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Original Scientific Paper

Digital Motivation of Generation Z: Immersive Technologies as a Catalyst for Museum Visitation and Cultural Engagement

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Abstract: The rapid integration of immersive digital technologies is fundamentally reshaping how cultural content is experienced, challenging museums to adapt to the expectations of digitally native audiences, particularly Generation Z. This study empirically examines whether digital, virtual, and multimedia content serves as a motivational factor for museum visitation and enhances the user experience among this generational cohort. An empirical, cross-sectional study was conducted using a structured, anonymous questionnaire administered to 97 undergraduate students (aged 19–25) at the University of Zagreb, Faculty of Graphic Arts. The results indicate that 64% of respondents perceive digitally enhanced museum content as a motivating factor for more frequent visits, while 76% believe such solutions foster a new form of experiential engagement. Concurrently, a notable proportion of respondents express caution toward technology-mediated interpretation, underscoring generational heterogeneity and the importance of user autonomy. The findings are interpreted through established theoretical frameworks, including the Technology Acceptance Model (TAM), Uses and Gratifications Theory (U&G), and Self-Determination Theory (SDT), and are contextualized by a systematic literature review. The study contributes to ongoing debates on digital transformation by providing empirically grounded insights into the motivational dynamics of Generation Z. It concludes that digital technologies are effective when thoughtfully aligned with user expectations, educational goals, and institutional values.

Keywords: artificial intelligence (AI); augmented reality (AR); multimedia; new technologies.

1. Introduction

Day by day, technology is developing extremely fast and entering human lives. For today's man, life without smart devices is completely unimaginable. Artificial Intelligence (AI) has become our reality and is everywhere around us. It is built into, more/less, all the smart devices that surround us. Accordingly, whether we are aware of it or not, the forms of human behaviour, communication, learning, and expectations are changing. New technologies are entering all aspects of our lives. Consequently, they enter the museum sector too, affecting the way people experience and perceive works of art. As new technologies become present in our everyday life day by day, the number of various research in that field increases. Thanks to new technologies, augmented reality (AR) and mixed reality (MR), as well as new and innovative solutions, a completely new experience has been created in the interaction between humans and works of art. As time goes by, the museum audience is changing. Museums cannot be only places with exhibits/works of art on display. The new generation and museum audiences/visitors expect more, new experiences, and museums have to respond to these demands if they want to be attractive to a new generation of visitors.

The availability of powerful mobile devices that can run AR/MR/VR applications and content creates new expectations on user experience (UX) that do not affect just the virtual environment but also the physical world around us [1]. The current level of development of artificial intelligence (AI), mixed reality (MR), and

augmented reality (AR) gives an unlimited range of options and possibilities for various usage possibilities and scenarios [1].

In the last few years, there has been a considerable increase in the use of new technologies in museum environments in an attempt by museums to embrace technological innovations and adapt to the challenges of the digital era [2]. However, for museums, this adaptation to the digital era created "one of the most important challenges of their modern history" [3] since it created new dynamics in storytelling and content creation. At the same time, the implementation of new technologies affects not only museum visitors but also museum professionals (museum employees). They are responsible for the museum's collections and material (some of them available to the public, some of them preserved in vaults), and exhibitions. With the implementation of new technologies, they will be responsible for the creation of AR content for artifacts. This opens a new field to explore – are they willing to do so, and do they have the knowledge and capacity to do it?

A new technology currently has some limitations, but day by day they are improving. This is definitely the case for AR, which is at the incipient stage of its development and has some limitations with regard to its implementation. The potential benefits of AR offer exciting research possibilities. In spite of the comments of AR can provide a better understanding of museum exhibits because it enables the enhancement of physical objects with additional external information, as discussed by both [4].

Augmented reality (AR) and mixed reality (MR), in museums, can be used for reconstructing historical environments [5], for interpretation and experience enhancement for increased visitor engagement and education [6], and for creating interactive, engaging, and immersive experiences in museum environments [7, 2].

