GAMIFICATION IN AUSTRIAN MUSEUMS

Research Summary

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Patrimonio, Identidad y Mediación Cultural. Curso 2021/22

“The most important things in life are learned through play.“

- Francesco Tonucci

Introduction

Playing is a fundamental human need and an important catalyst for learning new skills and acquiring knowledge. In addition to its traditional forms, the digital world particularly demonstrates the widespread nature of playing as a leisure activity. The latest study on gaming in Austria from 2021 found that 7 out of 10 Austrians play video games and highlights their increasing popularity among people of all ages in Austrian society (Austrian Association for Entertainment Software [ÖVUS], 2021).

With the goal to increase motivation and participation of individuals, game design and mechanics have expanded to fields such as marketing, healthcare and education. The term we now know as gamification refers to the application of game elements in these non-game contexts (Deterding et al., 2011).

Museums too have started to experiment with the concept of gamification, implementing gamified educational programs or hosting workshop series on the topic. However, the extent of gamification in Austrian museums was unknown so far because no data had been collected on this topic.

For this reason, as part of my master's thesis in the program *Education & Museums. Cultural Heritage, Identity & Mediation* at the Universidad de Murcia in Spain, I explored whether and how gamification is used in the educational programming of Austrian museums. My study examined the number of museums that currently use gamification in analog and digital formats and the game elements that are applied. I also analyzed the reasons for (not) using gamification among the museums.

The study was based on a quantitative data collection through an online survey. The survey was sent to all registered museums in Austria. A total of 143 completed questionnaires were collected. The research findings drawn from these questionnaires are presented and summarized in this report.

Highlights



Over 50% of museums in Austria incorporated gamification in their educational programming.



The main reasons for its use were to enhance visitor experiences and diversify the audience.



Lack of know-how, insufficient financial resources, and technological limitations made the implementation more challenging.

Meaningful Gamification

The most frequently used game elements align with the theory of meaningful gamification.



Apps, interactive screens and walls were among the most used technological tools.



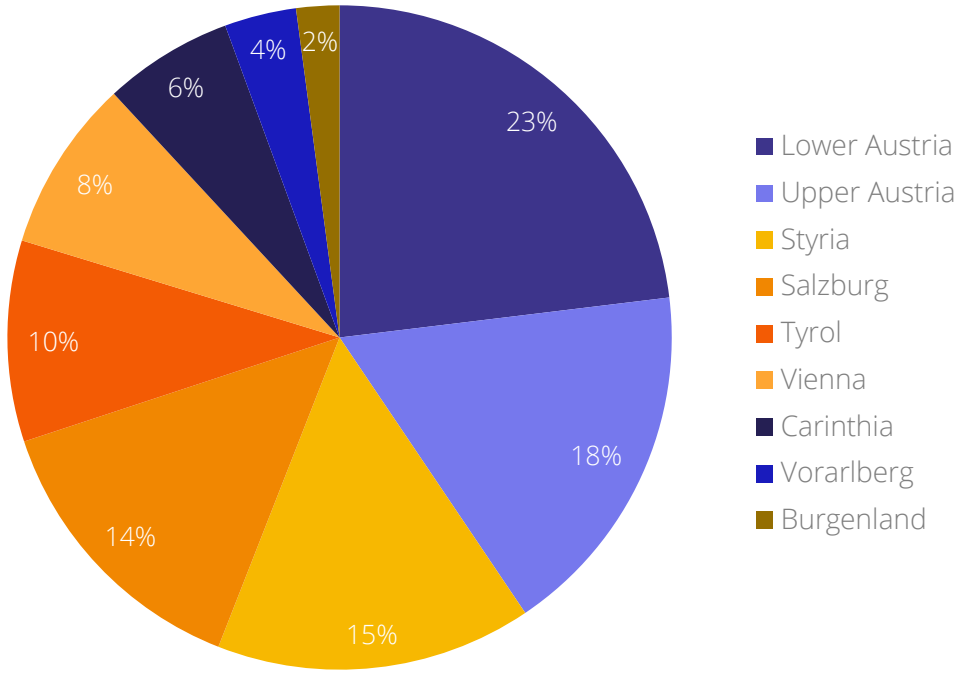
Facebook and the museum websites were among the most used distribution channels.

Analysis of the surveyed museums

To begin with, this chapter will give an overview of the museums that have responded to the survey. It visualizes data related to the museums' geographical location and distribution within Austria, collection focus, ownership, annual budget, awarded museum quality seal and existence of an education and/or digitalization department.

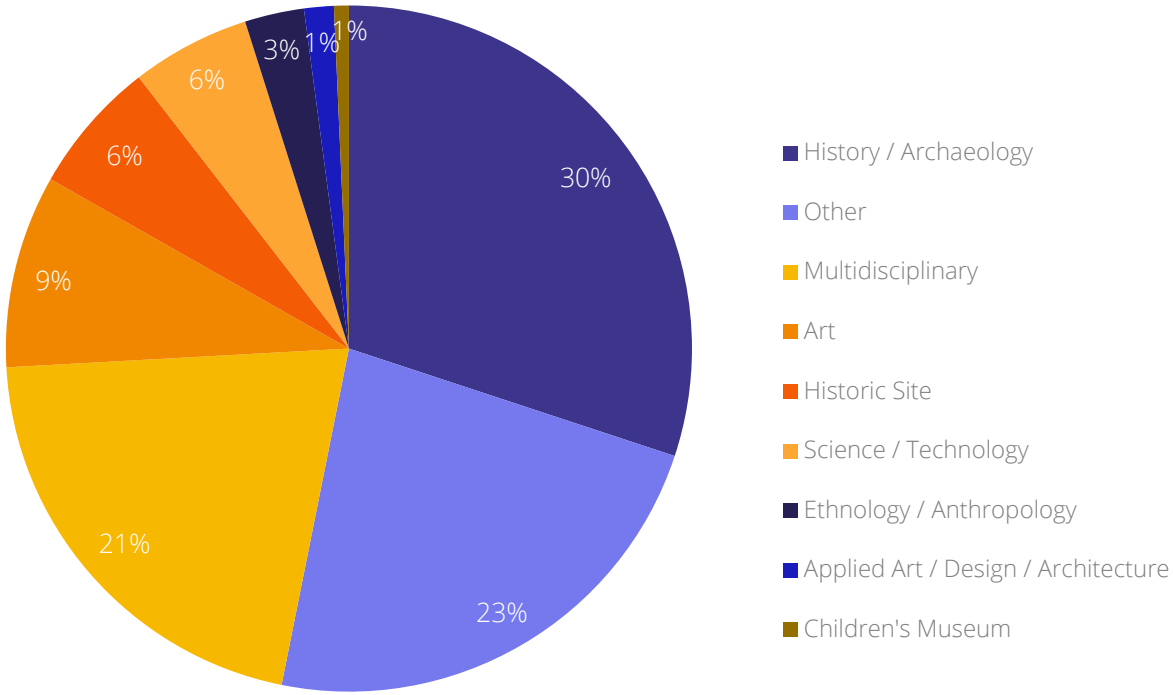
Geographic Distribution

Museums from all Austrian federal states participated in the survey. The distribution of responses roughly corresponds to the distribution of museums in the respective federal states. More than half of the responses came from the federal states with the highest museum density: Lower Austria, Upper Austria, and Styria.



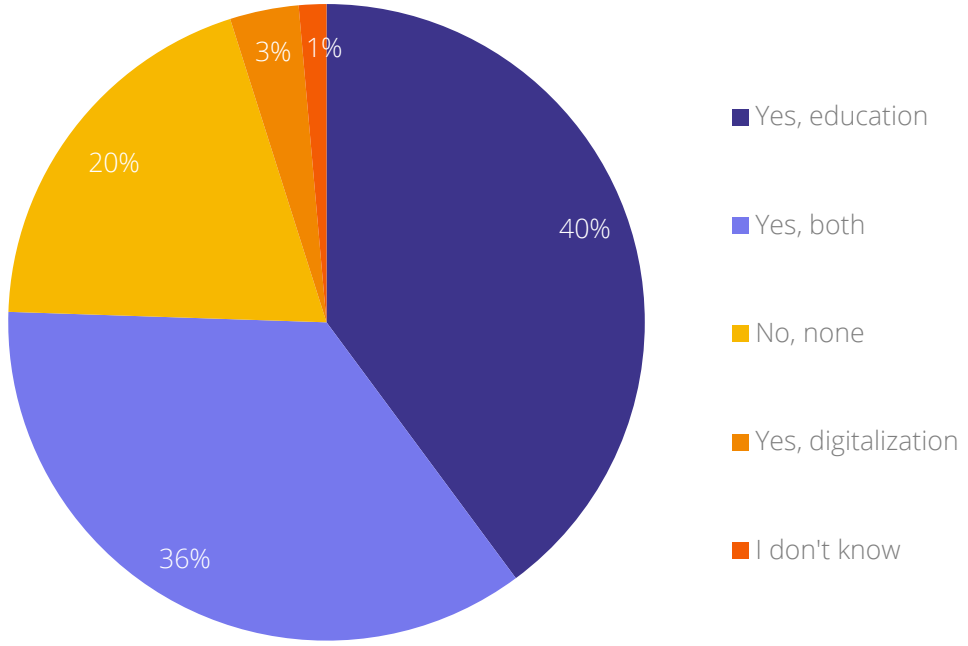
Collection Focus

The largest group of museums that responded to the survey had a collection focus for history or archaeology (30%). The second largest group (23%) were museums having focuses that could not be easily placed into predefined categories such as city museums, specialized museums, and museums that focused on specific personalities, etc. Finally, 21% of museums stated a multidisciplinary collection focus.



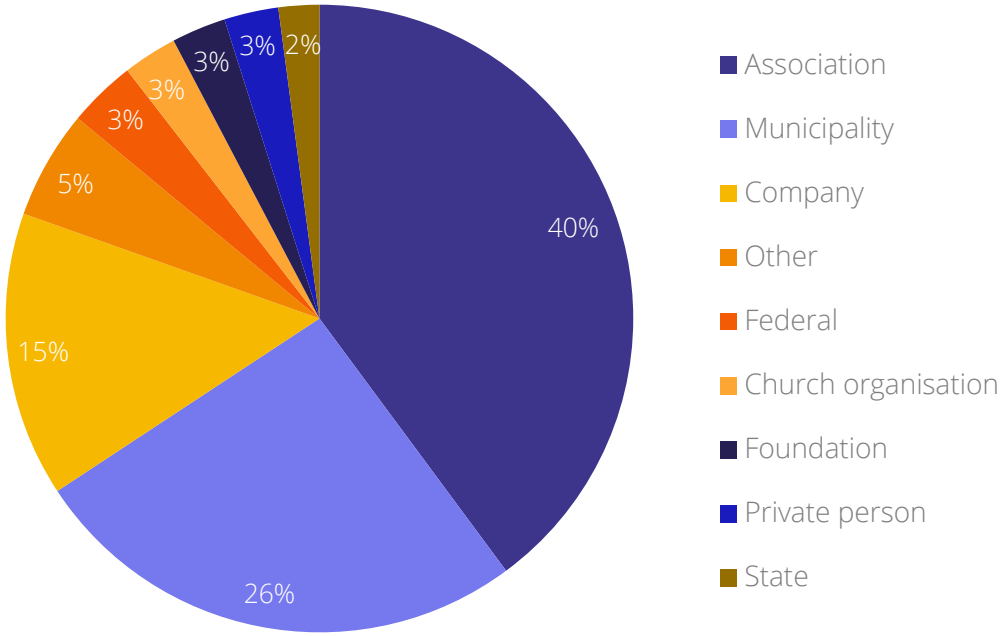
Education | Digitalization

When asked if there was a dedicated department or responsible person for education and/or digitalization, more than 70% answered with yes. 40% of the surveyed museums had a department or person for education, 3% had a department or person for digitalization, and 36% had both. 20% of the museums had neither a department or person for education nor for digitalization.



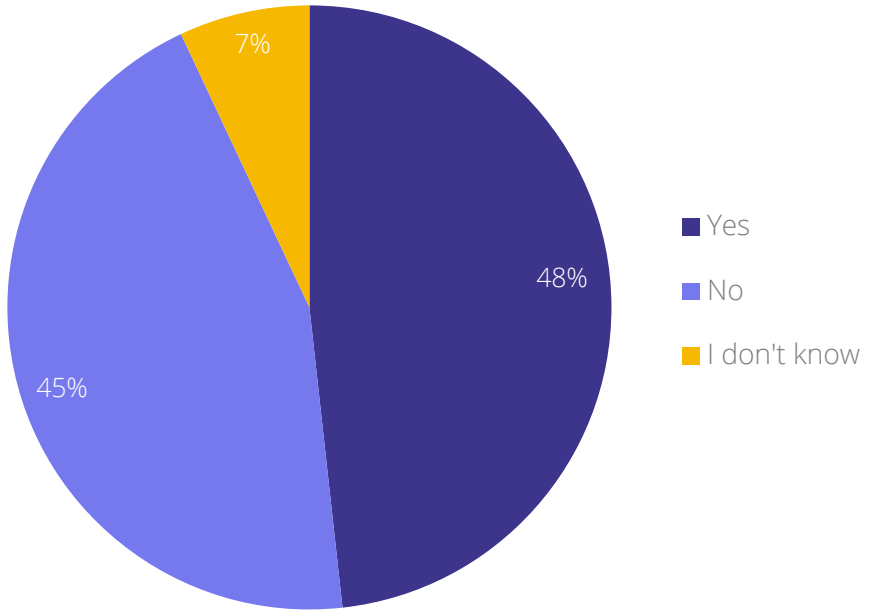
Ownership

63% of the surveyed museums were under private ownership (association, company, organization, religious institution, private person, foundation), and 31% were in public ownership (municipality, state, federal).



Museum quality seal

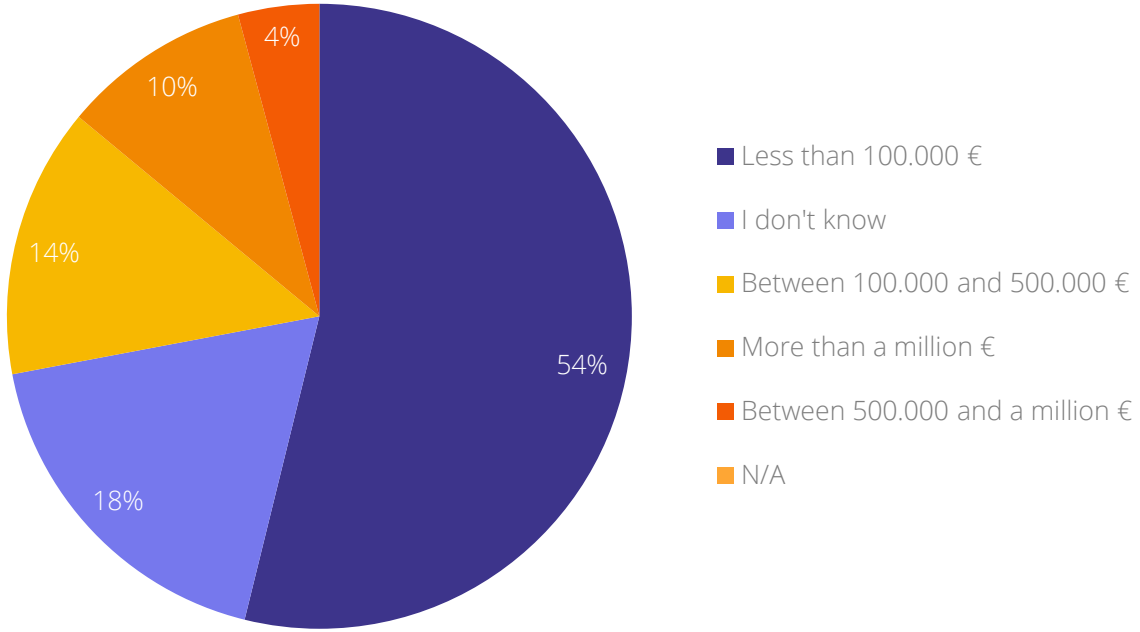
Just under half of the surveyed museums had a museum quality seal awarded[1] by the Austrian Museum Association.



