

## Socioscientific Perspectives on ‘Fake News’ in the Era of Social Media among Generation Z Filipinos

Andy Nestor Ryan Pazon<sup>1,2</sup>

<sup>1</sup>Doctor of Philosophy in Science Education

College of Graduate Studies and Teacher Education Research

Philippine Normal University, Taft Avenue, Manila 1000

pazonanr@gmail.com

<sup>2</sup>De La Salle – College of Saint Benilde, Taft Avenue, Manila Philippines

School of Multidisciplinary Studies – Natural Science Department

andynestorryan.pazon@benilde.edu.ph

**Abstract** – In the era of the society where the platform of connectivity and sharing of information is the social media, perspectives on authentic information, digitized rumor spreading, misinformation and disinformation becomes more alarming, relevant and relative. This exploratory research design elicited an understanding of the socioscientific perspectives among the generation Z Filipino students about fake news proliferating in the social media. There were thirty – eight (n=38) freshmen college students from a private university in Metro Manila who participated. This study used an open access technology on word cloud, open – ended questionnaire and focus group discussions to gather the data and qualitatively analyzed using coded scheme. The results showed that sources of information, purpose, relevance of the article, accuracy, precision, intended receiver, social media user engagement and user characteristics were assumed to be the factors in their metrics for determining fake news. From the focus group discussion and on the participants’ answers on the open – ended questionnaire, there were 7 coded themes on their perspectives on fake news. An ontological quadrants showing the participants’ socio scientific perspective were drawn. Majority of the participants also agrees that social media becomes an instrument of lies, deception and rumors. Further, it can be noted in the results that the participants have personal metrics in determining fake news. Lastly, this study provides a deeper understanding from the different literature in neuroscience on the neural development of adolescents, cognitive control and their developmental sensitivities to social media use.

**Keywords** – fake news, perspective, generation Z, Era of Zuckerberg, social media, STS (Science, Technology and Society)

### INTRODUCTION

In this technology driven society, obtaining and spread of information becomes easy and fast pacing. The current conditions of acquiring knowledge and information became possible because of the development of printing press by Gutenberg. This revolutionizes the age of information leading to the birth of democracy and a voice to be able to share pertinent pieces of information throughout the history[1].

The bunch of information poses new challenges and drives a question of “what is true and what is false?”[2]. A more pressing concern to this current digital society is the extreme question with the reliability of information, spread to millions of people in a matter of seconds to couple of minutes at a very least cost since people are now in a highly interconnected world through the internet technology[3]. This connectivity is made effortlessly possible through the power of social media where an individual is wirelessly visible to both real and

virtual friends across the globe. This current intertwined digital society and technology leads to the achievement on one of the goals of scientific literacy in the Philippines[9], which is to create a knowledge – based society or make informed citizens through the use of available technologies.

Hosseini, et. al (2017), has identified that over 67% of Americans received their news in social media in 2017 while around 40% of the world’s population are logging in to the different social media networks around the globe [4] [5]. This means that over 3 billion people spends a fraction of their day updating a status or story, uploading pictures or sharing posts from their timeline. In the Philippines over 60 million are internet users and active social media users[5], and around 70% of the active social media users are youth and young adults [6].

The Philippines Star published that in October 2018 Pulse Asia survey, 88% of the social media users believed that ‘fake news’ exists in the different social media platforms used by among the Filipinos[7]. This alleged ‘fake news’ could be text, visual images, audio, vide, which was posted or shared in the different social media accounts. Possible themes or trending topics were the current political climate, issues on the dengvaxia, controversy with the death of SAF 44, exposure of graft and corruption to the different government procurement and projects, or claim on attempts to revise the history during martial law. Road rage, scandalous acts, crimes, trailers for movies and television series, business marketing, online selling and election campaigns becomes almost real – time because of social media. The different posts in social media allow an increased transparency in the government transactions for public scrutiny or public opinion on certain issues were easily obtained through the social media.

In the recent study of Stanford History Education Group (SHEG), it showed that young people becomes vulnerable and susceptible to

bias in the different social media posts since they are more fluent to it [2]. While Anderson (2017) claimed that the youth as a tech – savvy may still not have the abilities to tell the news as fake or not and seemed to be confused like the rest of the 44% of social media users or could hardly make a balance and tell the objectivity of the information shared and posted in the social media platforms [8]. This is supported by the 2016 results of the study in Stanford University on which Wineburg (2018) claimed that young people are not equally observant to what information has been shared in social media [2].

The gravity of responsibly disseminating correct and non – fictitious news both in print, radio and television media has been a long standing issue. In the digital media, the spread of ‘fake news’ has seen to be a global concern and threat not only to business and politics but also to educational institutions. This alarming concern prompted the Philippine Senate to conduct two hearings in aid of legislation on ‘fake news’ on how to control if not totally legislate pertaining to the issue[14].