Augmented reality (AR) adds multimedia content (elements: 3D, sound, video, text, animation, photo, and link to content) to the real-world environment in real-time and can be used/experienced on various devices such as smartphones, tablets, and AR glasses.

This study aims to examine whether digital, virtual, and multimedia content can influence museum-related attitudes and motivate members of Generation Z to visit museums more frequently. Given that this generation has grown up immersed in digital technologies, the research focuses on understanding how technology-mediated interpretation affects user experience, perceived proximity to artworks, and overall engagement with museum content. By addressing these issues, the study seeks to contribute empirically grounded insights into the role of immersive technologies in contemporary museum environments.

Grounded in established theoretical frameworks of technology acceptance and media use, the study assumes that digital technologies can function as facilitators of cultural engagement when they are perceived as useful, engaging, and supportive of user autonomy. Accordingly, it is hypothesized that digitally enriched museum content positively influences visitation motivation and user experience among Generation Z, while also acknowledging the presence of diverse and sometimes cautious attitudes toward technological mediation within this cohort. These assumptions are empirically examined through a quantitative survey and further interpreted through a critical review of relevant interdisciplinary literature.

2. Experimental Part

2.1. Research Design and Empirical Data Collection

The empirical part of the research was conducted at the University of Zagreb, Faculty of Graphic Arts, during the period from 2 to 7 June 2023. The study adopted a quantitative, cross-sectional research design, using a structured questionnaire as the primary data collection instrument. A cross-sectional approach was selected because it enables the examination of attitudes, perceptions, and behavioural intentions at a specific point in time and is particularly suitable for exploratory research in the fields of user experience, technology acceptance, and cultural participation.

The questionnaire was administered on-site in a written, paper-based format and completed anonymously. This mode of administration was intentionally chosen to reduce social desirability bias and to encourage honest and reflective responses, particularly given the normative expectations often associated with technology use among younger generations. Although this approach was more time-intensive

than online data collection, it enhanced response reliability and reduced the likelihood of respondents providing answers perceived as socially expected rather than personally held.

The questionnaire focused on three core dimensions directly related to the research questions:

(1) motivation for museum visitation,

(2) acceptability and trust in digital and immersive technologies, and

(3) perceived impact of digital solutions on user experience (UX) and engagement with exhibits.

Sampling was conducted using a convenience sampling method, drawing from the undergraduate student population of the Faculty of Graphic Arts. This approach is commonly employed in early-stage and exploratory research on emerging technologies, particularly when the aim is to examine perceptual and attitudinal patterns within a theoretically relevant user group rather than to achieve population-level generalization.

The target population consisted of undergraduate students belonging to Generation Z, defined as individuals born between 1995 and 2010. A total of 97 valid questionnaires were collected from students aged between 19 and 25. The gender distribution of the sample was 31% male and 69% female (Figure 1). While this gender imbalance reflects the demographic structure of the study program, it is also analytically relevant and is therefore explicitly considered in the interpretation of results in the discussion section.

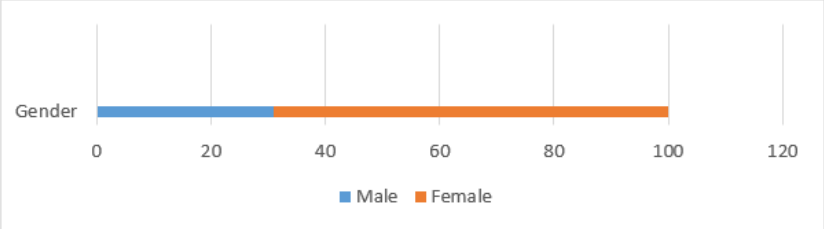

Figure 1. The gender distribution.

2.2. Role of the Literature Review in the Research Design

In addition to the empirical survey, the research incorporates a systematic and theory-driven literature review, which plays a central role in contextualizing, interpreting, and critically discussing the empirical findings. Importantly, not all conceptual dimensions examined in the literature were operationalized through the questionnaire. This methodological decision was intentional and grounded in the recognition that certain phenomena—such as long-term behavioural change, institutional readiness, ethical implications, and curatorial practices—cannot be adequately captured through short-form survey instruments.