[1] The museum quality seal refers to the *Museumsgütesiegel*, which is awarded to all Austrian museums that meet a high level of quality going beyond the minimum standards required for registering a museum. The criteria for awarding the *Museumsgütesiegel* are based on the International Council of Museums' Ethical Guidelines for Museums and guarantee that visitors receive an exceptional museum experience.

Annual Budget

More than half of all museums that completed the survey had a total annual budget of less than one hundred thousand Euros. 18% were unable or unwilling to provide information. 10% of the museums had a budget of over one million Euros per year.

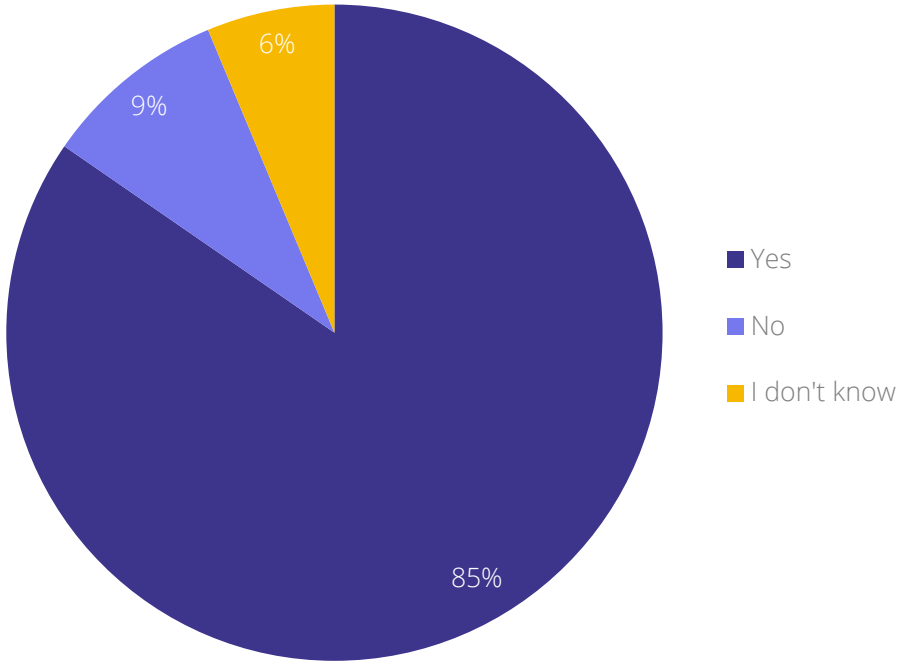


Educational Programming

The following chapter explores whether the surveyed museums generally had an educational programming or not in place and which kind of formats, analog or digital, they offered. It also gives information on who was responsible for the development of digital formats in their institution.

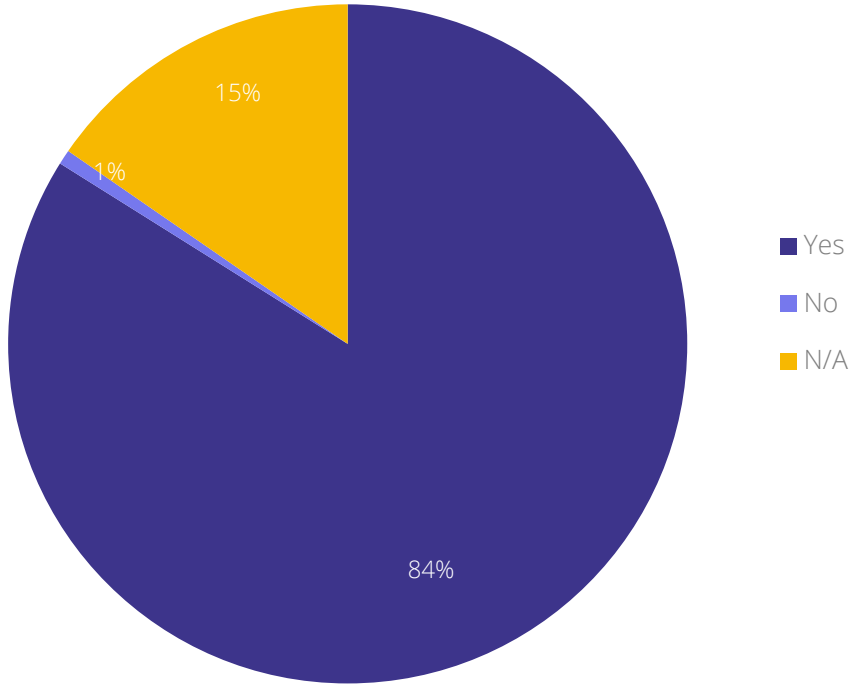
Educational Programming

85% of all surveyed museums had educational programming in place. Only 9% did not have educational programming, and 6% responded with I don't know.



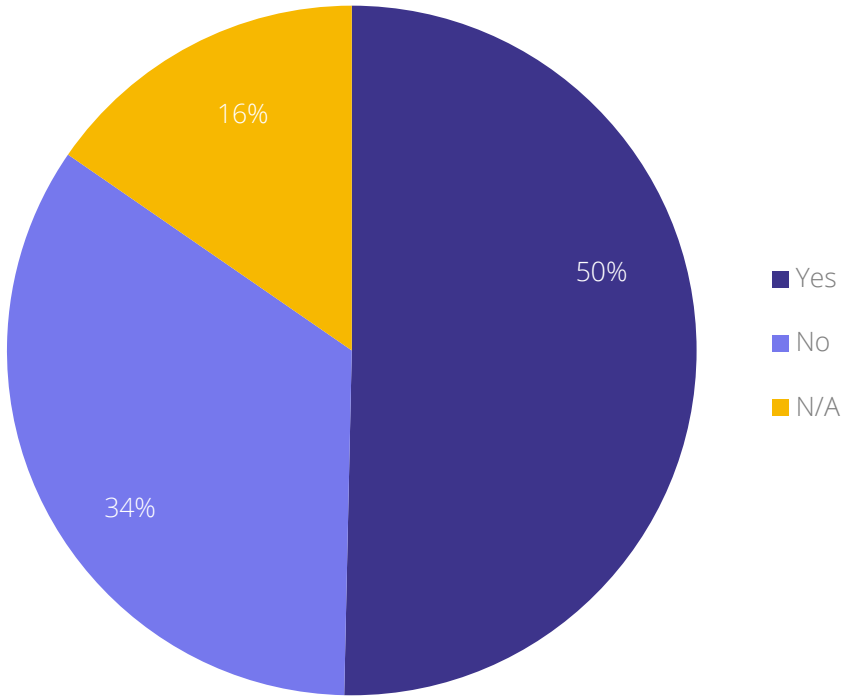
Analog Programming

84% of all surveyed museums offered analog educational programs. This corresponds to 120 museums. Only one museum did not have any analog educational programs. The N/A segment refers to those museums that either had no educational programming, or they did not know, and therefore could not answer this question.



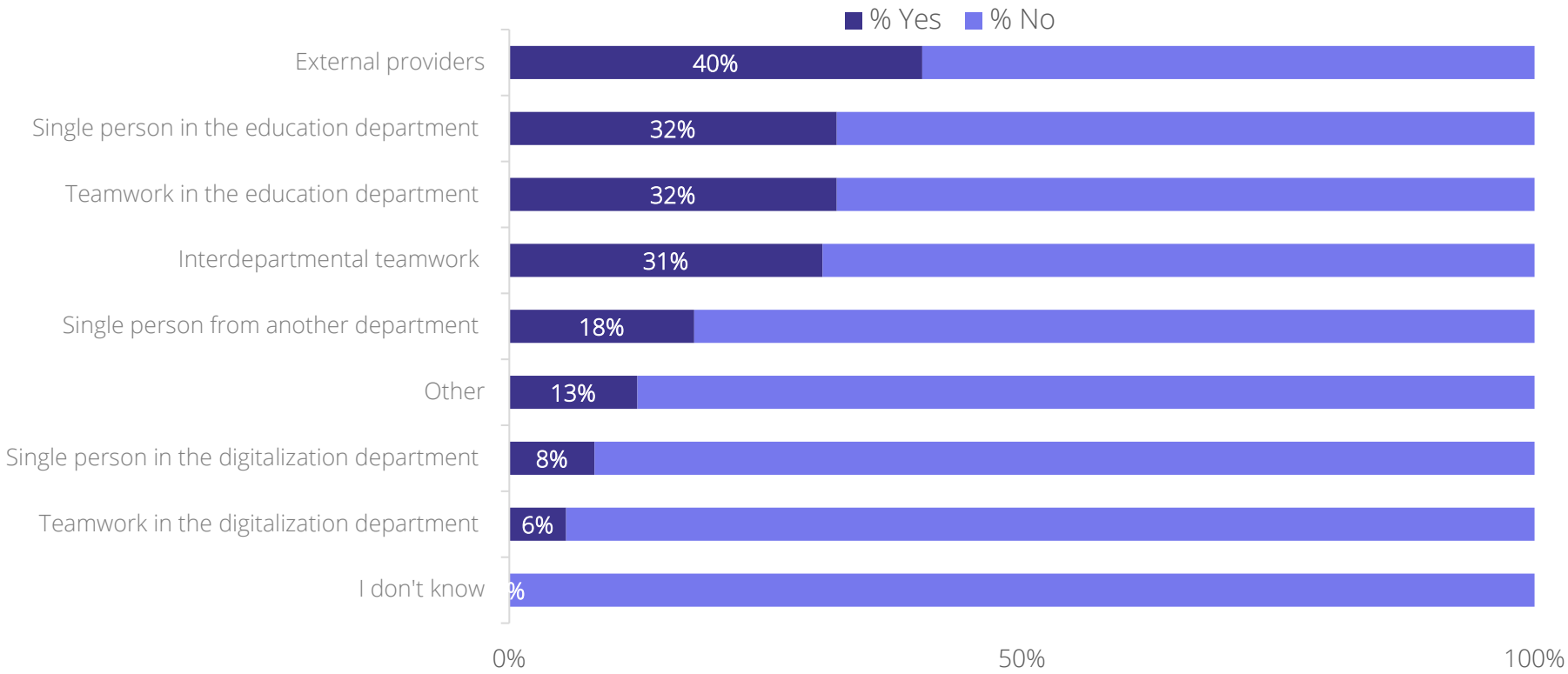
Digital Programming

Half of all museums that offered educational programs also had digital formats. The N/A segment refers to those museums that either had no educational programming, or did not know, and therefore could not answer this question.



Who is Responsible for the Development of Digital Education Formats?

Currently , the majority of who is responsible for the development of digital educational formats are external providers. They are closely followed by designated teams or appointed single personnel in the organization's education department. It is reported that digitalization departments are only occasionally responsible for creating digital education formats. Below shows a more detailed layout of the development responsibilities.

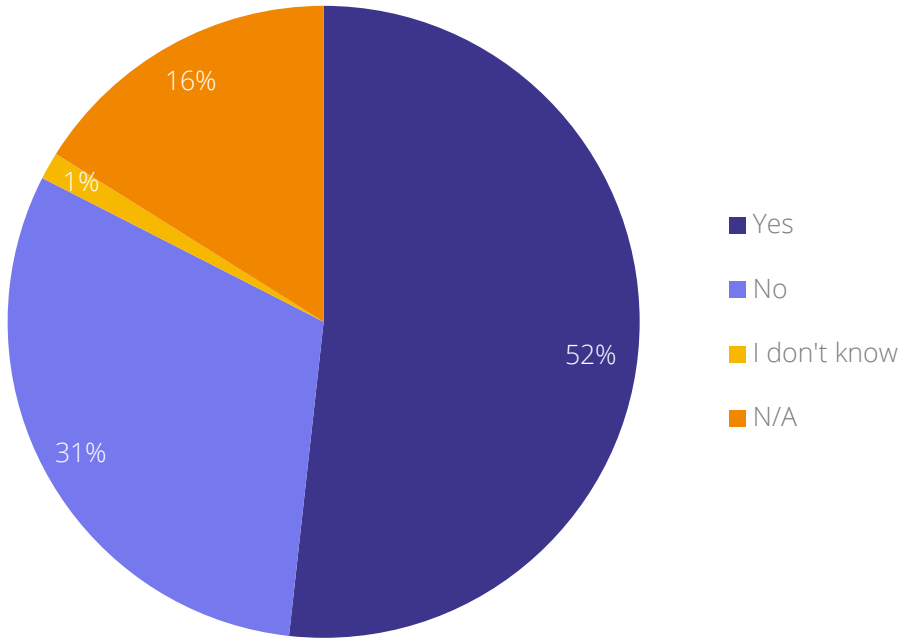


Gamification in Educational Programming

After having explored the general existence of an educational programming in the last chapter, the following section focuses on the implementation of gamification in analog and digital educational offers. It also presents the reasons why gamification was (not) used in the surveyed institutions.

Gamification in Analog Programs

More than half of all surveyed museums that had analog educational programming incorporated gamification into their analog educational projects (61%) .



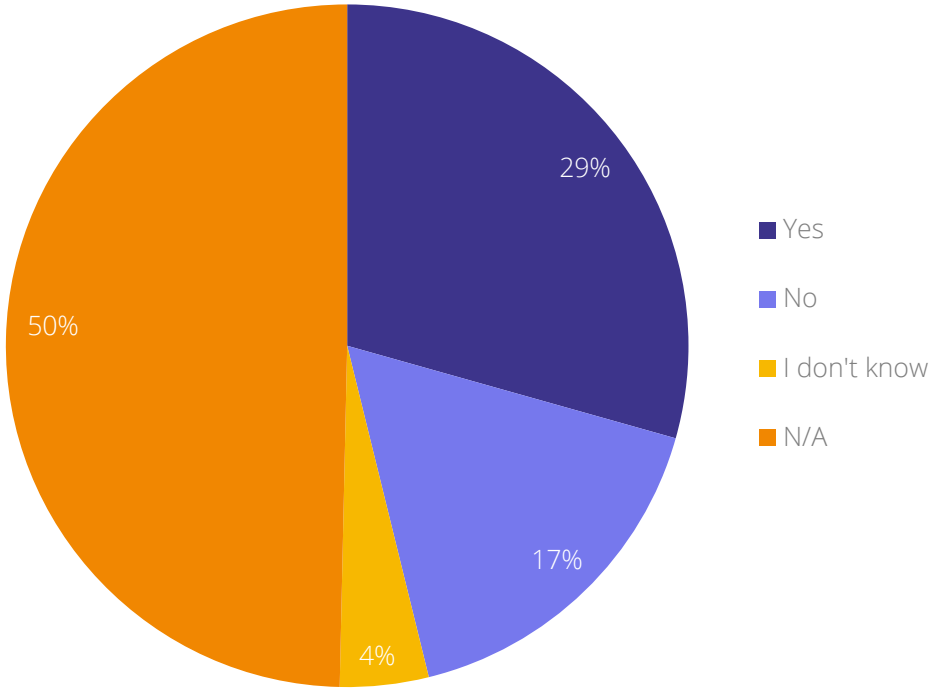
Gamification in Analog Programs

The surveyed museums used the following games or game elements in their analog educational programming:

