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Assessing Students' Achievement through Problem-Based Learning to Reveal the Implicit Bias of Fake News

Karisma Erikson Tarigan[1] ✉ Murad Hassan Sawalmeh[2] and Margaret Stevani[3]
[13]Fakultas Pendidikan Bahasa Inggris, Universitas Katolik Santo Thomas Sumatera Utara, Indonesia
[2]Assistant Professor of Translation and Linguistics, Dhofar University, Oman
✉**Corresponding Author:** Karisma Erikson Tarigan, **E-mail**: erick_tarigan2006@yahoo.com

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ABSTRACT

The widespread dissemination of fake news could have serious negative consequences for individuals and society. First, fake news could upset the balance of authenticity in the news ecosystem. For example, the most popular fake news was more prevalent on Facebook or Instagram media. Second, fake news intentionally persuaded consumers to accept biased or false beliefs. Third, fake news was changing the way people interpret and react to real news. For example, some fake news was created to mistrust and confuse people, so it was impossible, to tell the truth from what was not. To mitigate the negative impact of fake news, it was very important to develop methods to automatically detect fake news in social networks, namely problem-based learning, in order to differentiate between real and fake visual content. Qualitative and quantitative approaches were performed using experimental and control groups to determine whether problem learning could induce students to engage more actively with the topic and develop critical thinking skills to avoid the implicit bias of fake news. This study was conducted at Universitas Katolik Santo Thomas Medan, Indonesia. This research showed that problem-based learning could promote the development of learning communities where learners could freely exchange ideas and ask questions related to the material being studied. Therefore, problem-based learning was an effective way to improve the analytical ability to distinguish between real news and fake news based on the credibility of the news.

1. Introduction

A frequent problem in the world of higher education is the poor ability of students to use their thinking skills to solve problems. Students often tend to receive a variety of information focused solely on cognitive abilities. Students have a lot of knowledge and information, but it is difficult to empathize with their situation. Instead of solving problems, their knowledge appears to have nothing to do with what they are facing. When students go to college, all they have to do is prepare them as smart and capable of solving problems they will later face in the real world. This becomes a problem to be addressed "Every university decides how to present its course material so that its students can become autonomous learners who not only acquire knowledge in their field of study, but also develop problem-solving skills that can be applied later when faced with the challenges of education, training, and future careers" (Stanford, 2011).

According to observations from the Catholic University of Santo Thomas in Indonesia, teachers often hear students complain about how difficult it is to grasp the volume of lecture material. They need to know everything the curriculum requires. Their intellectual abilities can handle this workload, but the students appear to be out of touch with their world, and what they meet should be determined by their own abilities. Therefore, education must equip them with the skills they can use to overcome their challenges. One of these abilities is problem-based learning. These skills can be developed in the learning process; the problems are raised

during lectures, and students are invited to solve them with all the knowledge and skills they have. Learning is no longer "knowledge transfer" but consciously developing the learner's potential through more dynamic and usable abilities.

Sharing real-world experiences with teaching in the classroom results in low motivation in the course of lecture learning. This can be seen from the results of the interviews conducted prior to this study. Low motivation also affects low student learning outcomes. Lecture templates that are not student-centered affect student inactivity in classroom learning. Therefore, the applied teaching model must be changed to be student-centered, using real-world materials that exist in the real world. Tarigan et al. (2021) criticized that the presence of real material in pedagogy can contextualize learning, facilitating the development of critical thinking in relation to linguistic phenomena that exist in the real world or simultaneous linguistic phenomena.

The ability to distinguish between good and bad information, good sources and bad information, has long been taught to students by journalism and mass communication teachers. False news is often spread by people who do not know that the story is actually a lie (Klein & Wueller, 2017). Fake news begins when false information is spread multiple times and ends when the story does not spread (Giglietto et al., 2016). According to the preliminary research conducted by the lecturers, it showed that students did not complete three critical steps performed by expert judges: checking the sources of information, ensuring the sources are not biased, and seeing the best results when using search engines.

Regarding the circulation of hoaxes, media literacy requires four skills to study the problem of information falsification, including analytical ability, comparison/contrast ability, evaluation ability and abstraction ability. In addition to that, you also need skills that can be used to investigate misinformation. One of the skills to learn misinformation is the skill of critical thinking. Critical thinking is rational and reflective thinking that focuses on making decisions about what to believe or do (Tsai et al., 2008). It is reasonable in terms of collecting, interpreting, and evaluating information for decision-making. Reflection means that students actively consider all alternatives before making a decision. According to Rubin et al. (2015), there are several stages of critical thinking, namely (1) Gathering important information related to the problem, (2) Starting an argument from multiple aspects or multiple perspectives, (3) Gathering additional information for further analysis if necessary, (4) Making decisions and reporting.

