Can you Believe This? College Students' Ability to Identify Fake News on Agricultural Topics

Mary Katelynn Horton
Graduate Assistant
806-834-5013
Mary.k.butler@ttu.edu

Dr. Courtney Gibson
Assistant Professor
806-834-8766
courtney.d.gibson@ttu.edu

Dr. Laura Fischer
Assistant Professor
806-834-0630
laura.fischer@ttu.edu

Department of Agricultural Education and Communications
Texas Tech University
Box 42131
Lubbock, TX 79409

Dr. Todd Chambers
Associate Professor & Associate Dean for Undergraduate Affairs
806-834-5712
todd.chambers@ttu.edu

College of Media & Communication
Texas Tech University
Box 43082
Lubbock, TX 79409

Introduction

For the past 20 years, trust in the news media has fallen significantly and the spread of misinformation online has become a major problem in today's media environment (Gallup & Knight Foundation, 2020). From 2006 to 2017, approximately 126,000 rumor cascades were spread on Twitter by 3 million people, and it was discovered that fake news reached more people than real news (Vosoughi et al., 2018), but what does this mean for agriculture? To date, there has been little to no research done on the implications of fake news in the agricultural industry. However, we are starting to see younger generations shifting away from traditional agricultural practices (Funk & Kennedy, 2016), and this, coupled with the growth of fake news on social media (Pierri & Ceri, 2019; Vosoughi et al., 2018), has set the stage for fake news to impact agriculture in a way that the industry may not expect. The lack of existing research on fake news in agriculture makes it all the more important to develop a basis for understanding how fake news can play a part in the public's perception of the agricultural industry. In line with Priority Area 3, understanding identification of fake news could lead to a workforce that is better prepared to address the unique challenges caused by fake news (Stripling & Ricketts, 2016).

Conceptual Framework

Critical thinking was used as a framework for this research. Critical thinking is "the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action" (What is critical thinking?, 2010, p. 70). Critical thinking is the basis for students' evaluations of news articles online (Pilgrim et al., 2019), and it has been previously linked to people's ability to identify fake news (Machete & Turpin, 2020). In fact, critical thinking has been identified as an essential skill for evaluating credibility of online information (Machete & Turpin, 2020). Therefore, this study utilizes critical thinking as a foundation for understanding how respondents classify information as real or fake.

Purpose and Research Question

The purpose of this study was to determine how adept college students are at identifying fake news when asked to select the fake and real news stories out of a series of social media post examples. The following research question guided this study: (RQ1) How well do college students perform at identifying fake news on agricultural topics?

Methods

The overall design of this study was influenced by previous research on fake news identification conducted by Leeder (2019), Pennycook and Rand (2020), and El Rayess et al. (2018). Using this pervious research as a foundation, we evaluated college students' abilities to correctly identify fake news stories. This study was performed through the distribution of an online survey questionnaire. The Qualtrics survey link was emailed to all 50 graduate students in the Department of Agricultural Education and Communications at Texas Tech University, all of whom had some prior experience with agriculture. We had a final sample of 28 for a 56% response rate. Using AdParlor's mockup generator, 14 mock Facebook posts with a picture, headline, and byline were created for this study. Participants were shown all 14 mock social media posts displaying either real or fake agricultural news, and the respondent's task was to identify if the post contained real or fake news. The seven fake news articles were found on

Snopes.com, a popular fact-checking site, which verified the articles were false. The seven real news articles were found on reputable agricultural journalism websites such as agdaily.com and pigprogress.net. The data were analyzed via descriptive statistics including frequencies and percentages using SPSS 26.

Results

Real posts were correctly identified by participants an average of 57.1% of the time, and fake posts were correctly identified an average of 75% of the time. Table 1 describes the students' beliefs that the posts were fake or real.

Table 1

Percentages and frequencies of students who identified posts as fake or real (N=28)

Topic Area	Real *f*	Real %	Fake *f*	Fake %
Real Posts				
CRISPR is used to alter corn's kernel sizes	25	89.3	3	10.7
Feeding cattle seaweed may reduce emissions	21	75.0	7	25.0
Pigs can play video games	19	67.9	9	32.1
Genetically engineered bull calf	17	60.7	11	39.3
Steak-like biosynthetic product created in lab	16	57.1	12	42.9
Pigs are the latest GMO animal approved by FDA	9	32.1	19	67.9
Cash-strapped farmers feed candy to cows	5	17.9	23	82.1
Fake Posts				
First genetically modified strain of marijuana	19	67.9	9	32.1
Turkey farm contaminated with Ebola	11	39.3	17	60.7
The real reason wheat is toxic (it's not the gluten)	9	32.1	19	67.9
Frosted Flakes are healthier than avocados	5	17.9	23	82.1
Chicken is contaminated with arsenic	2	7.1	26	92.9
Autism linked to pesticide use	2	7.1	26	92.9
First confirmed death caused by GMOs	1	3.6	27	96.4