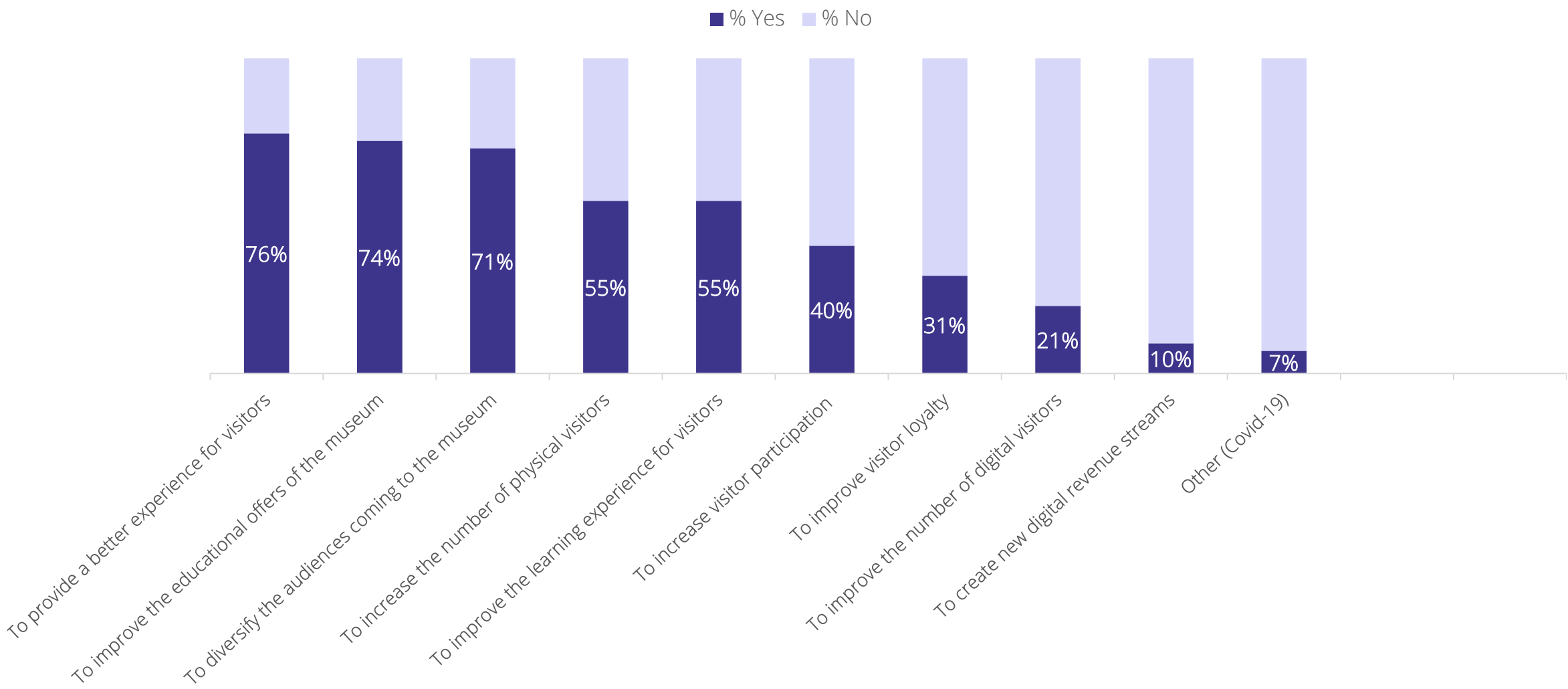


Gamification in Digital Programs

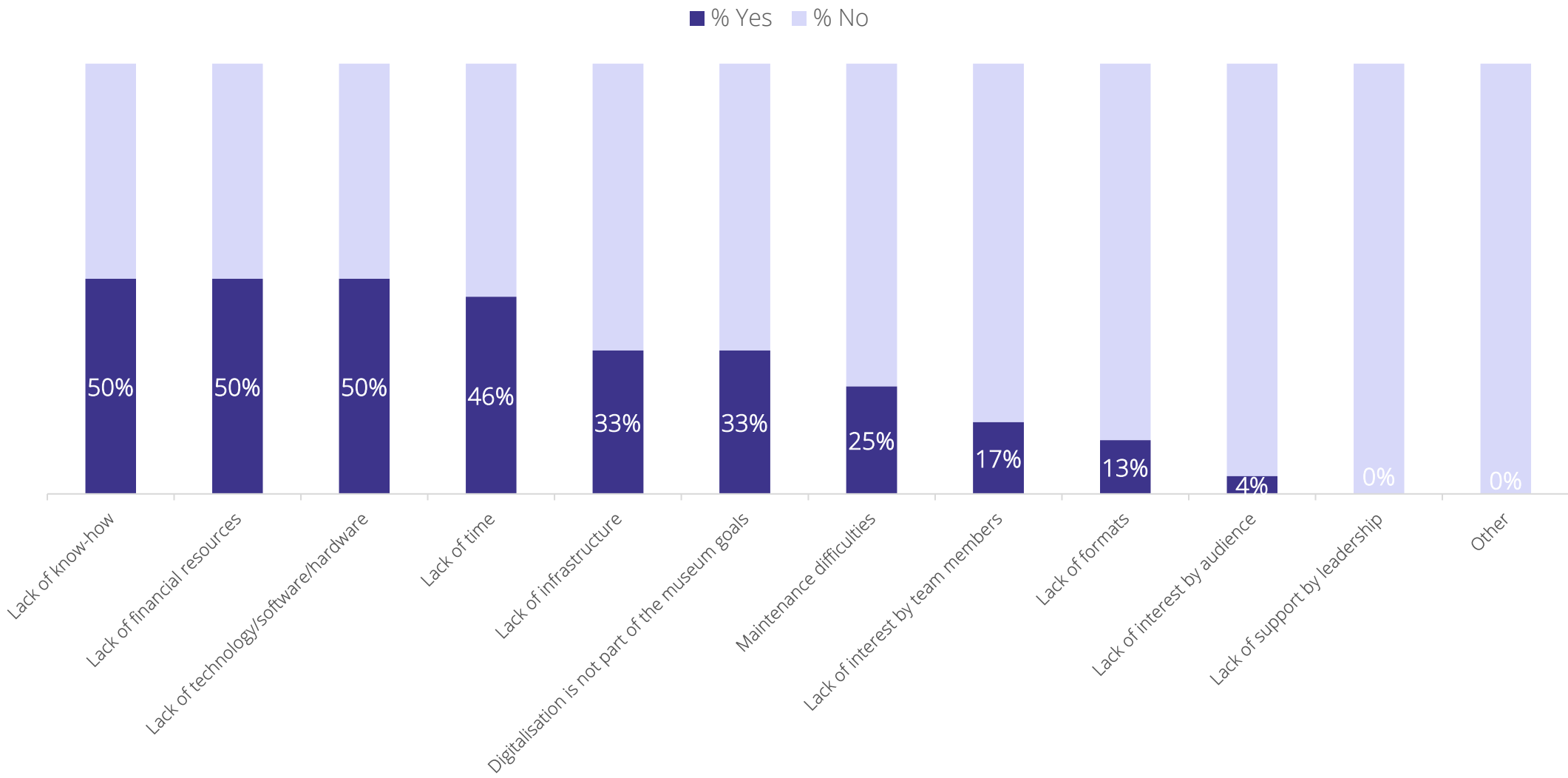
More than half of all surveyed museums that had digital educational programs incorporated gamification (59%) . 33% did not use game elements, and 8% could not provide information as they did not know about it.



Reasons for the Use of Gamification

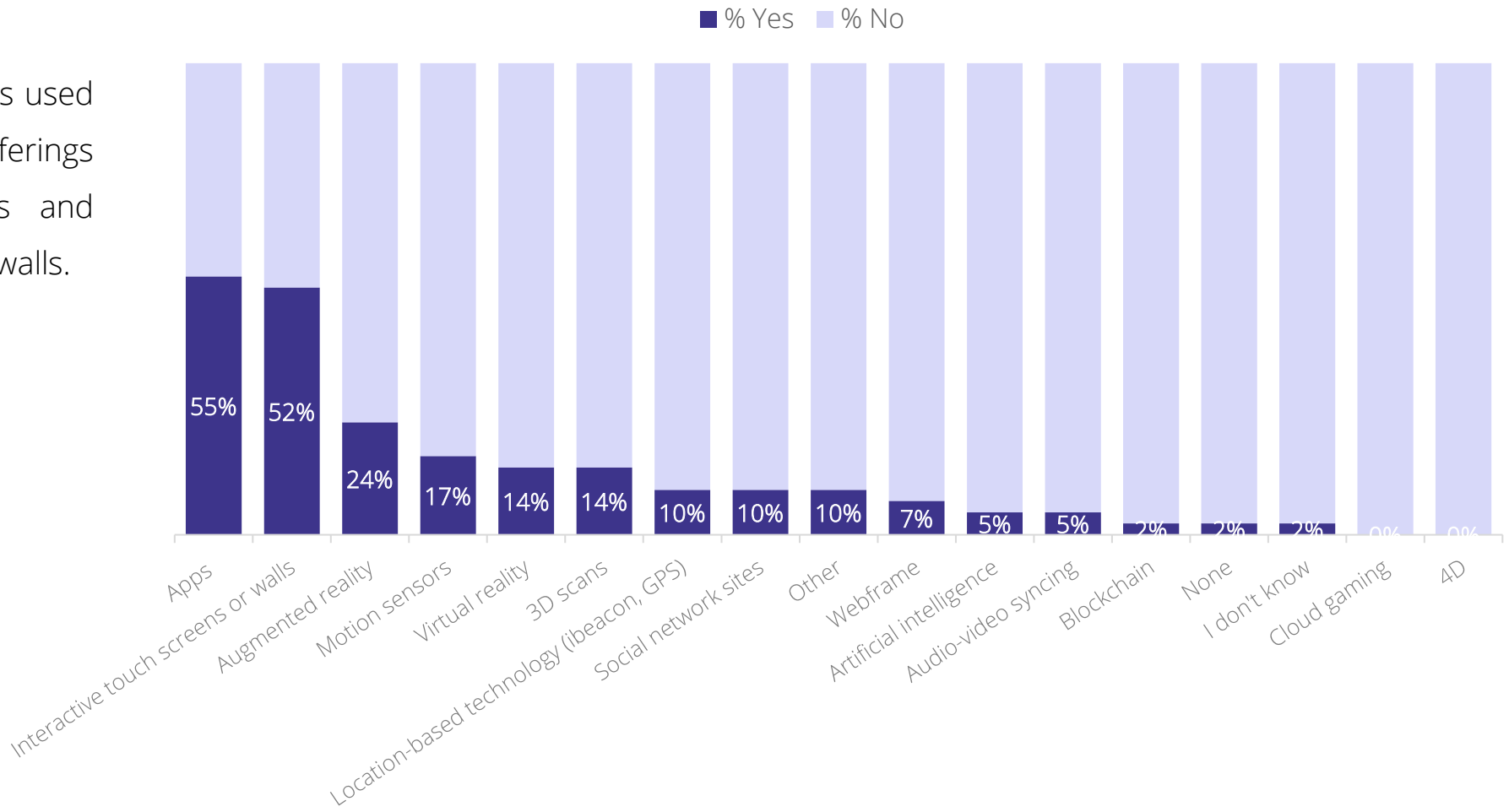


Reasons for the Non-Use of Gamification



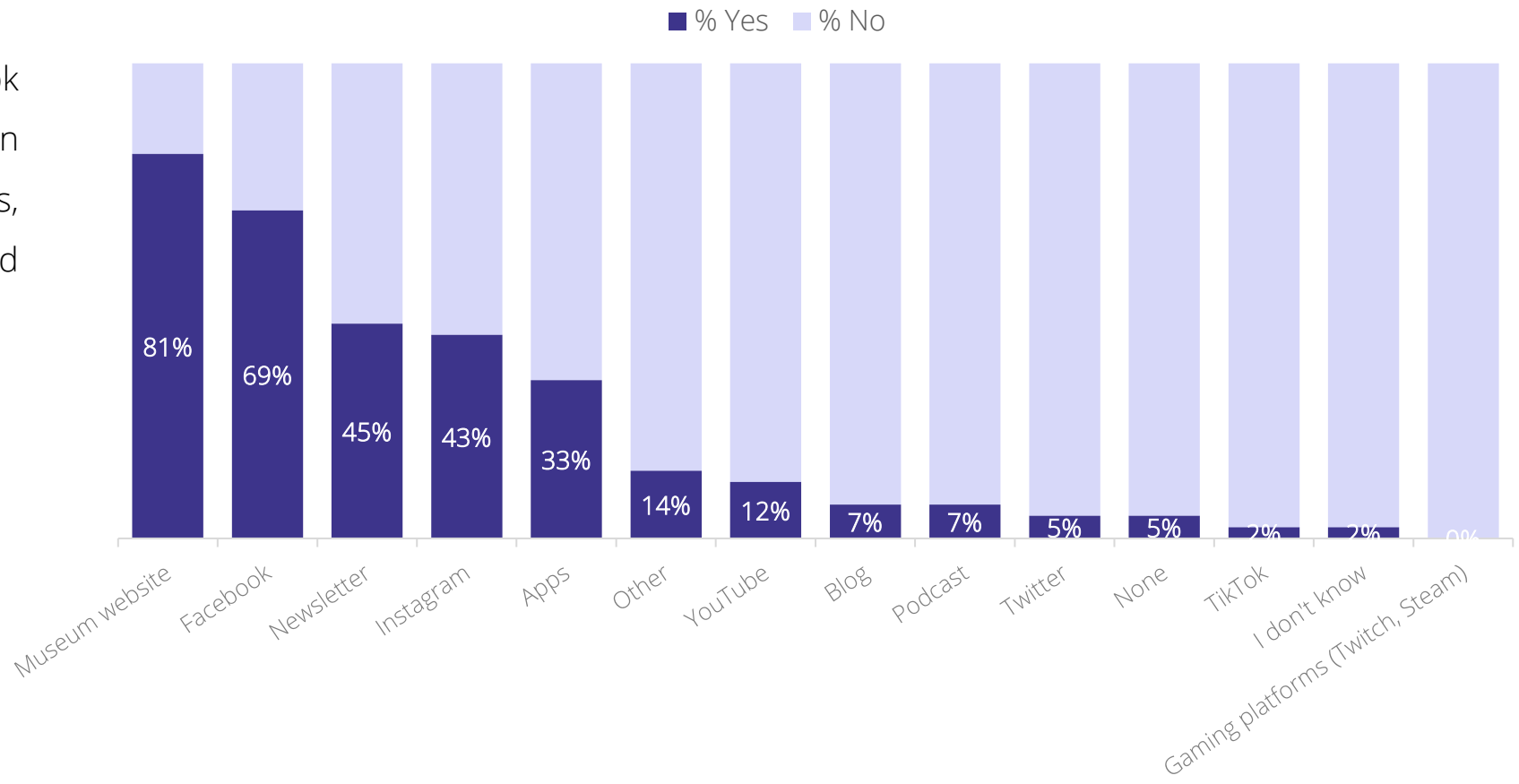
Technologies

The main technological tools used for gamified educational offerings are with distinction apps and interactive touchscreens or walls.



Distribution

Museum websites and Facebook are the preferred distribution channels for gamified offerings, followed by newsletters and Instagram.



Game Elements

This chapter delves deeper into the theoretical framework and survey results concerning game elements. The typology of game elements used for the survey is presented as well as a detailed description of all game elements. The chapter also includes an overview of the most used game elements in museums and how they relate to the concept of Meaningful Gamification.

Typology

As of now, there is no game element typology specifically designed for the museum realm. To be able to analyze the use of game elements in digital educational programming in museums, the study relied on the game elements typology developed by Toda et al. (2019). They developed a typology analyzing game elements used in the educational context dividing them into five categories:

- Performance
- Ecological elements
- Social elements
- Personal elements
- Fictional elements

For this study, Toda et al.'s typology was expanded and adapted, renaming the category *Performance* to *Performance & Feedback* and including additional game elements (e.g., role-play). On the following page, a table describing the five categories and all game elements can be found.