The literature review, therefore, supports the discussion by addressing several thematic areas that extend beyond the scope of the questionnaire, including:

- Theoretical models of technology acceptance and media use (e.g., Technology Acceptance Model, Uses and Gratifications Theory, Self-Determination Theory), which provide explanatory frameworks for interpreting respondents' attitudes and motivational patterns.
- Museum studies and cultural participation research, focusing on generational differences in museum engagement, evolving audience expectations, and the transformation of museums from object-centred to experience-oriented institutions.
- Human–computer interaction (HCI) and user experience (UX) research, particularly studies examining how immersive and interactive technologies influence attention, learning, emotional engagement, and perceived authenticity.
- Institutional and professional perspectives, including the impact of digital transformation on museum professionals, curatorial authority, and content authorship—issues that are critical for implementation but not directly accessible through visitor surveys.
- Ethical and societal considerations, such as algorithmic mediation, autonomy of interpretation, accessibility, and inclusivity in digitally augmented cultural environments.

By integrating these thematic strands, the discussion moves beyond descriptive reporting of survey results and situates the empirical findings within broader academic and professional debates.

2.3. Literature Review Strategy and Reduction of Bias

To ensure methodological rigor and minimize selection bias, the literature review followed a structured and transparent search strategy. Relevant academic publications were identified through systematic searches conducted in established scientific databases, including Scopus, Web of Science, Google Scholar, IEEE Xplore (for technology-focused studies), and ScienceDirect.

Searches were conducted using combinations of predefined keywords and Boolean operators, including but not limited to: augmented reality, mixed reality, virtual reality, museums, cultural heritage, user experience, technology acceptance, Generation Z, digital storytelling, and immersive technologies.

To reduce thematic and methodological bias, the review included studies from multiple disciplinary perspectives, including media studies, museum studies, psychology, education, and computer science. Preference was given to peer-reviewed journal articles, conference proceedings, and authoritative academic books published within the last ten years, while seminal earlier works were included when theoretically foundational.

The literature was analysed comparatively rather than selectively, allowing convergent and divergent findings to inform the discussion. This approach ensures that the empirical results are not interpreted in isolation but are critically examined in relation to existing evidence, theoretical assumptions, and practical implications.

3. Results and Discussion

3.1. Interpretation of Empirical Findings

The results of this study indicate a generally positive orientation of Generation Z toward the integration of digital, virtual, and multimedia content in museum environments. However, these findings gain deeper analytical value when interpreted in relation to the characteristics of the respondents, particularly their gender distribution and educational background.

The finding that 64% of respondents reported that digital and multimedia content would motivate them to visit museums more frequently (Figure 2) can be partially understood through the lens of both generational and disciplinary factors. As members of Generation Z, respondents have grown up in digitally saturated environments in which visual, interactive, and multimedia formats dominate everyday communication. Consequently, museums that adopt similar modes of engagement may appear more relevant, accessible, and aligned with their habitual ways of consuming information.

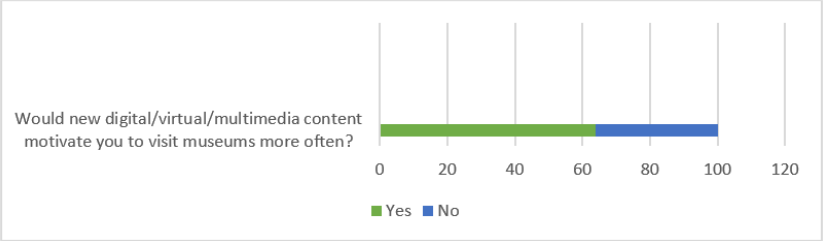

Figure 2. Would new digital/virtual/multimedia content motivate you to visit museums more often?

