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---

[HOME](#)

---

[PREFACE](#)

---

[ARTICLES](#)

---

[AUTHORS](#)

---

[SESSIONS](#)

---

[ORGANIZERS](#)

---

[PUBLISHING INFORMATION](#)

---

---

[< PREVIOUS VOLUME IN SERIES](#)[NEXT VOLUME IN SERIES >](#)

---

On behalf of the organizing committee of the 2nd TICASH 2020, I would like to welcome all to this event with great pleasure. The 2nd TICASH 2020 has attracted many academicians, scientists, engineers, postgraduates and other professionals from many countries. The aim of the conference is to promote exchange of ideas among researchers and scientists active in the related areas of social science and humanity. It presents a high-level international forum to introduce, to exchange and to discuss recent advances, new applications in the field of Social Sciences and Humanities.

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---

[HOME](#)

---

[PREFACE](#)

---

[ARTICLES](#)

---

[AUTHORS](#)

---

[SESSIONS](#) ▼

---

[ORGANIZERS](#)

---

[PUBLISHING INFORMATION](#)

---

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HOME

---

PREFACE

---

ARTICLES

---

AUTHORS

---

SESSIONS 

---

ORGANIZERS

---

PUBLISHING INFORMATION

---

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HOME

---

PREFACE


---

ARTICLES

---

AUTHORS

---

SESSIONS 

---

**ORGANIZERS**

---

PUBLISHING INFORMATION

---

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HOME

---

PREFACE


---

ARTICLES

---

AUTHORS

---

SESSIONS 

---

**ORGANIZERS**

---

PUBLISHING INFORMATION

---

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## Proceedings of the 2nd Tarumanagara International Conference on the Applications of Social Sciences and Humanities (TICASH 2020)

[HOME](#)[PREFACE](#)[ARTICLES](#)[AUTHORS](#)[SESSIONS](#)[ORGANIZERS](#)[PUBLISHING INFORMATION](#)[+ Advanced search](#)

182 articles

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HOME

---

PREFACE


---

ARTICLES

---

AUTHORS

---

SESSIONS 

---

ORGANIZERS

---

PUBLISHING INFORMATION

---

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### The Urgency of Government Regulations in Substitute of Law About the Drone Usage Regulation

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This study aims to look at the construct validity of the Indonesian version of HCL-33, namely (1) factor loading per dimension and overview of HCL-33 Mean (positive response) in Bipolar Disorder participants and MDD participants. In addition, this study (2) wanted to see the reliability (Alpha Cronbach),...

- [➤ Article details](#)
  - [➤ Download article \(PDF\)](#)
-

HOME

---

PREFACE


---

ARTICLES

---

AUTHORS

---

SESSIONS 

---

ORGANIZERS

---

PUBLISHING INFORMATION

---

#### Proceedings Article

### The Impact of the Vacancy of Vice-Regent to the Performance of Rokan Hulu Regional Government

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  - [Download article \(PDF\)](#)
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### Communication Network in Reducing Uncertainty

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-



# Communication Network in Reducing Uncertainty

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## ABSTRACT

Individuals experience a condition of uncertainty when they are entering a new environment. In this study, the individuals will refer to freshmen or first-semester university students. When freshmen enter the university for the first time, they haven't recognised each other, hence the condition of uncertainty will arise within them. These uncertainties are reduced by creating online and offline networks in which the members share the same experience. Networking will help individuals to decide whether they should end or continue their relationship with other members. This research point out a problem regarding how freshmen use network communication not only to reduce uncertainty but also the roles of actor within them. In the Uncertainty Reduction Theory, Charles Berger introduced the axiom of shared networks in developing relationship to reduce uncertainty. Individuals recognized each other, and decide whether they will maintain their relationship based on the communication network. By using qualitative approach combined with network analysis and interview method, the current research discovered the importance of dominant/central actor's role in reducing the uncertainty in a network. The dominant actor will have the goal to distribute information, remind the urgency of an information, and help the implementation of the information. The research also concludes the importance of friendship in a smaller group in reducing uncertainty.

**Keywords:** *uncertainty reduction theory, network communication, network analysis, freshmen*

## 1. INTRODUCTION

Communication network is an important element to consider whenever an individual is exchanging information to reduce uncertainty. Such case frequently occurs when an individual is entering a new job or organization, learns new ideas, or when they are encountering a recent event which has just occurred [1]. For instance, on August 4<sup>th</sup> 2019, a twenty-four hours power outage occurred in Jakarta and some parts of Java. The people living in the affected areas were unable to access news about the blackout due to no electricity, but they managed to get their hands on the information about the PLN (Perusahaan Listrik Negara/ State Electricity Company) blackout from their personal network, subgroup or instant message group network, despite the virtual network was not going well when the incident happened. This shows that the membership of a person in a network, as well as the information contained can reduce uncertainty.

