



ANALYSIS OF THE COST-EFFECTIVENESS OF THE UNIVERSITY INSTAGRAM MARKETING CAMPAIGN USING A/B TESTING

Aleksandar Mihailović*,

[0009-0001-0777-2308]

Jelena Gajić,

[0000-0001-9107-5398]

Tamara Papić

[0000-0002-9666-7824]

Singidunum University,
Belgrade, Serbia

Abstract:

In today's digital age, colleges and universities are increasingly using social media platforms like Instagram to promote themselves. This study examines the cost-effectiveness of such marketing campaigns using the A/B testing methodology. By comparing the outcomes of campaigns using static images and animated images, this research aims to determine which format delivers better results in terms of cost efficiency. The analysis shows that campaigns featuring static images are more cost-effective, with lower costs per click (CPC), cost per lead per visit (CPLPV), and cost per result (CPR). The findings also reveal that Carousel posts are more effective than video ads in terms of ROI, with Carousel campaigns yielding approximately 32.45% higher returns. Additionally, the study highlights the importance of segmenting the target audience, as different age groups and genders respond differently to marketing campaigns. Despite limitations such as sample size and timeframe, the research shows the reliability and durability of results, emphasizing the effectiveness of Carousel posts in attracting prospective students and enhancing institutional image. Overall, this study provides valuable insights for optimizing university Instagram marketing strategies, leading to increased enrolment and visibility.

Keywords:

Cost Effectiveness, A/B testing, Advertising, Instagram, Higher Education.

INTRODUCTION

In the contemporary era, digital marketing is essential for higher education institutions to attract potential students. Many of the authors raised important challenges and candidly discussed the costs, benefits, and return on investments of the social media planning and management process. [1] Social media platforms, such as Instagram, are critical for communication and interaction with students [2]. In Serbia, limited budgets present challenges for effective marketing strategies. [3]. Additionally, these platforms play a significant role in recruiting future students and are an integral part of the marketing promotions of higher education institutions. This can directly correlate with institutional success and influence various educational policies. [3] [4] Within the Republic of Serbia, higher education institutions are facing challenges in creating cost-effective marketing strategies to attract students. Paid advertising on Instagram is a popular solution and its success depends on choosing the right ad formats and creative approaches to achieve optimal ROI. [5]

Correspondence:

Aleksandar Mihailović

e-mail:

amihajlovic@singidunum.ac.rs



This research aims to address the challenge of analyzing the effectiveness of marketing campaigns for higher education institutions in Serbia. This was done through the implementation of A/B testing on the Instagram platform with a focus on comparing two different creative approaches. The first approach involves using graphic solutions in the form of static images, presented in a series of five specially designed displays through carousel posts. The second approach involves a 17-second animated video advertisement with an additional audio narrative. Special attention was given to comparing the results of these two approaches. This research topic is particularly significant as it provides practical guidelines for institutions striving to optimize their marketing campaigns with limited budgets while simultaneously aiming for better results. [5] Existing literature contains some studies addressing the use of social media in the context of higher education, but there is a lack of literature focusing on identifying and analyzing direct comparisons of creative approaches and campaign effectiveness through A/B testing, specifically tailored to the Serbian market. [3] [4] Through systematic analysis of the results of this research, significant insights are gained as to which type of paid marketing campaign (static image vs. video) with the same creative approach yields better results. [5] These findings provide higher education institutions with actionable information to guide their marketing resources and improve strategies for effectively attracting students.

2. LITERATURE REVIEW

2.1. SOCIAL NETWORKS AND INSTAGRAM

Social media technologies are not only changing the way we communicate but also disrupting the business world. [6] The growing popularity of social media is reflected in its broad integration into various aspects of everyday life, a result of significant progress in internet technology [7]. It is estimated that 5.85 billion people worldwide will use social media by 2027 [8]. Social media is defined as a group of internet-based applications that provide infrastructure for user interactivity, user-generated content, and mass personal communication [9], [10].

Launched in 2010, Instagram is one of the leading photo and video-sharing-based social media platforms, experiencing rapid user growth [11]. Instagram excels in the visual sharing of images, photos, and short videos with creative design [12].