Loftus’ Misinformation Effect claimed that memory impairment happens due to exposure to misleading information or even relatively subtle information[12]. One of its influences is news reports or repeated exposure to misleading information. This calls the attention of how the scientific and technological literacy plays a vital role deterrent to the remarkable potentials of real world impacts to the generation Z learners.

### ***Fake News***

As more people engages in social media platforms, people tend to seek out and use news from social media[10]. The primary reasons of consuming news from social media than other news organization like print and television, since it is often real – time and less expensive, easier to comment, discuss and share with other friends or users in social media.

Renwick (2018), expressed that ‘fake news’ is a deliberate spread of misinformation or hoaxes across various media, that means not only in social media but possibly traditional news media outlets, considerably to mislead the readers in order to gain financially, politically or otherwise [2][8][11]. Figueira and Oliveira (2017), noted that distorted news and “alternate facts” did not become a problem until the recent US Presidential election where the US elected President, Donald Trump coined ‘fake news’, conveying its origins in the political area [8]. Similarly, in the Philippines it was not a persistent concern not until the Duterte Administration was severely criticized in social media and the rise of the different social media bloggers.

The Manila Times reported that the biggest source of fake news in the Philippines is President Rodrigo and his army of online “trolls” or known to be the “keyboard warriors”, if his opponents were asked. Basing on reports and findings, these fake account operators were liking, posting or sharing messages in favor for the political party or attack of their opponents. This has been described as a systematic manipulation or distort of political discourse on Facebook and Twitter by these various ‘click armies’ across political spectra [13].

University of Massachusetts in Amherst Professor Jonathan Corpus Ong, and his fellow PhD, lecturer Jason Vincent Cabañes of the University of Leeds recognizes that this methodical architect of networked misleading information or disinformation is complex [13]. The disinformation work is an “opposing dynamics”, and no one really admits to be a troll while everyone conveys to be a victim of trolls [14].

The literature however recognizes that there until today there was no agreed definition of the term ‘fake news’ which may be necessary for the directions of future researches [10][11]. Nonetheless, the bunch of related studies pointed out that ‘fake news’ is false information and the

mechanisms of spreading are prevented if an individual is aware that the post contains fictitious information.

The emerging researches focused more on the detection methods, which others in this early age of development; conceived some algorithms, models or software applications that could possibly detect and diminish the spread of fake news. This study may be different to other existing literature since this explores the contextual definition and their views of ‘fake news’, their determinants and metrics of a ‘fake news’, what they usually do when they spot ‘fake news’ on their timeline or shared by other social media users and the effects to the Filipino generation Z learners’ on thinking and conceptual understanding.

### ***Era of Zuckerberg***

The internet allows the creation of a new connectivity in a wireless networked society. A new jargon that expends complexity, the social media. Social is the interaction with people by sharing information, in today’s context an intersection of humanity and technology. Media is the use of the internet as an instrument of communication [15]. Common social media feature includes individuals use their accounts to connect with other users, usually receives updated information in real – time via newsfeeds.

*Era of Zuckerberg* is recognized to be the age of social media. This era is coined in favor of Mark Zuckerberg who launched and lead the much used social media by the Filipinos, which is the Facebook.

The social media is a pervasive part of man’s daily activities. According to Ratner (2018), people usually checks out phones about 80 times a day or once every 12 minutes as an estimation and mostly spent on interacting with Facebook, Instagram, Snapchat, and other social media sites.

Usually, young people greatly benefitted the internet and social media. They receive a large opportunities that empowers them in different ways. Social media is now part of culture of the younger people; its services can help young people develop their talents and skills. This sometimes became an avenue to find for people with extremely similar interests, introduce to new things and ideas. This also deepens their appreciation of existing things to movies, inspirational quotes to gaining and losing jobs via social media[17].

### **Generation Z Filipinos**

The youngest generation is known to be generation Z (gen Z) who were born from the mid-1990s to the late 2000s. This group of individuals may differ in extent with baby boomers or older millennials in terms of their political views and more accepting of sexual fluidity [18].

Gen Z are known to be digital natives, they've never known a world without the internet or cell phones; younger Z's have never known a world without *smartphones*. Electronics has been their luxury and perceived to be a necessity of their existence. Google has always existed to be their great ally and they are incubated in Wi-Fi.

These gen Z becomes vulnerable to misinformation or disinformation since their venue of obtaining much information comes from the internet and their world is nurtured by the social media. In this case, the circulated misinformation in the social media may have lasting impact to the Filipino youth and difficult to correct[11].



Figure 1. Fake News Samples in the Philippines

In figure 1, the inquirer.net shows sample fake news circulating in the internet. Young people spend even more time online and surfing in the internet reading these circulated false information. These gen Z assumed to experience a real separation anxiety when they don't check their phone, or don't see the latest feed[18].

