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ARAŞTIRMA MAKALESİ / RESEARCH ARTICLE

Institutionalization of Science Communication in Universities of Türkiye: A Qualitative Analysis of Central Communication Units*

Türkiye'deki Üniversitelerde Bilim İletişiminin Kurumsallaşması: Üniversitelerin Merkezi İletişim Birimleri Üzerine Nitel Bir Analiz

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Abstract

In contemporary policy documents and academic literature, the significance of institutional actors, particularly universities, in the communication and interaction processes between science and society is increasingly emphasized. This study aims to explore the science communication activities carried out by central communication units of universities in Türkiye, the distribution of these activities among sub-units within universities, the priorities and motivations for such activities, and the problems encountered in the institutionalization of science communication. Using a qualitative research method, semi-structured in-depth interviews were conducted with senior officials from 20 public and foundation universities in Türkiye, and a thematic analysis approach was utilized to analyze the coded data. The results indicate that while there are noteworthy differences between public and foundation universities, central communication units prioritize routine and one-way science communication activities categorized as PR and Marketing, while Public Engagement and Public Affairs activities involving dialogue are carried out to a more limited

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extent. The primary motivation behind universities' science communication is meeting specific institutional strategic goals rather than creating public benefit. Furthermore, institutionalizing science communication in universities has been hindered by personnel and budget constraints in communication offices, the lack of institutional autonomy, and undefined duties and authorities of these units under the legal regulations of the higher education system.
Keywords: Science Communication, Universities, Public Engagement, Institutionalization, Türkiye

Öz

Güncel politika belgelerinde ve akademik yazında, bilim ve toplum arasındaki iletişim ve etkileşim süreçlerinde kurumsal aktörlerin, özellikle de üniversitelerin önemi giderek daha fazla vurgulanmaktadır. Bu çalışma, Türkiye'de üniversitelerin merkezi iletişim birimleri tarafından yürütülen bilim iletişimi faaliyetlerini, eğer mevcut ise üniversiteler içinde iletişim birimi dışında kalan diğer alt birimlerin hangi bilim iletişim faaliyetlerini yürüttüklerini, iletişim birimlerinin bilim iletişiminde önceliklerini, motivasyonlarını ve bilim iletişiminin kurumsallaşmasında karşılaşılan sorunları ortaya koymayı amaçlamaktadır. Nitel bir araştırma yöntemi kullanılarak, Türkiye'deki 20 devlet ve vakıf üniversitesinden üst düzey yetkililerle yarı yapılandırılmış derinlemesine görüşmeler yapılmış ve kodlanan verilerin analizinde tematik analiz yaklaşımı kullanılmıştır. Sonuçlar, kamu ve vakıf üniversiteleri arasında dikkate değer farklılıkları göstermekle birlikte, merkezi iletişim birimlerinin Halkla İlişkiler ve Pazarlama olarak sınıflandırılan rutin ve tek yönlü bilim iletişimi faaliyetlerine öncelik verdiğini, diyalog içeren toplumun bilime katılımını ve kamusal faaliyetleri içeren etkinliklerin ise daha sınırlı ölçüde yürütüldüğünü göstermektedir. Üniversitelerin bilim iletişiminin ardındaki temel motivasyonun ise kamu yararı yaratmaktan ziyade belirli kurumsal stratejik hedefleri karşılamak olduğu görülmektedir. Ayrıca, üniversitelerde bilim iletişiminin kurumsallaşması, iletişim ofislerindeki personel ve bütçe kısıtları, kurumsal özerklik eksikliği ve yükseköğretim sisteminin yasal düzenlemeleri kapsamında bu birimlerin görev ve yetkilerinin tanımlanmamış olması nedeniyle engellenmektedir.
Anahtar Kelimeler: Bilim İletişimi, Üniversiteler, Kamusal Katılım, Kurumsallaşma, Türkiye

Introduction

Universities are not only responsible for generating scientific knowledge but also play a crucial role in establishing links between science and society. They can organize science communication activities for their own benefit or to benefit the public by bringing science and society closer. Since the mid-2000s, universities worldwide have diversified and professionalized their communication activities to enhance their reputation and brand image (Schäfer & Fähnrich, 2020). Universities have started to allocate more resources to communication, intensified their media relations, and started to use social media more effectively. These activities can be based on traditional science communication or participatory approaches that involve the public in scientific processes and encourage dialogue. Public engagement of science (PES) aims for societal benefit, organizing public events that are research-related and conducting activities that facilitate interaction with society by collaboration. This research focuses on the role of universities and their institutionalized communication units in science communication, employing a qualitative approach.

The study focuses on universities in Türkiye, which traditionally have not been considered at the forefront of scientific knowledge production and where mechanisms regulating the relationship

between science and society were established later than in Western countries (Dursun, 2010, p. 23). We aimed to investigate the prominent science communication activities carried out by the communication units of universities, how these activities are organized between the communication unit and other sub-units within the university, the motivations prioritized in these activities, and the current problems regarding the institutionalization of science communication in universities. For this purpose, in-depth interviews were conducted using semi-structured questions with officials from the central communication units of 20 foundation and public universities in Türkiye. The interview data were analyzed thematically, and categories were identified under four main themes and interpreted with their sub-categories.

The communication strategies developed by universities within the framework of institutional strategies heavily influence today's dominant understanding of science communication (Bauer & Gregory, 2008), as well as the media coverage of scientific topics (Horst, 2013; Sumner et al., 2014; Vogler & Schäfer, 2020) and the media activities of individual scientists (Marcinkowski et. al, 2014; Bauer & Jensen, 2011; Marcinkowski & Kohring, 2014). Institutional science communication studies are relatively limited in the existing science communication literature and despite their importance, have gained prominence only after 2009 (Schäfer & Fähnrich, 2020, p. 140). Science communication literature in Türkiye mainly focus on the problems of science journalism (Erdoğan, 2007; Koloğlu, 1997; Öztunç, 2020; Utma, 2022), and the role of traditional (Dursun, 2021) and online media (Bedir, 2020) in science communication. However institutional science communication and science communication activities of universities attracted a very limited scholarly attention. While there are studies on web-based corporate communication activities (Gökler & Onay, 2020; Çoban & Tüfekçi, 2015) of universities in Türkiye, there are very few studies that specifically focus on science communication in the context of universities (Burakgazi, 2017; Ozdemir & Koçer, 2020); and none of them are based on systematic field research.

