ISSN 1339-3189 4/2021

Mladá veda

Young Science

www.mladaveda.sk

Mladá veda
Young Science

MEDZINÁRODNÝ VEDECKÝ ČASOPIS MLADÁ VEDA / YOUNG SCIENCE

Číslo 4, ročník 9., vydané v decembri 2021
ISSN 1339-3189
Kontakt: info@mladaveda.sk, tel.: +421 908 546 716, www.mladaveda.sk
Fotografia na obálke: Brhlík obyčajný / Sitta europaea. © Branislav A. Švorc, foto.branisko.at

VYDAVATEĽ
Vydavateľstvo UNIVERSUM, spol. s r. o.
www.universum-eu.sk
Javorinská 26, 080 01 Prešov
Slovenská republika

Mladá veda
Young Science
ISSN 1339-3189

Vol. 9 (4), pp. 32-37

DISINFORMATION RECOGNITION IN SLOVAK MANAGEMENT

ROZPOZNÁVANIE DEZINFORMÁCIÍ V SLOVENSKOM MANAŽMENTE

Tomáš Bačinský[1], Gabriela Hrabčáková[2]

Tomáš Bačinský pôsobí ako odborný asistent na Fakulte manažmentu, ekonomiky a obchodu Prešovskej univerzity v Prešove. V rámci výskumu sa venuje najmä problematike determinantov kvality vzdelávacieho procesu a ekonomickej aktivite turizmu. Na fakulte vyučuje Matematiku, Štatistiku a predmety s informatickým zameraním. Gabriela Hrabčáková študuje magisterský stupeň štúdia na Fakulte manažmentu, ekonomiky a obchodu Prešovskej univerzity v Prešove a vo svojich záverečných prácach sa venuje vnímaniu hoaxov a dezinformácií riadiacimi pracovníkmi z praxe aj ich budúcimi kolegami z radov študentov.

Tomáš Bačinský works as a lecturer and researcher at the Faculty of Management and Business, University of Presov. His research is mainly focused on quality of educational process and economic activity of tourism. At faculty the author teaches Mathematics, Statistics, and Informatics. Gabriela Hrabčáková studies master's degree at the Faculty of Management and Business, University of Presov and in her final theses she focuses mainly on how managers and students of management perceive hoaxes and disinformation.

Abstract

The aim of this study is to demonstrate differences in disinformation and hoax perception between managers and students of management, who shared their subjective experience in a questionnaire. Also, we suggest predictors for managers' ability to recognize hoaxes. Their age, level of management, experience with negative consequences of hoaxes, level of trust in traditional and new media and the ability to recognize hoax are subject of this research. Similar questions were answered by students of management. As a result, a discrepancy between managers' and students' ability to recognize hoaxes was identified. According to created multiple linear regression models, managers' ability to identify hoaxes depends on age and level of management. We also found out, that there are no predictors of trust in traditional or new media.

Key words: hoaxes and disinformation, managers and students, differences in perception, multiple linear regression model

[1] Address: Mgr. Tomáš Bačinský, PhD., Department of Finance, Accounting and Mathematical Methods, Faculty of Management and Business, Prešov University, Konštantínova 16, 080 01 Prešov, Slovakia
E-mail: tomas.bacinsky@gmail.com
[2] Address: Bc. Gabriela Hrabčáková, Faculty of Management and Business, Prešov University, Konštantínova 16, 080 01 Prešov
E-mail: gabriela.hrabcakova@smail.unipo.sk

Mladá veda
Young Science
ISSN 1339-3189

Vol. 9 (4), pp. 32-37

Abstrakt

Cieľom tejto štúdie je poukázať na rozdiely vo vnímaní dezinformácií a hoaxov medzi manažérmi a študentmi manažérskych študijných programov, ktorých subjektívne skúsenosti boli zisťované pomocou dotazníkového prieskumu. Článok sa tiež venuje identifikovaniu prediktorov schopnosti rozpoznávať hoaxy u ľudí na riadiacej úrovni. Predmetom skúmania je ich vek, úroveň riadenia, skúsenosti s negatívnymi dôsledkami výskytu hoaxov, úroveň dôvery v informácie v tradičných a nových médiách a schopnosť rozpoznať hoax. Vo výsledku sme identifikovali významné rozdiely medzi skupinou študentov a manažérov v miere schopnosti rozpoznať hoaxy. Vytvorili sme viacero viacnásobných lineárnych regresných modelov, podľa ktorých táto schopnosť u manažérov významne závisí od veku a úrovne manažmentu. Podľa ostatných realizovaných analýz neboli zistené žiadne prediktory vplývajúce na mieru dôvery v správy v tradičných a nových médiách.