When teaching using problem learning models involving hoax information, students are automatically trained to think critically to solve problems, then observe phenomena, perform basic explanations for deceptive problems, gather information from trusted sources, and conduct research, draw conclusions and correct data. After researching the right solutions to overcome misinformation, students concluded by determining the right steps to overcome the hoax problem and communicate with others. In this way, knowledge will be more meaningful and critical thinking skills will be developed (Khaldarova & Pantti, 2016).

Problem-based learning is a problem-solving pedagogy, a process in which students are encouraged to engage more actively with topics and develop critical thinking skills (Arends, 2008). Problem-based learning is closely related to critical thinking skills because it combines the learner's abilities with the topic and environment of discussion. This requires learners to think actively in a holistic and contextual way to address the comprehension problems they face (Anitah, 2008). In their opinion on problem learning, Bowers (1996), Finkle and Thorpe (1995) stated that learners acquire knowledge with real problems in the context of learning how to think critically and practical problem-based learning skills encountered in everyday life is one of the characteristics of problem-based learning. Therefore, it is clear that problem-based learning is designed to help students become independent and autonomous learners by developing their thinking skills for their intellectual abilities in real-world situations.

Savery (2006) also found that problem-based learning motivates students to work with groups to solve complex real-world problems so that they can develop the content of knowledge gained by solving problems, finding causes, communicating, and evaluating the solutions. These issues can certainly draw the learner's interest in the subject area as they are learning the skills they need to succeed in that subject area. Problem-based learning is carried out under the assumption that the learning process is active, integrative, and includes processes that construct context and social factors (Barrows, 1996; Gijselaers, 1996). The research problems that proposed regarding problem-based learning and fake news in this study are:

1. What is the result of students' learning achievement in applying problem-based learning?
2. What is the role of problem-based learning in identifying the implicit bias of fake news?
3. What are the steps to reduce the implicit bias of fake news in digital media?

2. Literature Review

2.1 Problem-Based Learning

Problem-based learning by American physician and medical educator Howard Barrows (1996) involves student-centred learning in small groups led by tutors or "experts" rather than traditional lectures. Students are expected to be able to organize their lives, studies and learning in a way that prepares them for the profession of their choice (Armstrong, 2012).

The purpose of problem-based learning is primarily based on knowing if college students are self-motivated, unbiased learners. By using peer overview and self-evaluation from institution interaction, college students construct independence and problem-fixing talents on their own. Studies of the long-time period blessings of problem-primarily based totally getting to know have proven that those talents observe college students into their expert lives and provide them with the equipment to be higher organized in phrases of interpersonal talents, expert talents, and the capacity to plot effectively and independently (Hung et al., 2008). These findings are supported with the aid of using studies displaying that actual self-evaluation leads the scholars for you to discover their very own deficiencies and development, which similarly builds at the thoughts of unbiased getting to know (Tai & Yuen, 2007). It is similar to Breton (2010) carried out studies to discover the concept of problem-based learning primarily based totally getting to know represents an essential paradigm shift in pedagogy. This paradigm shift approach that scholars who are unfastened from inner limitations, together with worry of being incorrect, can attain a self-assurance increase from an interactive facilitator of knowledge. Further, they advocate that this paradigm shift to problem-primarily based totally getting to know creates an environment wherein social competence, sharing feelings, and setting up relationships are advanced now no longer handiest with the aid of using the scholars but also with the aid of using the facilitators or teachers. Finally, in conventional lecture room settings, the slender evaluation specializes in rote reminiscence in place of authentic understanding. Problem-based learning evaluation consists of the bigger principles worried and concentrates on wondering and reasoning talents (Wong et al., 2011).

Parton and Bailey (2008) argue that problem-based learning is characterized as student-centred learning and that the teacher's task is to be a facilitator and disseminator, delimiting and stimulating the learning process. This confirms that the lecturer's role is expected to develop students' interest in the material being studied, enrich the material, create group work situations, and guide students to become autonomous learners. Regarding the critical thinking of problem learning, students must consciously study all the information about the problems they face and apply strategies to solve them. The ability to use a variety of thoughts helps students solve problems effectively and become independent learners. In this process, knowing one's own abilities develops critical thinking skills, enabling them to pursue and realize the need for knowledge in the content of learning. In addition, the selection and application of problem-solving strategies will stimulate the emergence of critical thinking skills based on the real situations they face and social factors.