This study makes an important contribution to the science communication literature in Türkiye in terms of addressing the roles and challenges faced by university communication units. Furthermore, it is anticipated that the research can guide for decision-makers and practitioners in improving the role, function, and effectiveness of universities and central communication units in science communication within Türkiye.

Conceptual Framework

Demands and opinions advocating for an enhanced role of universities and research institutions in fostering interaction between science and society, as well as promoting engagement with diverse segments of society, have been highlighted in various policy documents since the early 2000s (European Research Advisory Board, 2007). Although 'Public Engagement' (PE) is a very flexible term that encompasses a range of approaches, goals, and activities, some of its basic assumptions remain constant: Accordingly, mutually supportive relationships between science and society are important for the advancement of scientific knowledge and the betterment of society. Furthermore, effective establishment of such relationships is best attained through extensive and

diverse interactions or engagements between the two entities (Burchell, 2015). Collaborative initiatives with industry and non-governmental organizations for societal benefit, organizing public events that are research-related, and conducting activities that facilitate interaction with society, such as science cafés, can be regarded as part of the domain of PE (Süerdem et. al, 2023). In this regard, PE diverges from the traditional concept of science communication, which predominantly involves one-way communication from scientists and scientific institutions to society, aimed at enlightening society with scientific knowledge.

On the other hand, under the influence of neoliberal Higher Education reforms, including the automatization and professionalization of management (Mejlgaard et. al, 2012) and the increasing commercialization of higher education and competition for students, knowledge, and financial resources (Aquilani & Lovari, 2008; Engwall, 2008; Rowe & Brass, 2008; Autzen & Weitkamp, 2019), universities are increasingly turning to non-scientific audiences.

For universities and research organizations, interacting with the media is also becoming important to attract the attention of politicians, policy makers and increase social influence (Peters et al., 2008). For these reasons, universities today are expanding and diversifying their communication efforts, while at the same time allocating more resources to communication and intensifying their relationships with media and journalists (Rowe & Brass, 2008). They have also become more strongly involved in public relations (PR) (Borchelt & Nielsen, 2014; Autzen, 2014; Vogler & Schäfer, 2020), branding (Chapleo, 2011; Bélanger et. al, 2014) reputation management (Melewar et. al, 2018), and interacting with various target audiences through online and social media (Duke, 2002; Linvill et. al, 2012; Lo Presti et. al, 2020). Under such conditions, communication with different segments of society, especially industry, has become a 'third mission' (Laredo, 2007) and a structural part of the scientific production process (along with education and research) rather than an external duty or ethical responsibility for universities and other research organizations (Polino & Castelfranchi, 2012).

In the past, science was independent and not accountable to social actors as it was more closed to communication, yet this new approach allowed society to interact with science and science to be accountable to other segments of society with the Public Engagement with Science (PES) approach. However, the organizational shift in science communication has been criticized from different angles by different researchers. The most common criticism is that the forms of corporate strategic communication based on self-promotion, publicity, and public relations (PR) are incompatible with the public interest requirements of science communication and that this leads to exaggerated representations of science in the media (Nelkin, 1987; Bauer & Gregory, 2008; Bauer, 2008; Sumner et al., 2014; Weingart, 2017). However, certain scholars hold the viewpoint that the mediatization of scientific institutions may pose a threat to academic autonomy, as it could potentially result in an increased emphasis on sensational topics and heightened visibility pressure on academics (Marcinkowski et al., 2014, p. 3).

On the contrary, it has been argued that PR should not be reduced to mere propaganda, as highlighted by (Autzen & Weitkamp, 2019, p. 475). Moreover, proponents of PR and other

strategic communication approaches assert that they can contribute to the advancement of science communication by extending its reach to a broader and more diverse audience (Roberson, 2020, p. 2). Additionally, criticism has been raised against universities and scientific organizations for primarily engaging in one-way communication activities, such as issuing press releases, while neglecting more interactive forms of communication such as consensus conferences, open days, web-based communication, etc., which provide the public with a platform to participate in scientific processes and share their perspectives (Carver, 2014; Claessens, 2014). Nevertheless, it is worth noting that some research organizations, which have adopted a more structured and professionalized approach to their communication activities, have started to embrace symmetrical communication practices such as science cafés and public lectures. These initiatives aim to foster connections with various stakeholders including businesses, civil society organizations, local authorities, decision-makers, and journalists (Autzen, 2014).

In recent years, a number of studies have examined what kind of public communication activities universities and research institutes engage in, the factors that influence the level of these activities, the motivations behind them and their target audiences (Rowe & Brass, 2011; Aquilani & Lovari, 2008). In this regard, a notable finding emerging from the literature is that universities are progressively dedicating more resources to public communication efforts and factors such as the overall size of the university, the size of the staff and budget allocated to public communication affect the level of activity (Neresini & Bucchi, 2011). On the other hand, the country and specialization also affect the PE frequency of the scientific organization (Entradas et al., 2020; Entradas & Bauer, 2017).

Several indicators signify the development of PE culture and the institutionalization of science communication within universities and research organizations. As defined by Aquilani & Lovari (2008), the institutionalization of communication activities entails the seamless integration and alignment of these functions with the existing values, norms, and structure of the organization. Moreover, several factors can be seen as indicators of the institutionalization of PE, such as duration of establishment of the communication office within the organization, the name under which it was established, whether external services are outsourced, the presence of a communication director in the senior management team, and the level of direct involvement and engagement of the Rector or other senior managers with the communication unit. Additionally, the diversification of internal and external target audiences and communication channels, strategic planning of the communication office along with its own budget, and the degree of autonomy granted to the communication office by legal regulations of the higher education system can all be important indicators of the institutionalization of PE (Aquilani & Lovari, 2008, pp. 1133–1136). Maintaining autonomy within the organization appears as a significant challenge for communication departments, as they face pressure from senior management (Claessens, 2014, p. 4).

