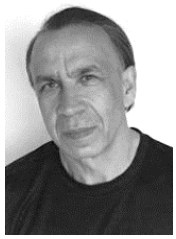

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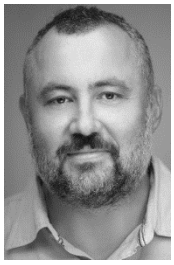

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HOW UNIVERSITIES COMMUNICATE WITH THE PUBLIC VIA SOCIAL MEDIA: A CONTENT ANALYSIS

Ludvík EGER – Mikuláš GANGUR

ABSTRACT:

In recent years, social media have developed the strong potential to effectively communicate and to create a value proposition about university educational services, research activities and their third role. The social media content should be designed in a way which creates value for social media users to build a stronger level of engagement and facilitate brand communication. The conducted research not only investigates how selected universities use their profiles on Facebook and Instagram and communicate with the public, but the analysis also focuses on a deeper understanding of the characteristics that influence the interactivity and the relationship between a selected university and its page visitors. The findings reveal that different types of post sources generate different engagement per post (by follower) and behaviour of target groups. Furthermore, content analysis was performed to assess differences among universities in their communication. The findings document how selected categories according to uses and gratifications theory influence target groups' engagement. The results offer scholars and practitioners new knowledge for communication in the higher education field using social media.

KEY WORDS:

brand in higher education, engagement rate, higher education marketing, social media, uses and gratifications theory

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1 Introduction

Social media (SM) are changing the way hundreds of millions of people relate to one another and share information not only between themselves, but also between them and organisations (see, for example, Alalwan et al., 2017; Appel et al., 2020). SM also allow for the use of expositive resources (text, photos, emojis, audio, video) and interactive elements (links, hashtags), which have a different effect on *user engagement* (see, for example, Dhanesh et al., 2022; To et al., 2022). Thus, it is no surprise that *social networking sites* (SNs) such as Facebook, Twitter, LinkedIn, Instagram or TikTok represent one of the most common forms of socio-cultural interaction, in particular for young people (Anderson, 2020). The use of social media among today's college students continues to grow, which is reflected in the amount of time these young students spend on SM (Kemp, 2023).

SM have become as an important vehicle in fostering social connections that maintain and expand existing relationships between organisations and their target groups. It is possible to state that SM are currently transforming into the most important part of the promotion strategy to foster relationships and to support *branding,* especially in the higher education (HE) sector (see, for example, Nguyen et al., 2021; Ramadanty & Syafganti, 2021; To et al., 2022).

On the other hand, published research results (see, for example, Capriotti et al., 2023; Bonilla Quijada et al., 2021; Lund, 2019; To et al., 2022) show that there are differences between universities in their use of SM for communication with the public. Therefore, a deeper understanding is needed of the characteristics that influence the interactivity and the relationship between HEIs and page visitors.

The main purpose of this study is to investigate how selected universities use their profiles on Facebook and Instagram to communicate with the public. A new approach in this analysis is the application of *correspondence analysis* according to the *uses and gratifications theory* (UGT). The conducted research contributes to the literature that has implications in SM *marketing for the HE field*.

2 Social Media and Marketing of Higher Education

The application of Web 2.0 has enabled profound changes in human interaction. Communication via SM is not only interactive but also participatory, collaborative, personal, and simultaneously communal, thus allowing organisations to engage their clients/consumers in constant conversations, supportive behaviour, and meaningful relationships (Tsai & Men, 2017).

SNs have become one of the most significant options for interaction because these communication channels support social relationships, and especially allow people to get in contact with new people and to keep in touch with friends. Given the massive potential audience available spending many hours a day using social media across the various platforms (Statista, n.d.), it is obvious that people responsible for PR also use SM as a marketing channel (Appel et al., 2020).

The integration of SM into the overall communication and marketing strategy has changed the communication activities and PR of organisations. It is especially evident in PR where they are an important part of the promotional mix (Tajudeen et al., 2018).

An essential component of social media marketing is the *brand page* or brand profile on SM, which represents an interactive communication platform. Social networking sites such as Facebook or Instagram, with their heavy reliance on visual imagery, have provided a platform for organisations to strengthen engagement with their public through the use of organisation-generated visual content (Dhanesh et al., 2022). Research results show that *social media engagement* enhances the public's affiliation and identification with organisations, triggers further online interactions in their peer networks, and can create positive attitudes towards and stronger relationships with organisations, including HEIs (see, for example, Dhanesh et al., 2022; Nguyen et al., 2021; Pringle & Fritz, 2019).

In recent years, *Generation Z* have become university students and prospective students and these target groups, as digitals natives, use SM every day (see, for example, Kemp, 2023; Statista, n.d.). Another important group is academic staff who, although representing *Generations X and Y*, usually have a good level of ICT skills and routinely use ICT tools in their work (see, for example, Calvo-Porral et al., 2019; Maran et al., 2022). At present, the challenge for HEIs is not whether to use SM for communication with their public but rather how to effectively use this tool to reach their marketing goals. Reaching and engaging current and prospective students through social media is considered to be the most important marketing method for HEIs today (see, for example, Capriotti et al., 2023; Lund, 2019; Eger et al., 2021; To et al., 2022).

