

# Effectiveness of personalized advertisement recommendation system of Instagram on Teenagers.

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## ABSTRACT –

The rapid growth of competition in the global market has encouraged companies to adopt strategies that help them sustain and grow. One such strategy is the use of personalized advertising. This study examines the effectiveness of personalized advertisement recommendation systems of Instagram on teenagers. Personalized ads are delivered based on user's interests, past online behaviour, and mobile app usage patterns. The objective of this research is to determine whether personalized advertisements lead to higher user engagement, click-through rates, and purchase intentions compared to non-personalized ads. The study also explores teenager's perceptions of such advertisements in terms of usefulness, relevance, and privacy concerns. Data is collected through a structured questionnaire survey of teenagers, and their responses and attitudes toward personalized ads are analysed. The findings of this study will help marketers better understand how personalization can enhance the effectiveness of mobile advertising while maintaining user privacy and comfort.

Keywords: personalized advertisement recommendation, click through rate, purchase intentions rate and consumer engagement.

## 1.Introduction-

When the concept of advertisement is introduced, literacy was defined as the abilities and skills that individuals have to understand the meanings of advertising (Boush et al., 1994). Advertising literacy is developed over time with experience (John, 1999). As internet is widely accessible, digital marketing become important method for industries to increase their revenue and personalized advertisement is something that helping industries to know the preference of consumer and accordingly recommend them product or services (De Veirman et al., 2019). Recent studies suggest that adolescents spend a considerable amount of their daily time interacting with social media platforms (Yang & Brown, 2016; Neira & Barber, 2014). Several definitions have been proposed in the literature. (Amanda Lenhart et al. (2011) describe teenagers as individuals between the ages of 12 and 17, whereas Katherine Higley (2019) categorizes young adults as those aged 18 to 25. In this context, Social Networking Sites (SNSs) have emerged as platforms where individuals can express their identities and present themselves in ways they wish to be perceived by their peers and followers.

Social media influencers are independent third party who endorses brand on social media considered to be a powerful source of both entertainment and inspiration to their young followers how are the target audience of most of marketers, and therefore have persuasive power over their audiences (De Veirman et al., 2019) Digital marketing has become a critical method for many industries to increase their revenue. The boundary between commercial and non-commercial content on social media is often unclear. Because of this, it becomes difficult for users to identify which posts are advertisements and which are not (Evans et al., 2019). Considering teenagers', it is difficulties for them to recognize the hidden advertising on social media (Boerman & van Reijmersdal, 2020; Rozendaal et al., 2016; van Dam & van Reijmersdal, 2019) . Studies shows that it is important to understand the advertisement by teenagers' and their hidden meanings (Naderer, Peter, & Karsay, 2021) . thus, adolescents are a distinct case from other age groups (De Jans, Hudders, & Cauberghe, 2018; Wright et al., 2005). Digital marketing has surpassed offline sales in volume and revenue and gain popularity after the global pandemic that limits human mobility. During the pandemic, Adolescents relied heavily on digital platforms for shopping and information. Instagram has a rising number of consumers who are engaging in buying through Instagram recommendation of any age since its inception in 2010 (Purnama, 2020). As

customers has wide access to data through active engagement with social media platforms, consumers become more reactive to advertising processes (Añaña & Barbosa, 2023). Instagram, is one such social networking platform that gains wide popularity and most of teenager's spend their time in Instagram, it catches the attention of corporate and they start using this for their advertisement. (Teo et al., 2019). According to the two-step flow of communication theory, the influencer, as a representative of an organization, is inviting to filter, decode and create messages to match with his particular follower base (Lazarsfeld et al., 1944). sponsored advertising allows for greater control over the message (Teo et al., 2019). According to Tarsakoo and Charoensukmongkol (2019), social media marketing implementation capabilities have a positive effect on customer relationship sustainabilitys Instagram should not just provide video content but helping corporate to engage with target audience through one platform (Purnama, 2020)

## 1.1 Background of the Study

In recent years, social media platforms have become important part of the daily lives of teenagers worldwide. Among these platforms, Instagram is most widely used and having high engagement levels among young users. According to industry reports, Instagram users specially teenagers are becoming audience for both content creators and advertisers as the spent most of their time there. Social media companies leverage advanced data analytics and machine learning to tailor advertisements to individual users' interests, behaviours, and interaction histories.