These gen Z ages 18 -19 are currently in the freshmen tertiary level, since their views and concepts are unique and distinct to the views of the millennials, it is necessary to study their perspectives in terms of societal issues in a socioscientific manner.

### **Socioscientific Perspectives**

Perspectives would mean views, concepts or understanding of a certain relevant topic. Social media is still believed to be sanctuary of rational minds, thus scientific way of treating societal issues are relevant and imperative.

In this societal issue, the work of the digital or social media influencers becomes penetrating and poses a threat to the authenticity and clarity of information. This is not to be dismissed easily or taken for granted; this corresponds a great research work in the academe especially in science, technology and society.

### **OBJECTIVES OF THE STUDY**

This study explored the socioscientific perspectives of the generation Z Filipino students on 'fake news' in this era of social media use. Specifically, this study aimed to answer the following questions:

1. What are the participants' definitions and views of 'fake news' in social media?

2. What are the participants' perceived factors on the proliferation of 'fake news' in social media?
3. What are the participants' assumptions of why 'fake news' is shared in social media and some strategies of sharing information in the social media?
4. What are the participants' metrics and determinants in detection and analysis of 'fake news' or behaviors and treatments towards suspected 'fake news' or when they spot 'fake news'?
5. What does the literature on neuroscience provides on the adolescents' social media use which relates to their socioscientific perspectives?

The data serves a framework to provide actions through models and other classroom activities to help the students in detecting and search for truth in the proliferation of 'fake news' in social media.

## **MATERIALS AND METHOD**

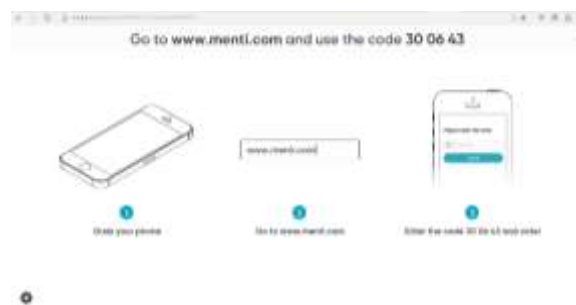
This study used the exploratory research design [19]. This study also uses the action research design since at the end of this study, a plan of action shall be coined to help the Filipino students on detecting 'fake news' in the different social media platforms.

This was conducted to a private tertiary institution in Metro Manila, with thirty – eight (n = 38) freshmen students as participants of this study. These students were aged 18 – 19 years old with average engagement in social media of 2.5 hours per day approximately similar to the average global web index result in the latest trends of social media engagement [20]. All participants have smartphones, or either personal computers, laptops or tablets as their device for social media engagement. The participants also have multi – social media networking engagements with possibly multiple accounts in the same social media. Engagements of the participants toward social media at least have

three (3) of these social media such as facebook, facebook messenger, twitter, instagram, snapchat, tumblr, myspace, viber, LinkedIn, Pinterest, Google+ and WeChat. Likewise, the participants were taking up Science, Technology and Society as one of the GE Courses in the Tertiary Education by virtue of Commission on Higher Education Circular Memorandum Order No. 20 series of 2013 [21].

The instruments used to gather the data were an open – ended questionnaire composed of 5 questions to elicit their understanding and perspectives about the proliferation of 'fake news' in the different social media. This open – ended questionnaire was conducted after the viewing of a video available in youtube on the Fake News in the Philippines by the CBC News: The National (Canada) about 11 minutes and 40 seconds. Included in the open – ended questions are two pictures of a shared information in social media and asked them which is a 'fake news' and how they were able to detect that it was the 'fake news'.

An open access online learning management tool was utilized to create a word cloud on their views and definition of 'fake news'. The participants were given up to three attempts to answer the question posted on the projected screen on their views and definition of 'fake news' in a word or phrase.



*Figure 2.* Accessing the word cloud formation.

The figure 2 shows the three simple steps in obtaining the access to the word cloud formation. The passcode access were also given



to the students and they were given up to three times to answer in two (2) minutes. The question can be seen on the participants' screen when they were able to enter the passcode. The participants can also obtain access to the questions and posts their responses through the QR Code as shown in figure 3.



Figure 3. QR Code for voting

There were focus group discussions (FGD) also conducted to the participants to further obtain a deeper understanding of their perspectives on 'fake news', their perceived factors towards proliferation of 'fake news', metrics and determinants in detecting 'fake news', their behavior and treatment of shared 'fake news' on their social media timeline and the possible individual effect of social media 'fake news'.