However, tutors must design their curriculum/plan according to the method that must be followed when using problem-based learning. (Bokonjic et al., 2009), that was described as follows:

1. Glossary of terms: First, a group of participating students draws a four-column table on the classroom blackboard—text facts, problems, cause and effect hypotheses, learning objectives. Students then familiarize themselves with texts with problems to be identified, solved, and clarified unknown terms. Facts presented in the text are listed in the "Facts in Text" column on the chalkboard.
2. Problem definition: The second stage consists of a group discussion about what the problem is and how it can be used to find a solution. Identified issues are logged in the issues column of the board.
3. Brainstorming: Another group discussion opens in which students use their previous knowledge to generate ideas for various hypotheses to explain the problem. All students voice their opinions and grade and record all ideas at this stage.
4. Structure and hypothesis: Steps 2 and 3 are reviewed. Various possible explanations for the problem are presented, ultimately leading to one final structured hypothesis, recorded in the "Cause and Effect Hypothesis" column.
5. Learning objectives: Once a hypothesis is chosen and formulated, students must agree on an achievable and understandable learning goal for a given task. These goals will be essential knowledge that students must acquire before they can hypothesize. These learning objectives are recorded in the "Learning Objects" column on the board.
6. Retrieve information: Information retrieval is conducted individually, focusing on general learning objectives. This gives students a deeper understanding of the problem they are currently working on. The minimum time for this study is two days, but a longer time should be desirable as it gives students the opportunity to find their own resources and may require additional time to explore their credentials.
7. Synthesis: In the final step, team members share with each other the consequences of individual outcomes, including structure, function, cause, and so on. With this new information, the students can analyze the stated problem, identify issues, and solve the problem.

8. Sharing feedback. Students and teachers provide feedback on individual and group processes, assignment organization and teacher recommendations. This is to improve the workflow for the next class.

2.2 Fake News

Fake news refers to content that contains false information in the form of imitation of media facts and is mainly distributed through social media (Himma Kadakas, 2017). Fake news can be defined as false, often sensational information disseminated under the guise of news reports (CollinsDictionary, 2017). Fake news has attracted public attention for a number of reasons. First, disinformation has become a part of everyday life. Second, fake news can have serious consequences when people believe in misinformation and act on it. Third, peaceful human interactions and personal and social prosperity depend on interpersonal trust (Lyons et al., 2020). In empirical research, false information is often manipulated as information characterized by simple falsehood, unreliable sources, or low evidence base. Other studies have focused on certain types of false information rumours, myths, or native advertising (Pek & Damian, 2018).

While fake news is not new, there are several reasons for the growing importance and concern of fake news in the digital age, such as:

1. The fixed costs associated with going to social media in the process of spreading fake news are very small. The barrier to media entry is significantly lowered by making it easy to create a website and monetize it through advertising. This increases the feasibility of short-term strategies related to building a social media presence for a particular fake news campaign and reduces the incentive to build.
2. With quality journalism, social media is great for spreading fake news. The format of social networks tends to disseminate information in short chunks of text, making it difficult for users to evaluate its credibility.
3. Public confidence in the mainstream media continues to decline.
4. In many Western countries, political polarization (the degree of negative emotions directed to opposite ends of the political spectrum) is increasing in many Western countries, which can increase the likelihood of believing fake news (Allcott & Gentzkow, 2017).

Figure 1. An Example of Fake News about Vaccine Covid-19

Fake news consists mainly of sensational and controversial headlines, and its emotional language can contribute to widespread dissemination (Vosoughi et al., 2018). Emotions may be related to beliefs about fake news and the impact and beliefs of fake news on the public (Martel et al., 2019). Content that elicits strong emotions (positive and negative), such as happiness, excitement, or anger, are more likely to be shared (Valenzuela et al., 2017). In addition, a user's social relationships and social status or reputation are important indicators for news exchange (Bright, 2016). Users feel that their social reputation is strengthened by showing that there is "information" in their engagement centres (friends, individuals and public groups) and that there is new and relevant "information". Broadcasting a news item makes it easier for users to receive, especially if it is impressive information that largely matches the basic characteristics of fake news (Galeotti, 2019). The same motives contribute to engaging in gossip (Talwar et al., 2019). However, Duffy et al. (2019) showed that sharing fake news can negatively affect interpersonal relationships. Spreading false

information can jeopardize users' overall social reputation. Social media can also serve to expose hate speech or retaliatory behaviour (Fox & Rooney, 2015).

2.3 News Credibility

The prevalence of fake news among teens may be related to students' lower ability to evaluate information currently available on the Internet (Stanford History Education Group, 2016). News credibility is defined as a multidimensional construct measuring the perceived credibility of a message (article), source (journalist or media company), or media (newspaper, website, radio station, etc.). Meyer et al. (2010) state the three concepts for determining the news credibility, such as: (1) The credibility of a message is related to the credibility of the message itself, including its quality and accuracy (Li & Suh, 2015), (2) The credibility of the source is often the credibility of the message. Ability, the credibility of a source, the likelihood that a source will provide reliable information (Berlo et al., 1969), (3) The average reliability is often related to the reliability of the news channel itself (Bucy, 2003). Furthermore, the three factors that can influence how well the public can distinguish between real and fake news based on news credibility studies are the amount of information, demographic and personal preferences, and news research attitude.