Brand in Higher Education and Engagement on Social Media

Similar to the business sector, in the HE field *brand management* brings sustainable and competitive advantages to universities and their faculties. Currently, HEIs need to be increasingly managed as corporate brands (see, for example, Juříková et al., 2021; Momen et al., 2020; Nguyen et al., 2021).

The brand in the HE field consolidates *external and internal public* perceptions about HEIs and their services (Rauschnabel et al., 2016). The important topic of brand in the HE field is usually associated with the quality of education, research provided by the particular university, and the corporate image of this institution, including regional cooperation and international outlook (Capriotti et al., 2023).

At the core of all communication on social networking platforms is a single post which can take different forms. It represents the unit of all communication on social media. *Two-way communication* and creating and sharing content online are the most critical aspects of SM (see, for example, Kim & Yang, 2017; Pringle & Fritz, 2019).

The use of SM is usually a part of marketing strategy that plays a role in building brand awareness and increasing engagement between the university and its stakeholders (see, for example, Bonilla Quijada et al., 2021; Ramadanty & Syafganti, 2021). Some authors (e.g., Peruta & Shields, 2018; Shah et al., 2021) even consider engagement on SM as a critical factor for the customer relationship management of HEIs.

Online engagement can be defined (Mollen & Wilson, 2010, p. 923) as "a cognitive and affective commitment to an active relationship with the brand as personified by the website". Engagement metrics are commonly used to measure the effectiveness of communication using SM and with it also the effectiveness of the institution's marketing strategy on SM (see, for example, Eger et al., 2021; Peruta & Shields, 2017; To et al., 2022). Variants of total engagement are proportional engagements, defined as the level of engagement that takes the reach for each post or in one year or per special measure (e.g. number of students).

Kim and Yang (2017) underlined that each engagement behaviour differs in the value and commitment of resources. Liking represents a very basic form of engagement and is an affectively driven behaviour. Commenting is cognitively triggered and enables people to share their thoughts, ideas, opinions, or to show their interest in the post's topic (see, for example, Kim & Yang, 2017; Zell & Moeller, 2018). Sharing is either affective or cognitive or a combination of both (Kim & Yang, 2017). Regarding this, Alsufyan and Aloud (2017) state that sensory and visual features lead to likes that indicate the simple online reaction to the posted content. Shares represent the virality and comments represent conversation. Comments lead to rational and interactive features, and shares lead to sensory, visual, and rational features (Dhanesh et al., 2022).

Uses and Gratifications Theory and Communication on Social Media

Uses and gratifications theory (UGT) is based on the origins of social and psychological needs and explains the concept of why people use media (Katz et al., 1973), including social networking sites, to satisfy their needs (Muntinga et al., 2017). In the past UGT was focused on traditional media and it is also appropriate for studying SM (see, for example, Boztepe Taskiran, 2019; Raza et al., 2020). The well-established theoretical perspective on UGT provides valuable insights into SM as a new medium (Dolan et al., 2016). In communication on SM, a brand's overt goal is to attract users (followers/fans) by providing value, or gratification, through its content (Lin & Lu, 2011). The SM content should therefore be designed in a way which creates value for individual SM users to build a stronger level of engagement and facilitate brand communication.

For UGT research motivation is a central factor because this theory assumes that people purposely select and use media according to goals they actively aim to achieve (Muntinga et al., 2017). It also means individuals are motivated to fulfil their needs and wants by taking particular actions or accessing content on selected SM (Kim & Kim, 2019).

In order to extend the scope of the literature on UGT and SM use, this research assumes that the types of gratifications and engagement measures of Facebook and Instagram are related to the extent to which users (followers/fans) have interacted with these platforms during a selected time period.

Table 1. Types of gratifications

Informational content	The informational type of gratification represents the extent to which the social media content provides users with resourceful and helpful information.
Entertaining content	The entertainment content of Facebook or Instagram posts refers to the extent to which social media content is fun and entertaining to media users.
Remunerative content	Social media content that offers a reward or remuneration also includes monetary incentives, giveaways, prize draws or monetary compensation. In addition, also the ability to learn something new, the possibility to receive exclusive content, etc.
Relational content	This content supports relations, also the relationship between the selected university and its target groups (prospective students, students, teaching staff...). Socialising involves motivations such as gaining peer support, meeting interesting people, belonging to a community and staying in touch with friends.

Source: See, for example, Dolan et al. (2016); De Vierman et al. (2017)

This approach is close to the theory about the dimensions of *dialogic communication* (see, for example, Capriotti et al., 2021; Sommerfeldt & Yang, 2018) where effective communicative exchange involves continuous interactions between the organisation and the online users, and further among the online users themselves within the selected social network. Carpenter et al. (2016) argue that the nature of organisation-public communication has changed dramatically with the emergence of various SM platforms, and thus people associated with HEIs increasingly expect relational forms of communication rather than top-down approaches through static channels.