The accounts and narratives from the focus group discussions were examined, accounted for themes, and created the analytic categories or emerging themes. The participants' accounts and narratives in FGD undergone through open coding which constantly asks questions of who, what, when, where, how much and why pertaining to the discussed topic. After themes have been created, it underwent to axial coding to put together the data and developed connections between a category and its sub – categories to find relationships.

## RESULTS AND DISCUSSION

This study focuses more on the discussion of the qualitative data obtained to describe the socioscientific perspectives of the participants on 'fake news' in terms of their

definition, views, factors of the proliferation of 'fake news', why 'fake news' exists and how the participants treat when they detect 'fake news' on their social media timeline.

The participants' definitions and views on 'fake news' are shown in the word cloud in figure 4.



Figure 4. Participants' views on 'Fake news'

The most apparent idea on 'fake news' are false information and lies. The participants also viewed 'fake news as unreliable, hoax, inaccurate, not credible, propaganda, clickbait, false, trying to get attention of social media users and distractive.

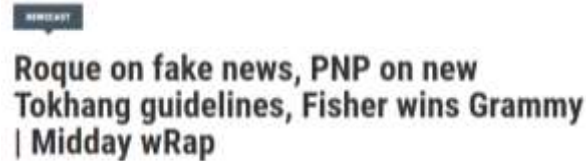
From the word cloud and the coded transcript of focus group discussions, the following *themes emerges* for their definition and views.

1. Attack (Ct1) – this refers to the manufactured stories or evidences to attack the integrity of an individual or an institution; could possibly aim to make good also of the person.
2. Evidence (Cx1) – this refers to the quality of evidence – based information proliferating in the social media which may have appeared to be relevant, timely, realistic but unverified information such as in figure 5.



Figure 5. 'Fake news' sample which refers to evidence

3. Headlines (Ct2) – these are text articles, which normally have sensational news headlines posted or shared but when clicked to read the content does not actually contain about the headline.
4. Mind conditioning (Cx2) – these are some shared information in the internet which conditions the readers to agree in the current political, economic or social climate. Some of the examples given by the participants were on the government's war against drugs, inflation rate and by the government officials themselves.



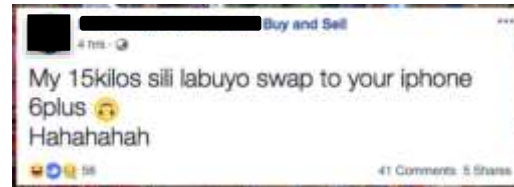
(a) a government official justifies disinformation, account from Rappler



(b) propaganda on Tokhang to be implemented in school campuses



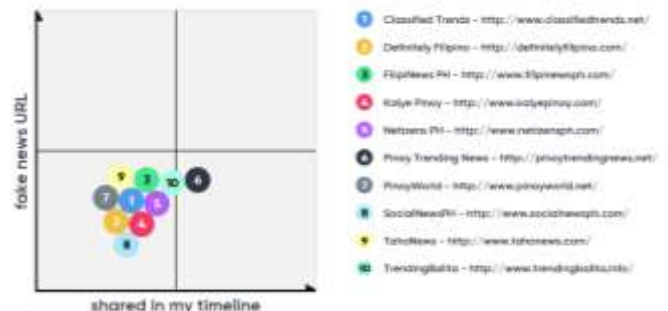
(c) Circulating photos in facebook on inflation of the price of 'sili' © Photo from Inquirer.net



(d) Posts of Facebook Users about the inflation of 'sili' prices

Figure 6. 'Fake news' sample on mind – conditioning.

5. Opinion (Ct3) – respecting the freedom of speech, the participants viewed that false or baseless accusations which sometimes posted or shared in social media are purely opinion which has been perceived by the readers to be factual. The participants recognize the very thin distinction between news facts and opinion. Misinformation and disinformation are viewed to ripple from irresponsible individuals who could be in the government or other social media users creates confusion or even fraud.
6. Intentions (Cx3) – the purpose of liking, posting and sharing information in social media despite of the knowledge that contents and other information are biased, manipulative and no supporting evidences. For politics, the participants determined that it is very dynamic since these shared information in social media could either to boost up the image of a politician or to destroy the opponent.
7. Users (Cx4) – these are individuals who use social media either as an authentic personal account, poser or digital influencers to gain money from their online activities. 'Fake news' in this case depends to the user, sharer or the



receiver.

Figure 7. Frequent URL shared in Social Media with 'Fake News'

In figure 7, the participants identified that Pinoy Trending News most frequently appeared to their social media timeline and tagged to be fake news. These URLs were stripped by facebook recently. On the other hand, only few of the participants recognized that SocialNewsPH is a URL which posts 'fake news'. From figure 7, it can be noted that the participants were not able to highly recognize the internet sites as spreading 'fake news'. This support to the claim the gen Z are vulnerable to the exposure of 'fake news in social media' but it is difficult for them to recognize it [11].