One of the key innovations in digital marketing is the “**personalized advertisement recommendation system**”—a technology that uses algorithms to select and deliver ads that are most likely to appeal to specific users. These systems analyse large volumes of data, including user profiles, browsing patterns, likes, shares, search history, and time spent on specific content. On Instagram, personalized ads appear to user feeds, Stories, Reels, and explore pages, often making it difficult for users to distinguish between original content and targeted promotions.

While personalized advertising can increase engagement, there is growing concern about its impact. Exposure to targeted ads may influence teenagers' consumption behaviours, self-image, and social comparisons. At the same time, personalized ads can benefit advertisers by improving advertisement effectiveness, increasing conversion rates, and optimizing marketing budgets.

This research seeks to examining the **effectiveness** of Instagram's personalized ad recommendations on teenagers, exploring not just engagement and recall, but also their behaviour responses. Understanding these effects is crucial for policymakers, educators, parents, and platform designers aiming to balance commercial interests with the well-being of teenager's users.

## 1.2 Statement of the Problem

Instagram is most widely used social media platforms among teenagers, offering both entertainment and social interaction but also giving platform for digital advertising. With the rise of artificial intelligence and algorithm-based systems, Instagram uses personalized advertisement recommendation systems to deliver targeted ads based on users' interests, online behaviour, and engagement patterns.

Although personalized advertising is designed to increase advertisement effectiveness, its growing presence raises concerns, especially when directed toward teenage users. Teenagers are at developmental stage where they are more vulnerable to external influences. Continuous exposure to targeted advertisements may shape their purchasing decisions, lifestyle choices, self-perception, and even mental well-being. However, many teenagers may not fully understand how these ads are selected or the strategies behind them.

Despite the widespread use of personalized ads on Instagram, there is limited research focusing specifically on how effective these recommendation systems are in influencing teenagers' attitudes and behaviours. Most studies tend to focus on generalised ad to same group of people then personalised one.

Therefore, this study seeks to examine the effectiveness of Instagram's personalized advertisement recommendation system on teenagers by analysing how these ads influence their engagement, preferences, and buying behaviour. The findings of this research will contribute to a better understanding of the implications of targeted advertising on young users and may provide insights for marketers, educators, parents, and policymakers in ensuring ethical and responsible advertising practices on social media platforms.

### 1.3 Objectives of the Study

- 2.The study aims to identify whether personalized ads affect teenagers’ purchase intentions and consumption choices.
- 3.measuring interactions such as likes, clicks, shares, and interest in advertised products or services.
- 4.Assessment of teenagers whether they understand that ads are algorithmically targeted based on their online activities.
- 5.investigates the influence of ads on teenagers’ lifestyle taste aspirations, and social comparison.

## II. HYPOTHESIS

### H1 (Main Effect)

**H1:** Personalized advertisement recommendations on Instagram have a significant positive effect on teenagers’ purchase intention.

### H2 (Engagement Effect)

**H2:** Personalized advertisement recommendations on Instagram significantly increase teenagers’ engagement with advertisements (e.g., attention, clicks, and brand recall).

### Null Hypotheses

#### H0<sub>1</sub>:

Personalized advertisement recommendations on Instagram do not significantly influence teenagers’ purchase intention.

#### H0<sub>2</sub>:

Personalized advertisement recommendations on Instagram do not significantly influence teenagers’ engagement with advertisements.

Ads relevance /purchase intension-	Low	Moderate	High	Total
Not relevant	12	6	2	20
Sometimes relevant	8	18	9	35
Relevant	3	10	32	45
Total	23	34	43	100

X square =24.75

df=4

critical value=9.448

24.75>9.448

Hence H0<sub>2</sub> is rejected and H2 is accepted

## III. LITERATURE REVIEW

Advertising literacy has been widely used for the examination of a critical factor in understanding how individuals interpret and respond to marketing messages. Boush et al. (1994) state that advertising literacy is the ability to recognize, analyze, and evaluate advertising content or messages, while John (1999) focused that such literacy develops with growing age and by gaining maturity. Adolescents, due to their developmental

stage, often having limited ability to critically evaluate persuasive intent, making them more vulnerable to advertising influence.

With the growth of digital technologies and awareness among people, advertising has shifted from traditional formats to highly targeted digital strategies. Personalized advertising, which utilizes consumer data to deliver tailored content, has been identified as a powerful tool in influencing consumer behaviour (De Veirman et al., 2019). This form of advertising not only enhance relevance but also the engagement of the targeted audience at the same time raises concerns regarding consumer awareness and privacy.