According to Statista, in 2021, there were 1.21 billion Instagram platform users worldwide, representing a growth of approximately 16.34% compared to the previous year, and this percentage continues to rise, reaching 29.8% in 2023, with predictions of 38.46% for the year 2023 [13]. According to recent projections [13], "In 2021, there were 1.21 billion monthly active Instagram users, accounting for over 28% of global internet users. By 2025, it is predicted that there will be 1.44 billion monthly active users on the social media platform, constituting 31.2% of global internet users." Social media has developed rapidly and is recognized as a key strategic element of competitiveness and survival of the organization. [14] Paid advertising on Instagram encompasses various theories and concepts that aid in understanding the effective utilization of this platform for marketing purposes. [15] This includes theories on advertising and promotion, target audiences, visual storytelling, user engagement, influence, conversions, and ethics.

2.2. A/B TESTING IN DIGITAL MARKETING.

In data-driven digital marketing and web analytics, A/B testing is a prevailing method for comparing digital campaigns, selecting the winning ad, and deciding on targeting strategies. A/B testing is suitable when testing variations on similar solutions and involves one or more metrics that serve as clear indicators of success or failure. In digital marketing, A/B testing encompasses key concepts and theories related to testing various marketing variables to determine the effectiveness of campaigns. It is a powerful tool that enables marketing professionals to identify which campaign variations yield the best results. This process involves setting clear goals, identifying variable factors, selecting target audiences, creating different campaign variations, audience segmentation, tracking and measuring performance, determining the duration of testing, analyzing results, implementing changes, and continuously monitoring the campaign to achieve better market success [16]. Valid analysis and careful planning are crucial for successful A/B testing and optimization of marketing campaigns for higher education institutions in Serbia.



2.3. COST-EFFECTIVENESS AND RETURN ON INVESTMENT (ROI)

The theoretical framework for analyzing cost-effectiveness in higher education campaigns encompasses key theories and principles for assessing the economic efficiency of marketing activities. This framework includes theories of cost-effectiveness, metrics, and measurements, return on investment (ROI), long-term and short-term effects, competition and market dynamics, target audience segmentation, and sustainability [17]. It provides a foundation for a deeper understanding of how to optimize resources, identify the most cost-effective strategies, and evaluate the overall value of marketing activities in the higher education sector. Understanding return on investment (ROI) in digital marketing helps identify strategies that work best and empowers you to optimize your marketing budget [18].

3. METHODOLOGY

In this study, a quantitative approach was used, where the data was obtained by conducting A/B testing through the Facebook Ad Manager. When selecting campaigns for analysis through A/B testing in the research on the effectiveness of higher education advertising campaigns on social media, several key factors were taken into consideration. These factors include the use of the same or very similar creative concepts with variable campaign elements, targeting the same audience groups, allowing sufficient time for data collection, having access to precise performance data, budget constraints, and the relevance of campaign themes to the research. By carefully balancing these factors, a reliable and relevant analysis of the performance has been ensured.

3.1. TARGET GROUPS

When defining the target audience, various factors were taken into consideration, including demographic and geographic aspects. Marketers are increasingly combining several variables to identify smaller, better-defined target groups. [19] This involved primarily considering age groups, gender, location, and the possibility of segmenting the target audience into smaller groups with similar characteristics. The target audience included both genders in three different age categories from the territory of Serbia, specifically Group I (13-17), Group II (18-24), and Group III (25-34).

The focus was on Group II since it represents the largest demographic interested in enrolling in undergraduate academic studies. Additionally, according to data from NapoleonCat, illustrated in the graph (Figure 1), most Instagram platform users fall within this age group, making it one of the most valuable platforms for implementing paid marketing campaigns on social media.

According to studies conducted by the Pew Research Center, the first two groups can be categorized as Generation Z (1997-2012), while the third can be categorized as Generation Y (1981-1996), also known as Millennials [21]. Most future students come from the first two groups, belonging to the Generation Z category.

According to a survey conducted by Business Insider, Instagram is still the most dominant Social Networking Service (SNS) platform among teenagers, with 64.59% of Gen Z saying they check the app daily. [22]. The second most used platform is YouTube with 62%, followed by Snapchat with 51%, Facebook with 34%, and X (formerly known as Twitter) with 23%, among others. [23]