Figure 8. Trending topic of 'Fake News'

Figure 8, shows that the most trending 'fake news' topic is about Pres. Duterte but most frequently appearing on their social media account is about Philippines and China. Recently, the participants noted that most frequently appearing topic in their social media is the replacement of Korean with Filipino, which reports are said to be misleading.

### ***Emerging Definition on 'Fake News'***

'Fake news' is a shared social media post either text, image, or video which contains false information, fabricated ideas or facts which intends to defame or attack the integrity of a person, group or an institution relative to the user, sharer or receiver.

Most of the gen Z social media users would opt to believe a posted or shared article even if it is fabricated, distorted or contain

alternate facts because they tend to be bias on a person or a trending societal issue.

### ***On Proliferation of 'Fake News'***

The participants have identified at least four perceived factors on the proliferation of 'fake news'.

1. Belief or Bias – it refers to the prior knowledge of the issue, engagement of the societal issue and personal bias on the said topic. The participants believed that people would actually share immediately any article that appears to be boosting the image of those political persons whom they support. They tend to be bias also on a person, if the person posts a blog or a video; they tend to judge that it is 'fake news'.
2. Authority – the participants identified the government officials, elders within the family and their teachers who are their social media friends to be still in authority of determining the article to be fake news or not. When teachers posts, some of the gen Z automatically reposts it.
3. Scientific Knowledge – the gen Z participants have recognized that those who have vast scientific knowledge would tend to outweigh the contents of the article than any other factors before sharing. The participants suggest that detecting 'fake news' is also an experimentation process.
4. Visual Effect – the gen Z does not believe that all articles either posted or shared in the social media suspected to be 'fake news' have poor grammar and visual appearance. The participants have noted that some containing fabricated stories have grabbed the pictures or have appealing texts that would catch the



attention of the readers and appear to be true to them.

***Information Sharing in Social Media***

The participants have agreed in common that the social media becomes an instrument of lies and false information. The gen Z actually posts only on topics of their interest and usually does not include some societal issues. A lot of the participants actually don't read the contents of the articles with respect to the societal issues and their understanding to some of these issues in the country are shallow.

Gen Z is more concerned with digital marketing, new technologies in the market, movies, blogs about fiction and some listening to podcasts. The participants' strategies of sharing the information in the social media are posting on their own timeline, sharing posts, reposting, videos or blogging.

The participants do not see that 'fake news' is a national concern since they know that 'fake news' has been proliferating even before there was a social media. They suggests that media literacy must be extensively taught in schools to make sure that pure and authentic information are being shared and received by the social media users.

The participants assumed that 'Fake news' is still shared by the social media users because it is a money generating strategy. They assumed that there are paid online "trolls", volunteer keyboard warriors and digital influencers, which consciously maintain the political climate of the Philippines. Gen Z believed that the main reason of 'fake news' is the people engaging politics.

***Metrics and Determinants of 'fake news'***

Table 1. Gen Z Metrics to determine 'fake news'

	Code
Reliability of Websites	St1

Contents of the Article	Ct1
Grammar	Sm1
Coherence of the topic	Sm2
Biases of the Authors	Cx1
Credibility of the source	Cx2
Legitimacy of the site	St2
Date and place of publication	Ct2
Cross – references/ links	Cx3
Thinking Critically	Us1
Substantial content	Ct3
Design of the website	St3
Manipulative	Cx4
Integrity/Dignity Attack	Cx5
Contradicting Title and Content	St4
Illogical	Cx6
Propaganda	Cx7
Hearsay	Cx8
Photoshop Mistakes in Thumbnails	St5
Showbiz personalities Topic	Ct4
No idea about the post	Us2

From table 1, the participants metrics can be categorized into, Content (Ct), Context (Cx), Semantics (Sm), Structure (St) and User (Us).

In the content, the article content itself, the date and place of publication, cross – references or links, and if the topic is in showbiz. These are the initial metrics to be checked to determine if the information is authentic.

In the context, it means the different underlying circumstances about the article. It includes the biases of the author, credibility of the sources or the links that were used also, if the article does not appear to be manipulative, if the article does not convey attack to the integrity or dignity of the person, if it has logical contents, if it is just a propaganda or political smearing, and purely hearsay. In the initial appreciation of the content, the social media user must be able to determine the context on which the information included in the article posted.

In semantics, it includes the grammar and the coherence of the ideas on which the article is written. It can be noted that ‘fake news’ would contain many grammatical errors and basic information were not present in the article.

The next is the structure, this is in terms of the architectural layout of the website itself. The reliability of the web site if it does not produces hoax, not a money generating web sites but it can be noted that even the digital platforms of the media companies of the country is not free from bogus or distorted reporting of news. Legitimacy, design, title to content contradiction, and mistakes is photo editing are the other metrics on which the gen Z used in determining if it is a ‘fake news’.