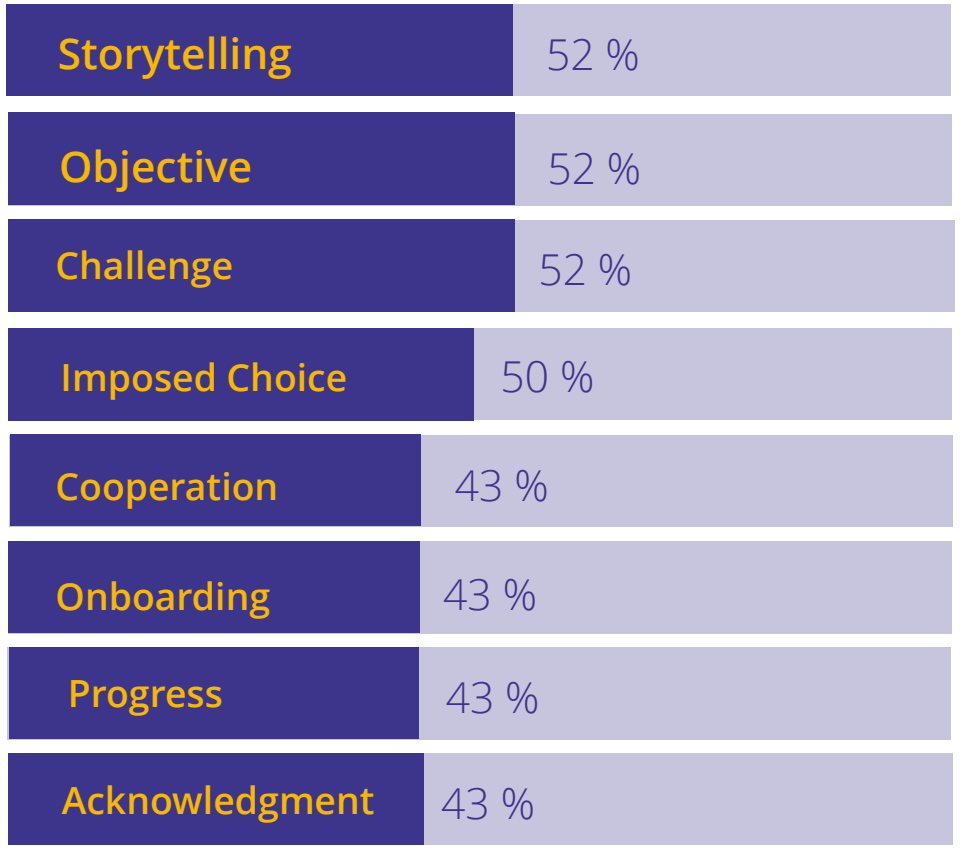


Figure 1. Typology of Game Elements by Toda et al. (2019).

Performance & Feedback	Ecological Elements	Social Elements	Personal Elements	Fictional Elements
This category includes elements that measure the performance of the player and provide feedback on actions taken or assistance for upcoming actions.	*These elements serve the purpose of encouraging the player to interact with the game world.*	*These elements aim to promote interactions, exchange, and communication among the players.*	*These elements promote the intrinsic motivation of the player to carry out actions in the game giving them a sense of purpose.*	*Fictional elements create a framework within the game that connects the actions of the player with the predefined storyline of the game world. They provide context and give meaning to the actions.*
Onboarding Introduction/explanation of the game mechanics at the beginning of the game, such as a tutorial, that introduces the player to the game world and demonstrates what is possible and how to perform actions.	**Chance** Use of randomness to increase/decrease the likelihood of actions, such as a random generator, shuffle function, roulette, etc.	**Competition** When two or more players compete against each other to achieve a goal, such as challenges, a leaderboard, player vs. player battle/duel.	**Novelty** Availability of new information during the game, integration of new content, such as surprises, updates, easter eggs.	**Player Agency** Refers to the ability of the player to influence the course of the game and the sequence of events within the game world through their decisions/actions/strategies.
Signposting Tips, hints, comments, etc., that assist the player when they are unsure of what to do next.	**Imposed Choice** Decisions that the player must make to advance in the game. The player has several decision options available. The narrative and the game progression are guided by the player's decisions.	**Cooperation** When two or more players collaborate to achieve a common goal, such as multiplayer, teamwork.	**Objective** Setting certain actions/goals that must be fulfilled/achieved to successfully complete the game, there are short-term goals and long-term goals or the final objective, such as fulfilling missions, reaching milestones, quests.	**Storytelling** The existence of a narrative underlying the game and the way in which the story is told within the game (e.g., through text, audio tracks, sensory resources, animated scenes).
Levels Stages in the game progression that must be mastered by the player to advance in the game or achieve the final goal, with increasing difficulty and expanded possibilities/abilities.	**Virtual Economy** In-game transactions, monetization of game assets and other elements, such as the acquisition of virtual goods, transactions, use of in-game currency, player-to-player trading, etc.	**Reputation** Titles that the player collects, granting them a certain status within the game.	**Puzzle / Challenge** Prompts/actions that the player must master using their knowledge, such as puzzles, challenges, treasure hunts, boss battles.	**Role-Play** The ability to assume the role of one or more game characters.
Progress Visual feedback that shows the player how far they have progressed in the game, such as a progress bar, display, unlocked areas on game maps, etc.	**Rarity** Limited resources and collectibles that are available only for a short time, under certain conditions, or after completing specific levels, actions, etc.	**Gifting / Sharing** Transfer of objects and goods in the game to other players.	**Renovation** Option to repeat/restart an action, such as extra lives, boosters, restart.	
Points Counting unit that measures the performance of the player, such as experience points, performance points, etc.	**Time Pressure** Time limits in the game, e.g. countdown, timer, clock.	**Social Pressure** Pressure through social interactions with other players within and outside the game world, such as weekly challenges where each player must participate as part of a team to complete the challenge.	**Sensation** Utilizing the senses of the player to create new experiences, such as visual stimulation through VR, AR, or dynamic user interfaces, acoustic stimulation, etc.	
Acknowledgment A type of feedback that marks the progress of the player and is awarded to them after successfully completing specific actions, such as in the form of badges, medals, trophies, etc.	**Collection** The ability in the game to collect items and similar objects and use them within the game or create collections.	**Social Network** The ability to communicate with other players during the game and specifically search for known players, for example, through a chat function, comments, creating "friend lists," etc.	**Customization** Customization options/personalization of certain aspects in the game system (color, images, name, etc.), use/selection of avatars.	
Stats Visible information that can be viewed by the player and relates to their results/performance in the game, such as a performance or resources display.	**Open World / Sandbox** The opportunity for independent exploration within the game, the ability for self-generated content, for example, as seen in Minecraft, Roblox, World of Warcraft.			

Game Elements

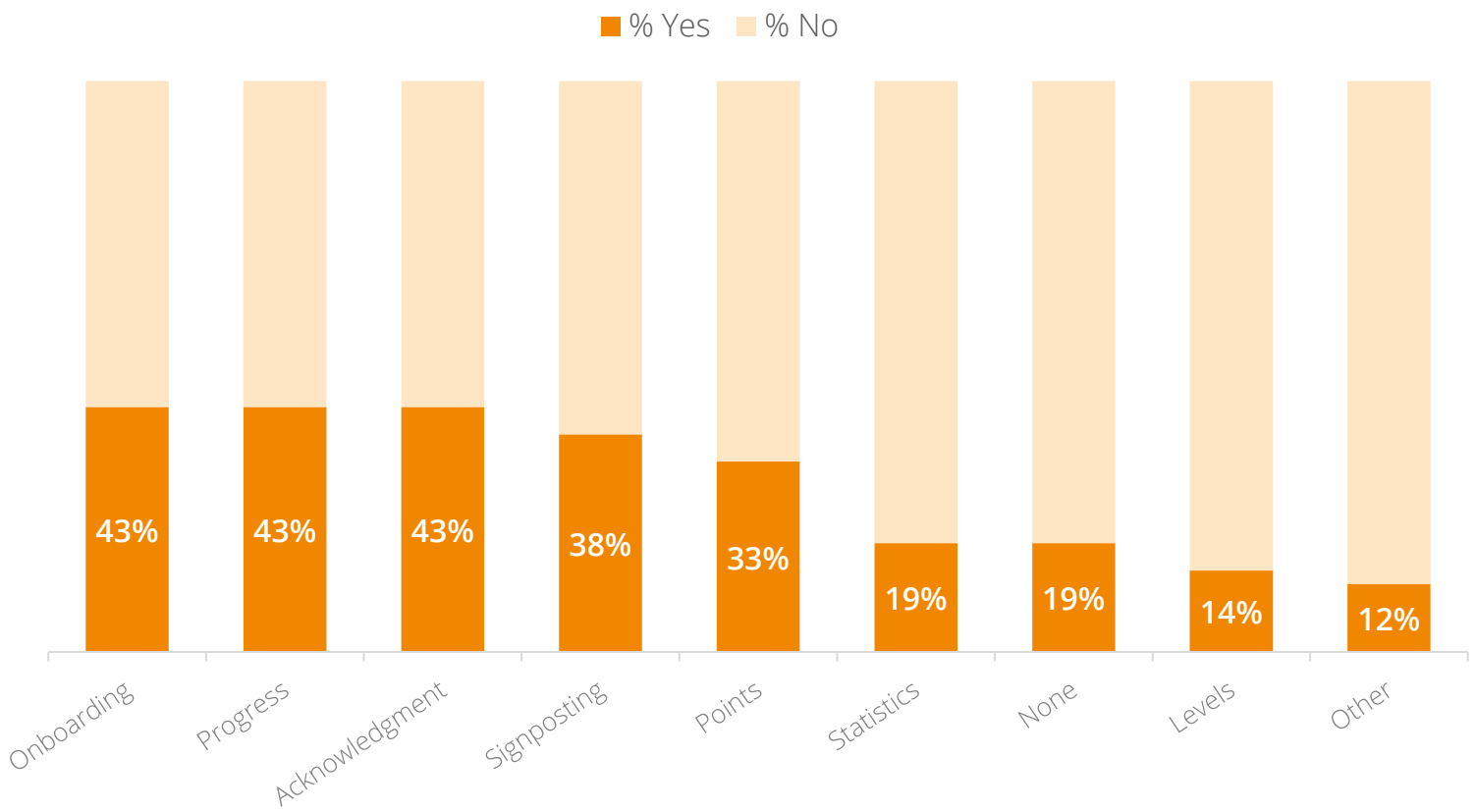
The most frequently used game elements in Austrian museums are *storytelling*, *objective*, *challenge*, *imposed choice*, *cooperation*, *onboarding*, *progression*, and *acknowledgment*. These elements were employed by nearly 50% of all surveyed museums.



Category *Performance & Feedback*

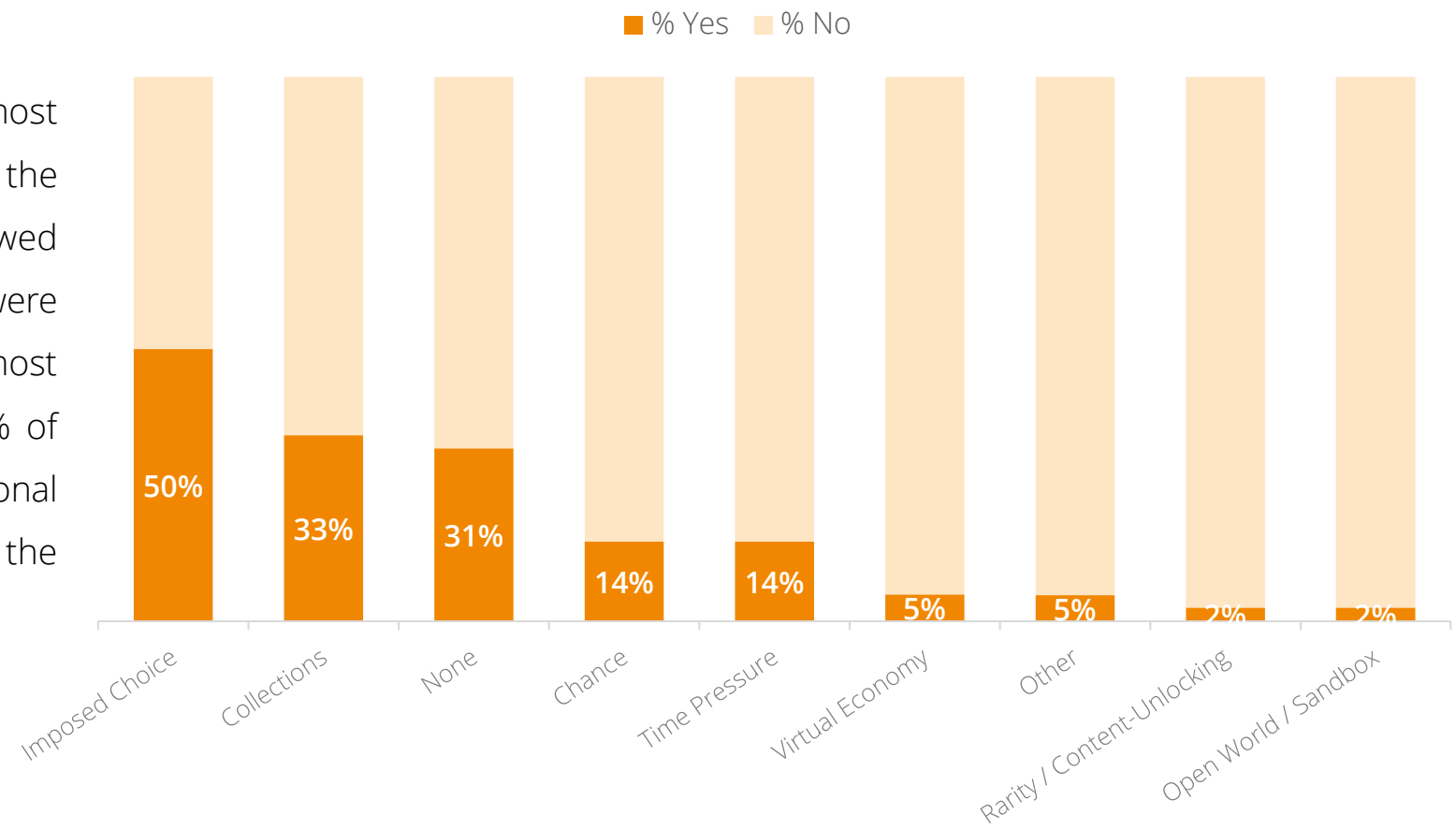
The surveyed museums that employed gamification in their digital educational offerings primarily utilized the elements of *onboarding, progress and acknowledgment*.

Other typical gamification elements like *points* and *levels* were less used in museums than the ones mentioned above.