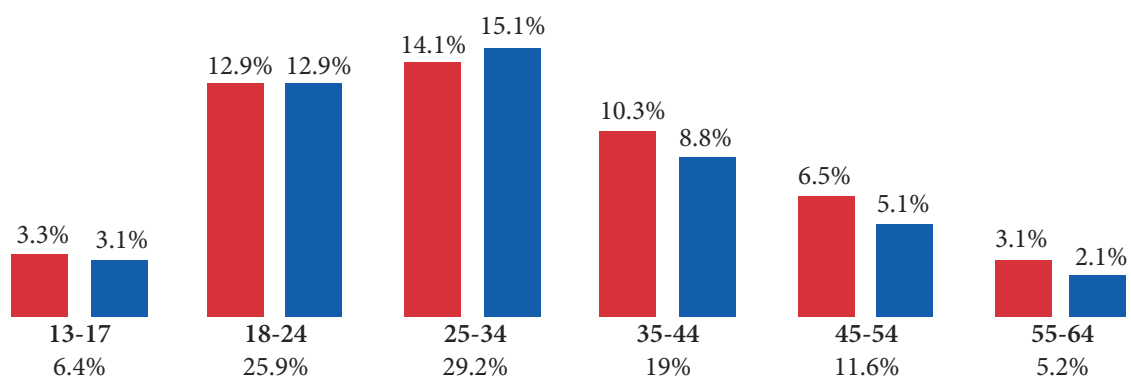


Figure 1. Distribution of Instagram users in Serbia as of July 2022, by age and gender. [20].



3.2. CREATIVE APPROACHES

Through an analysis of the advantages and disadvantages of each format, considering the campaign's objectives, a decision has been made to compare Carousel posts and video advertisements. According to a study by Metricool [24], the average view of images on Instagram in 2022 was 1,850 users, which is a decrease from 2,706 in 2021. Overall, the average views of Carousel posts have slightly declined to 2,325 users in 2022, while video views on social media remain at the bottom of the list (Figure 2).

3.3. ADVANTAGES AND DISADVANTAGES OF CAROUSEL POSTS AND VIDEO ADVERTISING

Carousel format, compared to other formats on social media, enhances users with greater control over the message through unique levels of interaction. Users can engage with small segments and continue to explore by swiping forward, creating tension and intrigue. This feature allows consumers to selectively read parts of the ad, providing flexibility in controlling content based on their interests. [26]. On the other hand, carousel posts require creative planning to make each card effective, and the creation and design process can be demanding.

Video ads offer a dynamic presentation of content with the inclusion of auditory senses, capturing attention and creating an emotional connection with the audience. [27] Statistics show that video advertising effectively generates potential customers, with a likelihood of purchase after watching a video ranging from 64% to 85%. However, challenges include high costs and the need for resources to create quality video content. Setting a clear call-to-action (CTA) in video ads may be challenging compared to Carousel posts. Both formats have their advantages and disadvantages, emphasizing the importance of careful selection in line with marketing goals and institutional resources.

4. RESULTS

When analyzing the results of the tested marketing campaigns, it is crucial to emphasize that specific factors were considered to assess campaign effectiveness. A comparative analysis of metrics was conducted, including Cost Per Link Click, Landing Page View, conversions (in our case, CPR - Cost per Registration), and overall return on investment (ROI). These evaluations aim to make a comprehensive decision about which campaign yields the best results in the context of achieving the marketing goals of higher education institutions in Serbia.

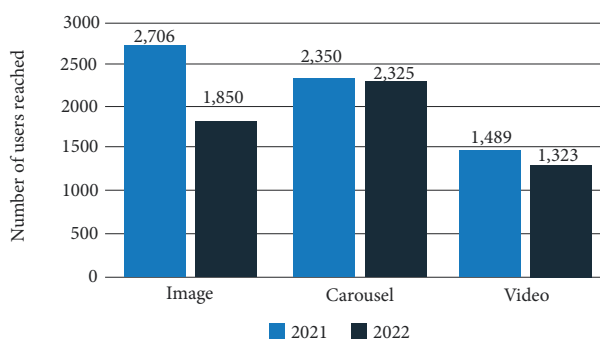


Figure 2. Instagram: average reach per post type 2022. [25].

Table 1. Results of A/B tested marketing campaigns.

Campaign name	Reporting starts	Reporting ends	Impressions	Reach	Frequency	Link clicks	CPC - Cost per link click (EUR)	Unique link clicks	Landing page views	Cost per landing page view (EUR)	Website registrations	Amount spent (EUR)	Results	Cost per result (EUR)
VIDEO 21/22	18 th March 2021	19 th April 2021	1.421.677	231.070	6,152	692	1,896	663	325	4,038	108	1.312,43	108	12,152
IMAGE 21/22	18 th March 2021	19 th April 2021	1.380.512	220.714	6,254	1827	0,717	1701	838	1,564	142	1.311,17	142	9,233



4.1. CPC - COST PER LINK CLICK

The presentation and interpretation of CPC results (Cost Per Click) are crucial for evaluating the effectiveness of campaigns [28]. The analysis of these results highlights a significant difference in costs between VIDEO and IMAGE campaigns, providing key insights into the effectiveness of creative approaches. In this case, the cost for the VIDEO campaign was even 164.93% higher compared to the IMAGE campaign. Based on these data, we can conclude that the IMAGE campaign is more cost-effective in terms of CPC compared to the VIDEO campaign, i.e., each click on the IMAGE campaign costs 0.38 times less than a click on the VIDEO campaign. This indicates the cost-effectiveness of the IMAGE campaign in attracting visitors or potential students.