In terms of information, Park (2005) found that information volume was not a statistically significant factor in print news or television news reliability. The amount of information has little positive relationship to the credibility of online news. Tsai et al. (2008) agree that more information only increases confidence in answers rather than actual accuracy in answers.

Demographics and personal preferences have also been shown to influence public confidence in online news (Sun, 2014). Political affiliation has been found to influence perceived trust in the media (Johnson & Kaye, 2000), and conservatives view the media as more authoritative than liberals. Age was also found to be a factor. Bucy (2003) found that men and older and more educated people have lower confidence in the media than women and younger people because they are often more critical of the media.

In terms of news research attitude, news errors and inaccuracies have been suggested as major issues for the credibility of online news, including why online news is perceived as more vulnerable and less reliable than offline news (Choi et al., 2006). In their survey, Flanagin and Metzger (2000) found that respondents found information on the Internet as reliable as most major news outlets (television, radio, magazines) but still less reliable than newspapers. Respondents said they seldom verify the information they find on the Internet, especially when they believe the nature of the information is reliable.

2.4 Learning Achievement

According to Bloom, studying consequences encompass 3 domains: cognitive, psychomotor, and affective (Krathwohl et al., 1964). The cognitive studying consequences is a factor that is orientated to novices' capacity to question and reason and consists of novices' capacity to remember to clear up issues and create something. This circumstance defines for novices to mix the ideas which have been studied previously. The cognitive studying consequences in line with Bloom's revised Anderson and Krathwohl (1964) offer six classes for measuring cognitive studying consequences: remember (C1), understand (C2), apply (C3), analyze (C4), evaluate (C5), create (C6). From diverse evaluations on studying consequences, the studying consequences are the competencies that scholars advantage from beginning stages remembering, understanding, applying, analyzing, and evaluating.

One of the factors contributing to the emergence of an individual's motivation for achievement is that achievement. Success requires maximum commitment and effort to avoid failure to achieve optimal success. These needs include the need to succeed, overcome obstacles, solve difficult problems, and surpass others (Sardiman, 2007). Thus, according to Atkinson (1982), achievement motivation is higher when the desire for success is greater than the fear of failure. As a result, achievement motivation is an individual's desire for success, surpassing others, and goal orientation.

3. Methodology

This study uses a quantitative approach and a qualitative approach by using an experimental design. An experimental design was used to assess attitudes and performance before and after treatment. We collect data using research tools that can measure attitudes and academic achievement and other information collected and analyzed through statistical procedures and hypothesis testing (Creswell, 1994). The sample of this study is the third semester of Universitas Katolik Santo Thomas which is located on Jalan Setia Budi, Kecamatan Medan Tuntungan, Kota Medan, Sumatera Utara, Indonesia. In this study, the procedure of data analysis can be described as follows: (1) Defining a research problem, (2) Selecting a sample, (4) Formulating a data collection procedure, (5) Problem-based learning were applied to the experimental group, (6) Collect the data from the experimental group (7) Data validation, data classification, data scoring and tabulated processed data, (8) Statistical analysis of data using t-test, and (9) Conclusion of data analysis results.

4. Results and Discussion

4.1 The Students' Learning Motivation through Problem-based Learning

The application of problem-based learning in the experimental class showed a significant difference in the learning results. This implication is evident from the final test results obtained from both groups of the sample. The test results are shown in the following table.

Table 1. Control Group that Using Problem Based Learning

No.	Experimental Group		Control Group	
	Participant	Mark	Participant	Mark
1.	A	87,50	A1	57,50
2.	B	85,00	B2	71,00
3.	C	86,00	C3	75,00
4.	D	91,00	D4	76,50
5.	E	79,50	E5	65,50
6.	F	79,00	F6	75,00
7.	G	87,00	G7	70,50
8.	H	88,00	H8	73,00
9.	I	85,50	I9	65,00
10.	J	83,00	J10	67,50
11.	K	84,00	K11	70,00
12.	L	85,00	L12	72,50
13.	M	88,50	M13	65,00
14.	N	85,00	N14	65,00
15.	O	85,00	O15	67,50
16.	P	87,00	P16	63,00
17.	Q	87,00	Q17	78,50
18.	R	87,00	R18	71,00
19.	S	91,50	S19	73,50
20.	T	85,50	T20	63,00

Table 2. Group Statistics

	Class	N	Mean	Std. Deviation	Std. Error Mean
Mark	Class A	20	85.70	3.063	.685
	Class B	20	69.05	5.336	1.193