Category *Ecological Elements*

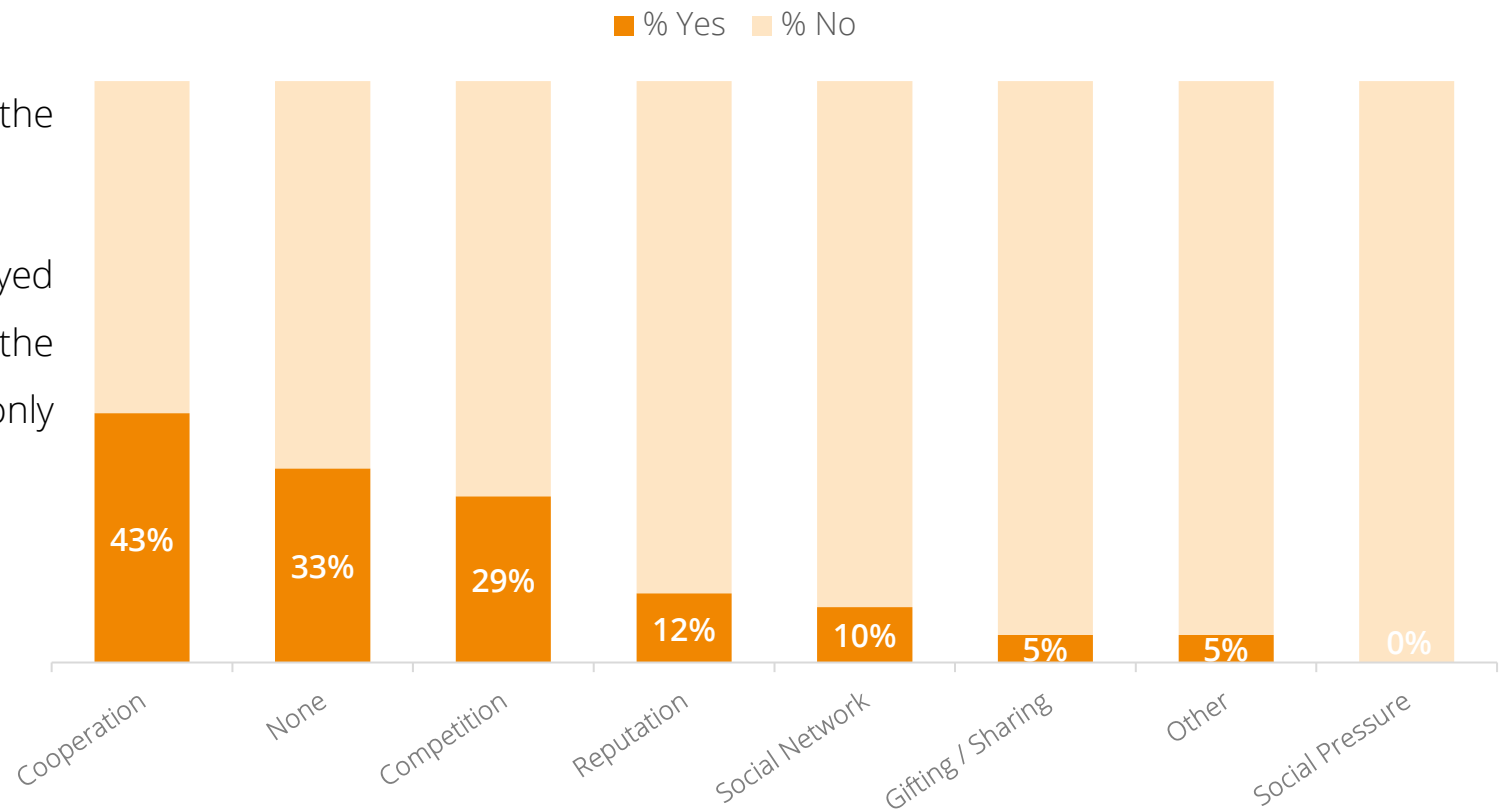
Imposed choice was by far the most frequently used element in the category *Ecological Elements*, followed by *collections*. All other elements were used infrequently or were almost absent in Austrian museums. 31% of all museums with digital educational programming did not use any of the listed elements in this category.



Category *Social Elements*

Cooperation leads the statistics in the category of *Social Elements*.

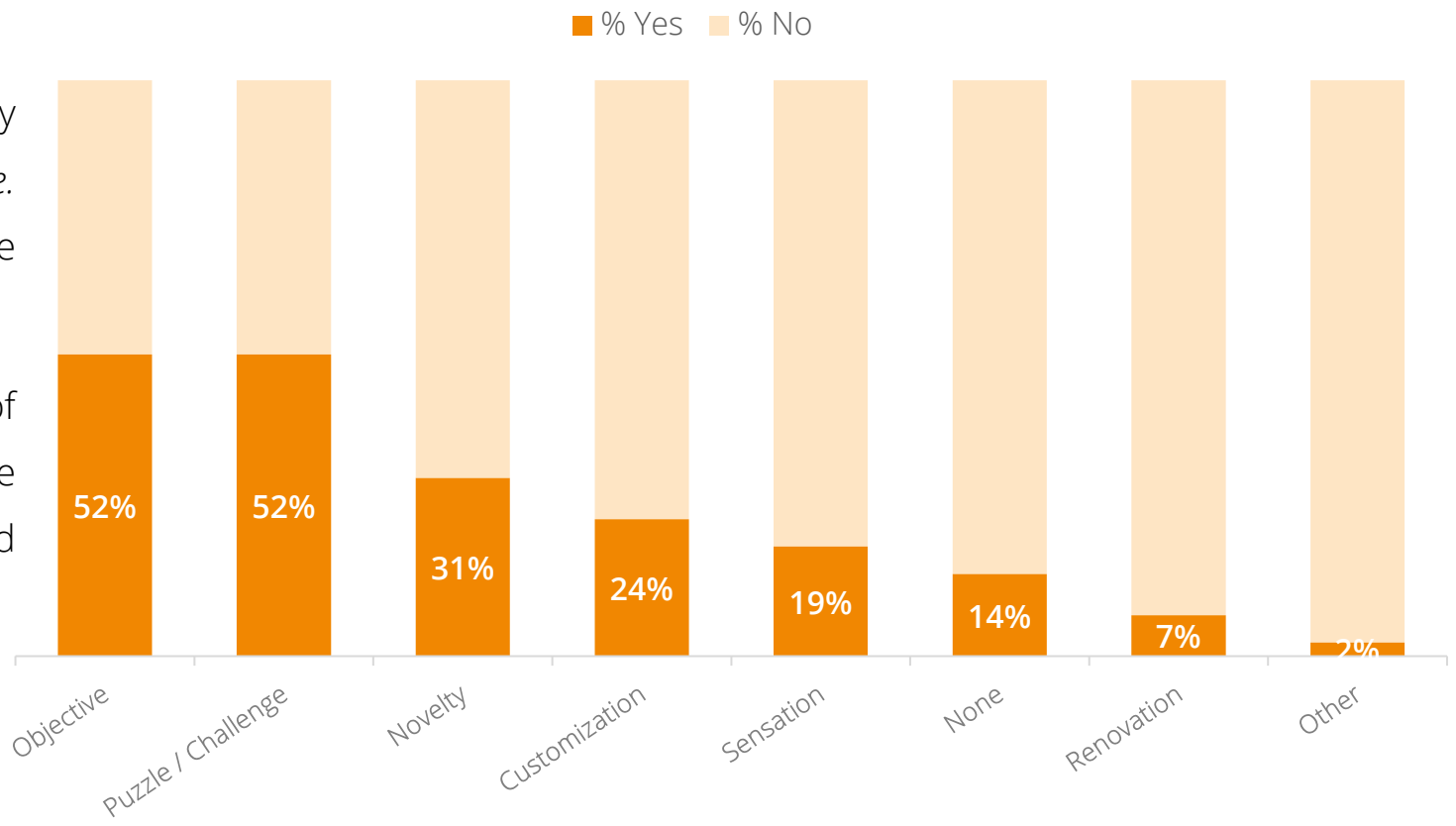
Reportedly, 33% of the surveyed museums did not use any of the elements in this category, and only 29% used the element *competition*.



Category *Personal Elements*

Frequently used *Personal Elements* by museums are *objective* and *challenge.* These represent classic game elements.

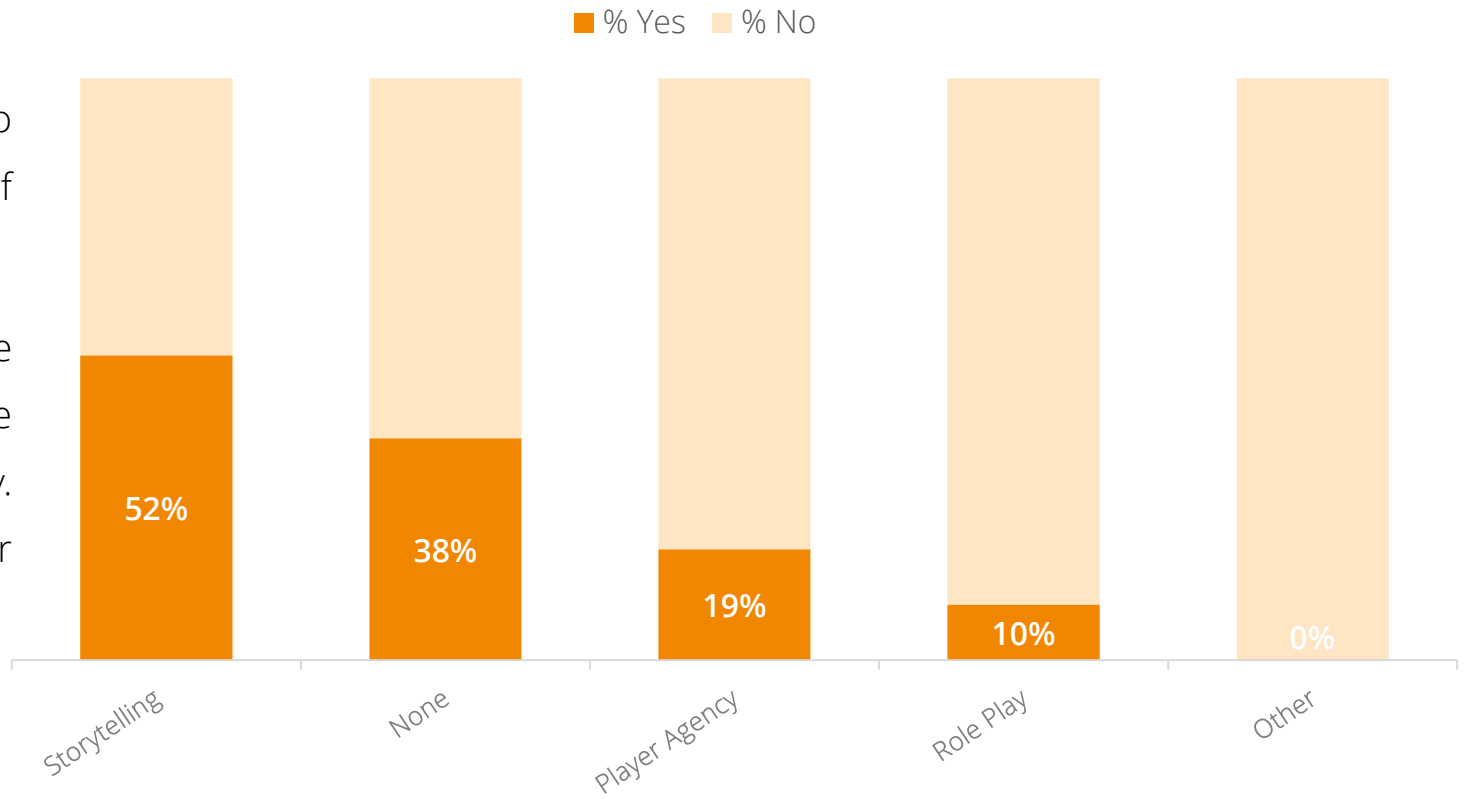
According to the study, 31% of museums also incorporated the game element *novelty*, and 24% included *personalization*.



Category *Fictional Elements*

The element *storytelling* was found to be the most utilized in the category of *Fictional Elements*.

As shown in the graph, 38% of the museums did not use any of the available elements in this category. Additionally, less than 20% opted for *player agency* or *role-play*.

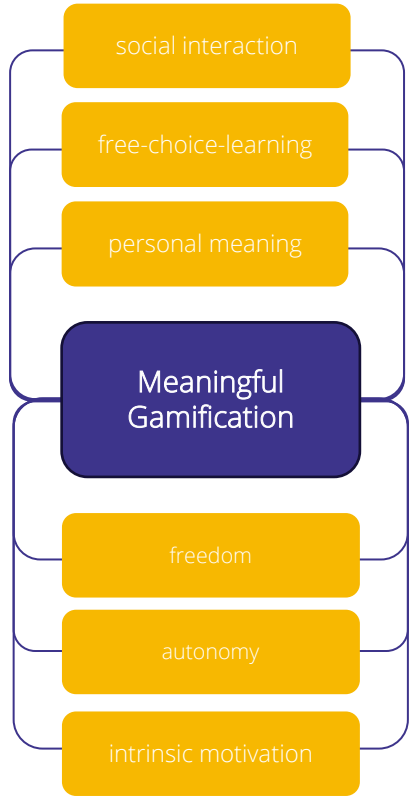


Meaningful Gamification

The most frequently used game elements in museums evoke intrinsic motivation and align with the concept of Meaningful Gamification (Nicholson, 2012). Meaningful Gamification refers to the use of game elements in a non-game context that help individuals form a personal connection with that context. This can lead to increased motivation, engagement with the context, and long-term personal development.

Meaningful Gamification prioritizes the needs of the player when integrating game elements promoting a sense of purpose, autonomy, self-determination, and agency for the player. In doing so, it stands in contrast to classic gamification that is often criticized and referred to as *exploitationware*, *pointification*, and *chocolate-covered broccoli*. Classic gamification usually relies solely on elements such as *points*, *levels*, and *badges*. These elements primarily provoke extrinsic motivation to turn arduous tasks into something enjoyable without understanding or considering the context in which these elements are embedded and the needs of the target audience.

Why is Meaningful Gamification the perfect playground for museums? As Meaningful Gamification, museums promote self-directed exploration, embody the principles of *Free-Choice Learning* (Falk & Dierking, 2000), focus on finding personal meaning, spark curiosity, and facilitate interaction and exchange with others. Museums share the principles of the concept and inherently embody its characteristics.



[1] Intrinsic motivation refers to the motivation that arises from inner interests, personal enjoyment, and an internal drive to engage in a particular activity. In contrast, extrinsic motivation is based on external incentives, rewards, punishments, or expectations.

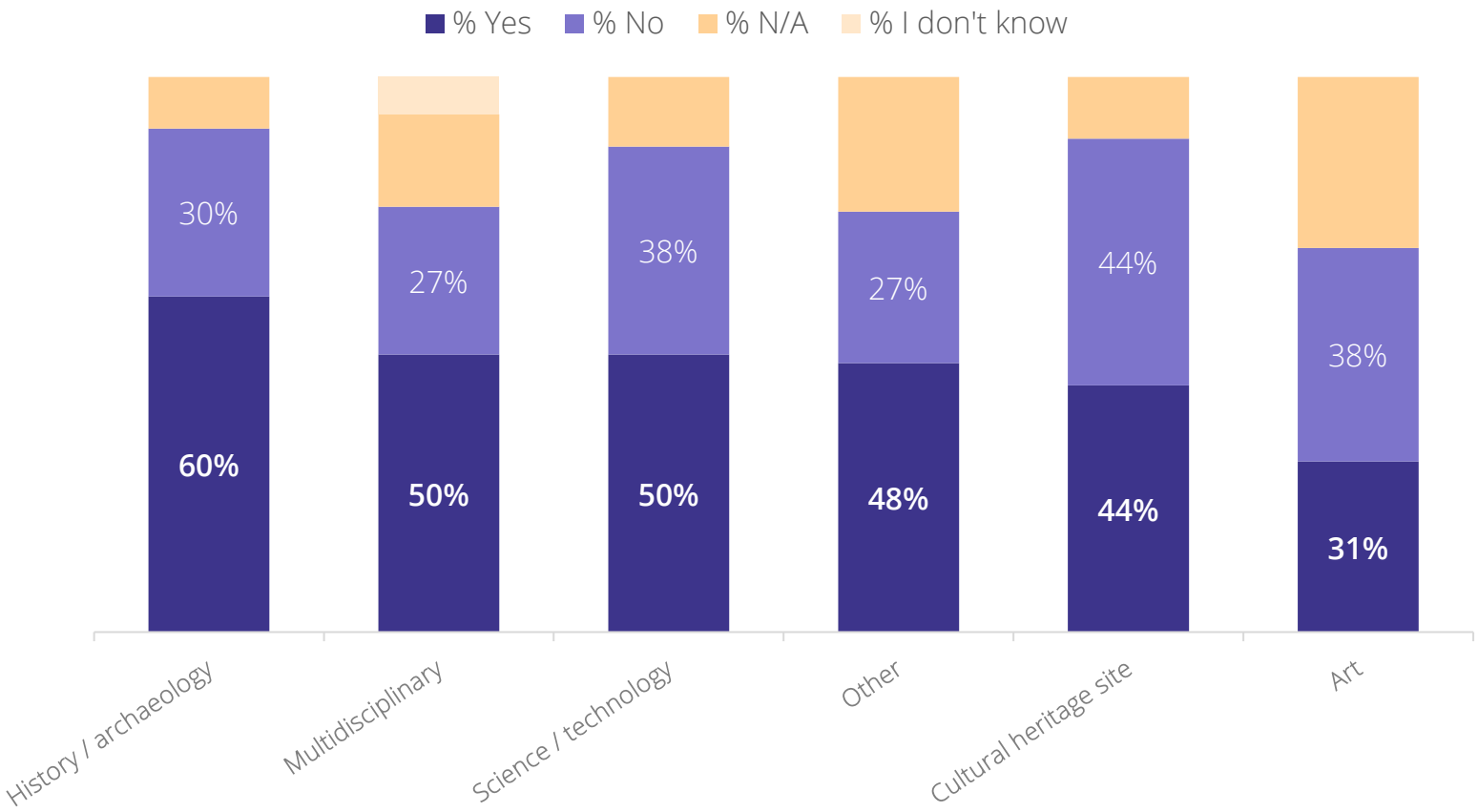
Correlation between Gamification and Museum Typologies

In this final chapter, the correlation between the use of gamification and specific variables regarding the museums are explored. It is examined how the use of game elements in analog and digital educational programming relates to the museum's location, collection focus, ownership, annual budget, awarded museum quality seal and the existence of an education and/or digitalization department.