The key dimension is conversation where recipients of the communication interact with the communicator and engage in communication exchanges. From this point of view, the informational approach (informational content in UGT) should refer to mainly one-way posts, where the level of interaction is low. On the other hand, the conversational approach should refer to posts, where the degree of interactivity is high. This is expected for relational, entertainment and remunerative content according to UGT.

Research Questions and Hypotheses

Based on previous research in the field of HE and marketing on SM mentioned above, the following research questions and hypotheses can be posited:

RQ1: How do top universities from a selected country in Central Europe use Facebook and Instagram to communicate with the public?

The hypotheses below were formulated in response to the research question RQ1:

Hypothesis H1: There is a positive association between the engagement rate of the university's Facebook and Instagram profiles and the number of students.

Hypothesis H2: Universities that are more active in communication on their Facebook and Instagram profiles (number of posts/2022) achieve a higher engagement rate.

Hypothesis H3: There is a positive association between the engagement rate of the university's Facebook profile and the engagement rate of their Instagram profile.

RQ2: Does the media type of communication resources influence the users' level of engagement on HEIs' social networks?
Hypothesis H4: Three types of expositive resources (text, graphic, audiovisual) influence the level of engagement per post.

RQ3: Does the type of communication approach measured by UGT content categories influence the users' level of engagement per post on HEIs' social networks?
Hypothesis H5: Greater implementation of the categories Relational + Remunerative + Entertainment will yield a higher level of engagement per post.

RQ4: What kind of dimension of dialogic communication is applied by selected universities on their social media profiles?
Hypothesis H6: Universities on Facebook achieve a greater reaction rate than viralization rate or conversation rate.

3 Methodology

The conducted research aims to describe the posting practices and selected engagement metrics of the Facebook and Instagram profiles of top universities from the Czech Republic in 2022. To capture the quantitative data researchers used the analytical tool ZoomSphere (n.d.). This tool captures statistics about only publicly available social media posts through the API platform.

The researchers simultaneously collected and mapped posts published by selected universities from September to December 2022 in detail with the aim of answering the research questions. This period covers active time, starting month in academic year (September), communication focused on prospective students (national higher education fair – October and information about recruitment activities at universities, from November), events focused on research promotion (researchers' night), promotion of new full professors (December) and prestige projects, ongoing events focused on university life, and also Erasmus internship offers, etc. All the universities also celebrated the Velvet Revolution, and the selected period ends with the Christmas holidays.

In the next part of the research only publicly available data on the Facebook and Instagram pages of selected HEIs was collected and manually coded. We adapted the content categories used in UGT research (see, for example, Dolan et al., 2016; De Vierman et al., 2017), see Table 1.

Sample Selection

The top seven public universities from the Czech Republic according to the evaluation by The times higher education (n.d.) were included (Chládková et al., 2021) in the research sample. Their size ranges from 9 to almost 50 thousand students. Furthermore, it is assumed that the number of academic staff and other staff, as well as alumni in the selected national context, depends on the number of students. Thus, this indicator provides relevant information about the differences in the size of the selected HEIs.

Data Collection

A paid account on ZoomSphere was used to extract quantitative data from the selected university profiles on Facebook and Instagram (2,230 on Facebook and 919 on Instagram = 7 universities/2022). Post-level data was collected directly from publicly available HEI profiles on Facebook and Instagram for the selected time period (834 on Facebook, 345 on Instagram, 7 universities/9-12/2022). The data was imported in chronological order by posting date in an Excel file (post type, number of likes/reactions, comments, and shares).

Data Analysis

Engagement metrics are commonly monitored to measure effectiveness of communication using SNs. The research used engagement rate per year and engagement rate per post (by follower) as two basic metrics. The research by Rival IQ (Feehan, 2022) using big data from the Internet points out that the more members or followers an organisation has, the more difficult it is to achieve high engagement values compared to smaller organisations. Thus, to compare engagement and effectiveness of communication on SMs we apply not only the number of followers or fans but also the number of students to gain a new insight into the topic of this research. Furthermore, the unit of analysis was the post for the selected day. Post content was categorised into predetermined categories based on UGT (Table 1).

Before the main content analysis, two pilot studies were conducted for the purpose of improving the codebook and training coders. Pilot study 1 tested the first version of the codebook in order to clarify the categories. The level of agreement was 85-90% (two sub-samples) and based on discussion, the codebook was revised and improved.

Pilot study 2 tested the revised codebook with the purpose of continuing the training of coders to achieve higher agreement. The sample of this pilot study consisted of new posts from both the Facebook and Instagram profiles. The level of satisfactory agreement was 92-96% (two sub-samples) and reached above 90%.

To answer RQ1 and hypotheses 1, 2, and 3, the classical engagement was calculated for the selected 7 universities by using data downloaded from ZoomSphere for the year 2022. Further, the engagement rate per post (by follower) was calculated (both for Facebook and Instagram) for the time period 9-12/2022 selected for detailed investigation.