Table 3. Independent Samples Test

Independent Samples Test		
	Mark	
	Equal variances	Equal variances

		assumed	not assumed
Levene's Test for Equality of Variances	F	8.430	
	Sig.	.006	
t-test for Equality of Means	T	12.103	12.103
	Df	38	30.293
	Sig. (2-tailed)	.000	.000
	Mean Difference	16.650	16.650
	Std. Error Difference	1.376	1.376
	95% Confidence Interval of the Difference Lower	13.865	13.842
	Upper	19.435	19.458

T-test analyzes of two independent samples were performed with equal variances taken into account. Then Ho = both samples are equal (Problem-based learning and discussion). Ha = Although these two patterns are not identical (problem learning and discussion are not). According to the SPSS calculation result, t-count values are 12 and 103, and the T table for the significance level for homogeneous data (sig. > 0.05) means that there is a significant difference in the learning performance of the experimental group (Problem based learning) and control group (Discussion).

The data t count 12.103 > 0.05 also shows that the effectiveness of oriented learning (based on the value) states that problem-based learning is effective in improving students` critical thinking skills in assessing fake news in digital media. It is clear that reviews and conclusions about methods used by groups in the form of problem-solving strategies, including the selection of various theoretical reference sources selected for the news cases they choose, can also show that: A high level of thinking means critical thinking. It is based on social contribution (a form of collective competence) and the fact that cases of fake news have been solved.

Table 4. The Result of Students' Learning Motivation after Taught Problem-based Learning

	Achievement Motivation	N	Mean	Std. Deviation	Std. Error Mean
Post-test	High motivation	20	80.6415	8.1877	1.8623
	Low motivation	18	75.0226	9.9524	2.4379

Independent sampling shows that when we find the value of t count, the t-test is 1.86 and the p-value (tailed Sig 2) is 0.071. It can be seen that at the significance level of $\alpha = 0.05$, the p(sig 2 tailed) value is 0.071 > 0.05. This shows that there is no significant difference between the group with high achievement motivation (mean value 80.63) and the group with low achievement motivation (mean value 75.05) when problem-based learning is introduced.

The seven steps of a problem-based learning activity to be applied in this research are:

1. Participate in difficult situations. The teacher identifies the problem or difficult situation that is appropriate for the course and the student. Organize students into groups and students into teams. This is achieved by having students identify their strengths and weaknesses, which will help them as they assume different roles in the process.
2. Identify and brainstorm problems. Students read and discuss the current knowledge and experiences of team members relevant to the situation. Consider possible solutions and get everyone involved.
3. Analyze the problem and make a plan. Students write in their own words expressions of the problem, such as possible solutions to the problem, actions to be taken as planned, and what the team needs to know to solve the problem.
4. Explore and self-teach. Students research and find based on the requirements of the assignment. Results include problem descriptions, questions, collected data, data analysis, and decision support. This step shows the course and results of the activity.
5. Explain, share and complete the information. Students present solutions and analyze what they have learned.
6. Assess your knowledge and learning process. Students reflect on their knowledge, learning processes and assessments.

7. Apply their knowledge in new situations. Students cope with difficult situations, prior knowledge is activated, and questions are posed.

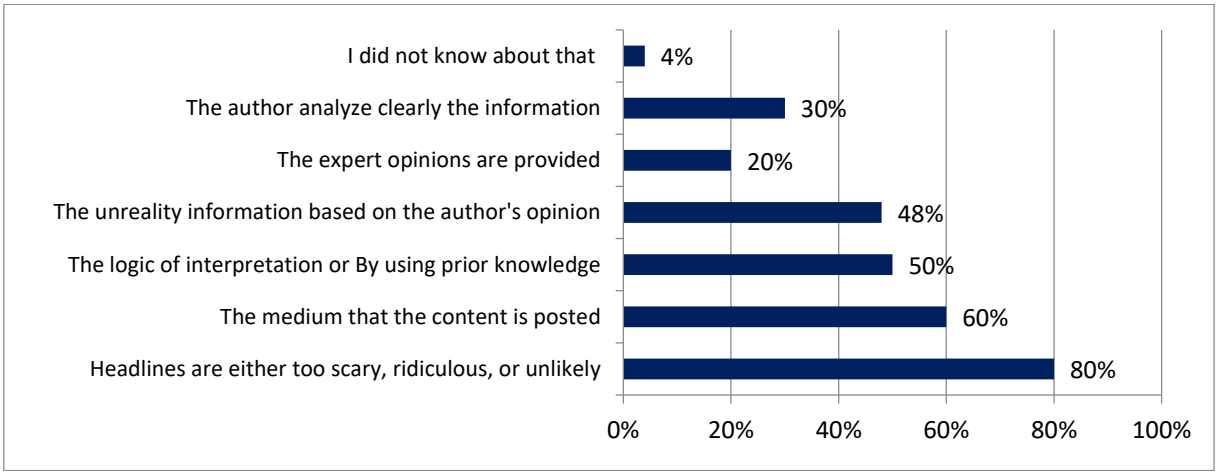
Problem-based learning, characterized by group work in understanding information and social realities, can promote the development of learning communities where learners can freely exchange ideas and ask questions related to the material being studied (Allen et al., 1996). This result can gain interest and motivation in a group that actively collaborates with other group members increases their communication skills (or exchange of ideas). Group work in this way can improve students' abilities, especially to support the creation of critical thinking processes. Consistent with this, Asmuni & Hasyim (2014) found that problem-based learning effectively improves the 'analytic skills' that contribute to the development of students' critical thinking skills.