Gamification by Collection Focus

in analog formats

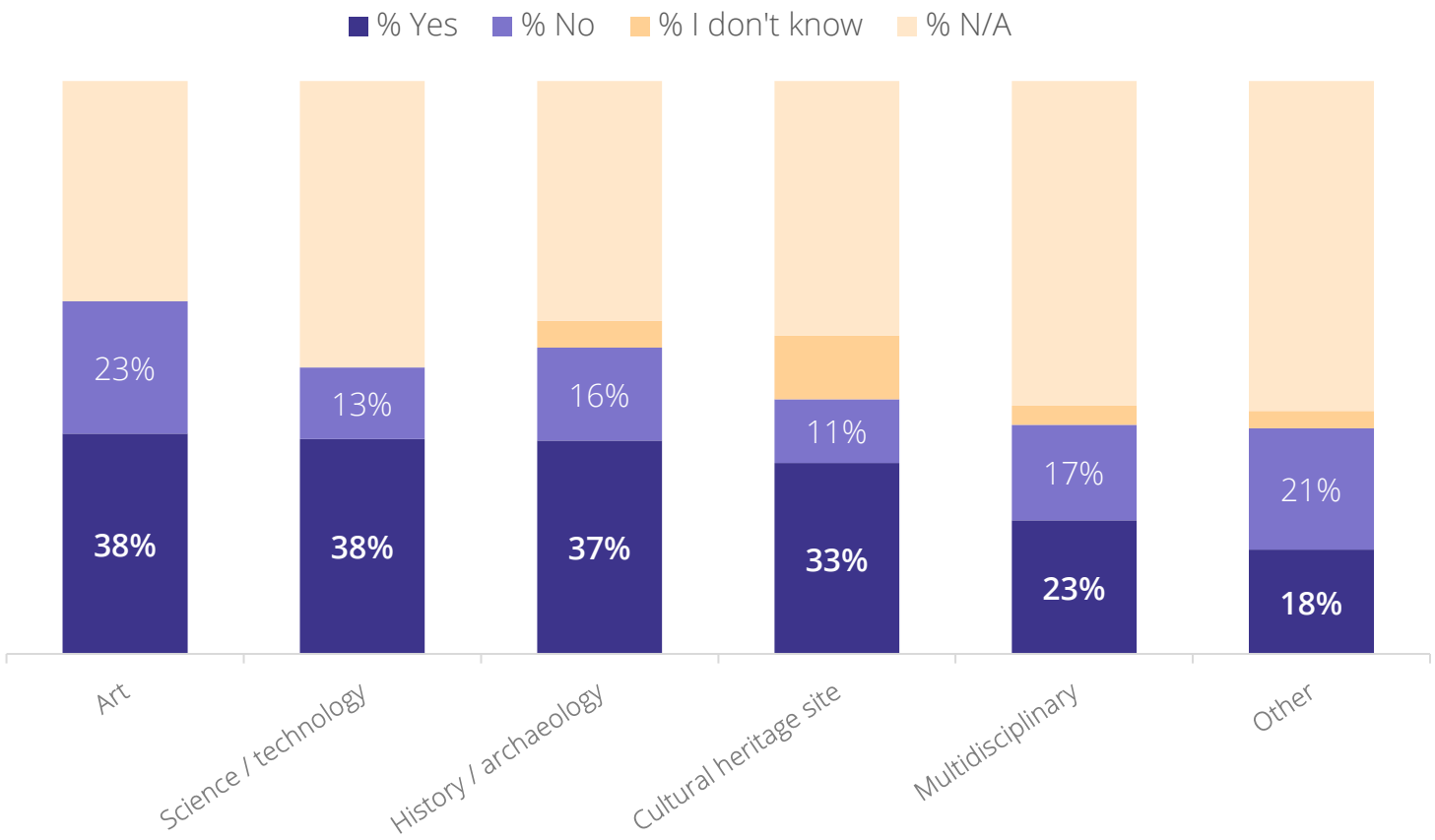
The surveyed museums with the highest proportion of gamification in analog formats were museums with a focus on history or archaeology. Museums with a multidisciplinary focus and those centered on science and technology followed. Ethnological or ethnographic museums, children's museums, and museums focusing on applied arts, design, and architecture were not included in the statistics due to the low number of responses and the lack of significant data.



Gamification by Collection Focus

in digital formats

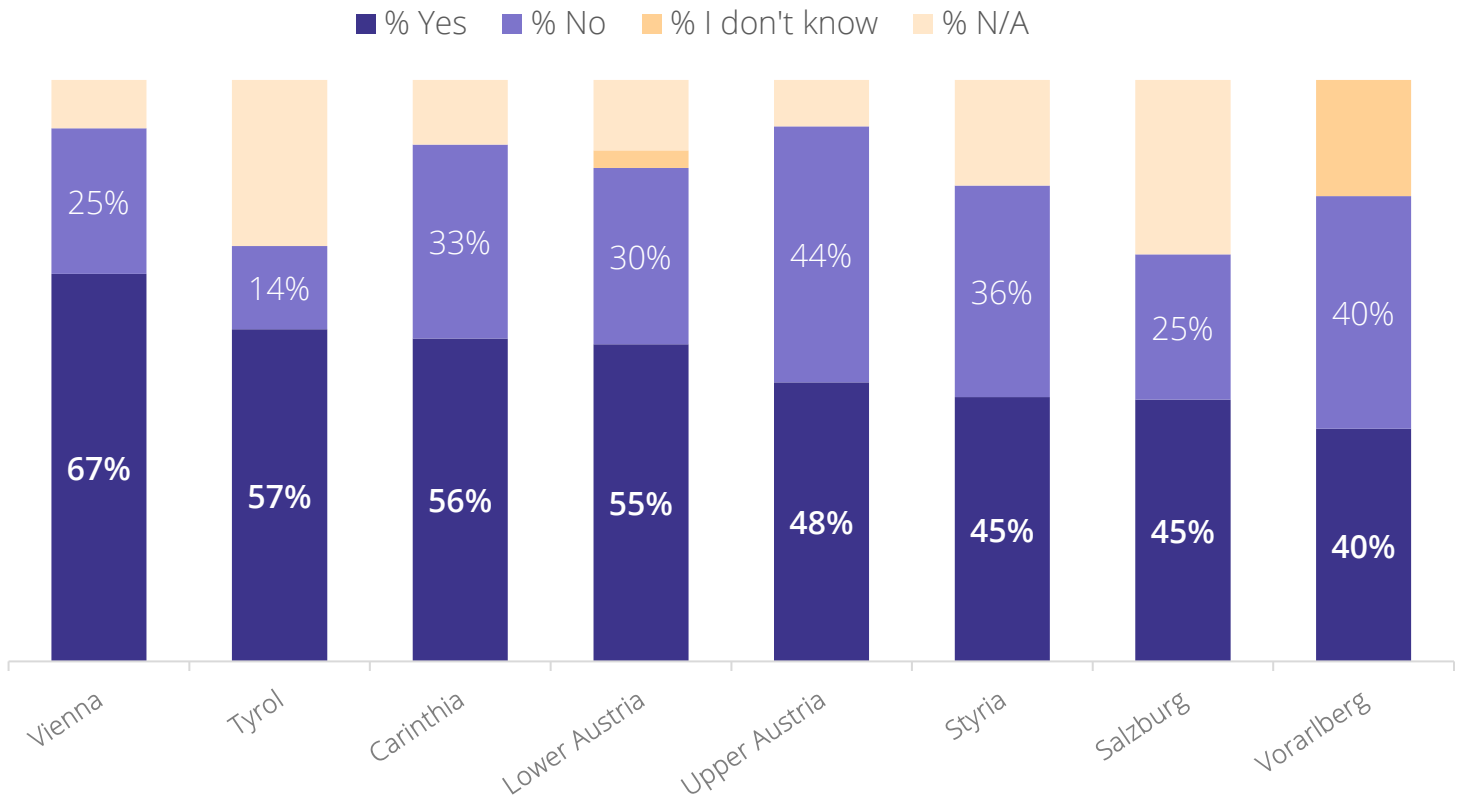
According to the survey, art museums show the greatest use of gamification in digital formats. Museums focused on science and technology, or history or archaeology came in next. As for analog formats, ethnological or ethnographic museums, children's museums, and museums specializing in applied arts, design, and architecture were not included in the statistics due to the low number of responses and the lack of significant data.



Gamification by Geographic Distribution

in analog formats

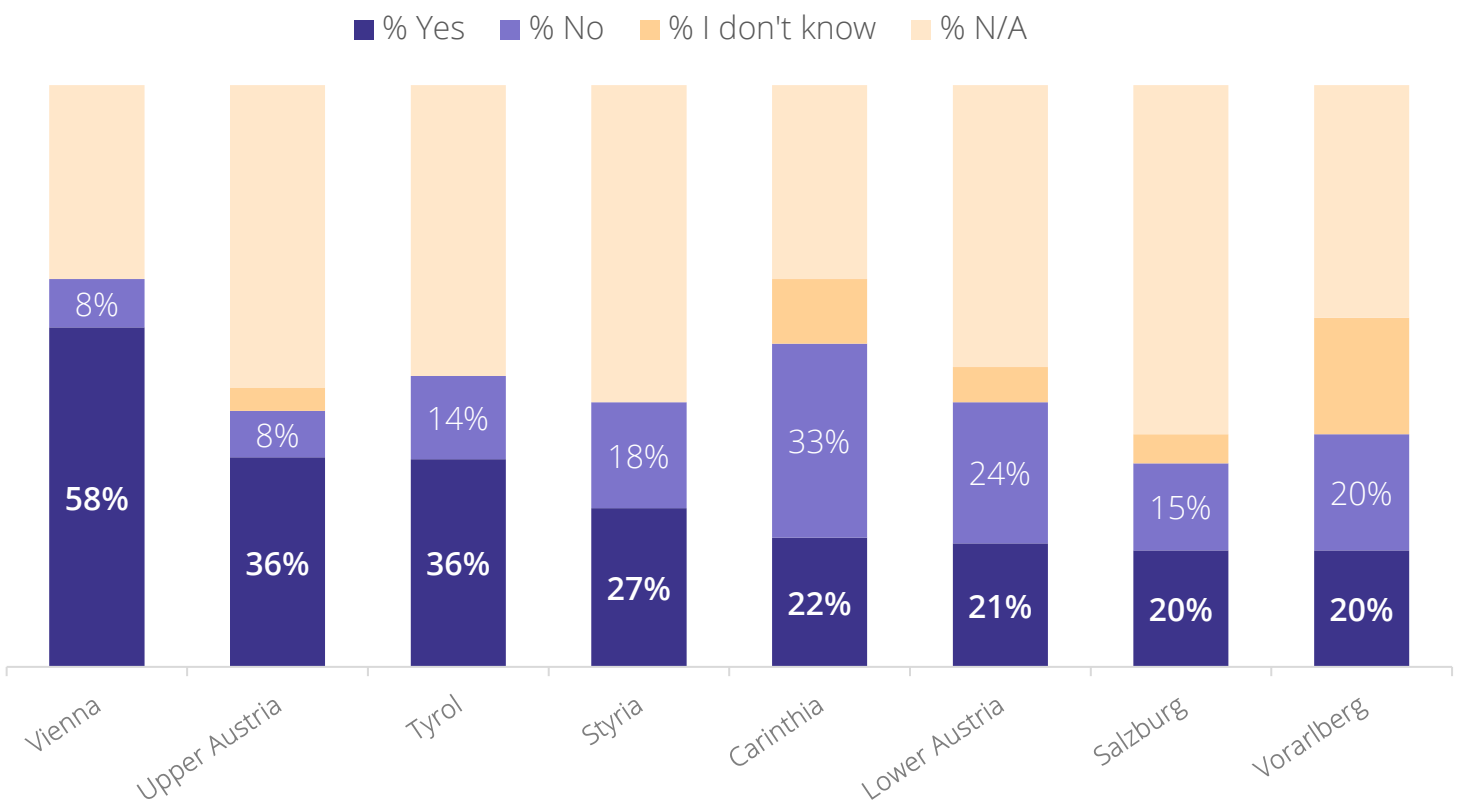
Museums located in Vienna had the highest proportion of gamification in analog formats, followed by Tyrol and Carinthia. Additionally, over 55% of the surveyed museums in Lower Austria used gamification in their analog educational offerings.



Gamification by Geographic Distribution

in digital formats

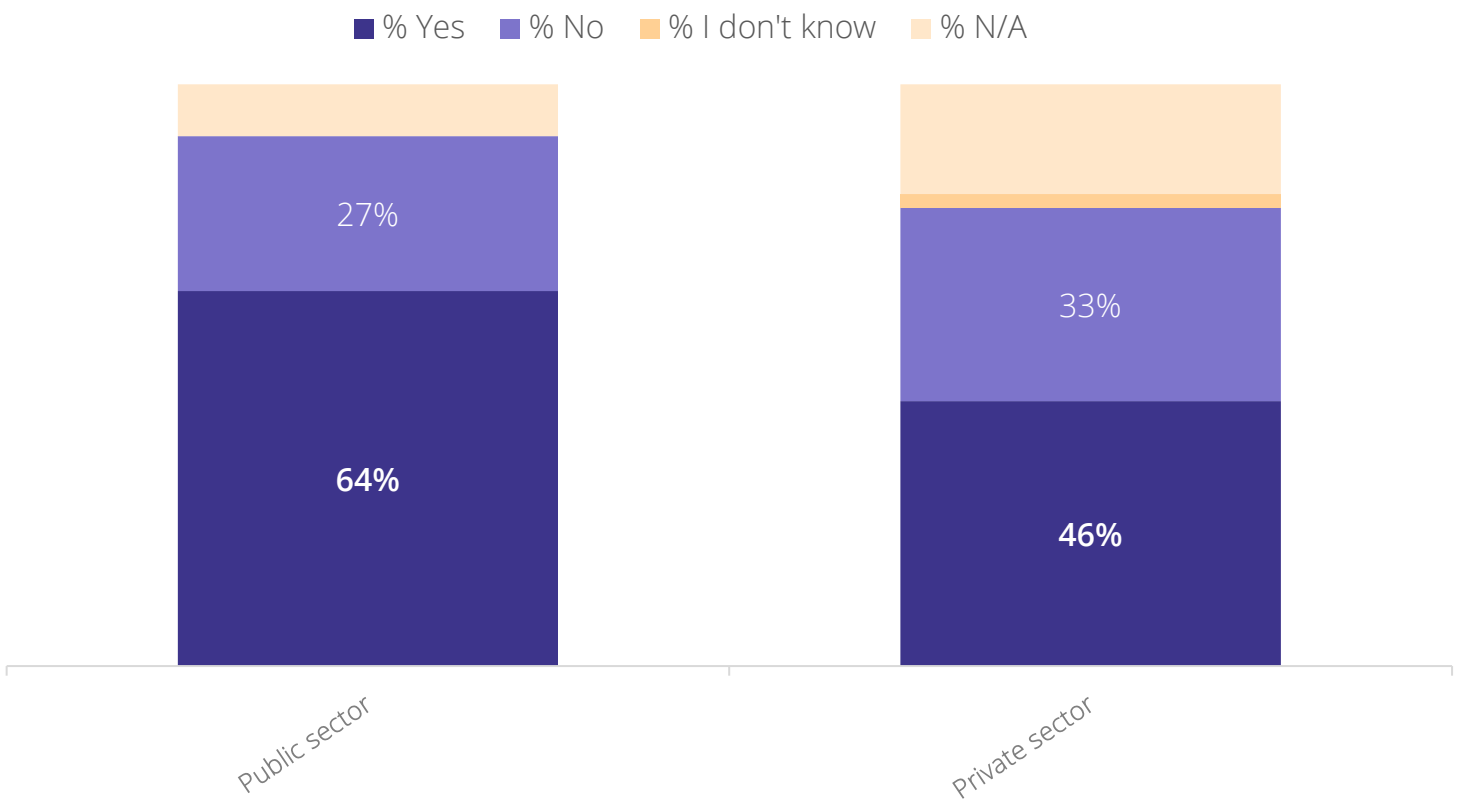
Museums in Vienna show the highest percentage of gamification implementation in digital formats, followed by Upper Austria and Tyrol.