The engagement rate is calculated in relation to the number of followers or fans the university has on social media (Facebook or Instagram) and furthermore, it is very important to take into account the size of the university according to the number of students.

Engagement rate (year 2022) = total number of likes + of comments + of shares (only for Facebook) divided by the total number of followers (or fans for Instagram), (ERS = not followers or fans but number of students/selected university/year 2021).

Engagement per post by follower (9-12/2022) = total number of likes + of comments + of shares (only for Facebook) divided by the total number of posts and divided by the total number of followers (or fans for Instagram), and multiplied by 100.

Spearman's rank-order correlation was used to analyse the statistical difference between the rankings of the two selected variables (number of followers or fans – number of students, ER/year – ERS/year).

To answer RQ2 and hypothesis 4, the results of the content analysis were used. The published posts were coded according to the type of media and the level of engagement rate was calculated. To answer RQ3, the research adapted some of the content category attributes used by higher education as suggested by previous studies. The researchers determined four content categories according to UGT (Table 1).

The correspondence analysis associates selected universities with UGT content categories on their Facebook or Instagram profile. Statistical analysis was performed in statistical software R version 4.0.3 (R Core Team, n.d.).

The resulting data is graphed on the correspondence map to show the observed relationships visually. The figures on the graph clearly show a relationship between the universities and categories; the distance between the two points shows the strength of that relationship.

Additionally, using the collected data, an evaluation of the Facebook communication of the selected universities was carried out according to the focus on the key dimensions for dialogic communication on SNs according to Capriotti et al. (2021). To gain new insights into university communication through social networking sites, the values of Reaction rate, Viralization rate and Conversation rate indicators were also calculated (Capriotti et al., 2021).

4 Results

4.1 Engagement Rate and Engagement Rate per Post/Year 2022

The list of selected universities and detailed information about their communication on their official Facebook and Instagram profiles using the ZoomSphere tool for the year 2022 are in Table 2 and 3.

Table 2. Universities, Facebook and Instagram, data – year 2022

University Facebook 2022 posts	ER year	ERS year	ER post %	ERS post %	Followers	Students
Charles University in Prague	0.97	1.09	0.254	0.286	54,965	48,828
Masaryk University	1.22	1.95	0.178	0.283	50,805	31,956
Palacký University	0.69	1.00	0.237	0.343	32,764	22,672
University of South Bohemia in CB	0.27	0.29	0.323	0.339	9,204	8,772
Czech University of Life Science Prague	0.62	0.66	0.216	0.231	22,599	21,081
Czech Technical University in Prague	0.40	0.38	0.171	0.165	16,870	17,496
University of West Bohemia	1.27	1.10	0.468	0.407	9,537	10,982
University, Instagram 2022 posts	**ER year**	**ERS year**	**ER post %**	**ERS post %**	**Fans**	**Students**
Charles University in Prague	4.05	1.28	0.024	0.007	15,386	48,828
Masaryk University	4.00	2.90	0.028	0.020	23,141	31,956
Palacký University	5.35	3.35	0.050	0.031	14,209	22,672
University of South Bohemia in CB	1.93	1.26	0.035	0.023	5,749	8,772
Czech University of Life Science Prague	2.99	1.16	0.024	0.009	8,173	21,081
Czech Technical University in Prague	3.97	1.91	0.017	0.008	8,404	17,496
University of West Bohemia	3.73	2.06	0.034	0.019	6,078	10,982

Source: ZoomSphere (n.d.)

Note: Full version of the dataset, see *Mendeley Data* (Eger, 2023).

Table 2 presents data downloaded using the ZoomSphere tool. Data show the number of posts published during the year 2022 on official HEI Facebook and Instagram (Instagram feed timeline) profiles, the number of followers or fans at the end of this year and values related to the level of reaction (likes + comments + shares). To answer RQ1, the ratio was determined between selected variables and bivariate correlation analysis (Spearman's Rho) was chosen.

As can be seen from Table 2, the universities' classical Engagement Rate/year 2022 was 0.78 (minimum 0.27; maximum 1.27) for Facebook and 3.72 (minimum 1.93; maximum 5.35) for Instagram. Data for Facebook also shows that the ranking of universities according to number of followers is exactly the same as according to the number of students. For Instagram, for this indicator, there is a minimal difference, the value of r is 0.929 and p (2-tailed) = 0.003.

H1 Association between Engagement Rate/a year (ER) and Engagement Rate/S/a year (ERS) has been proven. The value of r was 0.964 and p (2-tailed) = 0.0005. The association between these two selected variables would be considered statistically significant and is logically affected by the fact that in the sample of universities the institutions had the same ranking in terms of followers and number of students. The finding for Instagram was

different, r was 0.714 and p (2-tailed) = 0.071. As we can see in Table 2, some universities have worse results for engagement on Instagram in terms of the comparison with the number of their students.