On the other hand, the training and experience of communication unit staff within institutions (Watermeyer & Lewis, 2017), systematic monitoring and evaluation of the impact of PE activities and the target audience (Neresini & Bucchi, 2011), science communication training for academics (Claessens, 2014), and the establishment of science communication research and training programs

by universities (Bucchi & Trench, 2014) are all significant indicators. Watermeyer and Lewis (2018) conducted research on communication staff at universities and identified that there is a lack of standardization in terms of duties, titles, knowledge, and skills required for communication staff. Furthermore, they found that communication staff are often young, inexperienced, and are inadequately compensated and qualified for their roles.

Furthermore, the role of central communication units in the public communication efforts of universities and how communication activities are distributed among different sub-units within the institution is a crucial issue (Rowe & Brass, 2008). University media and communication offices have varying degrees of regulation and control policies for PE activities, ranging from strict to lenient governance. As a result, the role of media offices in organizing science communication activities may vary depending on their location, size, scope within the university, as well as their historical context and position in the national and international higher education landscape.

Rowe and Brass (2011, p. 17) also posit that universities are adapting to more flexible approaches in their public communication, particularly with the proliferation of social media and digital communication channels. This trend is evident in recent research projects such as the 'Mobilization of Resources for Public Engagement' (MORE-PE), which spans 10 countries and seeks to understand the evolving dynamics of science communication within universities. MORE-PE categorizes the interaction of universities with the public into three levels: central level (involving the central communication unit of universities), meso level (encompassing research institutes within universities), and micro level (comprising individual academics). Indeed, this research distinguishes itself from other studies by its specific focus on the central level, its inclusion of universities in Türkiye which have relatively less literature available.

Science communication has been integrated into public policies in developed countries since the 1980s. In contrast, in Türkiye, the understanding of the importance of establishing the link between science and society has only started to be included in various policy documents since the mid-2000s (Dursun, 2010, p. 23). Since then, The Scientific and Technological Research Council of Turkey (TÜBİTAK), as the responsible body for science communication in the country, has played a pioneering role in promoting science communication education, fostering science journalism, establishing science museums, and organizing activities such as café scientifique, science technology festivals, and competitions. TÜBİTAK has also provided support to various institutions, particularly municipalities and universities, to bolster science communication efforts (Ozdemir & Koçer, 2020, pp. 380–386). Furthermore, some prominent public universities in Turkey, such as Middle East Technical University (METU), Istanbul Technical University (ITU), and Ankara University, have taken the lead in institutionalizing science communication activities (Burakgazi, 2017, p. 253). The sole study that examines the public communication endeavors of universities in Turkey, using a quantitative approach and systematic field research, was published in 2023. This research, undertaken by Süerdem et al. encompassing 92 universities, reveals that the central communication units of these universities prioritize science communication activities that align with the institutions' strategic goals and are classified under public relations and marketing. Simultaneously, they engage less in activities

fostering interactive dialogue between society and science (Süerdem et al., 2023, p. 377). This current study, carried out within the same project, endeavors to further delve into the outcomes of the earlier research by employing a qualitative methodology. This unique approach provides valuable insights and contributes to the understanding of science communication in the context of universities in Türkiye.

Method

This study employs a qualitative approach to analyze the role and challenges of central communication units in Turkish universities in the field of science communication. The aim is to investigate the types of science communication activities carried out by universities and their central communication units, as well as whether there are other units responsible for science communication within the university and how coordination is established among these units. Furthermore, the study examines the primary motivations for engaging in science communication activities and the institutional challenges faced in executing these activities.

The current study included in-depth interviews with communication department of 20 universities and data collected from June to August 2022. This article is an output of the project titled "Institutional Communication Activies of Universities in the Context of Public Engagement With Science" and numbered 220K306, supported by the Scientific and Technological Research Council of Turkey (TÜBİTAK) 1002 Short Term R&D Funding Program. Permission for the study was obtained from the Istanbul Aydın University Social Sciences Ethics Committee Commission with a decision dated May 26, 2021, and numbered 2021/6. In this study, interviews conducted via Zoom were recorded and transcribed. The data were systematically coded using a thematic approach to derive meaning, with main categories consistently constructed and interpreted, along with sub-categories. As an exploratory analysis was employed in the interpretation process, instead of a rigid set of procedures with strict rules, emphasis was placed on identifying underlying meanings, themes, and patterns to address the main research questions, (Altheide et. al, 2008). The themes discovered played a significant role in defining the observed phenomena (Fereday & Muir-Cochrane, 2006).

During the interviews, the heads of central communication departments of the selected universities were asked open-ended questions related to the four main topics: science communication activities, distribution of duties on communication activities within the university, importance and motivations of science communication activities, and barriers in communicating science. These topics were the focus of the research, as outlined in Table 1.

Table 1. Interview Topics and Corresponding Questions

Topic	Questions
Communication Activities	What kind of activities do you carry out in this office? What communication activities do you usually carry out to announce scientific research? Which communication activities were organized by which units and how (by using activities list).
Distribution of duties on communication activities within university	Which other units are responsible for communication activities at your university? What are the communication activities that are carried out by other units within the university, and which activities are typically assigned to this unit? Are science communication activities mainly the responsibility of this unit or other communication units at the university?
Importance and motivations of Science Communication	What are the primary motivations behind the implementation of science communication activities at your university? To what extent is the implementation of science communication activities considered important in alignment with your university's mission? How would you characterize the role of your unit and other communication units within the context of fulfilling your university's mission?
Communication Unit' barriers in communicating science	Is your unit able to obtain adequate resources, such as budget and personnel, to support your science communication activities? How would you assess the quality, scope, and or frequency of your science communication activities? Do you believe they are the desired level? Have there been any unintended outcomes of your science communication activities, such as increased workload or negative feedback?

Research Sample

Sample selection was conducted using a quota approach, considering the proportion of public and foundation universities out of all universities in Türkiye. The cities where the universities are located were also considered in the sampling process. The study included a relatively homogeneous population from 20 universities in the sample, with 8 (40%) of them being foundation universities and 12 (60%) being public universities. This sample size was determined based on the concept of code saturation, as proposed by Hennink and Kaiser (2022). Code saturation refers to the point in qualitative research where new data no longer yields additional insights or themes, indicating that data collection is sufficient to answer the research questions or achieve the research objectives. By including 20 universities in the sample, we aimed to ensure that they have enough data to reach code saturation and obtain comprehensive insights from the population. The inclusion of both foundation universities and public universities in the sample may also contribute to the diversity of perspectives and experiences within the population, enriching the findings of the qualitative study. Furthermore, 35% of the sample universities were in Istanbul, as shown in Table 2.