Conclusions and Recommendations

The data showed that there is some confusion among participants on what is and is not fake agricultural news. In fact, none of the 14 posts used in this study were 100% correctly identified by the participants. These findings are important because this lack of agreement on what is or is not fake agricultural news may be detrimental to the public's opinion of agriculture as a whole. If participants with an agricultural background are unable to identify fake news, how can we expect people without experience in agriculture to do so? Because critical thinking plays such an important role in identifying fake news (Pilgrim et al., 2019), it may be worth considering how this skill can be better emphasized and taught in the classroom. Today's media environment makes it hard for students to know what is real and what is fake, which makes it even more important to teach students how to critically evaluate online information (Leeder, 2019; El Rayess et al., 2018). This research was performed as part of a pilot study, so the results are not yet generalizable to a larger population, although we are curious to see the results of this research on a larger-scale. Future research may find it beneficial to compare the respondents' involvement with agriculture to their proficiency in identification of agricultural fake news. Recommendations for educators include placing more emphasis on evaluating news and media in the classroom, and teaching students some best practices for fact checking information.

References

El Rayess, M., Chebl, C., Mhanna, J., & Hage, R. (2018). Fake news judgement: The case of undergraduate students at Notre Dame University-Louaize, Lebanon. *Reference Services Review*, *46*(1), 146-149. doi: 10.1108/RSR-07-2017-0027

Funk, C., & Kennedy, B. (2016, December 1). *The new food fights: U.S. public divides over food science.* https://www.pewresearch.org/internet/wp-content/uploads/sites/9/2016/11/PS_2016.12.01_Food-Science_FINAL.pdf

Gallup & Knight Foundation. (2020). *American views 2020: Trust, media and democracy*. https://knightfoundation.org/wp-content/uploads/2020/08/American-Views-2020-Trust-Media-and-Democracy.pdf.

Leeder, C. (2019). How college students evaluate and share "fake news" stories. *Library & Information Science Research*, *41*(3), 100967. doi: 10.1016/j.lisr.2019.100967

Machete P., Turpin M. (2020). The use of critical thinking to identify fake news: A systematic literature review. In: Hattingh M., Matthee M., Smuts H., Pappas I., Dwivedi Y.K., Mäntymäki M. (Eds.), *Responsible design, implementation and use of information and communication technology.* (vol. 12067, pp. 235-246). Cham: Springer International Publishing. doi: 10.1007/978-3-030-45002-1_20

Pennycook, G. & Rand, D. G. (2020). Who falls for fake news? The roles of bullshit receptivity, overclaiming, familiarity, and analytic thinking. *Journal of Personality*, *88*(2), 185-200. doi: 10.1111/jopy.12476

Pierri, F., & Ceri, S. (2019). False news on social media: A data-driven survey. *SIGMOD Record, 48*(2), 18-27. doi: 10.1145/3377330.3377334

Pilgrim, J., Vasinda, S., Bledsoe, C., & Martinez, E. (2019). Critical thinking is critical: Octopuses, online sources, and reliability reasoning. *The Reading Teacher*, *73*(1), 85-93. doi: 10.1002/trtr.1800

Stripling, C. T. & Ricketts, J. C. (2016). Research priority 3: Sufficient scientific and professional workforce that addresses the challenges of the 21st century. In T. G. Roberts, A. Harder, & M. T. Brashears (Eds), *American Association for Agricultural Education national research agenda: 2016-2020.* (pp. 29-35). Gainesville, FL: Department of Agricultural Education and Communication.

Vosoughi, S., Roy, D., & Aral, S. (2018). The spread of true and false news online. *Science (American Association for the Advancement of Science), 359*(6380), 1146-1151. doi: 10.1126/science.aap9559

What is critical thinking? (2010). *NACTA Journal*, *54*(4), 70. https://www-proquest-com.lib-e2.lib.ttu.edu/scholarly-journals/teaching-tips-notes/docview/845262146/se-2?accountid=7098