Additionally, we can conclude that the creative approaches were carefully designed to equally cater to the interests of all genders, as the CPC results are balanced between genders. In this case, there is also a noticeable and significant difference in CPC between the IMAGE and VIDEO campaigns.

Regarding the data on three different age categories and their relation to the cost per click, we can conclude that Category I (13-17 years) achieved the best results within the IMAGE campaign. This category achieved almost 97.5% better results compared to Categories II (18-24) and III (25-34) using the same creative solution. This indicates that the IMAGE campaign is creatively more appealing to a younger audience and is extremely effective in attracting visitors or potential students from that age group.

4.2. CPLPV - COST PER LANDING PAGE VIEW

The analysis of Cost per Landing Page View (CPLPV) results indicates that the IMAGE campaign also achieved a lower CPLPV compared to the VIDEO campaign, signaling the cost-effectiveness of the IMAGE campaign in attracting visitors to the landing page with lower costs per view. This is crucial for increasing visitor engagement on the page. In this case, the Cost per Landing Page View (CPLPV), or the cost per view of the destination page, shows a significant percentage difference between the prices of the VIDEO and IMAGE campaigns, amounting to as much as 155.7%.

This means that each landing page view resulting from the VIDEO campaign is 2.56 times more expensive compared to the IMAGE campaign. These data also indicate the higher cost-effectiveness of the IMAGE campaign in terms of CPLPV, as achieving the same or similar results in terms of landing page views is possible with lower costs. This is also crucial information for decision-making in marketing strategies, especially when considering budget constraints and campaign goals.

4.3. CPR - COST PER REGISTRATION

The results of Cost per Registration (CPR), representing the cost per registration, are crucial for evaluating the success of marketing campaigns. In this case, the cost of the VIDEO campaign is 31.55% higher compared to the IMAGE campaign. The difference in registration costs indicates the success of the IMAGE campaign in

Table 2. The results of CPR in Instagram Marketing Campaign Using A/B Testing.

Campaign	CPC - Cost Per link Click	Link Clicks	Reach	Impressions	Amount Spent
VIDEO 21/22	€1,90	683	221K	1.40M	€1,295.41
IMAGE 21/22	€0,73	1,786	210K	1.36M	€1,293.69

Table 3. The results of CPLPV in Instagram Marketing Campaign Using A/B Testing.

Campaign	CPLPV - Cost per Landing Page View	Link Clicks	Reach	Impressions	Amount Spent
VIDEO 21/22	€4,04	321	221K	1.40M	€1,295.41
IMAGE 21/22	€1,58	821	210K	1.36M	€1,293.69

Table 4. The results of CPR in Instagram Marketing Campaign Using A/B Testing.

Campaign	CPR - Cost per Registration	Link Clicks	Reach	Impressions	Amount Spent
VIDEO 21/22	€22,73	57	221K	1.40M	€1,295.41
IMAGE 21/22	€16,59	78	210K	1.36M	€1,293.69



attracting potential students and converting them into registrations with lower expenses. This information is essential for evaluating the cost-effectiveness of campaigns, especially when considering marketing goals and budgetary factors.

Similarly, it can be concluded that male users were fonder to decide on online registration through the IMAGE campaign. Analyzing registration data across three different age categories, it is observed that all three categories are evenly represented. An exception is the Cost per Registration (CPR) for Category I (13-17 years) within the VIDEO campaign, where the cost of the VIDEO campaign is higher by 775.71% compared to the IMAGE campaign. This significant difference suggests that a small number of users who registered on the site came through the VIDEO campaign.

Based on the analysis of these cost metrics, it can be concluded that the IMAGE campaign is more efficient and economical compared to the VIDEO campaign by 24.15% in terms of all three measured factors: CPC, CPLPV, and CPR. This means that considering the cost, the IMAGE campaign achieves the same or better results in attracting visitors, landing page views, and registrations of potential students with 24.15% lower costs compared to the VIDEO campaign. This data can serve as a basis for optimizing marketing strategies and resource allocation for higher education institutions to achieve better results with smaller budgets.