Table 2. Participants

	University Name	University Type	City/Region
1	Antalya Bilim University	Foundation	Antalya/Mediterranean
2	Bilkent University	Foundation	Ankara/Central Anatolia
3	Haliç University	Foundation	Istanbul/Marmara
4	Istanbul Aydın University	Foundation	Istanbul/Marmara
5	Istanbul Bilgi University	Foundation	Istanbul/Marmara
6	Izmir University of Economics	Foundation	Izmir/Mediterranean
7	Rumeli University	Foundation	Istanbul/Marmara
8	Üsküdar University	Foundation	Istanbul/Marmara
9	Kırklareli University	Public	Kırklareli/Marmara
10	Marmara University	Public	Istanbul/Marmara
11	Mersin University	Public	Mersin/Mediterranean
12	Muğla Sıtkı Koçman University	Public	Muğla/Aegean
13	Ondokuz Mayıs University	Public	Samsun/Blacksea
14	Pamukkale University	Public	Denizli/Aegean
15	İstanbul University	Public	Istanbul/Marmara
16	Sakarya University of Applied Sciences	Public	Sakarya/Marmara
17	Selçuk University	Public	Konya/Central Anatolia
18	Kahramanmaraş Sütçü İmam University	Public	Kahramanmaraş/Mediterranean
19	Tekirdağ Namık Kemal University	Public	Tekirdağ/Marmara
20	Gazi University	Public	Ankara/Central Anatolia

The interviews for this study were conducted with communication staff in the central communication units of universities. These individuals held positions such as director, deputy director, communication coordinator, or communication consultant, and had knowledge about the structure and functioning processes of the communication unit as well as the overall communication activities of the university.

To organize the interviews, the researchers first sent an official permission request for the research to the relevant universities through the Rectorates. The sample selection was limited to the universities that responded positively to the official request, and guidance from the rectorates was also sought in determining the interviewees.

After making the necessary arrangements, the researchers conducted face-to-face interviews with the pilot university. Subsequently, the other interviews were conducted between July and August 2022 using the "Zoom" platform, and they were recorded for later analysis. This approach allowed for flexibility in conducting the interviews, as it eliminated the need for in-person meetings and facilitated data collection from different universities within a specific timeframe.

Results

Science Communication Activities

Within the scope of the research, the science communication activities of the universities were classified under four main functions (Süerdem et al., 2023), namely Public Affairs, Public Engagement, Public Relations and Marketing, and the frequencies of the activities that the communication units declared in the interviews are shown in Figure 1.

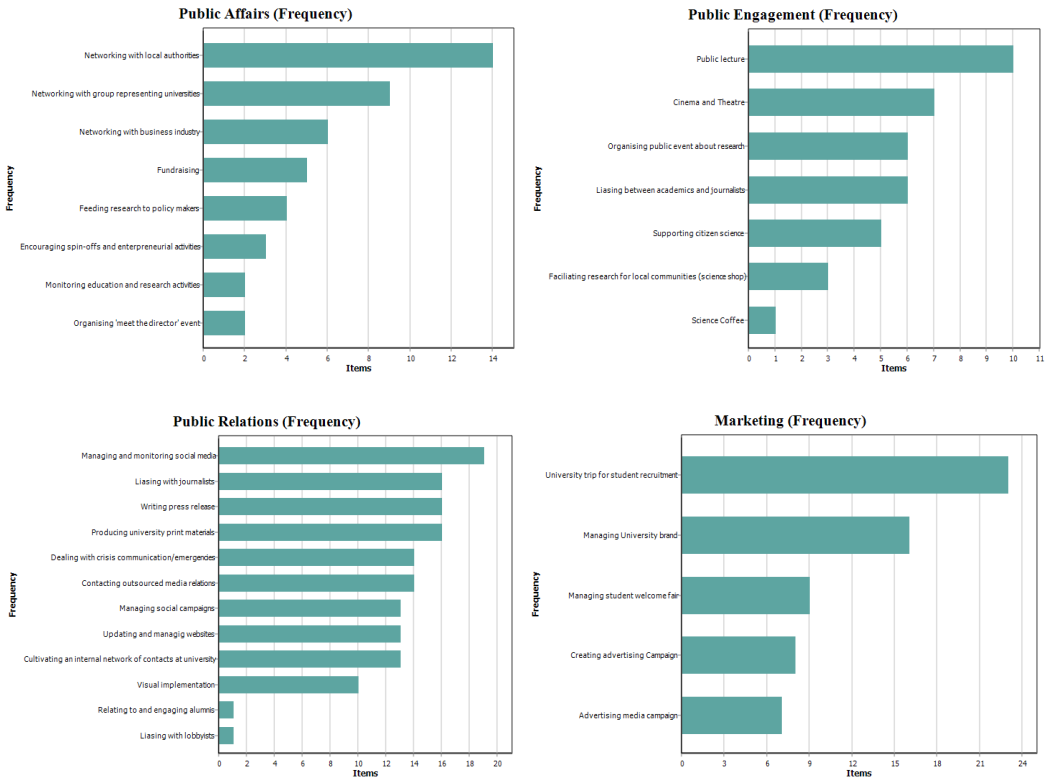

Figure 1. Science Communication Activities by Communication Functions

Findings show that, the most frequently reported science communication activities carried out by the communication departments are classified under the category of public relations (Figure 1). It is notable that all the interviewed universities primarily engage in public relations activities. Marketing activities rank second in terms of frequency, encompassing activities such as student recruitment, university brand management, and organization of orientation events for new students, which are commonly reported.

In recent years, the proliferation of foundation universities in Türkiye, particularly in Istanbul, has intensified competition among institutions for both financial resources and attracting students. This has led to an increased emphasis on science communication activities rooted in public relations

(PR) and marketing (M), guided by corporate strategies, within the foundation university sector. As a result, central communication units of foundation universities have exhibited more substantial development in terms of budget allocation, human resources, institutional autonomy, organizational capacity, and diversity of activities compared to their public university counterparts.