Therefore, it can be concluded that problem-learning strategies can improve learning. These teaching principles must be embodied in the learning process, enabling students to learn on their own, learn more meaningfully, learn problem-solving methods, and apply high-level thinking and integration from a variety of disciplines. This research invites students to take an active role in discussing topics with their peers to solve problems, share opinions, and formulate concepts. In addition, the benefits of problem-based learning that uses group work methods will train students to develop thinking power and initiatives, improve attitudes, help in understanding social behaviour, and can collaborate in presenting group work. In addition, a problem-based learning strategy will motivate all groups of students with different achievement motivations to continue to learn and work individually and in groups to achieve superior learning outcomes. Therefore, problem-based learning strategies are well suited to improving the quality of education for students with different motivations for academic achievement in college.

4.2 The Students' Perception with Fake News

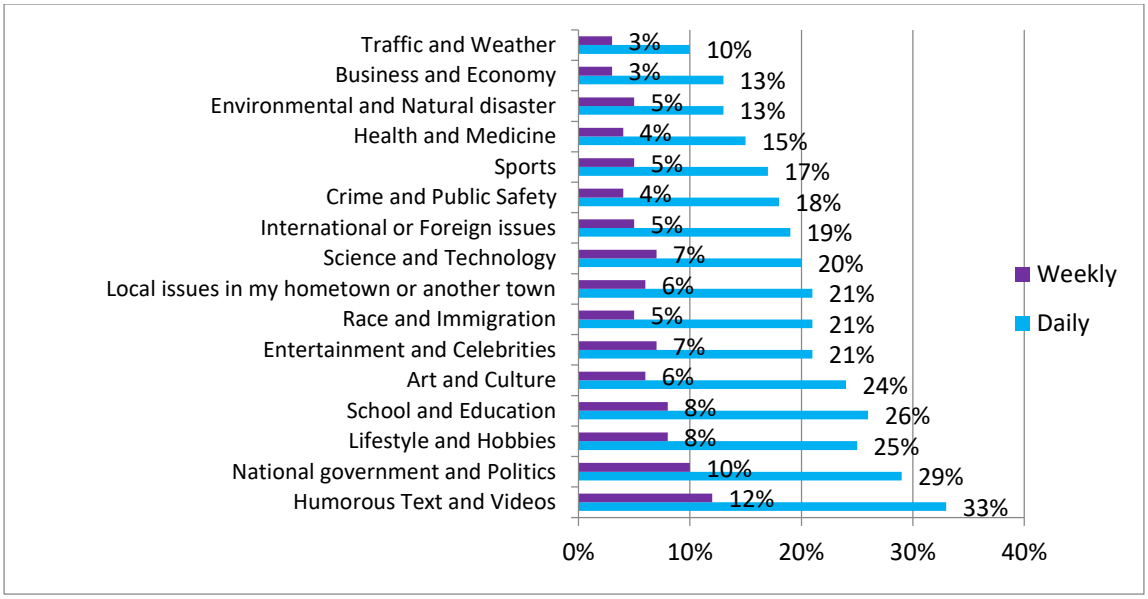
Overall, this chart in table 5 showed that the general public should be better prepared to receive fake news. Respondents could simply open a new tab in their browser and compare the information to data from other websites to see if the story was real or fake, but they did not choose to do that. This result may be due to respondents interpreting this survey as "testing" (including individuals) and implicitly seeing a match of information with other sources as "cheating".

Table 5. How Can the Students Sense Fake News?



Overall, this chart in table 6 proved that social media gives these students access to local events, sports, job opportunities, and other available news. Students may not actively seek out news and information through social media, but they want the information to be communicated through these social media (in part because they follow or affiliate with news organizations that communicate rather than receive information). In part, social media seems to have become a means of soliciting opinions in one's hometown to other hometowns before the news event. This traditional shift in the caller-to-call communication model appears to support or encourage young people to interact with other communities worldwide.