Kľúčové slová: hoaxy a dezinformácie, manažéri a študenti, rozdiely vo vnímaní, viacnásobný lineárny regresný model

Introduction

We live in times of almost unlimited access to information on the internet, be it right or wrong. The importance of this recognition differs in a way of its usage. The negative consequence of using disinformation in daily life is much less hurtful than in business decision-making process on any level of management. Managing with false information, spreading misinformation inside organization or to business partners can harm organization financially or its reputation. Also, managers unable to recognize disinformation and hoaxes are particularly prone to open and forward dangerous emails or messages on social media with lack of critical thinking, which is further harmful towards organization. It is essential to find differences between the groups of managers and students of management – those, who are going to be leading and managing people and information in organizations. Potential discrepancies could serve as a manual for educational institutions, containing aspects on which to focus to increase information and media literacy. The main goal of this paper is to identify differences in how managers and students of management perceive disinformation and hoaxes, to find out the level of trust in media and to specify predictors of successful hoax recognition.

Theoretical background

Information literacy and resulting competence mean the ability to recognize the need for information, acquire and evaluate information, organize and maintain information, and interpret and communicate information (Cohen, Jan 1995). These abilities are vital in this era of information overload, containing information, which is at disposal on daily basis (on internet) and information flowing to organization. Following types may be considered particularly dangerous for organization and its management. *Fake news* is completely or partially fictional information about certain individuals, public events and events in general, which is presented in the media as real authoritative journalistic materials (Dorofeeva 2019). *Hoax* is a deliberate falsehood intentionally fabricated to appear as the truth (Prasetijo et al. 2017). *Misinformation* is inaccurate information, open to multiple comprehensions and uses

(prefix indicating mistake or something wrong) and *disinformation* is information deliberately deceptive, intending to deceive (Santos-D'amorim and Miranda 2021).

Especially times of pandemic crises contributed heavily to dissemination of many fake news and hoaxes about the coronavirus, mainly using social networks (Salaverria et al. 2020). Borges-Tiago et al. (2020) found out studying brand management on a sample of over 26K respondents, that younger and tech savvy (well informed about the modern technology) users are much more likely to recognize fake news.

Teluma et al. (2020) specify three aspects and indicators of anti-hoax competency: cognitive aspects (reading entire content of news, having knowledge of hoax online checker), affective aspects (not spreading information, informing sender, that message is false) and psychomotorics aspects (searching for another news source for comparison, using hoax online checker).

Research sample and descriptive statistics

Research sample consists of 104 randomly selected students of management (*stud*) and 57 managers (*man*). A questionnaire was formed, which included demographics and several answered questions about topic of trust in media and hoax recognition. These are described below as statistical variables with potential values:

- *Sex*, *Age* – basic demographic variables with values {male, female} and numerical values (*Age*),
- *Lvl*, *Degree* – managers' level of management {I. low-, II. middle-, and III. top-level} and students' degree of ongoing study {I. bachelor and II. master},
- *Exp* – previous experience with hoaxes causing problems in workplace, e.g. loss of trust, communication mistakes {yes, no, don't know},
- *Recog* – degree of ability to recognize hoax {0-100} calculated as an average of subjective perception (6-degree scale of self-evaluation) and percentage of correctly identified hoaxes and non-hoaxes from the group of four,
- *Trust_TV*, *Trust_Rad*, *Trust_New*, *Trust_Int* – level of trust in traditional media (TV, radio, newspaper) and new media (internet) on a scale from lowest 1 to highest 5.

Frequency table for variables *Sex*, *Lvl*, *Degree* and *Exp* can be seen in Table 1.

	Sex			***Degree / Lvl***			***Exp***
	stud	***man***		***stud***	***man***		***man***
male	43	24	***I.***	63	27	***yes***	28
female	61	33	***II.***	41	22	***no***	20
			III.	-	8	***don't know***	9

Table 1 – Frequency table for *Sex*, *Lvl*, *Degree* and *Exp*
Source: authors' own calculations

We can observe that there is a good representation of all categories among respondents. Descriptive statistics (average value *Mean*, standard deviation *S.D.*) and frequency tables for variables *Age*, *Recog* and *Trust* are shown in Table 2.