The most common activity performed by the communication units of both public and foundation universities is the preparation of press releases. The preparation of press releases is guided by two main criteria: the scientific research should have popular content and should benefit society. These seemingly contradictory reasons highlight that current and popular topics of interest to society are prioritized in the selection of research for press releases.

"If we are confident that the topic will remain relevant and generate interest for 2-3 days, we refrain from making additional social media posts for at least one day. If the rector explicitly indicates that the topic will remain relevant, we continue to share the same new." (Public University)

Indeed, besides selecting popular scientific topics that can generate public interest, universities also consider criteria such as the academic impact of the shared research and the recognition of award-winning or supported projects. This indicates that universities prioritize topics that can increase their visibility by capturing the attention of stakeholders beyond the scientific community, and that can enhance their institutional reputation by sharing successful projects.

"*When our professors receive awards or national/international funding like TÜBİTAK or Jean Monet we contact with them for conducting interviews or creating news articles… We contact directly with them, and we produce news.*" (Public University)

By actively promoting these accomplishments, communication units can increase the visibility and reputation of the university. This strategic approach contributes to build a positive image for the university and highlighting its excellence in research and academia.

In public affairs activities, interactions are commonly observed with local governments and other organizations representing universities, as depicted in Figure 1. However, it is widely acknowledged that universities do not engage in lobbying activities, and they have relatively limited attempts to influence public policy, political and bureaucratic processes based on scientific evidence. When combined with the lack of motivation to actively shape public policies, it can be inferred that universities consciously refrain from endeavors aimed at exerting influence on political decision-making processes. Contrary Universities' position in Türkiye, in Europe, universities engage in lobbying activities to influence EU policy makers (Paulissen et. al, 2022), thus, universities are not only the main actors producing knowledge but also play an active role in political decision-making processes in the democratic process.

It could be argued that universities have a democratic right to actively participate in shaping the views of citizens and political leaders and utilize their influence for the public good. For instance, research conducted in various countries has shown that universities have played an active role in informing public opinion and policymaking through research, public engagement, and policy advocacy. There are also growing calls for academics (Rowe & Brass, 2008; (Gardner et. al, 2021) and

universities (McCowan et. al, 2021) to step beyond their traditional roles and influence policy more actively through advocacy and activism. This argument holds relevance in the context of Türkiye, where the role of universities in guiding public opinion and policymaking may be influenced by political, and social factors that require further investigation and understanding.

From a science communication perspective, it is crucial for universities to actively engage in political decision-making processes to effectively fulfill their multifaceted societal functions, which encompass teaching, research, and service provision to promote development. However, in Türkiye, the issue of university autonomy has historically faced challenges and has not been favorably viewed by political circles. The autonomy and powers of universities in Türkiye have remained considerably more limited compared to other countries (Çelik, 2014). After the 1980 coup d'état, with the 1982 Constitution, and since then, all governments have intervened in universities. As a result, universities have been unable to actively participate in political processes as institutions that are sometimes directed by politicians rather than influencing politics.

On the other hand, existing literature shows that universities can contribute to the productivity growth of firms and local systems (Acs et. al, 1994; Varga, 2001). In Türkiye, activities related to this area are predominantly carried out by public universities located in Anatolia, as indicated in Table 3. These public universities are found to be more actively involved in local development activities and exhibit a sense of responsibility towards local development. They also collaborate more extensively with local governments and companies engaged in local production. In contrast, foundation universities support policymakers intermittently through research in comparison to public universities. Notably, during the pandemic period, foundation universities have been more proactive in providing research outputs to bureaucratic institutions.

While there were some notable differences between public and foundation universities in terms of public engagement (PE) and public affairs (PA) activities, public universities, similar to foundation universities, predominantly pursued institutional strategic goals such as enhancing their public reputation, legitimizing their publicly funded budgets by publicizing their research outputs, rising in national and international university rankings, attracting high-achieving students, and promoting faculty research activities.

Table 3. Public Affair Activities by Foundation and Public Universities

PA	Government	Private
Networking with local authorities	8	6
Networking with the business industry	5	2
Networking with groups representing universities	3	6
Fundraising	3	2
Encouraging spin-offs and entrepreneurial activities	2	1
Monitoring education and research activities		2
Feeding research to policymakers		4

In general, PE and PA activities, which prioritize establishing connections with stakeholders such as civil society, alumni, other universities, local governments, and especially political decision-makers

in relation to scientific processes, are not accorded as much prominence as marketing and public relations activities, or these areas are not explicitly included in the job descriptions of universities' communication units.

When evaluating PE activities, notable examples include 'public lectures', 'cultural events', 'social events organized to share research', and 'supporting citizen science', although these activities may be fewer in number compared to other activities. Given the increasing importance of PE in science communication today, this study specifically analyzed the PE efforts of university communication units. Table 3 presents the reasons why PE activities are not included in science communication efforts by universities. The most significant reason identified is that there is no expectation from the communication units of universities, as PE activities are not included in their job descriptions. These units are typically expected to focus more on press releases or communication practices and provide technical support to other units and faculties. This suggests that the activities of central communication units in universities are generally limited to one-way communication. The majority of central communication units are not involved as key actors or decision-makers in the organization of PE activities.

Table 4. The Reason not to Focus on Public Engagement Activities

Category	Code	Case	Cases %
The reason not to focus on public engagement activities	Communication department is only in charge of the announcement	8	40%
	The approaches of the acdemics and the Communication offices are different	3	15%
	Academics don't care about public engagement	2	10%
	Lack of communication faculty	2	10%
	Turkish society is not interested in science	2	10%
	Science is too complex for public engagement	2	10%

The communication units of some universities, on the other hand, argue that society has no such expectations from universities and emphasize that the main purpose of the university is academic impact.

"*As a communication office, we are not inclined or motivated to intervene in the relationship between society and science. Our focus is on other priorities, and we have limited time for such interventions. However, if by "science communication" you mean making research accessible to the general public, we may consider it if we believe it can contribute to the university's brand. With the extensive volume of high-level and detailed research conducted at our institution, (…) it is not feasible to publicize all our research. Our main evaluation criteria revolve around citations, impacts, and academic conferences, which prioritize academic impact rather than communication with society*." (Foundation University)

Additionally, during the interviews, some challenges related to academics were also identified, albeit in a smaller number. These challenges included differences between the priorities of academics and the communication office, as well as academics being less open to engaging with society.