H2 Universities that are more active in communication on their Facebook and Instagram profiles (number of posts / 2022) achieve a higher engagement rate. To analyse the impact of the number of posts published on Facebook and Instagram profiles on the two different engagement rates mentioned above, Spearman's Rho was calculated. The findings show that there is no significant difference between the ranking of universities according to the number of published contributions per year and ER (r was 0.643 and p (2-tailed) = 0.119), on the contrary, there is a (slightly) statistically positive finding for the ERS with the number of students (r was 0.786 and p (2-tailed) = 0.036). For Instagram, both calculations are negative, and it turns out that the following detailed analysis of the HEIs' communication on SNs will be significant, which will lead to the discovery of differences. The difference in the number of published posts per year was large, from 687 (Masaryk University) to just 85 (University of South Bohemia) on Facebook, on Instagram from 232 (Czech Technical University) to 55 (University of South Bohemia), cf. Table 2. Hypothesis H3 assumes that an HEI active on Facebook is also active on their Instagram profile, which documents that those responsible for PR and branding communication are aware of the possibilities of SM. Surprisingly, as can be seen from Table 2, this was not confirmed. For example, Palacký University is third in the number of published posts on Facebook, but only sixth on Instagram, similarly Czech Technical University in Prague is first on Instagram, but only sixth on Facebook. This is also why it is important to pay attention to the more detailed evaluation that follows.

4.2 Influence of Media Type of Post Resource on Engagement Rate

RQ 2 focuses on the types of communication resources. The purpose of the analysed sample was to answer the question of which type of post is the most effective in terms of the engagement rate per post achieved (Tables 3 and 4).

Table 3. A Sample of universities, Facebook Engagement Rate per post, 9-12/2022

University + Followers/2022	Type of post	No	Reactions	ER per post	ERP/ Fans %
Charles University in Prague Followers 54,965	Text	1	33	33.00	0.06
	Photo	118	9,807	83.11	0.15
	Photo Album	31	4,384	141.42	0.26
	Video	4	102	25.50	0.05
Masaryk University Followers 50,805	Text	0	0	0.00	0.00
	Photo	192	14,360	74.79	0.15
	Photo Album	47	3,940	83.83	0.17
	Video	11	329	29.91	0.06
Palacký University Followers 32,764	Text	0	0	0.00	0.00
	Photo	73	3,172	43.45	0.13
	Photo Album	18	1,997	110.94	0.34
	Video	2	82	41.00	0.13
University of South Bohemia in CB Followers 9,204	Text	0	0	0.00	0.00
	Photo	28	148	5.29	0.06
	Photo Album	8	231	28.88	0.31
	Video	2	9	4.50	0.05

Czech University of Life Science Prague Followers 22,599	Text	4	104	26.00	0.12
	Photo	86	2,184	25.40	0.11
	Photo Album	18	992	55.11	0.24
	Video	8	190	23.75	0.11
Czech Technical University in Prague Followers 16,870	Text	2	77	38.50	0.23
	Photo	54	1,446	26.78	0.16
	Photo Album	20	634	31.70	0.19
	Video	8	100	12.50	0.07
University of West Bohemia Followers 9,537	Text	1	391	391.00	4.10
	Photo	74	2,033	27.47	0.29
	Photo Album	18	857	47.61	0.50
	Video	6	169	28.17	0.30

Source: own processing, 2023

Note: Full version of the dataset, see *Mendeley Data* (Eger, 2023).

The descriptive analysis reveals that photo/graphical resource was the most used by selected universities (75% for Facebook). The type of text reached the highest engagement but for the overall low number of this type of posts in the sample it is not possible to generalise this finding (only 8 posts from the sample = 1% for Facebook). The most successful post type for Facebook in terms of classified media was the Photo Album (Album in Table 3, 19% for Facebook), which surprisingly did better than the video (only 5% for Facebook). Thus, H4 is confirmed, and the type of expositive resources (text, graphic, audiovisual) influences the level of engagement per post. Photo album Engagement Rate per post on Facebook was 0.29% with observed dispersion from 0.17% (minimum) to 0.50% (maximum). Average Photo Engagement rate per post was 0.15% and for video posts only 0.11%.

Table 4. Sample of universities, Instagram, Engagement Rate per post, 9-12/2022

University Instagram 9-12/2022 posts	Category	Posts	Reactions	ER per post	ERP/ Fans %
Charles University in Prague Fans 15,386	Photo	55	16,210	294.7	1.92
	Photo Album	23	11,658	506.9	3.29
	Reels	1	246	246.0	1.60
Masaryk University Fans 23,141	Photo	20	14,329	716.5	3.10
	Photo Album	32	22,950	717.2	3.10
	Reels	15	6,834	455.6	1.97
Palacký University Fans 14,209	Photo	11	9,883	898.5	6.32
	Photo Album	20	13,356	667.8	4.70
	Reels	0	0	0.0	0
University of South Bohemia in CB Fans 5,749	Photo	8	950	118.8	2.07
	Photo Album	8	2,169	271.1	4.72
	Reels	0	0	0.0	0
Czech University of Life Science Prague Fans 8,173	Photo	16	2,341	146.3	1.79
	Photo Album	26	4,762	183.2	2.24
	Reels	8	2,658	332.3	4.07