Gamification by Ownership

in analog formats

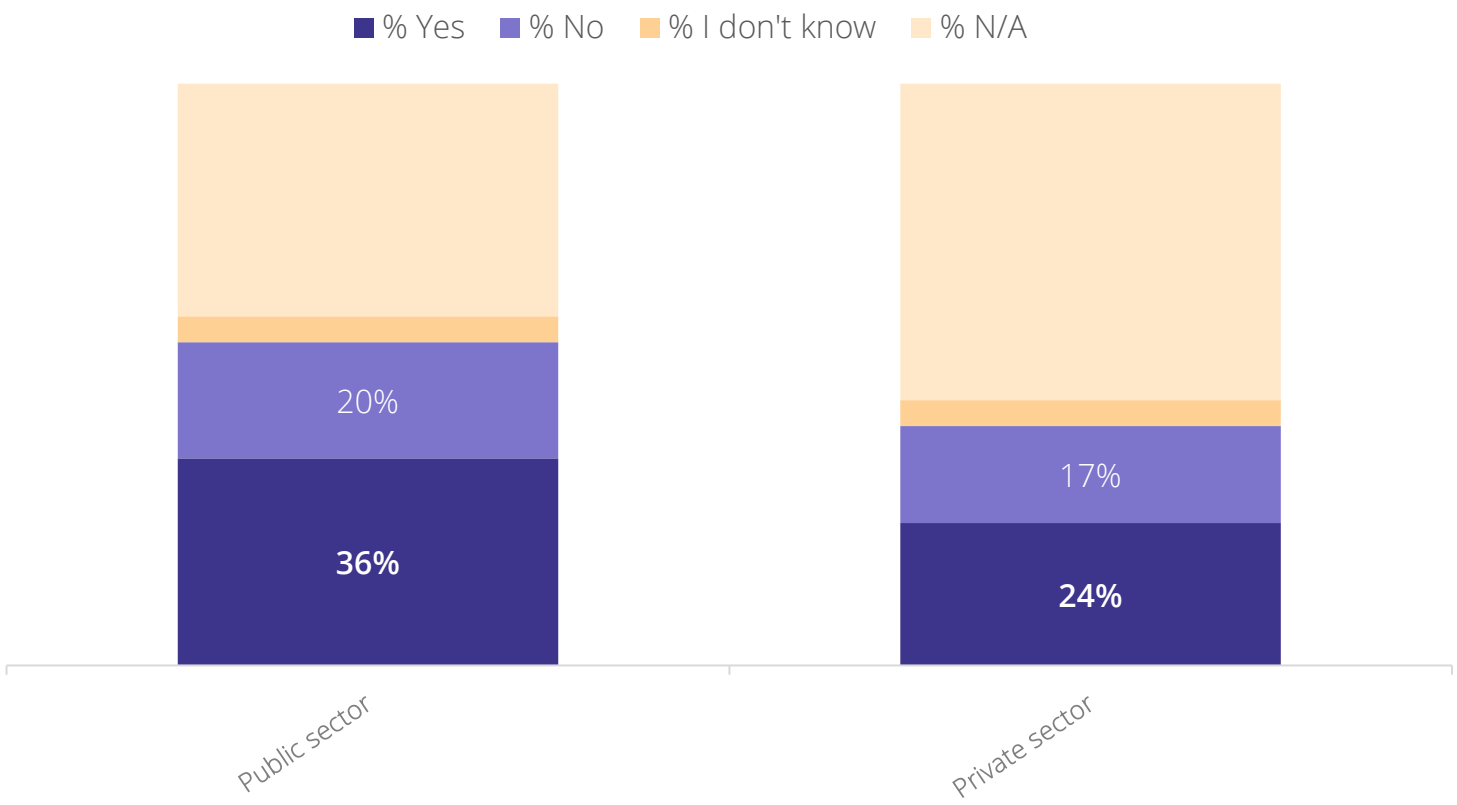
Museums in the public sector (federal, state, city or municipality) have more analog educational formats with game elements than private museums. These include museums run by associations, religious institutions, individuals and foundations.



Gamification by Ownership

in digital formats

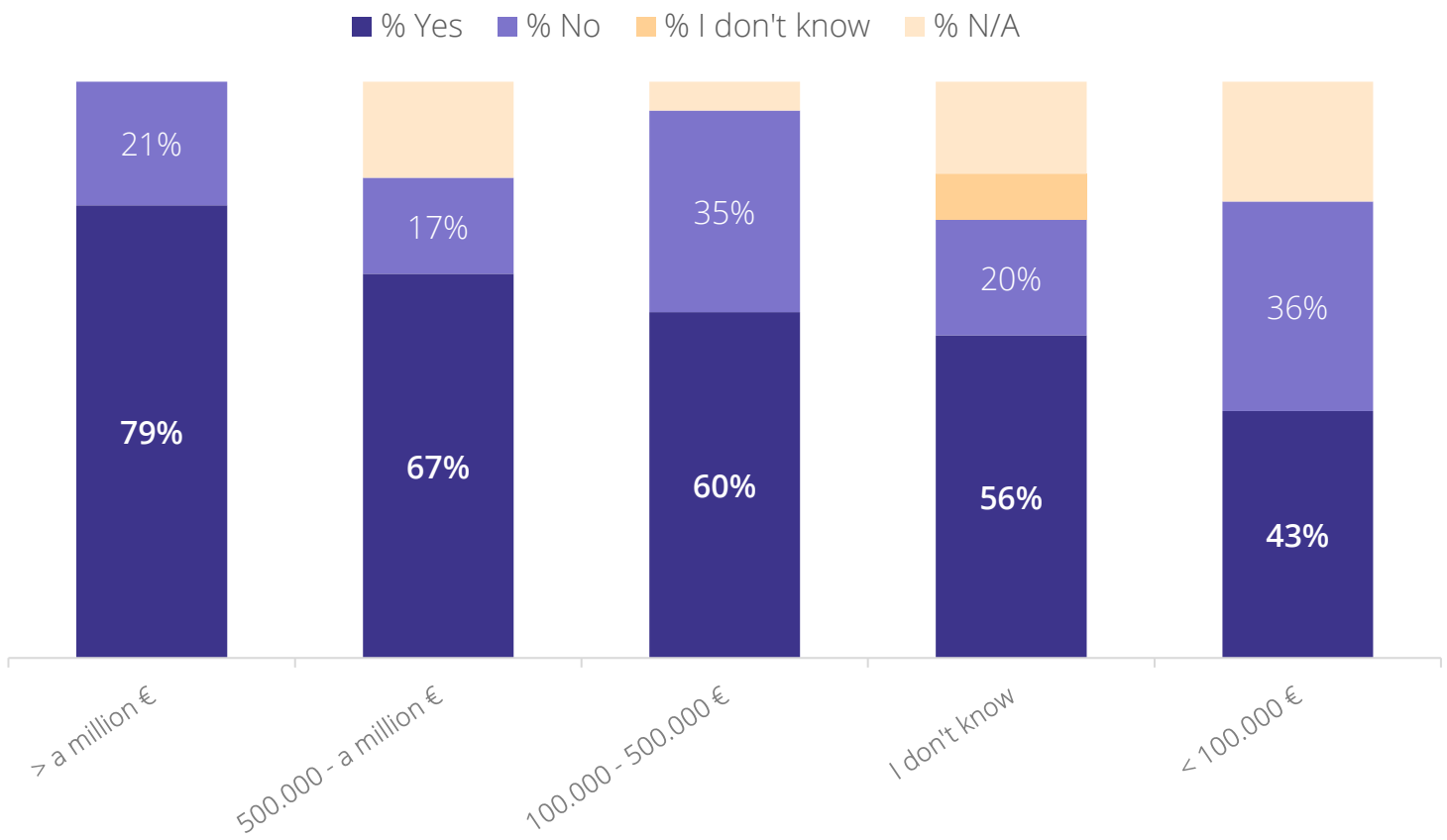
Compared to analog educational formats, the surveyed museums generally have fewer gamified digital educational formats. However, even in this case, museums in the public sector lead the statistics.



Gamification by Annual Budget

in analog formats

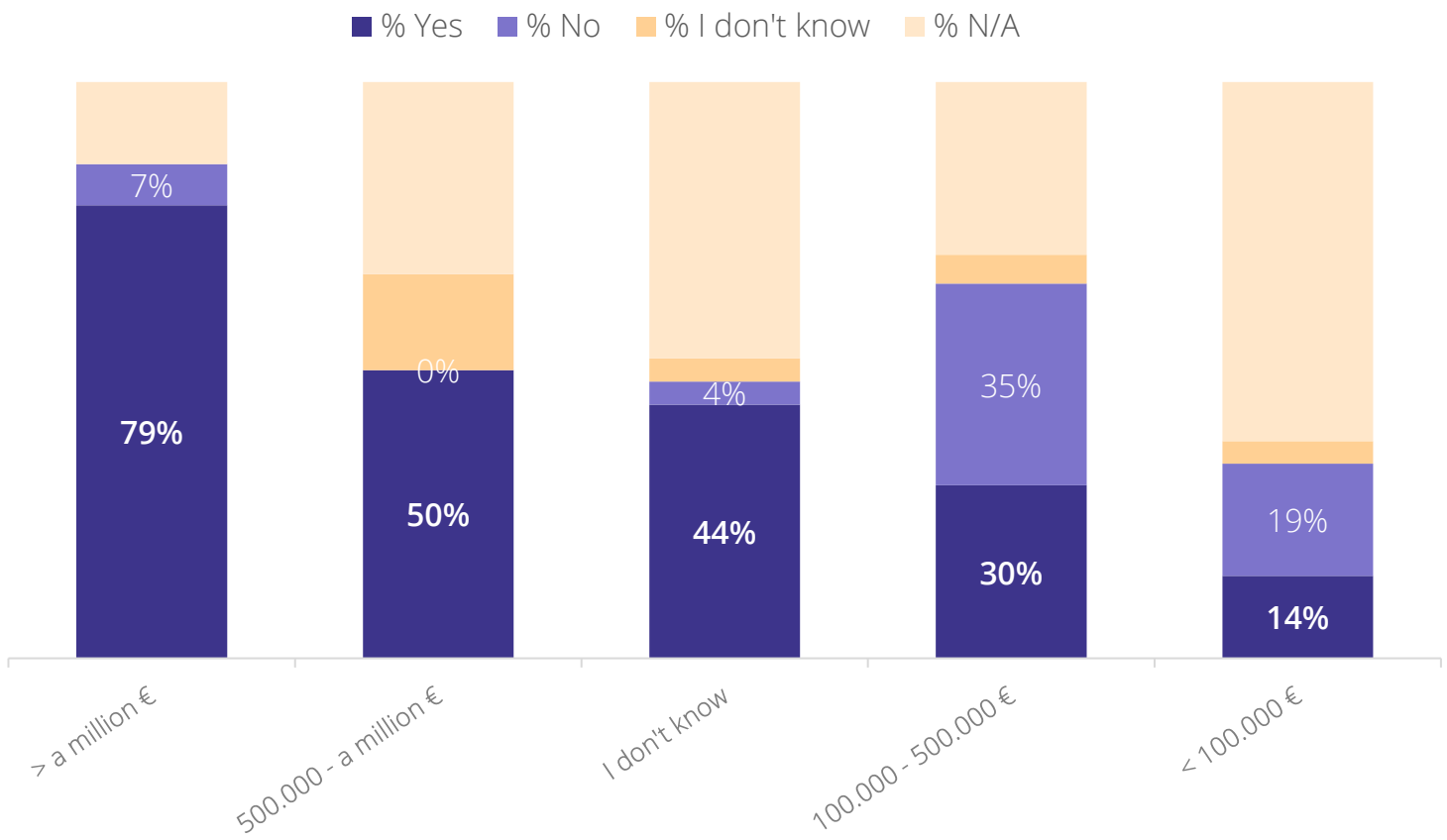
Museums with a higher budget are able to implement gamification in their analog offerings more easily. According to this study, nearly 80% of museums with an annual budget of over one million euros use gamification. In contrast, 43% of museums with a budget of under one hundred thousand euros applied game elements. As shown, the implementation of gamification correlates with the museum's budget.



Gamification by Annual Budget

in digital formats

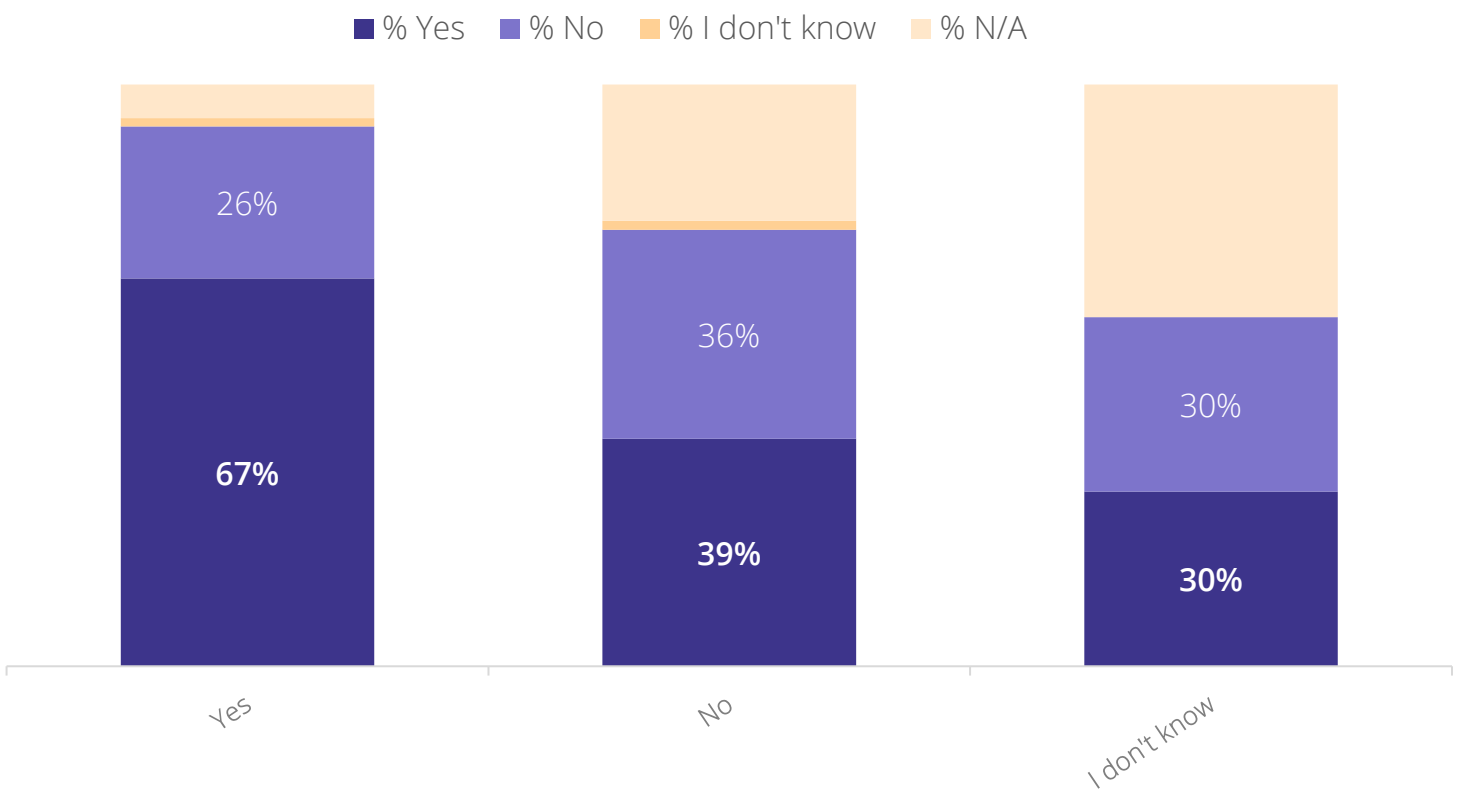
In the case of digital educational formats and gamification, the gap is even larger than regarding analog formats. While nearly 80% of the surveyed museums with a budget of over one million euros use gamification, the percentage drops to just 14% for museums with budgets of less than one hundred thousand euros.