Distribution of duties on communication activities within university

The coordination between departments within universities can play a crucial role in shaping science communication practices and clarifying the role of science communication within the institutional structure.

Table 5. Coordinated Units

Category	Code	Cases	Cases %
Coordination with other departments	Rectorate	8	40%
	IT Department	6	30%
	All faculties	5	25%
	R&D Unit	5	25%
	Department of health culture and arts	5	25%
	General secretary	4	20%
	Students Clubs	4	20%
	Alumni Office	3	15%
	Career Center	3	15%

Based on the results of the study, it can be concluded that the central communication units collaborate closely with senior management (the Rectorate and General Secretariat) to carry out their science communication activities. They also work in conjunction with the IT department, particularly in situations that require technical support such as website updates. Additionally, they frequently request information from faculties and R&D departments to stay informed of scientific research and activities taking place at the university, which they then publicize. Furthermore, the central communication units maintain frequent contact with student clubs, cultural and arts departments, and sporting organizations to promote and announce cultural, artistic, and athletic events and activities happening on campus.

Table 6. Other Units That are Responsible for Science Communication Activities

Category	Code	Cases	Cases %
	Head of health culture and sports	8	40%
	Rector	8	40%
	Faculties	8	40%
	Careers center	6	30%
Science Communication is other units' responsibility	R&D Department	6	30%
	Alumni association	5	25%
	Technology office	3	15%
	Student affairs	2	10%
	IT department	2	10%
	Deanship	2	10%
	Education Center	2	10%

Some science communication activities within universities are carried out by other departments independent of the central communication unit. For instance, PE initiatives such as science festivals, science competitions, citizen science events, and exhibitions may be managed by Health, Culture, and Sport Departments. Interactions and lobbying efforts with decision-makers, local authorities, journalists, industry, and other universities are often conducted through the Rectorates. On the other hand, comprehensive and high-quality communication activities that involve direct interaction and cooperation with society and other stakeholders may fall under the purview of senior management and other units. In some universities, the distribution of communication activities may be flexible, allowing faculties, R&D centers, and technology offices (meso level structures) to independently conduct studies and activities to promote the research conducted within their own structures to the society, apart from the central communication units. It has been also observed that the IT department can be more active in the management of the university's corporate website than the communication departments. Additionally, alumni association communicate with alumni and organize events.

Consequently, R&D centers, technology offices, faculties and institutes, student' clubs, head of health, culture and sport, and rectorate can communicate science. Additionally, scientists and researchers also communicate science by using social media or their own possibilities (Bedir & Öztunç, 2023). The main responsibilities of many central communication units, particularly in public universities, may be limited to routine and one-way communication activities.

The Motivations to Communicate Science

The research also sheds light on the purposes and motivations behind universities' science communication activities. Table 7 presents the most frequently recurring codes and sample remarks on this topic.

Table 7. The Main Motivation of Science Communication

Code	Cases	Cases %	Quotes
To promote and market the university	14	70%	If you mean science communication, it can be if we think that the research can be understood by society and contribute to the brand of the University (Foundation University). In the context of science communication, universities often engage in promotional activities to showcase their scientific research and generate interest among the public. The process of producing scientific knowledge is transformed into marketing materials by corporate communication teams, which are then shared with the public. The publicity unit of the university then utilizes these materials for physical dissemination. (Foundation University).
Accustoming society to science	7	35%	The goal is to engage the public and disseminate scientific knowledge in an inclusive manner that can be easily understood and appreciated by people from various backgrounds. By promoting open and accessible science communication, universities can foster greater understanding, appreciation, and engagement with scientific research among the public (Public University).

To inform the public about researches	7	35%	It seems that the rector of our university prioritizes research as a key goal and envisions our institution as a research-focused university. Considering this, effective science communication becomes crucial for promoting research projects and motivating new researchers (Public University).
To increase corporate reputation	6	30%	When we communicate research projects or other activities, we emphasize that they were produced, researched, designed, or implemented at our university. This helps to create a strong association between the institution and the outcomes of the research, showcasing the university's expertise and image (Public). If what you mean by science communication is that research can be understood by the public and can contribute to our university brand (Foundation University).
To encourage scientists	4	20%	We need to know how much our academics value these activities. We have very well-known academics. We need to draw them into this circle. We hold a ceremony to encourage every successful work and share it with other academics. So, the main motivation is to encourage academics (Public University).
To attract qualified students	3	15%	Now this is not a phrase I like to say, but we want to change the student profile. We want higher quality students. I mean, who doesn't want a higher-profile student? (Foundation University).
To increase university ranking	3	15%	University motivation for science communication YÖK indices and corporate image (Public University).

It has been observed that the primary motivation behind science communication activities in universities is often driven by the promotion and marketing of the university brand. Table 7 presents evidence that science communication is commonly perceived as a marketing or PR tool. This suggests that the true meaning and significance of science communication may not be fully comprehended, and universities may not fully embrace their responsibility in fostering the interaction between science and society through their communication units. Furthermore, the emphasis placed by communication units on science communication for managing the university brand and enhancing its reputation also indicates a lack of institutionalization of science communication within universities.

Universities are also motivated by 'public interest'-oriented goals and motivations when engaging in science communication, including initiatives aimed at bridging the gap between science and society, informing the public about research conducted at the university, fostering collaboration between academia and society, and encouraging young scientists. In addition, universities may have goals based on their 'institutional strategy', such as enhancing their institutional reputation, attracting highly qualified students, promoting, and marketing the university, and achieving recognition in national and international rankings. Nevertheless, it should be noted that the distinction between public good-based motivations and institutional strategic goals is not always clear-cut, and often these two aspects can be intertwined. For instance, in many cases, public universities may prioritize motivations that are aligned with the public good, whereas foundation universities may place greater emphasis on institutional strategies, as evident in Table 8.