The other important category in determining ‘fake news’ is the characteristics of the user. The interface and the content may be invalid but if the social media user accepts the veracity of the information despite of the suspicious contents based on the four metrics, ‘fake news’ will still be able to be shared and continue to proliferate in the different social media platform. The are two themes arouse in the user category: (1) thinking and may be the thought process of the user itself, this will be used to provide good judgment of the shared information; (2) knowledge of the topic, this would entail the ideas of the social media user about the topic or the solid understanding of the issues being posted or shared. Opinions and personal views must be very clear when users posts some information. Another note on which the gen Z has identified is the real intent of the users in liking, reposting or sharing information.

*Sample of participants’ response on their metrics of determining ‘fake news’ from the open – ended questionnaire.*

Destroying other people’s life, no proof, fake articles in 2017. I always see a fake news in social media. Like the death of other celebrity, suspension of classes and ██████████ Articles. But I check first in other articles.

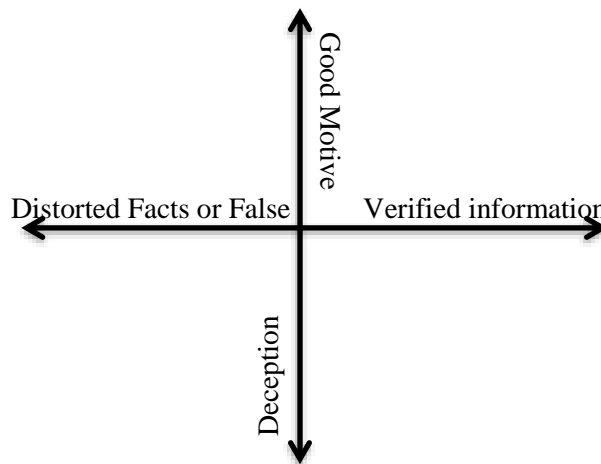
(Participant X)

The name of the person was intentionally deleted in the verbatim to protect the integrity of the person cited by the respondent to be one of the main creator of the current ‘fake news’ in the Philippines.

It can be noted that, the respondent was able to recognize that the start of the proliferation of ‘fake news’ to a large extent is 2017. While the participant was able to identify at least three main topics of 2017 ‘fake news’.

***Socioscientific Perspectives in Ontological Quadrants***

Figure 9, shows the relational ideas between participants’ socioscientific views or perspectives on ‘fake news’.



*Figure 9. Ontological Quadrants on ‘Fake News’*

In the x – axis, it shows the quality of content of the information, while in y – axis involves the context use or the purposes of posting or sharing information in social media.

In figure 9, there are 4 quadrants, and only in the first quadrant can be considered that it is a straight news or pure information. In quadrant three, the participants identified that it is the work of the digital influencers while in quadrant four are for fanatics of individual or

political party. In quadrant two, while motives are unquestionable but the information were distorted and believed due to less knowledge on the topic.

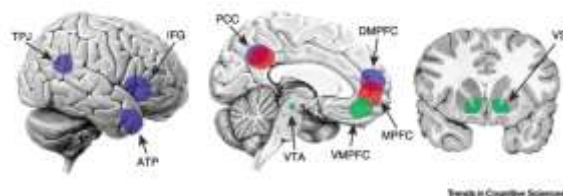
***Neuroscience in Social Media and ‘Fake News’***

The gen Z lived in a life of a media – saturated world with tablets and smartphones has been a way of life [22]. The Philippines Universities and Colleges now provide internet, and computer access. In today’s classroom setting, the students use their smartphone during class discussion or utilized to access different online learning activities. However, Valentine and Kurczek (2016) stated that how students use their access to technology may not be conducive to the learning experience. A lot of college students used their smartphones to engage in non – related classroom activities such as checking email, instant messaging, surfing the internet, playing games and largely browsing and updating their social media [23].

The emerging researches in educational sciences are now geared towards the effects of technology to the different students in terms of their learning and behavior as digital natives. In addition, cognitive scientists and educators are now venturing to the link between social media and the brain functions and structure [24]. Researches in cognitive neuroscience recently used structural and functional magnetic resonance imaging (fMRI) to examine the adolescent brain changes in their cognitive and socio – affective development [22].

The brain regions experiences changes during adolescence since all are used in many aspects of social life. The use of social media is not merely a routine but involves thinking processes about the mental states and motivations of other users, often termed as *mentalize* [24]. It is also likely that social influences – which mostly occur to gen Z as they connect in social media – are particularly potent at this brain developmental stage in coalescence

with the media use [22]. The subcortical brain regions undergo pronounced changes during adolescence. Evidences show that a structure associated with emotional processing (density of grey matter volume in the amygdala) is related to larger offline and online social networks.