Social media platforms have become central for the transformation, particularly among adolescents and young adults. Research shows that individuals aged between 12 to 25 spend an adequate amount of time on Social Networking Sites (SNSs), where they actively engage with content and construct their identities (Lenhart et al., 2011; Higley, 2019; Yang & Brown, 2016). These platforms serve not only as communication tools but also as key marketing place for brands to interact directly with consumers.

A significant aspect of social media marketing is the role of influencers. Influencers act as opinion leaders who help consumer to build particular attitudes and behaviours by endorsing products in a relatable and engaging manner. According to De Veirman et al. (2019), influencers have strong persuasive power, especially among younger audiences who view them as trustworthy and aspirational figures. This aligns with the two-step flow of communication theory (Lazarsfeld et al., 1944), which suggests that information is passed and filtered through influential individuals before reaching the wider audience.

However, the integration of advertising within social media content has nailed out the distinction between commercial and non-commercial messages. Evans et al. (2019) argue that users often find it difficult to differentiate between organic posts and sponsored content. This issue is especially critical for adolescents, who may lack of the skills required to recognize embedded advertising (Boerman & van Reijmersdal, 2020; Rozendaal et al., 2016; van Dam & van Reijmersdal, 2019).

Studies also highlight that adolescents represent a unique and sensitive demographic in advertising research. Due to their ongoing cognitive and emotional development, they are more prone to persuasive messages and less capable of identifying hidden advertising message and strategies (De Jans et al., 2018; Wright et al., 2005). Naderer et al. (2021) further focus on the importance of improving adolescents' understanding of advertising hidden meaning to enable them to be more informed during decision-making process.

The COVID-19 pandemic further accelerated the adoption of digital platforms, increasing adolescents' reliance on social media for information, entertainment, and shopping. This shift has significant impact on exposure to digital advertisements, particularly personalized recommendations driven by algorithms.

Among various platforms, Instagram has emerged as a dominant channel for digital marketing. Its visually driven interface and algorithm-based recommendation system enable brands to deliver highly personalized content to users. Studies suggest that Instagram significantly influences consumer behavior, especially among teenagers who frequently engage with influencer content and product recommendations (Purnama, 2020; Teo et al., 2019).

Moreover, personalized advertisement systems on Instagram allow marketers to have control over the advertisement and optimize message they deliver to enhanced the engagement and conversion rates. According to Tarsakoo and Charoensukmongkol (2019), effective social media marketing strategies contribute to stronger customer relationships and long-term brand loyalty. At the same time increased consumer interaction through digital platforms which made users more responsive to advertising stimuli (Añaña & Barbosa, 2023).

Despite these advantages, concerns remain same regarding transparency, ethics, and the ability of adolescents to understand and interpreted personalized and influencer-driven advertisements. The existing literature indicates a gap in understanding how Instagram's personalized advertisement recommendation systems specifically impact teenagers' perceptions, attitudes, and purchasing behaviour.

## IV. METHODOLOGY

### 4.1 Research Design

This study adopts a quantitative approach for its research design in assessing the impact of personalized advertisement recommendation systems on teenagers. The study primarily aims at analyzing how teenagers are influenced by personalized advertisements on the social media platform Instagram.

The survey method was used for data collection because it aids in gathering information and behavior patterns from a large number of people.

### 4.2 Target Population

The target population for this study includes teenagers who regularly use Instagram for socializing. Teenagers refer to people between the ages of 13 and 25 years who regularly interact with social media platforms and thus are exposed to personalized advertisements.

### 4.3 Sample Size and Sampling Technique

For this study, a sample of about 100 respondents was selected. The selected respondents included students who regularly interact with Instagram.

Convenience sampling was adopted for this study, where the respondents were selected based on convenience and willingness to participate in the survey.

### 4.4 Data Collection Method

This study adopts a primary data collection method through a structured questionnaire. The questionnaire was distributed online through Google Forms and social media platforms for easy access for teenage respondents. The questionnaire will be comprised of relevant questions such as: Frequency of seeing personalized advertisements Response to advertisements (likes, clicks, shares) Intention to purchase after seeing advertisements Knowledge about the use of personalized advertising algorithms Measurement Scale

A five-point Likert scale will be employed to measure the responses obtained from the participants. The scale will vary from:

1 – Strongly Disagree 2 – Disagree 3 – Neutral 4 – Agree 5 – Strongly Agree

This scale will be employed to measure the attitudes and perceptions of teenagers towards personalized advertisements.