Gamification by Museum Quality Seal

in analog formats

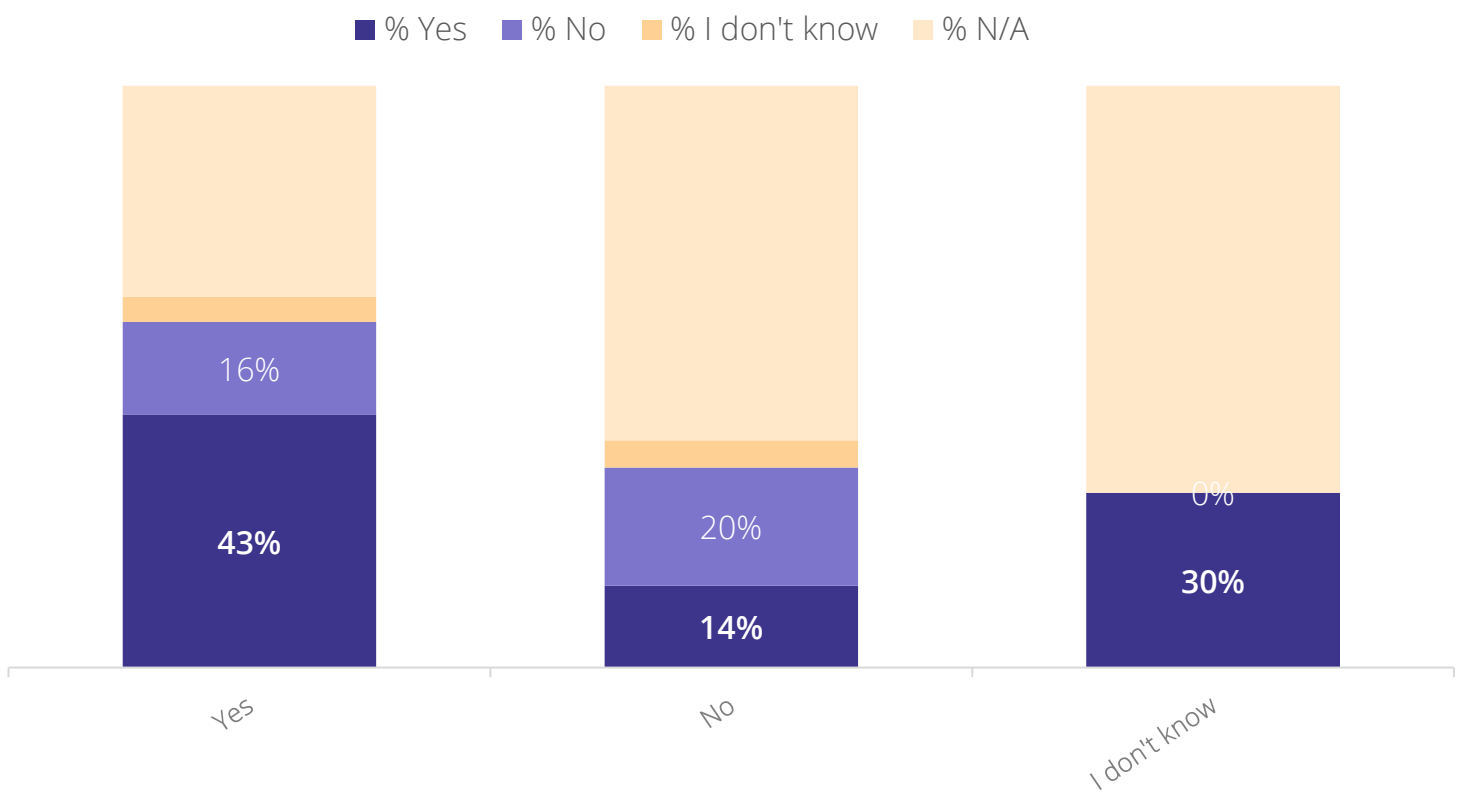
Correlations are reported between museums awarded with a museum quality seal and the use of gamification. Museums that possess a quality seal use around 30% more gamification in analog educational formats than museums without a museum quality seal.



Gamification by Museum Quality Seal

in digital formats

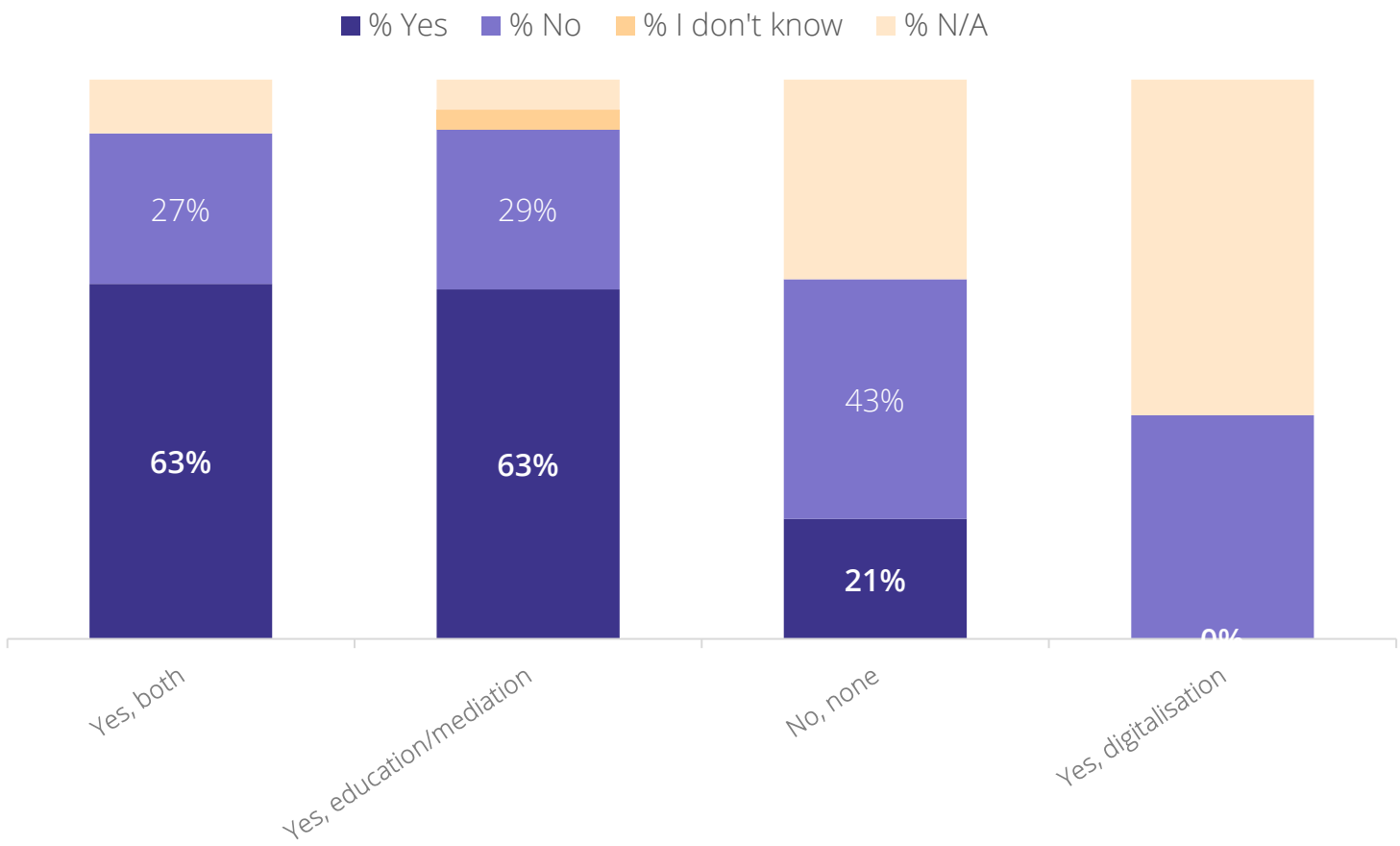
The same scenario can be observed with digital offerings: 43% of museums with a museum quality seal use game elements compared to 14% without a museum quality seal.



Gamification by Existence of Education and/or Digitalization Department

in analog formats

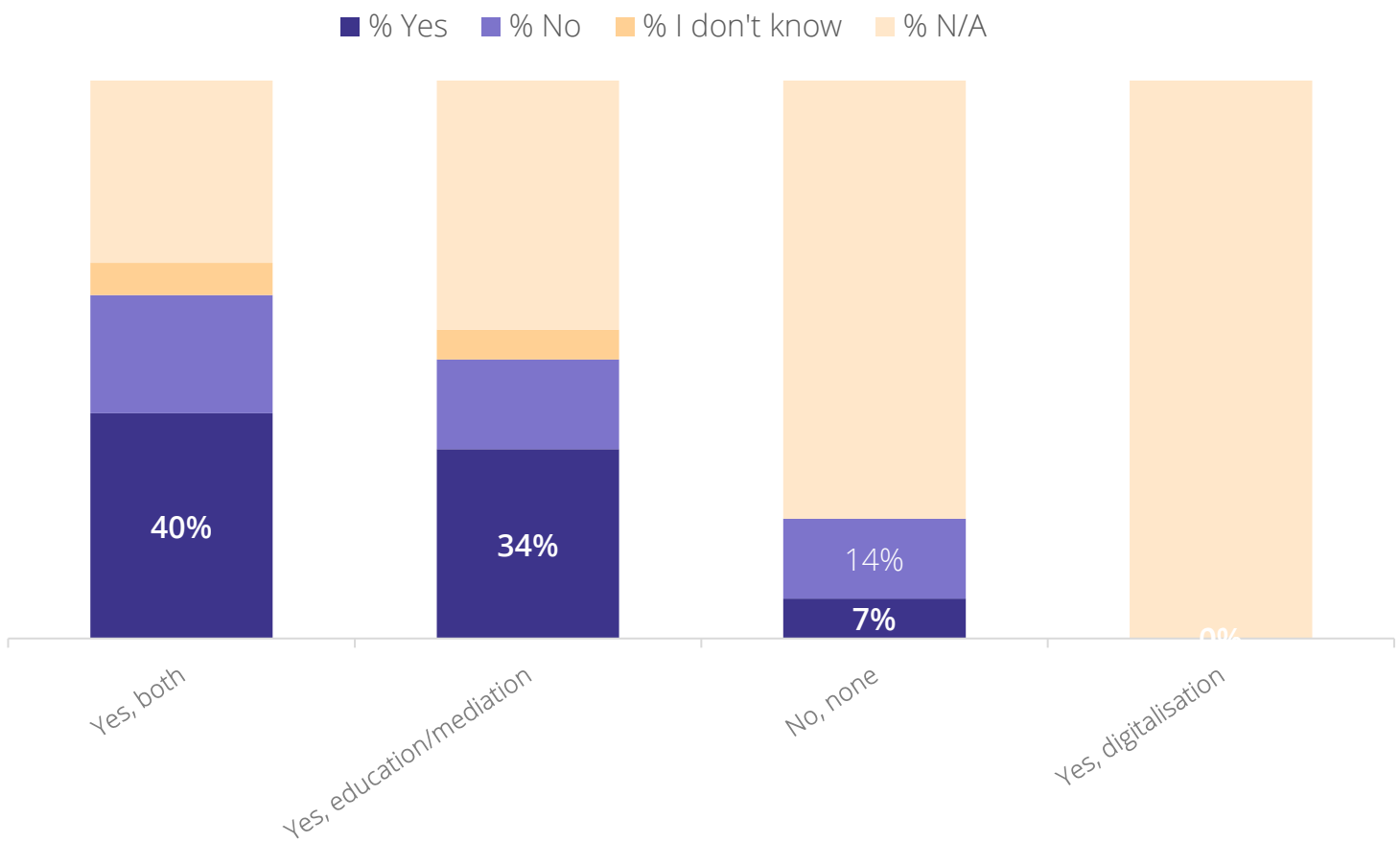
Museums that have reported having a dedicated department or responsible person for museum education and digitalization, are shown to be amongst the majority of those that use gamification in their analog projects. Interestingly, a reported 21% of the surveyed museums without a designated department also stated the use of gamification.



Gamification by Existence of Education and/or Digitalization Department

in digital formats

Concerning digital formats, museums consisting of a digitalization and an education department displayed the highest use of gamification.



Summary

In conclusion, the key findings of this study claim that more than half of the museums in Austria have already implemented game elements in their analog and/or digital educational programming. The results confirm what other related studies have postulated (Johnson, Adams, Estrada & Freeman, 2015; Madsen, 2018; Cosovic & Ramic, 2019): gamification is becoming increasingly popular, even in the museum sector. Within the last two years, the topic of gamification has been increasingly present in museum networks and projects (MuseumNext: Museums, Games & Play Summit, WeAreMuseums: When Museums Meet Videogames, ReInHerit: Engaging Museum Visitors with Gamification Apps; Museumsbund Österreich:#digitRoundtable).

According to the survey results, game elements are primarily used to enhance the museum experience for visitors, to optimize education programs, and to reach new audience segments. This aligns with one of the museums' missions in the 21st century: to put the audience at the center and diversify it.

However, the lack of knowledge as well as financial backing, time, and technological resources hinder the implementation of game elements in museums. Additional challenges include the short lifespan of digital devices and rapid technological change.

The implementation of gamification shows a correlation with other defined variables in the study. Museums that are

- located in Vienna,
- with a budget of over half a million euros,
- focusing on history or archaeology, or science and technology,
- belonging to the public sector,
- holding a museum quality seal,
- or having both, a department for education and digitalization

are more likely to offer gamified educational projects. This correlation is more pronounced in digital education projects than in analog ones.

The most frequently used game elements in Austrian museums align with the concept of Meaningful Gamification. Elements such as *storytelling*, *objective*, *imposed choice*, *cooperation*, and *challenge* help individuals find a personal connection within the gaming context, which can lead to increased motivation, engagement with the context, and long-term personal development.

This study gave first insights in how gamification is used in Austrian museums. However, the extent to which the use of game elements influences and promotes the learning of museum visitors is still "terra incognita" due to the lack of studies. To close this gap, more research focusing on gamification in the museum sector needs to be conducted.

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UNIVERSIDAD DE MURCIA
Máster Universitario en Educación y Museos
Patrimonio, Identidad y Mediación Cultural. Curso 2021/22