4.4. ROI - RETURN ON INVESTMENT

To calculate the return on investment (ROI), we determined both campaigns' total revenue or value. With the total conversion revenue information for both campaigns, we calculated the ROI for the VIDEO and IMAGE campaigns using the following formulas:

$$ROI_{VIDEO} = \frac{Income_{VIDEO} - \text{Cost of advertising}}{\text{Cost of advertising}}$$

$$ROI_{VIDEO} \approx 12.224,06$$

Equation 1. Formula for calculating the ROI for the VIDEO campaign.

$$ROI_{IMAGE} = \frac{Income_{IMAGE} - \text{Cost of advertising}}{\text{Cost of advertising}}$$

$$ROI_{IMAGE} \approx 16.157,24$$

Equation 2. Formula for calculating the ROI for the IMAGE campaign.

These calculated ROI values show how many times the revenue is greater than the cost of advertising for each campaign, which leads us to the conclusion that the IMAGE campaign achieves a higher ROI compared to the VIDEO campaign, indicating better advertising efficiency and a higher return on investment during the measured period.

$$\text{Percentage difference} = \left(\frac{ROI_{IMAGE} - ROI_{VIDEO}}{ROI_{VIDEO}} \right) \times 100$$

$$\text{Percentage difference} \approx 32,45\%$$

Equation 3. Formula for calculating the percentage difference between ROI for VIDEO and IMAGE campaigns.

This means that the ROI for the IMAGE campaign is about 32.45% higher compared to the VIDEO campaign over 31 days. The most important conclusion is that the IMAGE campaign achieved a significantly better ROI in percentages compared to the VIDEO campaign. This difference in percentages indicates a better return on investment and advertising efficiency for the IMAGE campaign, which is crucial for achieving marketing goals with smaller budgets.

5. LIMITATIONS AND FUTURE RESEARCH

The research was conducted on an appropriate sample of users; however, we believe that a larger sample size would allow for more accurate results and generalization to the entire population. Additionally, the research had a time frame of 31 days, which may limit the understanding of seasonal changes and long-term trends in campaigns. The focus of the study was on IMAGE and VIDEO campaigns. In the future, other creative approaches could be considered to obtain a more comprehensive view of advertising effectiveness. The research concentrated on creative approaches and target groups, neglecting other factors such as ad content, timing of publication, and geographical location. It is essential to note that social media algorithms and user preferences are continually changing, impacting campaign results. Therefore, continuous monitoring and proactive adaptation to changes are necessary. The inclusion of other communication channels or solutions in the analysis is crucial to gaining a comprehensive understanding of the appropriate communication strategy. Although this research provides valuable insights, higher education institutions in Serbia need to consider these limitations and continue monitoring and optimizing their marketing campaigns to achieve the best results in promotion and student attraction.



6. CONCLUSION

Based on the findings and analysis presented above, it is evident that both IMAGE and VIDEO campaigns have their respective advantages and disadvantages in terms of cost-effectiveness and audience engagement. The IMAGE campaign demonstrated lower costs per click (CPC), landing page view (CPLPV), and registration (CPR) compared to the VIDEO campaign, indicating its efficiency in attracting website visitors and potential students with lower costs. Additionally, the IMAGE campaign achieved a higher return on investment (ROI) compared to the VIDEO campaign, indicating better advertising effectiveness and a higher return on investment during the measured period.

Moreover, the analysis revealed that the IMAGE campaign was particularly successful in appealing to the younger age group (13-17 years), suggesting its effectiveness in capturing the interest of this demographic segment. On the other hand, the VIDEO campaign showed a higher cost per registration (CPR) and lower efficiency in attracting potential students, especially within the younger age group. However, it is important to acknowledge the limitations of this study, such as the sample size, the duration of the study, and the focus solely on IMAGE and VIDEO campaigns. Future research could explore additional creative approaches and factors such as ad content, timing of publication, and geographic location to gain a more comprehensive understanding of advertising effectiveness in the context of higher education marketing.

In conclusion, the results of this study showed that incorporating paid advertising in Instagram marketing campaigns is an effective strategy. The study also showed that, while both IMAGE and VIDEO campaigns have their merits, the findings suggest that the IMAGE campaign may offer a more cost-effective and efficient strategy to attract prospective students. By continuously monitoring and optimizing marketing efforts, institutions can attract more students and remain competitive. This is shown by the increase in newly enrolled students.

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