Table 8. The Motivations to Communicate Science

The motivations to communicate science	Government	Private
Accustoming society to science	5	2
To encourage scientists	4	
To inform the public about the research	3	4
To promote and market the university	3	3
To increase corporate reputation	1	5
To increase the university's ranking	1	1
Science communication is a part of the job	1	1
To open the path for stakeholder relations	1	
If you are research university	1	
The integration of the student into the scientifical process	1	
To increase local value	1	
Being visible in mainstream and social media		2
Science communication can negatively affect science	1	
To explain who we are to the public		1
To explain new technologies		1

Public universities are often driven by a strong commitment to familiarize society with science and foster collaboration between academia and society. The communication units of these universities aim to bring the academic community closer to society and emphasize the importance of regional projects that engage the local community. These universities believe that society should not be alienated from science, and they emphasize the importance of regional projects that involve the people of the city.

The Organizational Problems of Central Communication Units

Semi-structured in-depth interviews addressed the problems of central communication units of universities in Türkiye (Table 9).

Table 9. The Organizational Problems of Central Communication Units

Code	Cases	Cases %	Quotes
Human resource is insufficent	11	55%	We encounter challenges in coordinating our science communication activities due to the large number of faculties, institutes, and clubs within our university, totaling to approximately 17 faculties, numerous institutes, and over 180 clubs. With nearly 50 events taking place each day, it becomes crucial to manage the content of these events, including guest speakers, topics, relevance, and potential announcements, as well as coordinating the participation of distinguished guests such as the university rector, professors, ministers etc. However, with limited staffing resources of 5-6 people, it becomes challenging to effectively manage and produce rich content for all these events (Public University).

Dont have their own budget	9	45%	The administrative and financial affairs of our communication unit are overseen by the coordinator's office, which directly reports to the rectorate. As a result, our unit does not have its own budget and requests for purchases or services are submitted directly to the rectorate for approval. However, the lack of an independent budget for our unit limits the level of interest and investment in science communication activities (Public University). Often, commercial considerations take precedence over societal benefits in decision-making, leading to challenges in prioritizing public good-oriented goals (Public University).
Budget and employees are not adequate.	7	35%	Due to bureaucratic procedures and internal assignments, the process of hiring new personnel for our communication unit can be slower, as it requires appointments and assignments for civil servants. In contrast, foundation universities may have more flexibility in making purchases and hiring personnel, which can result in differences in the efficiency of operations between public and foundation universities (Public University).
The rector's approach is the determinant factor	5	25%	The reliance on the individual decision-making authority of the manager can lead to difficulties in an organizational framework. It is imperative to establish a structured framework that determines expenditure items and outlines a fixed staff structure for the press unit. The top management has a significant influence on the activities of the communication unit and top management constantly intervenes in them (Foundation University).
Employees are unqualified	4	20%	In recent years, there has been a gradual shift in the perception of the power of communication within the university management. This change is partially attributed to our efforts in advocating for communication, as well as their own realization or relatively young age. As a result, the university has made efforts to hire experts and academic staff with communication backgrounds. On the other hand, it is worth noting that one of the hires has transitioned from another unit and the remaining staff in the communication unit primarily comprise of computer operators and personnel recruited from other departments, who has not a background in communication (Public University)
Interference can block our job	3	15%	As an example, I noticed that sharing the achievements of students, rather than solely focusing on the accomplishments of professors, tends to generate more public interaction. I acknowledged this and expressed my intention to implement it. However, there has been a shift in the perception of social media as merely another promotional tool, or self-promotion, rather than a platform for professional communication. As a result, the level of autonomy and trust in our professionalism has decreased, and they have taken a more hands-on approach, dictating what and when to share. For instance, we now measure the duration of viewership, and regardless of whether we produce videos that are 10 minutes or 1 minute long, they are watched for an average of 2 minutes. Despite suggesting to not create videos longer than 2 minutes, our manager insisted on shooting a 10-minute video. As an employee, I felt unable to voice my concerns at that time, as he is our manager (Public University).
Don't have their own employee	3	15%	The departure of our last graphic designer from the corporate communication team occurred two years ago. In accordance with the regulations of the Council of Higher Education (YÖK) in universities, vacancies are typically opened by the Council of Higher Education. Without a vacancy being granted by the Council of Higher Education, new appointments cannot be made. As academics, we are aware that our time here may be limited, as we may choose to leave in 2-3 years or even after just 1 month due to various factors. Our goal is to establish a robust institutional structure, train capable personnel, and ensure their continuity in the team. Although we have managed to recruit a photographer and an expert in live broadcasting from TRT (Turkish Radio and Television Corporation), it is not a permanent solution to hire professional (Public University).

Corporate communication is changing acording the managers	3	15%	The organization and structure of institutional communication varies across different institutions, with some placing it under the deputy general secretaries, vice-rectors, or solely under the rector. However, I believe there should be a standardization in terms of defining the scope of activities, roles, and responsibilities of the communication unit. The constant circulation of staff and administrators, with administrators changing frequently and attempting to change the staff along with them, can hinder the institutionalization process. It becomes a contradiction when the communication unit, which is tasked with promoting institutionalization, struggles with its own institutionalization. It is evident that the unit is facing significant problems that need to be addressed for effective communication and institutional development (Public University).

The findings from the interviews indicate that public universities are facing significant challenges in terms of personnel and human resources, as well as institutionalization of their communication units. One of the key problems identified by unit officials is the lack of a fixed budget allocated to communication units, forcing them to rely on other units with budgets for organizing events and procuring even basic equipment and consumables. This lack of financial autonomy can hinder the effectiveness and efficiency of the communication unit's operations. In particular, the absence of dedicated staff and budget in communication offices of public universities poses a major obstacle to their institutionalization. In such cases, staffing is often drawn from other units, and the lack of resources impedes effective science communication based on expertise.

The lack of institutionalization of communication units in public universities can be attributed to several factors, according to communication professionals interviewed in this context. One key factor is the absence of clear definitions and delineations of communication units and their areas of responsibility within the Higher Education Council (YÖK) law and related regulations and legislation. Without official recognition and defined roles, it becomes challenging to employ qualified communication personnel and adequately address the needs of these units. The absence of official recognition also contributes to the ambiguity surrounding the mandate of communication units. As a result, these units often find themselves responsible for a wide range of tasks, including protocol work, official correspondence, call center operations, photography, and camera work. This lack of clarity hampers the ability of communication units to establish themselves as dedicated and specialized entities within public universities.