### 4.6 Data Analysis Techniques

The data obtained will be analyzed using various data analysis techniques such as descriptive statistics, i.e., percentage and frequency distribution. These techniques will help in understanding the general trends and patterns in the data obtained from teenagers.

In addition, correlation analysis will be employed to check the correlation between personalized advertisements and teenagers' response.

### 4.7 Ethical Considerations

The research was conducted keeping in view ethical research guidelines. The participants in the research study were given a voluntary option to participate in the survey. The participants were made aware of the purpose of conducting the research. The data obtained was kept confidential, and no personal information was revealed. The data was utilized only for academic purposes.

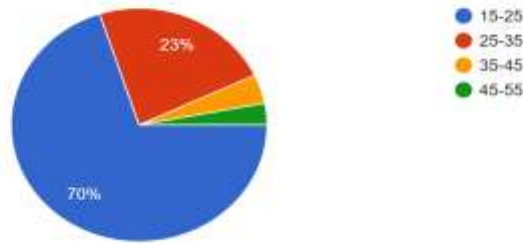
## V. ANALYSIS

Impact of Personalized Instagram Advertisements on Teenagers

### 1.Age Group of Respondents

Most respondents belong to the 15–25 age group, which represents teenagers and young adults. A small number of respondents are from 25–35 and above age groups. This shows that the study mainly focuses on the target audience of teenagers who are highly active on Instagram.

Age Group  
100 responses



## 2.Instagram Usage Among Teenagers

The survey shows that teenagers spend significant time on Instagram.Many respondents use Instagram 1–2 hours per day.

Gender  
100 responses



A large number also use it 3–4 hours or more than 4 hours daily. Only a few use it less than 1 hour per day.

### Interpretation:

This indicates that Instagram is a frequently used platform among teenagers, making it an effective medium for advertisers.

## 3. Most Used Instagram Features

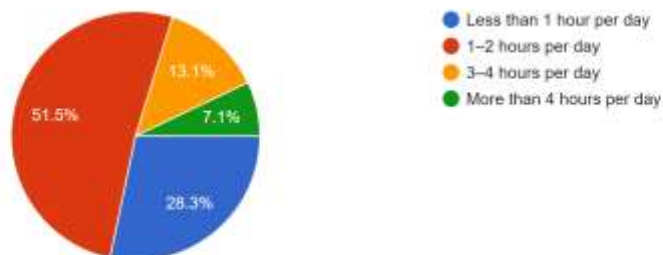
Respondents mostly use:

Reels (most popular)

Feed

Stories

How often do you use Instagram?  
99 responses



Explore page

### Interpretation:

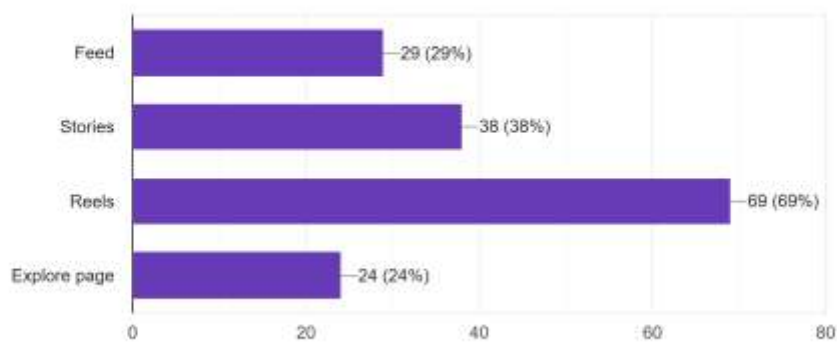
Since Reels and Feed are the most used features, advertisers usually place ads in these sections to reach teenagers.

#### 4. Frequency of Advertisements Seen

Most respondents reported that they see advertisements frequently on Instagram. Some respondents rated the frequency 3 to 5 on the scale, indicating that ads appear regularly while scrolling the platform.

Which Instagram features do you use most?