*Figure 10.* Proposed Brain Networks Involved in Social Media Use. Extensive neuroimaging research into social cognition with offline paradigms has revealed several key brain networks that may be involved in social media use. (i) The mentalizing network (brain regions in blue): dorsomedial prefrontal cortex (DMPFC), temporoparietal junction (TPJ), anterior temporal lobe (ATL), inferior frontal gyrus (IFG), and the posterior cingulate cortex/precuneus (PCC); (ii) the self-referential cognition network (brain regions in red): medial prefrontal cortex (MPFC) and PCC; and (iii) the reward network (brain regions in green): ventromedial prefrontal cortex (VMPFC), ventral striatum (VS), and ventral tegmental area (VTA). Adapted and lifted, with permission, from Meshi, et. al (2015)[24].

Neuroscientist Odell (2018) analyzed how the three main social media platforms (Facebook, Instagram and Twitter) affecting the human brain. These three main social media platforms were mainly used also by the gen Z participants of the study. One of the features of facebook is “like” which is thought to be connected with the social reward pathway in the brain. In the results, it shows that when using facebook the brain shows activation of the amygdala and the striatum, the two areas significantly associated with addiction (digital cocaine) but there was no evidence of activation in lower prefrontal areas of the brain, which is associated with substance addiction [25].

Younger people look and are conscious with the number of likes or loves on Facebook because they provide vanity metrics that provide positive or negative reinforcement about their social capital.

In Instagram, neuroscientists associated that posting pictures is associated with feelings of loneliness. Functional MRI studies of teenage brains show increased activation in the virtual cortex of the brain when viewing a photo with a significant number of likes versus photo with less likes [25].

Users of Twitter were less likely to be swayed by false information. When the participants were focused more on crafting retweetable content, the temporoparietal junction of the brain works. The temporoparietal junction (TPJ) is associated with mentalizing or understanding how others think and feel [25].

Hambrick and Marquardt (2018), identified a major risk factor for pernicious effects of misinformation. There are dissociation effects on the mind of those who were exposed to 'fake news' after it is being debunked [26]. The effects on the belief of 'fake news' would depend on the cognitive ability of the person. Persons with higher cognitive ability tend to regulate the workings of their "working memory", not easier to be swayed by 'fake news'. The literature claimed that education is positively correlated in their ability to detect 'fake news' and age also serves as a predictor of their vulnerability to 'fake news'. Younger and people with advanced ages are more vulnerable to 'fake news'.

The results of the study need to be addressed in Science, Technology and Society. 'Fake news' should be dealt in using socioscientific approaches in teaching and learning.

## **CONCLUSION AND RECOMMENDATION**

The participants defined 'fake news' according to its content and context; the emerging definition is, it uses false or distorted information to deceive the social media users. It is a misnomer since news must be accurate, timely and verified. There were seven themes as

we categorize the definition and views of the respondents on 'fake news', includes attack, evidence, headlines, mind conditioning, opinion, intentions and users. The perceived factors on the proliferation of the 'fake news' in social media are the beliefs and bias of the originator of the posts, authority – based information source, scientific knowledge and on the visual appearance of the posts or shared information. A comparative analysis can be conducted on time of exposure on social media, frequency of 'fake news' detected or analyzed on their timeline and on their cognitive abilities.

Metrics and determinants of 'fake news' by the participants are categorized also in terms of the content, context, semantics, structure and the user – receiver. It is also proposed that a contextualized metric system or algorithm for young Filipinos must be developed as a model, which should be included the discussion of science, technology and society. Logical – mathematical metrics may be further studied and developed that will be suited for the Filipino learners.

'Fake news' is continuously proliferating in the different social media platforms due to the belief of the presence of fake accounts working as digital influencers to deceive the social media users with the distorted facts.

The literature in neuroscience conveyed that exposure to 'fake news' could affect the cognitive ability of those who were always exposed. This study proposes that an actual experimental research among Filipino learners will be conducted on the actual effects of the presence of 'fake news' on their social media account.

## **REFERENCES**

- [1] The Gutenberg Revolution. *What's new, new media?*. Available at [http://newmedia.wikia.com/wiki/The\\_Gut](http://newmedia.wikia.com/wiki/The_Gut)