Czech Technical University in Prague Fans 8,404	Photo	16	1,735	108.4	1.29
	Photo Album	42	7,910	188.3	2.24
	Reels	2	177	88.5	1.05
University of West Bohemia Fans 6,078	Photo	16	4,501	281.3	4.63
	Photo Album	19	4,387	230.9	3.80
	Reels	7	1,011	144.4	2.38

Source: own processing, 2023

On Instagram (Table 4) the highest Engagement Rate per post was also for Photo Album (carousel) at 3.44% with observed dispersion from 2.24% (minimum) to 4.72 (maximum). Average Photo Engagement Rate per post was 3.02% but Palacký University reached 6.32% but only for 11 published posts of this type in the selected period. Average Reels Engagement Rate per post was only 1.92%. It should be noted that of the 345 coded posts, 49% were Photo Album, 41% were Photo and only 10% were video-reels, and overall, there were almost 60% fewer posts on Instagram in the observed period.

4.3 UGT Categories and Differences among HEIs in Their Communication via SM

RQ3 focuses on conducted research on UGT content categories. Tables 5 and 6 present the final findings of the coding process.

Table 5. UGT content categories, Facebook, 9-12/2022

Category	Charles University in Prague	Czech Technical University	Palacký University Olomouc	West Bohemia University	University of South Bohemia	Masaryk University	Czech University of Life Science
Informational	88	49	51	71	20	192	74
Entertaining	2	1	2	2	0	7	2
Remunerative	15	11	15	7	4	21	14
Relational	49	23	25	19	14	30	26

Source: own processing, 2023

In terms of UGT content presented via Facebook, different findings were found when correspondence analysis was applied. In general, the correspondence map shows that universities promoted themselves using a different content category via Facebook. The two dimensions, 1 and 2, are sufficient to retain 99.34% of the data's total inertia (variation). The analysis of dimensions and correspondence shows that the two dimensions' contribution in explaining the variance of most universities (6 of 7) is above 90%, and 4 of 7 are explained by the first dimension. Inertias are comparable to each other.

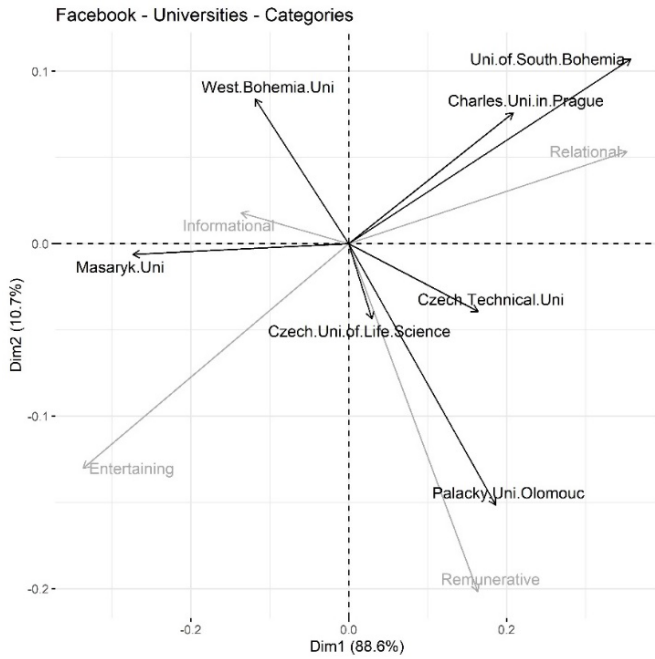

Figure 1. Correspondence map of universities' promotional content, Facebook, UGT categories
Source: own processing, 2023

Figure 1 – the correspondence map shows that each university has different content categories to promote themselves using their official Facebook profile. For example, Palacký University exclusively resides in a position that is far away from the other universities with a category renumeration connection, to which the Czech University of Life Science is also very close. Charles University and the University of West Bohemia support relational content and surprisingly, the content using entertainment is far from the position of all universities in Figure 1.

Table 6. UGT categories, Instagram, 9-12/2022

Category	Charles University in Prague	Czech Technical University	Palacký University Olomouc	West Bohemia University	University of South Bohemia	Masaryk University	Czech University of Life Science
Informational	56	47	27	28	12	53	32
Entertaining	2	1	2	0	0	3	0
Remunerative	8	5	1	6	1	6	10
Relational	13	7	1	8	3	5	8

Source: own processing, 2023

In general, Table 6 and the correspondence map show that almost each university promoted itself via Instagram namely using content category Informational. Four universities published even less than 50 posts/four months on their Instagram feed timeline. The two dimensions, 1 and 2, are sufficient to retain 96.3% of the data's total inertia (variation). The analysis of dimensions and correspondence shows that the two dimensions' contribution in explaining the variance of most universities (5 of 7) is above 95%, and 4 of 7 are explained by the first dimension. Inertias are comparable to each other.