Table 6. The News Topics that Students Choose in Social Media



4.3 The Efforts to Avoid the Implicit Bias of Fake News through Problem-based Learning

Here are the steps to evaluate information in media social in order to avoid the implicit bias of fake news for students:

1. Give students one piece of news about the event. Divide the students into groups and ask them to list the facts from the article, using the exact words the author used in the article.
2. Give the students a second article about the same event and see if the article's tone is different. Ask the same group to list the facts in the article using the exact words they used in the article.
3. For the entire class, simulate creating a chart with the words in each article reflecting the same fact or event. For example, you could write killed in one column and killed in another. Have students build their own charts.
4. Check and discuss tone and charge as these ideas are applied to word choice in class. Then have students discuss in groups what biases they identified in the two articles based on tone and word rates. Use the "Evaluating The Implicit Bias in Fake News" on the news bulletin handout to allow you to record your observations.

Table 6. Evaluating The Implicit Bias in Fake News

No	Evaluating The Implicit Bias in Fake News	The Descriptions (Fill the Blank)
1	Locate, organize, analyze, evaluate, and synthesize the information from various sources and media.	
2	Evaluate and select information sources based on the appropriateness of tasks.	
3	The information is true based on your personal beliefs and preferences.	
4	Language is not extreme, absurd, absolute, or flashy.	
5	The information is not from an advertisement or sponsored content.	
6	The news is up to date.	
7	The information is not to promote a goal or agenda of one person.	
8	The information can be found on another website.	
9	You can identify the author's point of view or purpose.	
10	You can identify fact, opinion, and reasoned judgment in a text.	
11	You can evaluate the author's premises, evidence, and claims by challenging them with other information.	
12	You can evaluate the argument and specific claims in a text whether the evidence is relevant and sufficient to support the claims.	
13	You can analyze how two or more authors writing about the same topic can shape different interpretations of facts.	

5. Ask class members the following two questions: (1) How do we know what actually happened? (2) Why is it important to know both stories? Discuss or have students write their answers to each question.
6. Tell students that they will now practise writing their own "paid" articles based on a given scenario related to current events. Review the "The Authentication of Information" handouts together to guide you through the process.

Table 7. The Authentication of Information

No	The Authentication of Information	The Descriptions (Fill the Blank)
1	Copyright: I always ask my students to check the footer of a web page to ensure that information is submitted for ownership.	
2	Validation using multiple sources: Students will need to double-check the information on several web pages. As in court, the more witnesses you have, the more likely the truth will be revealed.	
3	Source credibility between, for example, History.com and any unknown source: I instructed them to check if the source was created recently. Sources that have existed for a while will show credibility over time and can be verified retrospectively, but newly created sources will not have a good reputation.	
4	Posted date: I always ask them to check how old the page has been to see how up-to-date the information is and if anything has changed.	
5	Author's experience and subject matter experience: Students should ensure that the author is someone who has put time and effort into researching the subject. For example, university professors are generally more reliable than amateurs.	
6	Is this consistent with your previous knowledge: Ask if the information is consistent with what you previously learned.	
7	Is this realistic?: I tell my students to use common sense. Does something seem certain or possible?	

7. Finally, invite students to share their writings with each other. Ask them to highlight the words they have criticized, identify bias in each other's work, and explain how the bias is expressed.

Here are some tips for teachers and lecturers to teach students to avoid the implicit bias of fake news:

1. **Help your students become experts in creating notifications.** Tell them to check which app has permission to send a notification. Once you know what's on this list, teach them to scrutinize applications that can communicate information as energetically as using resources to complete tasks. It is important to understand that students have a lot of control over the information communicated through notifications. You need to create alerts populated with the most reliable sources available and provide your students with the skills to give them a different perspective.
2. **Provide students with some strategies to avoid noise when accessing the information on their mobile phones.** Mobile ad-blockers are not widely used, but some browser apps (Safari for iOS and Firefox or Edge for Android) offer a reading mode that allows users to browse content without paying attention to ads, videos, links to sponsored content, etc. It is an effective way for kids to focus on the information first and use fact-checking strategies related to content without distracting them from other bullshit.
3. **Teach students to delete app browsing history**. One way to counter the filter bubble effect (the way the internet adjusts our experience based on browsing history) is to occasionally delete those stories. Even if we are well aware of the bias we put into spreadsheets when evaluating sources of information, internet algorithms can be a barrier between our good intentions and access to multiple perspectives. Cleaning your browsing history may require you to re-enter your password, but the benefits outweigh the inconvenience.
4. **Teach students to care more about who the author of the information is than with the person with whom it is shared.** When people share news on our network, they may admit that they are not the original source of the information, but their

approval is actually important. Moreover, the identity of the distributor instills in many people undue confidence in the authenticity of the information. However, it is ultimately our responsibility to ensure that we do not spread misleading or biased information by sharing material posted by friends without further confirmation.