100 responses



#### Interpretation:

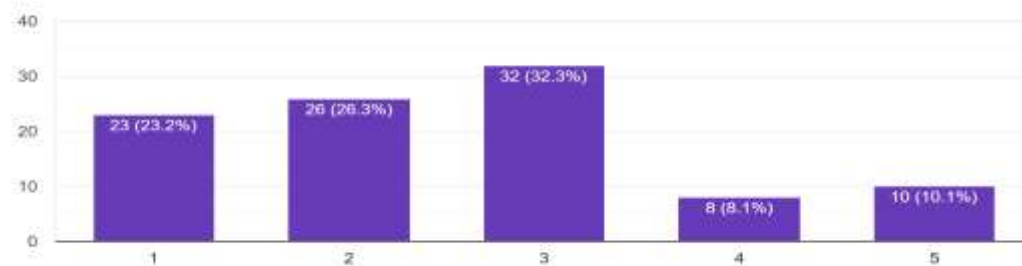
This suggests that Instagram advertisements are highly visible to teenagers.

#### 5. Relevance of Personalized Advertisements

Many respondents stated that advertisements match their interests or preferences. However, a few respondents said ads do not always match their interests.

How frequently do you see advertisements on Instagram?

99 responses



#### Interpretation:

Instagram's algorithm often shows ads based on user behavior such as searches, likes, and followed accounts. Therefore, personalized advertising is somewhat effective but not perfect.

#### 6. Interaction with Advertisements

The survey shows mixed results regarding engagement:

Some respondents click on ads occasionally. Many respondents have liked, shared, or saved product advertisements. Some respondents do not interact with ads at all

#### Interpretation:

This shows that while advertisements are visible, not all teenagers actively engage with them.

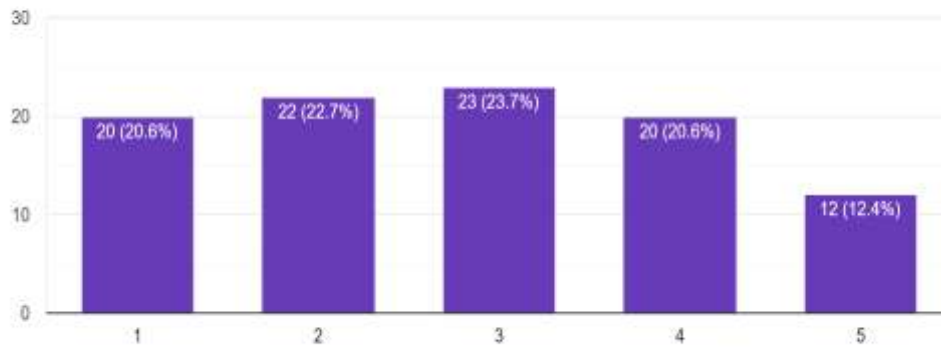
#### 7. Types of Advertisements Seen

The most common product categories advertised are:

- Fashion and clothing
- Beauty products
- Electronics
- Food and beverages

How often do you click on advertisements on Instagram?

97 responses



**Interpretation:**

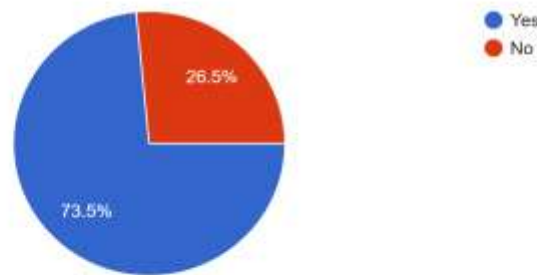
These product categories are highly targeted because they are popular among teenagers.

**8. Influence on Purchase Desire**

Many respondents rated moderate agreement that Instagram ads create a desire for new products. However, some respondents disagreed, suggesting that ads do not always influence their buying decisions.

Have you ever liked, shared, or saved a product advertisement on Instagram?

98 responses



**Interpretation:**

Personalized ads can increase curiosity and product awareness, but they do not always lead to purchases.

**9. Preference for Personalized Ads**

A significant number of respondents said they prefer personalized ads over general advertisements, while some were unsure or disagreed.

**Interpretation:**

Teenagers generally prefer ads that are relevant to their interests, but concerns about privacy and excessive advertising still exist.

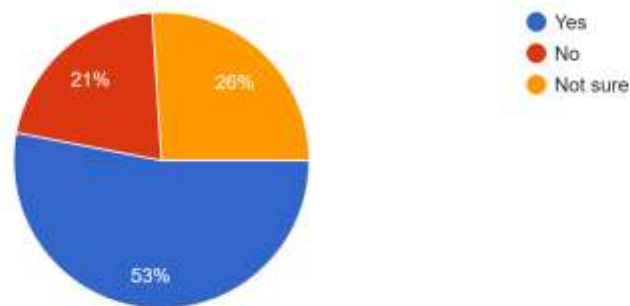
**10. Respondents' Opinions and Suggestions**

Several common opinions were expressed by respondents:

Advertisement frequency should be reduced. Some ads are fake or misleading. Personalized ads feel intrusive or affect privacy. Ads should be more relevant and authentic. Instagram should control scam advertisements.