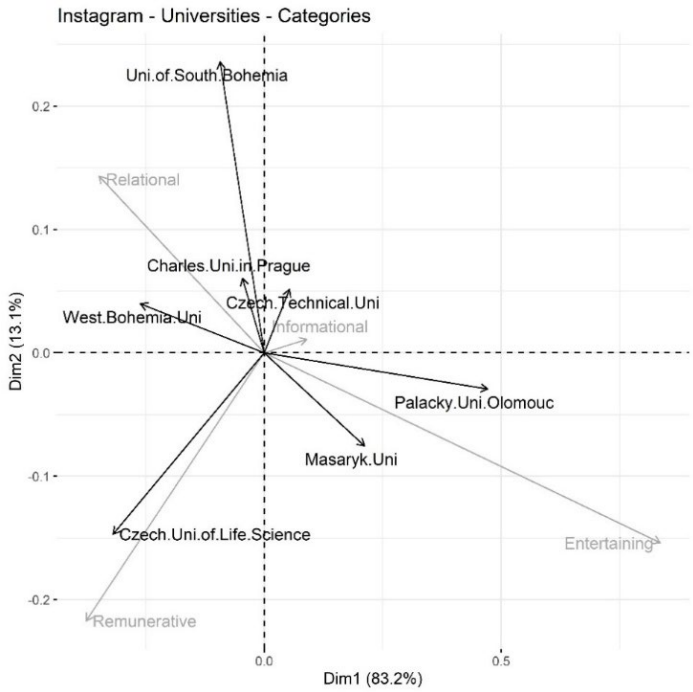

Figure 2. Correspondence map of universities' promotional content, Instagram, UGT categories
Source: own processing, 2023

On the one hand, Instagram is the most popular SM among Generations Z and Y in the country, on the other hand, findings show that universities preferred Facebook or that they published fewer posts on their Instagram timeline. The University of Life Science preferred the post category Renumeration. The category Relational is close to 2-3 universities and again the category Entertaining was used very seldom by all institutions. The category Informational is in the middle of the figure and is key for all the selected universities.

Hypothesis H5 assumes that the categories Relational + Remunerative + Entertainment received a higher level of engagement per post than the category Informational. The analysis was employed only for Facebook posts due to the low number of posts published on their Instagram feed timeline during the four evaluated months. Findings from universities showed that the category Informational achieved a higher Engagement Rate per post (minimum = 0.15%, maximum = 0.22%). Engagement Rate per post for all the following categories was from 0.08% (minimum) to 0.14% (maximum). However, the exception was the finding from the West Bohemia University, where the category Informational reached a value of 0.32% and the indicator for the other three categories had a value of 0.47%. We can cautiously state that hypothesis H6 was partially confirmed.

4.4 Dialogic Communication and Differences among HEIs

Additionally, to assess users' degree of interaction with social media posts, the analysis of data from Facebook is presented in Table 7. These findings show how effective HEIs were from this point of view in communication with the public.

Table 7. Reaction Rate, Viralization Rate, Conversation Rate, Facebook 2022

Universities, Facebook 2022	Total Posts	Total Likes	Total Shares	Total Comments	Followers	Reaction Rate %	Virali-zation Rate %	Conver-sation Rate %
Charles University in Prague	381	48,146	2,941	2,171	54,965	0.23	0.014	0.010
Masaryk University	687	58,268	2,956	1,012	50,805	0.17	0.008	0.003
Palacký University	292	20,381	2,036	296	32,764	0.21	0.021	0.003
University of South Bohemia in CB	85	2,401	197	31	9,204	0.31	0.025	0.004
Czech University of Life Science Prague	286	12,552	994	182	22,599	0.19	0.015	0.003
Czech Technical University in Prague	229	6,205	343	96	16,870	0.16	0.009	0.002
University of West Bohemia	270	11,119	758	174	9,537	0.43	0.029	0.007

Source: own processing, 2023

As can be seen from Table 7, universities achieved their highest results in the type of engagement rate called the Reaction Rate. This indicator included likes. Indicators that included shares (Viralization) and comments (Conversation) achieved significantly lower values. The findings support hypothesis H6. It is also noticeable that again there are large differences in the effectiveness of communication, here according to dialogic communication. For example, the very active Masaryk University achieves low values compared to the University of West Bohemia, even in all the three monitored indicators.

5 Discussion

The purpose of this research was not primarily to analyse the big data of HEIs' communication on social media, but rather to bring new insights into universities' communication with the public through a deeper, more specific analysis. In a detailed analysis of university communication on SNs, this research evaluated the strategy of university communication on SNs using UGT. Further, using a specific research sample, the research evaluates key dimensions for dialogic communication on SNs. From a theoretical perspective, the research builds on previous work by various scholars including, i.e., Alalwan et al. (2017), Capriotti et al. (2021), Dolan et al. (2016), Lund (2019), Peruta and Shield (2018), Rutter et al. (2016), and To et al. (2022).