	Age			*Recog*			*Trust_TV*		*Trust_Rad*		*Trust_New*		*Trust_Int*	
	stud	***man***		***stud***	***man***		***stud***	***man***	***stud***	***man***	***stud***	***man***	***stud***	***man***
Mean	25.12	30.88		60.39	69.47		2.99	2.72	3.05	2.91	2.65	2.7	2.63	2.44
S.D.	5.79	9.81		34.02	30.73		1.31	1.41	1.15	1.18	1.12	1.16	1.37	1.24
18-25	81	25	***≤ 20***	26	7	***1***	20	17	12	8	18	11	29	19
26-33	14	12	***≤ 40***	12	8	***2***	15	8	20	14	28	13	22	8
34-41	5	11	***≤ 60***	10	7	***3***	29	13	33	14	37	18	27	19
42-49	3	5	***≤ 80***	34	17	***4***	26	12	29	17	14	12	11	8
50-57	1	4	***≤ 100***	22	18	***5***	14	7	10	4	7	3	15	3

Table 2 – Descriptive statistics and frequency tables for *Age*, *Recog* and *Trust*
Source: authors' own calculations

Levels of trust in media do not indicate extreme differences between the two groups but means of degree of recognition of hoax look quite different. This is the result of data distribution (relatively evenly distributed student data and negatively left-skewed managers recognitions). Also, variance of *Age* (*S.D.*) is naturally higher among managers. All the above-mentioned variables are statistically analyzed.

Statistical analysis

Several tests are calculated to answer following questions about students and managers using Gretl software.

- *Q1*: What does trust in media depend on?
- *Q2*: Are there significant differences between groups in media trust perception?
- *Q3*: Are there statistically significant differences between groups in degree of ability to recognize hoax?
- *Q4*: What are the predictors for successful hoax recognition among managers?

To answer *Q1* for each media we quantify differences between categories of *Sex* and *Exp* (Mann-Whitney U test), *Age* (Spearman correlation) and *Degree* and *Lvl* (Kendall rank correlation). *Q2* is answered using Wilcoxon rank sum test for group of students and group of managers. The resulting *p*-values for both questions can be seen in Table 3.

	Sex		*Age*		*Degree / Lvl*		*Exp*	*Trust*
	stud	***man***	***stud***	***man***	***stud***	***man***	***man***	***stud vs. man***
Trust_TV	0.872	0.196	0.115	0.762	0.362	0.913	0.171	0,247
Trust_Rad	0.133	0.316	**0.017**	0.351	0.341	0.994	0.497	0,521
Trust_New	0.644	0.692	0.336	0.956	0.327	0.444	0.122	0,741
Trust_Int	0.600	0.936	0.268	0.778	0.286	0.444	0.198	0,512

Table 3 – Dependance of trust in media on variables *Sex*, *Age*, *Degree*, *Lvl* and *Exp*
Source: authors' data according to calculations in Gretl

Only students' level of trust in radio news (*Trust_Rad*) is statistically dependent on *Age* (see highlighted number in Table 3). No other significant dependence ($p < 0.05$) was identified among other pairs of variables and categories, resp. there is no significant difference between group of students and group of managers in perception of trust in media.

Question *Q3* is answered using Student's t-test with following results

$$n_1 = 104,\ n_2 = 57,\ t(159) = -1.677,\ p\text{-value} = 0.048,$$

where *p*-value is significant. This means that managers have significantly higher degree of ability to recognize hoax (and to prevent its spreading) than students of management.
Q4 is answered using multiple linear regression model for dependent variable *Recog* and independent variables *Sex*, *Age*, *Lvl* (in model divided into indicator variables *Lvl_low* and *Lvl_mid*) and *Exp* (ignoring values "Don't know"). We suggest several models in following form.

$$Recog_i = \beta_0 + \beta_1 Sex_i + \beta_2 Age_i + \beta_3 Lvl\_low_i + \beta_4 Lvl\_mid_i + \beta_5 Exp_i + u_i$$

Regression coefficients (β_0–β_5) for regressors in models *M1*-*M6* together with adjusted coefficient of determination (*Adj.* R^2) can be seen below in Table 4.