5. **Encourage students to study carefully and then share information.** One of the things that can make accessing the information on your phone a preference over other methods is that it can be easily shared with others and across platforms.
6. **Teach another teacher to provide two resources for adults as students explore, experiment, and challenge new challenges.** You can identify digital and print resources that support content and media literacy learning. In addition, you can help students evaluate products and guide them for improvement.

Below is the table as a guide to identify fake news in social media:

How to Identify Fake News in 10 Steps

Beware fake or misleading news.
Be skeptical. Ask Questions.
Verify.
It's up to you.

Name: _____

Date: _____

Researchers: Karisma Tarigan, Murad Sawalmeh, Margaret Stevani

Select "Yes" or "No" to the following questions.
The more thumbs-down icons you select, the more likely the news article is fake.

1. Do a Visual Assessment
Assess the overall design. Fake news sites often look amateurish, have lots of annoying ads, and use altered or stolen images.
Overall, does the news article and website seem high quality? ☐ Yes ☐ No

2. Identify the News Outlet
The Wall Street Journal and CNN are examples of news outlets. If you haven't heard of the news outlet, search online for more information.
Is the news outlet well known, well respected, and trustworthy? ☐ Yes ☐ No

3. Check the Web Domain
Many fake news URLs look odd or end with ".com.co" or ".lo" (e.g., abcnews.com.co) to mimic legitimate news sites.
Does the URL seem legitimate? ☐ Yes ☐ No

4. Check the "About Us" Section
Trustworthy news outlets usually include detailed background information, policy statements, and email contacts in the "About/About Us" section.
Does the site provide detailed background information and contacts? ☐ Yes ☐ No

5. Identify the Author
Fake news articles often don't include author names. If included, search the author's name online to see if he or she is well known and respected.
Does the article have a trusted author? ☐ Yes ☐ No

6. Identify the Central Message
Read the article carefully. Fake news articles often push one viewpoint, have an angry tone, or make outrageous claims.
Does the article seem fair, balanced, and reasonable? ☐ Yes ☐ No

7. Assess Spelling, Grammar, and Punctuation
If the article has misspelled words, words in ALL CAPS, poor grammar, or lots of "!!!!," it's probably unreliable.
Does the article have proper spelling, grammar, and punctuation? ☐ Yes ☐ No

8. Analyze Sources and Quotes
Consider the article's sources and who is quoted. Fake news articles often cite anonymous sources, unreliable sources, or no sources at all.
Does the article include and identify reliable sources? ☐ Yes ☐ No

9. Find Other Articles
Search the internet for more articles on the same topic. If you can't find any, chances are the story is fake.
Are there multiple articles by other news outlets on this topic? ☐ Yes ☐ No

Figure 2. How to Identify Fake News

5. Conclusion

The results of this study show that problem-based learning for teachers and lecturers serves as a facilitator, including group formation, presenting or explaining problems, asking open-ended questions, recommending appropriate sources, asking open-ended questions, teaching avoidance, and managing interpersonal relationships, minimizing conflicts, and misunderstandings that impede learning, encourage students to become independent by encouraging them to explore what they already have and identify

needed knowledge, encourage group work, and allow groups to set goals and plan to help, identify group problems and help arrive at a solution. Teachers also advocate as assessors of student progress. Lecturers and teachers can also be evaluators for evaluating group processes, providing feedback, evaluating discussions, and serving as models or models for improvement in terms of content and processes. On the other hand, the role of the learner in problem-based learning is to enable self-learning by finding, selecting, and using the most appropriate and most appropriate sources for solving problems and obtaining new ideas or knowledge.

Regarding the implicit bias of fake news, students can learn about how news information spreads in modern society, the dangers of fake news, and how to identify them. As the number of "fake news" increases simultaneously and the inability to judge the credibility of a particular news message on social media increases, it becomes important to educate young people to distinguish between real and fake news using the following steps: (1) Understand the concept of rumor spread, including the extent and mechanisms by which it spreads on social media, (2) Read and interpret visualizations that describe the spread of information over time, (3) Conduct scientifically research on the subject, that is a set of questions to explore who spread the story and when and how the story spread, (4) Identify indicators and characteristics that influence the credibility of news on social media. Future research will also focus on comparing the credibility of stories within or across different subjects, for example, comparing fake news about politics with other fake news about politics, and stories about politics and sports or international issues must match.

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Google Scholar:

Karisma Erikson Tarigan: https://scholar.google.co.id/citations?user=NK2uTFQAAAAJ&hl=id

Margaret Stevani: https://scholar.google.co.id/citations?user=6StyCAkAAAAJ&hl=id

Murad Sawalmeh: https://scholar.google.com/citations?user=Nh0UK5wAAAAJ

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