- [enberg Revolution](#). Retrieved last October 5, 2018.
- [2] Renwick, M. (2018). Helping Students Search for Truth in an Era of ‘Fake News’. *Front and Central*. Available at <http://frontandcentral.com/k-12-trends/students-struggle-search-truth-era-fake-news/>. Retrieved dated October 1, 2018.
- [3] Kumar, S. & Shah, N. (2018). False Information on Web and Social Media : A Survey. 1,1, 35 pages. <https://doi.org/10.1145/nnnnnnn.nnnnnnn>
- [4] Hosseini, Pedram & Diab, Mona & Broniatowski, David. (2018). False News on Social Media. 10.13140/RG.2.2.35434.57285.
- [5] Mashable Asia. *Global Digital Snapshot*. Available at <https://mashable.com/2017/08/07/3-billion-global-social-media-users/>. Retrieved last October 30, 2018.
- [6] Rappler.com. The Profile of the Internet Users in the Philippines. Available at <https://www.rappler.com/brandrap/profile-internet-users-ph>
- [7] PhilStar Global. *Pulse Asia: 88% of Filipino internet users aware of fake news on social media*. October 10, 2018. Available from: <https://www.philstar.com/headlines/2018/10/10/1858917/pulse-asia-88-filipino-internet-users-aware-fake-news-social-media#osm5EFakMIGGEpt5.99>
- [8] Figueira, A. & Oliveira, L. (2017). The current state of Fake News: Challenges and opportunities. *Procedia Computer Science*, 817-825. Available at [www.sciencedirect.com](http://www.sciencedirect.com)
- [9] Science Curriculum Guide (2013). K to 12 Resources. [www.deped.gov.ph](http://www.deped.gov.ph)
- [10] Shu, K., et. al. (2017). Fake News Detection on Social Media: A Data Mining Perspective. *Explorations Newsletter*. Available at arXiv:1708.01967v3
- [11] Stahl, K. (2018). Fake News Detection in Social Media. Available at [https://www.csustan.edu/sites/default/files/groups/University%20Honors%20Program/Journals/02\\_stahl.pdf](https://www.csustan.edu/sites/default/files/groups/University%20Honors%20Program/Journals/02_stahl.pdf)
- [12] Cherry, K. (2018). The Misinformation Effect and False Memories. *VeryWellMind*. Available at <https://www.verywellmind.com/what-is-the-misinformation-effect-2795353>
- [13] The Manila Times. *Fake News in PH: Here's the real story*. February 15, 2018. Available at <https://s14255.pcdn.co/wpcontent/uploads/2014/11/saludo1.gif>. Retrieved last October 24, 2018.
- [14] BBC, N. *The rise and rise of fake news*. BBC Trending 2016; Available from: <http://www.bbc.com/news/blogs-trending-37846860>.
- [15] Nations, D. (2018). Lifewire. *What is Social Media?*. Available at <https://www.lifewire.com/what-is-social-media-explaining-the-big-trend-3486616>. Retrieved last October 15, 2018.
- [16] Ratner, P. (2018). Big Think Edge. *Why the Era of Social Media is due come to an End?*
- [17] Reachout.com. *Benefits of Internet and Social Media*. Available at <https://schools.au.reachout.com/articles/benefits-of-internet-and-social-media>. Retrieved last October 10, 2018.

- [18] LifeWay. *10 Traits of Generation Z*. Available at <https://factsandtrends.net/2017/09/29/10-traits-of-generation-z/>. Retrieved last October 10, 2018.
- [19] Singh, K. (2007) “Quantitative Social Research Methods” SAGE Publications, p.64 Retrieved in <https://research-methodology.net/research-methodology/research-design/exploratory-research/> last October 25, 2018.
- [20] The Global Web Index. The latest social media trends to know in 2018. Available at <https://www.globalwebindex.com/reports/social>.
- [21] CMO 20. Series of 2013. General Curriculum: Holistic Understandings, Intellectual and Civic Competencies. Available at <https://ched.gov.ph/wp-content/uploads/2017/10/CMO-No.20-s2013.pdf>
- [22] Crone, E. A. & Konijin, E. A. (2018). Media Use and brain development during adolescence. *Nature Communications*. 10.1038/s41467 – 018 – 03126 – x.
- [23] Valentine, A. & Kurczek, J. (2016). “Social” Neuroscience: Leveraging Social Media to Increase Student Engagement and Public Understanding of Neuroscience. *Journal of Undergraduate Neuroscience Education*, 15(1), 94 – 103. Retrieved at <https://www.reserachgate.net/publication/312065230>
- [24] Meshi, D., Tamir, D. & Heekeren, H. (2015). The emerging neuroscience of social media. *Trends of Cognitive Sciences*, 19(12), 771 – 782. Retrieved at <https://doi.org/10.1016/j.tics.2015.09.004>
- [25] Amerland, D. (2018). The Sniper Mind. Neuroscience of Social Media Engagement <https://thesnipermind.com/blog/the-neuroscience-of-social-media-engagement.html>
- [26] Hambrick, D. Z. & Marquardt, M. (2018). Cognitive Ability and the Vulnerability to Fake News. *Scientific American*. Available at <https://www.scientificamerican.com/article/cognitive-ability-and-vulnerability-to-fake-news/>