	M1	***M2***	***M3***	***M4***	***M5***	***M6***
const	65.24 [a]	67.89 [a]	90.57 [a]	90.92 [a]	40.54 [a]	43.21 [a]
Sex	3.72	·	1.62	·	·	·
Age	0.61 [c]	0.57 [c]	·	·	0.83 [a]	0.62 [b]
Lvl_low	−22.32 [b]	−21.34 [b]	−28.79 [a]	−28.13 [a]	·	·
Lvl_mid	−21.91 [b]	−20.6 [b]	−25.98 [b]	−25.25 [a]	·	·
Exp	−4.15	−4.35	−5.65	−5.69	−3.6	·
Adj. R²	0.168	**0.179**	0.123	0.141	0.119	0.088

[a] *significant at 0.01 level* [b] *significant at 0.05 level* [c] *significant at 0.1 level*

Table 4 – Multiple linear regression models for variable *Recog*
Source: authors' data according to calculations in Gretl

All models confirm that higher level of management predicts higher degree of ability to recognize hoaxes ($\beta_3 < \beta_4 < 0$). Also, older managers are better in identifying hoaxes ($\beta_2 > 0$). Above mentioned regression coefficients β_0–β_5 are significant. Other possible considered models resulted to be insignificant or underfitting.
Best fitting model (*Adj.* R^2 = 0.179) with four predictors having significant regression coefficient and explaining almost 25% of variation in the dependent variable *Recog* is in form

$$Recog_i = 67.889 + 0.567\ Age_i - 21.343\ Lvl\_low_i - 20.601\ Lvl\_mid_i - 4.353\ Exp_i + u_i.$$

When considering only age of managers, there is statistically significant positive linear dependency (according to model *M6*) of the ability to recognize hoaxes on *Age*.

Conclusion

The ability to recognize disinformation and hoaxes surely gains importance not only in management. On the sample of managers and students of management we found out, that there is dependency of trust in media neither on sex, nor on age, degree of education, level of management or past negative experience with hoaxes (except for dependency of students'

trust in radio on their age). Also, there is no difference between students and managers in trust in traditional and new media. However, we identified significant difference in degree of ability to recognize hoaxes between mentioned groups. On six suggested multiple linear regression models we demonstrate that the ability to recognize hoaxes positively depends on age and level of management. Model with best fit also includes past negative experience with hoaxes. It is useful for hoax recognition ability to be subject of further research using adjusted models or more variables for potential use in human resources management.

This article was recommended for publication in a scientific journal Young Science by:
PhDr. Petra Vašaničová, PhD.

References

1. BORGES-TIAGO, T., F. TIAGO, O. SILVIA, J. M. G. MARTINEZ, and D. BOTELLA-CARRUBI, 2020. Online users' attitudes toward fake news: Implications for brand management. In: *Psychology & Marketing*. Volume 37, Issue 9, pp. 1171-1184. ISSN 0742-6046.
2. COHEN, I., and E. JAN, 1995. *Basic Library and Information Competencies: A Unified State-Wide Approach. Final Report.* San Francisco: City College of San Francisco Library.
3. DOROFEEVA, V. V., 2019. Fake News in Modern Media Space. In: *Theoretical and Practical Issues of Journalism*. Volume 8, Issue 4, pp. 774-786. ISSN 2308-6203.
4. PRASETIJO, A. B., R. R. ISNANTO, D. ERIDANI, Y. A. A. SOETRISNO, M. ARFAN, and A. SOFWAN, 2017. Hoax Detection System on Indonesian News Sites Based on Text Classification using SVM and SGD. In: M. FACHTA et al., eds. *2017 4th International Conference on Information Technology, Computer, and Electrical Engineering (ICITACEE).* pp. 45-49. ISBN 1538639483.
5. SALAVERRIA, R., N. BUSLON, F. LOPEZ-PAN, B. LEON, I. GONI-LOPEZ, and MC. ERVITI, 2020. Disinformation in times of pandemic: typology of hoaxes on Covid-19. In: *Profesional de la Información.* Volume 29, Issue 3. ISSN 1386-6710.
6. SANTOS-D'AMORIM, K. and M. K. F. de O. MIRANDA, 2021. Misinformation, Disinformation, and Malinformation: Clarifying the Definitions and Examples in Disinfodemic Times. In: *Encontros Bibli: revista eletrônica de biblioteconomia e ciência da Informação*. Volume 26. eISSN 1518-2924. Dostupné z: https://periodicos.ufsc.br/index.php/eb/article/view/76900/45818
7. TELUMA, A. R. L., S. D. FAJARICA, A. P. HADI, and N. MAULIDA, 2020. Developing Anti Hoax Competency of Teenagers Through Critical Thinking Practice: An Action Research. In: S. KHOLIFAH et al., eds. *B-SPACE 2019. Proceedings of the First Brawijaya International Conference on Social and Political* Sciences. Ghent: European Alliance for Innovation. pp. 359-365. ISBN 1631902466.