The relatively high proportion of female respondents in the sample may also contribute to this positive evaluation. Prior research in museum studies and cultural consumption suggests that female visitors often demonstrate higher levels of emotional engagement, narrative sensitivity, and openness to interpretative mediation. Digital and multimedia content—particularly when designed to provide contextual storytelling, visual explanation, or immersive interpretation—may therefore resonate more strongly with female audiences, increasing their perceived motivational value.

At the same time, the presence of 36% of respondents who reported no motivational effect underscores the diversity of attitudes within Generation Z. This group may include individuals who prefer traditional, object-centred

museum experiences or who perceive digital interventions as unnecessary or distracting. This internal variation reinforces the argument that technological enhancement should remain optional and adaptable rather than prescriptive.

The results further show that 60% of respondents consider it acceptable for new technologies to define content for them, while 37% reject this notion (Figure 3).

This division reflects a broader tension characteristic of digitally native generations. On one hand, the acceptance of algorithmically curated content aligns with everyday practices shaped by social media, recommendation systems, and digital learning platforms. For students educated in graphic arts and visual communication, such systems may be perceived not as restrictive but as tools that efficiently structure information and enhance the user experience.

On the other hand, the substantial proportion of respondents who reject technologically defined content indicates a critical awareness of algorithmic mediation. This response may be particularly influenced by the respondents' educational background. As students trained in visual culture, design, and communication, they are likely sensitized to issues of authorship, interpretation, and meaning-making. From this perspective, resistance to technologically defined content can be understood as a desire to preserve interpretative autonomy and personal engagement with artworks, a principle central to museum ethics and curatorial practice.

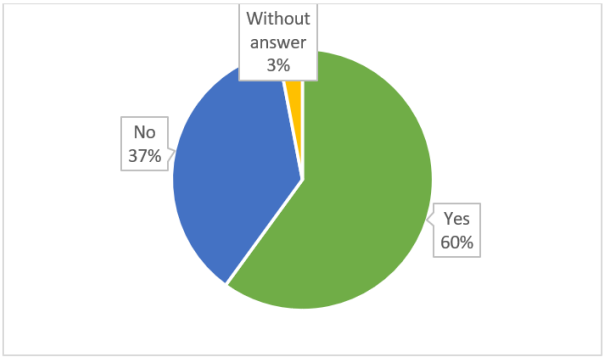

Figure 3. Is it acceptable for you to let new technologies define content for you?

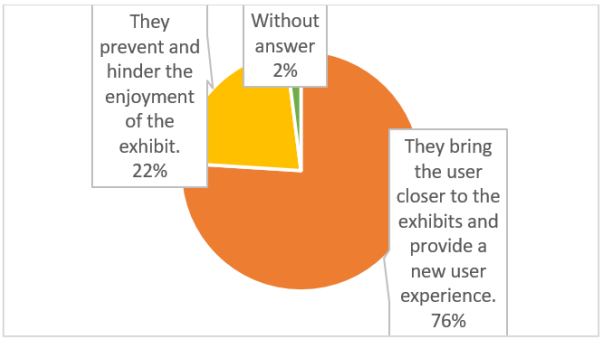

Figure 4. Contribution of solutions.

The experiential dimension of digital technologies is most clearly reflected in respondents' evaluations of their impact on enjoyment and engagement with exhibits. The findings show that 76% of respondents believe that digital solutions bring users closer to exhibits and provide a new user experience, while 22% perceive them as hindering enjoyment (Figure 4).

The strong positive response supports the assumption that digitally mediated experiences can enhance perceived proximity to artworks by offering layered interpretation, visual reconstruction, or interactive exploration. For visually trained students, such enhancements may align particularly well with their cognitive and perceptual preferences, allowing them to

engage with artworks not only aesthetically but also analytically and experientially.

However, the critical responses should not be overlooked. The perception that digital solutions hinder enjoyment may reflect concerns about sensory overload, fragmentation of attention, or the disruption of contemplative viewing. These concerns are consistent with previous research emphasizing that immersive technologies must be carefully integrated to avoid overshadowing the physical artwork or reducing the authenticity of the museum experience (Jung et al., 2020).