Do you prefer personalized ads over general advertisements?

100 responses



Overall Findings From the analysis, the following key findings can be observed :-

- Teenagers spend considerable time on Instagram, making it a strong platform for advertising.
- Reels and Feed are the most used features where advertisements appear frequently.
- Personalized advertisements often match user interests, but not always accurately.
- Teenagers sometimes interact with ads by clicking or saving them, but engagement varies.
- Fashion, beauty, and electronics are the most common product categories advertised.
- Personalized advertisements create awareness and interest, but do not always lead to purchase.
- Some teenagers have privacy concerns and feel ads appear too frequently.

## VI. CONCLUSION

The study shows that personalized Instagram advertisements have a noticeable impact on teenagers. They increase product awareness, influence interests, and sometimes affect purchasing behavior. However, excessive advertisements and privacy concerns reduce user satisfaction. Therefore, companies should focus on relevant, trustworthy, and less intrusive advertising strategies to improve the effectiveness of personalized ads on teenagers.

## VII. KEY FINDINGS

### High Usage of Instagram Among Teenagers

Teenagers aged 15 to 25 are very active on Instagram, with most spending between one to four or more hours daily. This makes Instagram a strong platform for targeted advertising.

### Reels and Feed Dominate User Engagement

Reels and Feed are the features used most often. This means that ads placed in these areas have better visibility and reach.

### Frequent Exposure to Advertisements

Teenagers regularly see ads while scrolling. This shows that Instagram's algorithm keeps ads visible.

### Moderate Effectiveness of Personalization

Most respondents feel that ads match their interests, but this isn't always the case. This indicates that while personalization is working, it still needs improvement.

### Mixed Engagement with Advertisements

Some teenagers interact with ads by clicking, liking, or saving them, but many do not engage actively. This suggests that just seeing an ad doesn't mean people will interact with it.

### Popular Advertisement Categories

The ads teenagers see most often are in fashion, beauty, electronics, and food. These categories reflect their preferences and lifestyle interests.

### Influence on Purchase Behavior is Limited

Personalized ads raise awareness and curiosity, but they do not always lead to actual purchases for every user.

### Preference for Personalized Ads

Most teenagers like personalized ads better than general ads because they find them more relevant and interesting.

## Concerns About Privacy and Intrusiveness

Many respondents think that ads are too frequent and sometimes intrusive. They also expressed worries about privacy and distrust of misleading ads.

## 7.1 Recommendations

### Improve Accuracy of Personalization

Advertisers should refine targeting algorithms. This will ensure ads are more relevant to users' true interests and behaviors.

### Reduce Advertisement Frequency

Too many ads can frustrate users. Brands should aim for an optimal ad frequency to avoid irritation and ad fatigue.

### Focus on High-Engagement Formats

Given that Reels and Feed are the most popular, advertisers should create engaging, short videos to effectively grab attention.

### Enhance Content Quality and Authenticity

Advertisements should be:

- Honest and transparent
- Visually appealing
- Informative rather than misleading

This will help build trust among teenage users.

Leverage Influencer and Relatable Content

Using relatable influencers or real-life situations can boost engagement and make ads feel more natural instead of forced.

### Address Privacy Concerns

Instagram and advertisers should:

- Clearly explain how data is used
- Offer better privacy controls
- Avoid overly intrusive targeting

Encourage Interactive Advertising

Including features like polls, swipe-ups, or gamified ads can boost user participation and engagement.

### Target the Right Product Categories

Brands in fashion, beauty, electronics, and food should keep investing in Instagram ads since these categories resonate most with teenagers.

### Build Trust to Improve Conversion

To increase purchase behavior, brands should:

- Display reviews and ratings
- Use authentic testimonials
- Steer clear of fake or scam advertisements

Final Insight

Personalized advertising on Instagram is effective for raising awareness and engagement among teenagers. Its success relies on relevance, trust, and user comfort. A balanced approach between personalization and privacy is essential for long-term effectiveness.

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