The problems that have mentioned by interviews, highlight the challenges that central communication units in public universities often face in becoming autonomous institutional structures that operate independently and strategically. The authority and areas of responsibility of communication units may be determined by the personal approach, vision, and priorities of the current rector and administration, rather than being guided by a clear communication strategy. In the context described, it has been observed that the allocation of budget and personnel to the central communication unit in public universities is contingent upon the priorities of the current university management. When there is a management structure that recognizes the significance of communication activities, the communication unit may receive increased resources. However, these resources may be withdrawn when there is a change in management, resulting in instability and inconsistency in the university's communication efforts.

However, considering the other findings of the study and considering that foundation universities prioritize their strategies based on institutional goals and the success of the university, the budget and staffing challenges faced by public universities become apparent as a significant obstacle to the establishment of effective science communication practices. Public universities, despite their willingness and entrepreneurial approach towards creating social and regional benefits, often encounter difficulties in terms of budget allocation and staffing for their communication units. Addressing these budget and staffing issues is crucial in overcoming the obstacles to the institutionalization of science communication in public universities and enhancing their ability to engage effectively with the wider community and promote the benefits of scientific knowledge and research.

Moreover, despite the efforts of central communication units to work in coordination with various units within the university, ensuring effective information sharing and coordination can be challenging, particularly in newly established universities. The frequent changes in the roles and organization of newly established faculties or the central communication unit itself may further exacerbate these challenges. This can result in difficulties in maintaining a seamless flow of information and coordination among different units, which can impact the effectiveness and efficiency of communication efforts. It is essential to establish robust mechanisms for information sharing, coordination, and communication within the university, including clear lines of communication, standardized procedures, and well-defined roles and responsibilities to overcome these challenges and ensure smooth coordination among various units involved in science communication activities. This would help to enhance the effectiveness and impact of science communication efforts in the university setting.

In some of the foundation universities that were part of the interviews, it was observed that the communication units, which were granted autonomy, emphasized their central position in overseeing and coordinating all communication activities of the university. They are responsible for managing relationships with various stakeholders in alignment with the communication goals and strategies of the university. Consequently, these units are tasked with creating a common language in communication and have responsibilities and authorities that entail liaising with all units within the university and managing these relationships in line with the communication objectives. This centralized approach enables the communication units to play a pivotal role in facilitating effective communication throughout the university and ensuring consistency in messaging and branding, thereby contributing to the overall institutional communication efforts.

Another challenge highlighted is the composition of communication staff, who are mostly seconded from different departments of the university and lack professional training or background in communication. Institutionalization of science communication can also be evaluated through various factors such as the expertise and training of the staff working in the communication units (Watermeyer & Lewis, 2017), systematic monitoring and evaluation of the impact of PE activities (Neresini & Bucchi, 2011), science communication training for academics (Claessens, 2014), and the availability of science communication research and training programs within universities (Bucchi & Trench, 2014). However, the study reveals that the communication units in foundation universities

encounter difficulties such as understaffing and being assigned non-communication related tasks. Furthermore, despite cooperation between communication units and academics, media training is almost non-existent. These units are primarily responsible for publicizing research and facilitating press interviews but lack the capacity to manage the relationship between academics, society, and the media due to their workload and the differing priorities of the university administration. Another indicator of the lack of institutionalization is the varying names given to central communication units, such as 'Corporate Communication', 'Communication Office', 'Press and Public Relations', and 'Marketing and Promotion', revealing the lack of national standards regarding the structure, duties, and functioning of these units.

Conclusion

In the last four decades, there has been a growing recognition of the importance of universities in communicating scientific knowledge to audiences beyond the traditional scientific community. This recognition has led to the inclusion of communication as a fundamental mission for universities, alongside formal education, and research (Laredo, 2007, p. 446). As the role of universities in bridging the gap between science and society continues to gain significance globally, this study highlights a notable lack of well-defined standards for defining, managing, and organizing communication functions within Turkish universities. In this sense, one of the most crucial findings of the study is that universities communication units are primarily responsible for publicizing research and facilitating press interviews but lack the capacity to manage the relationship between academics, society, and the media due to their workload and the differing priorities of the university administration. R&D centers, technology offices, faculties and institutes, student' clubs, head of health, culture and sport, and rectorate are the main department that communicate science or work in coordination with communication units. Furthermore, the study also identifies insufficient institutionalization of central communication units in these universities.

The main difference between foundation and public universities is that foundation prioritize their strategies based on institutional goals and the success of the university, the budget and staffing challenges faced by public universities become apparent as a significant obstacle to the establishment of effective science communication practices. Public universities, despite their willingness and entrepreneurial approach toward creating social and regional benefits, often encounter difficulties in terms of budget allocation and staffing for their communication units.

To address this issue, an effective strategy would be to give greater emphasis to the communication functions of universities within the existing laws and regulations governing higher education. This can be achieved by explicitly recognizing the role of universities in promoting PE and delivering societal and scientific benefits. Policy documents should also acknowledge the duties, responsibilities, structure, organizational autonomy, and financial autonomy of central communication units.

Additionally, it is crucial to establish new training programs in science and society studies within universities. These programs would equip communication staff with the necessary knowledge and skills to effectively engage with diverse audiences and facilitate meaningful interactions

between science and society. Furthermore, providing science communication training to existing communication staff would enhance their ability to effectively communicate complex scientific concepts to non-expert audiences.

By implementing these initiatives, universities can enhance their communication efforts and better fulfill their mission of disseminating scientific knowledge beyond the scientific community. This would result in increased public understanding and engagement with scientific advancements, fostering a more informed and scientifically literate society.

This study contributes to the field in terms of revealing the current role, motivations, and problems of universities in science communication by investigating Universities' communication units. Drawing on the outcomes of the present investigation as a crucial actor, it is thought that promoting both theoretical and practical research activities to advance the current role of universities as key players in science communication, fostering citizen science practices, and augmenting the involvement of communication units in this domain would enhance public engagement with science and reinforce institutionalization of science communication. Such initiatives could provide a solid foundation for an effective exchange of knowledge and dialogue between the scientific community and the wider public, leading to a more inclusive and informed society.

The present research focuses solely on the role of central communication units within universities, omitting the analysis of scientific organizations external to universities or meso-level structures such as research institutes or faculties. Consequently, future studies investigating this dimension of science communication will yield substantial contributions to the literature on institutional science communication in the Turkish context.

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