Importantly, these findings suggest that educational background does not lead to uncritical acceptance of technology. On the contrary, respondents' disciplinary knowledge may foster both appreciation and critique. This dual response strengthens the scientific value of the results, as it demonstrates that positive attitudes toward digital museums coexist with reflective scepticism.

Rather than positioning digital technologies as inherently beneficial or detrimental, the results indicate that their effectiveness depends on contextual, experiential, and user-specific factors. Gender, educational orientation, and generational identity all appear to shape how digital interventions are perceived and evaluated. This nuanced understanding aligns with recent studies by Bosman et al. (2024) [8] and Popova et. al., which emphasize that immersive technologies achieve their greatest impact when they support learning, interpretation, and user agency rather than functioning as standalone attractions [9].

In this sense, the findings contribute to a more differentiated understanding of technology-enhanced museum experiences, highlighting the importance of audience-aware design and theoretically informed implementation strategies.

3.2. Theoretical Framework and Contribution

From a theoretical perspective, the results of this study can be interpreted through several established frameworks in media, technology adoption, and cultural consumption research.

Firstly, the findings strongly align with the Technology Acceptance Model (TAM), which posits that users' acceptance of new technologies is primarily determined by perceived usefulness and perceived ease of use [10]. In this context, the affirmative responses of 64% of participants suggest that digital, virtual, and multimedia museum content is perceived as useful in enhancing the museum experience. This perceived usefulness likely stems from the ability of such technologies to provide richer contextual information, multisensory engagement, and more personalized modes of interaction with artworks and exhibits.

Secondly, the results support principles derived from Uses and Gratifications Theory, which emphasizes that audiences actively select media technologies to satisfy specific psychological and social needs [11]. For Generation Z, these needs often include interactivity, immediacy, visual stimulation, and autonomy in information consumption [12]. Digital and immersive museum technologies directly address these gratifications by transforming passive viewing into a participatory experience, thereby aligning museum visits with contemporary media consumption habits.

Furthermore, the findings can be situated within Self-Determination Theory (SDT), particularly its emphasis on autonomy, competence, and relatedness [13]. Interactive digital content allows visitors to control the pace and depth of their engagement (autonomy), enhances understanding through visual and experiential learning (competence), and may foster social sharing and collective experiences (relatedness). The positive responses observed in the study suggest that such technologies can support intrinsic motivation to engage with cultural heritage, rather than relying solely on external incentives.

3.3. Relation to Existing Research

The present findings extend and complement existing empirical research on immersive technologies in cultural institutions. As demonstrated by Gong et al. (2022), AR-assisted experiences increase visitors' curiosity and interest [14], particularly when visual augmentation replaces or supplements extensive textual explanations. This is especially relevant for Generation Z, whose media consumption patterns favour visual and interactive content over traditional text-heavy formats. The current study

reinforces this observation by empirically demonstrating a generational readiness to accept digitally mediated cultural experiences.

Similarly, Jung et al. (2020) showed that intentions to visit physical art galleries are mediated by intentions to use wearable AR technologies [15]. This mediation effect is crucial, as it suggests that technology does not replace the physical museum visit but rather functions as a gateway or catalyst that reshapes visitors' expectations and emotional connections to cultural spaces. The results of the present study provide further evidence for this indirect motivational mechanism, indicating that digital content may lower psychological barriers to museum visitation among younger audiences.

Studies by Paulauskas et al. (2023) and Kleftodimos et al. (2023) further contextualize these findings by emphasizing the educational and experiential value of AR and VR in situations where physical access, historical reconstruction, or contextual understanding is limited [16, 17]. Taken together, these studies support the notion that immersive technologies are most effective when they are purposefully integrated into interpretive strategies rather than deployed as novelty-driven additions.