Commitment between a university and its key target groups is a demanding dimension that is not easily obtained, and universities should make a more customer-orientated effort to further build brand equity. The findings on engagement on Facebook and Instagram show significant differences between the selected top universities from the Czech Republic in the use of popular SNs for their communication with the public. Therefore, we first wanted to check whether the number of followers corresponds to the size of the university according to the number of students. Data for Facebook showed that the ranking of universities according to number of followers is exactly the same as according to the number of students. For Instagram this indicator had minimal difference. This finding from one country in Central Europe does not support previous results by Lund (2019).

The actual survey by Rival IQ (Feehan, 2023) states that the average Engagement Rate per Post (by follower) on Facebook across all industries was 0.06 and for HE 0.15, and on Instagram across all industries 0.47 and for HE

2.58. However, as previous research from HE with big data has shown, it is advisable to consider differences in communication between, for example, the US, Europe, or Asia (see, for example, Capriotti et al., 2023; Lund, 2019; To et al., 2022). For our sample of universities, the Engagement Rate per Post (by follower) on Facebook was 0.78 for 2022 and 3.72 on Instagram. But there were differences in the values achieved between the evaluated subjects.

The detailed analysis focused on the media type of the post. The photo/graphical resource was used most by selected universities (75% for Facebook) but the highest observed Engagement Rate per Post (by follower) was achieved by Photo Album on Facebook, 0.29% with observed dispersion from 0.17% (minimum) to 0.50% (maximum). On Instagram the highest Engagement Rate per Post (by follower) was also for Photo Album (carousel) at 3.44% with observed dispersion from 2.24% (minimum) and 4.72 (maximum). For example, observed average Reels engagement rate per post (by follower) was only 1.92%. The findings show that responsible persons should take into consideration the type of media when planning communication on SNs (Capriotti et al., 2021).

Next, this research also focused on the content of published posts and evaluated differences among HEIs from this point of view. The subsequent analysis focused on UGT categories and differences among HEIs in their communication via SNs. New insights into the use of SNs in brand communication between competing universities provide valuable information for marketing of HEIs. As can be seen in Figures 1 and 2, there are significant differences between universities in terms of the use of targeting communications to UGT categories. Social media are based on conversation and interaction between people online (see, for example, Strauss & Frost, 2012; Tuten & Solomon, 2015), and in general users value, among other things, Entertainment, but also Interaction that leads to Renumeration (De Vierman et al., 2017). The universities in our sample were unable to leverage the entertainment focus (either for Facebook or Instagram), and most are also far from the category that leads to renumeration.

Additionally, one other specific look at this topic brings a partial analysis inspired by Capriotti et al. (2021). It is worth noting here that this is an emotional reaction, for cognitive feedback (comments) is highly desirable and for extending communication sharing (both cognitive and emotional reaction) is best, cf. Kim and Yang (2017).

In recent years, SM have had the potential to effectively communicate HEI branding and to construct a value proposition of their educational services to their target groups (see, for example, Pringle & Fritz, 2019; To et al., 2022). This empirical research with the focus on a detailed analysis of promotional content not only reviews the current practices of selected universities but also brings new knowledge on how better to promote a university in its main roles and build its brand.

Implications

This research makes several contributions, both to researchers and to practitioners that focus on marketing in the HE field. The outputs provide new insights into the possibility of evaluating competing university brands in the region. In particular, content analysis of posts using correspondence analysis revealed differences in the communication of content categories relevant to the university environment. There are even noticeable differences between the outputs of these analyses per Facebook and Instagram profile.

As can be seen from the results of this research, HEIs should regularly evaluate their communication plans and strategies on SM. This activity provides them with an opportunity to improve their communication strategy on SM and also helps them to identify what communication contents are being promoted by competing universities on SM. Administrators and managers are encouraged to consider not only integrating SM into existing communication tools in order to support the image and brand of the university, but also to manage this communication purposefully. Higher education marketers must encourage social media promotion strategies through Facebook and Instagram with effective use of the type of media and with relevant content for the main target groups. On SM, marketers could reach not only existing customers and fans (student, staff, alumni, etc.) but also their networked friends and contacts, creating a significant multiplier or virality effect.

While the findings of this research have practical and theoretical implications for those engaged in the practice or research of SM in the HE field, several limitations still exist. First, the study focused exclusively on top universities

from the Czech Republic, a country in Central Europe. Second, a different sample from a different cultural context should be addressed by further research. Third, data using the tool ZoomSphere in December 2022 was obtained from Facebook as well as Instagram. Nevertheless, some minor differences in data are beyond the control of the researchers. Next, the limitations of this study are related to the observation period, which for the detailed analysis is only four months, and only for the SNs Facebook and Instagram. Further, expanded research could be focused also on other SM platforms that are currently popular with young people, such as YouTube and TikTok.

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