticized for their posts (Alkis et al., 2017; Aktan, 2018). Such concerns are related to individuals' desire to adapt to the expectations in their social environment and to be accepted (Caplan, 2007; Berman & Schneier, 2004). As a result of a study, it is stated that individuals with high social anxiety levels use SM in different ways, such as watching others' posts or making their posts (Erliksson et al., 2020). The content anxiety shared in this research is mainly anxiety arising from the likes of the shares or negative evaluations. In this respect, it is thought that pre-service teachers with a high level of SCA exhibit behaviour such as passively watching others' posts. However, it will be clarified by experimental studies to determine such behaviour precisely. The absence of SCA is a fundamental and balancing affective feature for educators in providing rich interaction with students and feedback. This should not be a feature that pre-service teachers can earn randomly. In this respect, teachers training institutions and educators should be role models for them. In addition, self-evaluation anxiety is an essential dimension in pre-service teachers' low and high profiles. There are cases of negative criticism and judgment in SCA. In this regard, social performance anxiety, which includes negative social feedback, negative social evaluation, or negative judgment of shared content by others, are quality involved in both SCA and SEA.

Pre-service teachers' concerns about self-evaluation reflect their sensitivity to how others perceive them and their search for social approval. Individuals in this group may have to pay special attention to their images and interactions on SM due to their future professional roles and reputation in society. However, Kocovsky and Endler (2000) stated that a person who evaluates himself negatively tends to believe that others agree, and this expectation of negative evaluation can cause anxiety in social situations. It is emphasised that such environments can be effective for individuals to avoid negative opinions of others about themselves (Avisina & Ayriza, 2019). Therefore, individuals with such feelings may prefer online interaction more (Carruthers et al., 2019). Nevertheless, the fact that self-evaluation anxiety differs in the division of pre-service teachers who use SM into low-profile and high-profile groups requires supporting them with strategies that will eliminate their concerns. In this context, pre-service teachers being aware of

their self-evaluation concerns when using SM, setting limits for themselves when using SM, and focusing on positive communication in SM environments can benefit them in eliminating this kind of anxiety.

This research has found that gender and location covariates significantly impact profile memberships. However, it has been concluded that age, socio-economic level, SM membership duration, daily SM usage duration and the number of friends on SM sites are ineffective in assigning low or high social anxiety profile memberships. According to the results of this research, while male pre-service teachers have less SM anxiety than female pre-service teachers, it has been found that pre-service teachers living in a metropolitan city have less SM anxiety regarding residential location. This result is generally consistent with the studies that determined that female pre-service teachers' social anxiety levels were significantly higher than male students (Yıldırım et al., 2011; Bahçekapılı, 2021). In addition, some studies show that female university students have more social anxiety in SM environments than male participants (Aktan, 2018). Also, another study conducted on adolescents in the United Kingdom reported that girls spend more time on SM than males and females who use the Internet intensively are significantly different from boys in terms of the likelihood of having depressive symptoms compared to low users (Twenge & Farley, 2021). Besides using the Internet or SM, research results for university students have also shown that social anxiety is significantly higher in female students than male students (Izgiç et al., 2000). Some studies report that gender has an impact on privacy concerns and actions specifically for Internet users (Paine, 2007; Ağırtaş & Güler, 2020). Adrianson (2001) suggests that women display distinct communication patterns in computer-mediated interactions compared to face-to-face dialogues, such as a higher frequency of idea shifts. In contrast, men show consistent communication patterns across both face-to-face and computer-mediated environments. However, some studies report that university students or pre-service teachers do not differentiate their social concerns according to gender (Arslan & Bardakçı, 2021; Karaşar, 2014). The results of our research, drawing attention to the decoupling of social anxiety levels between the genders, make an essential contribution to the literature on this subject. However, more research is needed since the relationship between social anxiety and SM use is multifaceted and complex. According to Türkiye's 2021-2022 National Education Statistics, 61% of teachers in formal education, excluding higher education, are female (Ministry of National Education, 2022). Female teachers' deep social concerns related to gender can hinder their effective and efficient use of technology in education. To address this, it is important to evaluate SM tools and resources in a way that alleviates their concerns and provide targeted training, particularly in information technology courses. Research on the gender factor impacting pre-service teachers' SM anxiety levels and coping strategies can inform educational policies and practices, enabling healthier and more effective SM usage for professional development and improved student communication.

The research highlights that the place of residence significantly affects the assignment of profile memberships among pre-service teachers. It suggests that SM use and anxiety levels may vary based on exposure to different cultural characteristics and life experiences shaped by upbringing in different settlements, impacting interaction, privacy, and interpersonal trust. Indeed, the living environment is a contextual factor affecting mental health, such as in urban or rural areas (Jackson, 2003). This study determined that pre-service teachers living in metropolitan cities and using SM were assigned to the social anxiety group at a significantly lower level than other groups (province, town, village). Conversely, Arslan and Bardakçı (2021), in their study utilizing variance analysis to explore face-to-face social anxiety among university students, did not discover a significant difference in relation to the variable of residence. There appears to be an absence of other studies in the existing literature that delve into the connection between social anxiety and the living conditions of individuals who use social media. In this regard, apart from using SM, no studies directly examine social anxiety.

## 6. Conclusion and Suggestions

In conclusion, this academic research utilized LPA to examine the social anxiety levels of pre-service teachers using SM and their profile memberships. The study found distinct differences between low and

high-profile groups in terms of shared content and social anxiety levels. Gender and residence variables significantly influenced the assignment of profile memberships, with male pre-service teachers exhibiting lower SM anxiety compared to females and those residing in metropolitan areas reporting lower levels of SM anxiety. Notably, age, socio-economic status, SM membership duration, daily usage time, and number of friends on SM sites did not play a significant role in determining profile memberships. These findings shed light on the complexities of social anxiety in the context of SM use among pre-service teachers and emphasize the importance of considering gender and residential factors in developing interventions and educational practices.

Although there are studies examining social anxiety about SM or internet use in specific dimensions such as interaction, privacy and negative evaluation or in groups of adolescents, university students and Internet users, no studies have examined it using the forms of analysis used in this study. In this respect, LPA and multinomial logistic regression analysis methods can contribute to the field literature with an innovative point of view on the research conducted on this subject. Although a differentiation in the form of two profiles (low and high) is revealed with a limited group of pre-service teachers, it will help to have a broader understanding of SM formats and social anxiety levels with LPA-type analyses to be conducted with pre-service teachers and teachers of different sizes.

In this research, although the social anxiety of pre-service teachers who use SM is examined in terms of various variables, social anxiety may also be examined with variables such as the cultural, racial and ethnic origin of the person to evaluate the level of social anxiety of the individual (Hofmann et al., 2010). To better understand the impact of SM anxiety on pre-service teachers, future research may examine the impact of time spent on different SM platforms and interaction types on social anxiety levels. In addition, studies evaluating the relationship between SM anxiety and academic achievement, social cohesion and general life satisfaction will also be helpful. This information can contribute to the development of educational policies and support services by providing a more comprehensive perspective on the impact of SM use on the lives of pre-service teachers.

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