Prior research establishes the possibilities of immersive technology in museums; it overlooks differences among generations, motivational dynamics, and behavioural insights. This paper addresses these gaps by providing a theoretically framed, statistically interpretable, and empirically grounded examination of how Generation Z perceives technologies that are increasingly shaping contemporary museum experiences. This positions this paper as a significant contribution to a field that is still in the process of defining its methodological standards and conceptual boundaries.

3.4. Implications for Museums and Cultural Policy

From a practical standpoint, the findings have significant implications for museum practice, exhibition design, and cultural policy. The demonstrated motivational potential of digital content suggests that museums seeking to engage younger audiences should invest in well-designed, user-centred digital experiences that complement rather than overshadow physical

Importantly, the results indicate that digital technologies should not be implemented uniformly across all audiences. Instead, museums should adopt a segmented engagement strategy that recognizes generational differences in media preferences and cultural expectations [18]. For Generation Z, digital layers can function as entry points that foster initial interest, which may later develop into a deeper appreciation for traditional curatorial narratives [19].

On a broader societal level, increased engagement of younger generations with museums has implications for cultural sustainability and intergenerational knowledge transfer. By aligning museum experiences with contemporary digital practices, cultural institutions can help prevent the marginalization of heritage in an increasingly digitized society [20].

3.5. Societal and Behavioural Impact

The study also contributes to understanding how digital technologies may influence human behaviour in cultural contexts. The positive reception of digital content among Generation Z suggests a shift from passive consumption toward experiential and participatory cultural engagement. This shift has the potential to redefine the role of museums—from repositories of objects to interactive spaces of learning, dialogue, and identity formation [21].

Moreover, by enhancing accessibility and lowering cognitive and emotional entry barriers, digital technologies may contribute to more inclusive cultural participation. This is particularly relevant for individuals who perceive traditional museum environments as intimidating, irrelevant, or disconnected from their everyday experiences [22].

3.6. Limitations and Directions for Future Research

While the findings provide valuable insights, they are based on a convenience sample drawn from a single academic institution, which limits their generalizability. Future research should incorporate larger and more diverse samples, include comparative analyses across generations, and examine specific types of digital content (e.g., AR, VR, mobile applications) to identify which modalities are most effective in different contexts.

Additionally, longitudinal studies could explore whether digitally motivated museum visits lead to sustained cultural engagement over time, thereby addressing the question of long-term behavioural change [23].

3.7. Scientific Contribution

In summary, this study contributes to the growing body of research on digital transformation in cultural institutions by providing empirical evidence of Generation Z's motivational responses to digital museum content. It supports established theories of technology acceptance and media use while extending their application to the domain of museum studies [24]. By bridging empirical findings with theoretical frameworks and practical implications, the study offers a robust foundation for future interdisciplinary research at the intersection of technology, culture, and human behaviour.

4. Conclusions

Recent developments in augmented reality (AR), artificial intelligence (AI), and mixed reality (MR) are reshaping how cultural content is experienced and interpreted. Museums, as hybrid spaces of education and cultural communication, provide a critical context for examining these changes. This study explored the motivational and experiential impact of digital and multimedia content on museum engagement among members of Generation Z.

The results indicate that digital technologies have a clear, though not universal, positive effect. A majority of respondents (64%) reported increased motivation to visit museums when digital content is present, while 76% perceived such solutions as enhancing user experience and bringing them closer to exhibits. At the same time, a substantial proportion expressed reservations regarding technology-mediated interpretation, highlighting the heterogeneity of attitudes within Generation Z.

Theoretically, the findings support established models of technology acceptance, media use, and intrinsic motivation, demonstrating that immersive technologies function as effective facilitators of engagement primarily when they are perceived as useful, autonomy-supportive, and aligned with user expectations. The scientific contribution of this study lies in its empirical, theory-driven examination of generational responses to digital museum technologies.

Practically, the results suggest that museums should implement digital solutions as optional, user-centred interpretive layers rather than universal replacements for traditional exhibition practices. Overall, the study underscores the importance of human-centred and generationally sensitive approaches in the digital transformation of cultural institutions and identifies a promising direction for future interdisciplinary research.

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