A similar case of information uncertainty will also occur when an individual is entering a new environment, whether they are meeting new individuals or rules. Later on, individuals will try to reduce the uncertainty through networking. The Uncertainty Reduction Theory developed by Charles Berger and Richard Calabrese is an appropriate theory to describe this situation as the theory focuses on how humans communicate, and how the communication is used to gain knowledge and understanding. Berger states that when two people who have not recognised each other

meet for the first time, the first thing that they do is to appraise their interlocutors. The onset of a connection will be filled with doubt. One of the axioms in this theory is that when two foreigners are meeting for the first time, their main concern will be to reduce the uncertainty or increase the prediction of each other's behaviour in interactions [2]. Such uncertainty condition will also occur in school when a student is making friends with other students. In higher level education, the freshmen from various schools, regions, and backgrounds have to socialize, interact, and cooperate both inside and outside the class. The freshmen are compelled to adapt amid such uncertainty, as they do not know each other.

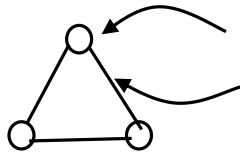
According to DeVito, all kinds of relationship contain uncertainty [3]. A high uncertainty level would create a gap with other individuals, whereas a low uncertainty would unite the individuals. When a communicator finds something in common with the recipients of messages, the interest level of each other will increase, and the need to gather more information of each other will decline [4]. Therefore, individuals will think and behave at the moment they begin communicating with each other to reduce the uncertainty towards the foreigners in the beginning of their meeting (West & Turner, 2017; Griffin, 2009).

The fact that one of the ways to reduce uncertainty is by creating a network because it indicates the negative relationship between uncertainty and social network interaction. It means that as the interaction with friends and

family members increases, the uncertainty that a person experience decreases [5]. The decreasing uncertainty is characterised by a number of clarifications and agreements [6].

A social network is a network that consists of individuals, and at some points, a group of individuals [7]. Currently, the world is entering a phase where an individual is connected with networks. Individuals, groups, and organizations are not constrained by time and space due to the development of communication and information technologies. A communication network is a technical network which is created by people to interact communicatively [8].

A network, in the simplest form is a collection of points that combine and pair with lines. A point is known as vertices, nodes, or vertex, and line is known as edges. A small network consist of eight vertices and ten edges [7]. A node can be an individual, group, organisation, or a set of entity that is properly defined. A relation can be in the form of communication, influence, interpretation sharing, or transfer of tangible or symbolic resources [9], and a link is a communication relation between two units (mostly individuals, although nodes can be groups, organisations, nations, etc.) in a system. A link usually attaches a trait to a relation [8].



**Figure 1** Small network [8]

A network starts from an individual relation, which is a starting level. Afterwards, an individual creates ties with family members, friends, acquaintances, neighbours, colleagues, etc [8]. A network operates based on, among others, the personal preferences, patterns of behavior, and opinions of its members. Kadushin and Peter Blau use the term “social cycle” to refer to the groups which are created from individual interactions [10].

A communication network consists of interconnected individuals connected by a patterned communication flow. The way to depict the linkage, which is created by information sharing, and interrelationship in an interpersonal communication structure, is done by analysing a communication network which might contain *clique*, *liaisons*, *bridge*, *isolates*.

*Cliques* are defined as a subsystem containing elements that interact with each other more frequently than the other members in one communication network. Some network experts treat the term “group” and “clique” as a synonym. A group is a relatively small number of individuals that share common identification, tend to be direct, and communicate through face-to-face interaction.

*Liaisons* are defined as an individuals that link two or more cliques in a system without becoming a member of any clique. *Liaisons* have a specific quality that accommodates its unique function. The *in-between* trait of *liaison* is an ideal trait to facilitate the information flow from one clique to another.

*Bridges* are defined as individuals that link two or more *cliques* in a system from its positions as one of the *cliques* members. Harary et. al. define *bridge* as a link that provides the one path between two individuals in a network. Granovetter prefers the term “*local bridge*” for the *link* that becomes the one path between two individuals from different local groups in a network. Nonetheless, Rogers and Kincaid refer *bridge* as an individual, not a *link* [1].

In a social network, there is a role of actor that interacts with the other to deliver meaning (symbol, ritual, story) that builds and strengthens their identities [11]. There are actors who are the center of a network (*star*), actors who have two or more connections (*liaison*), and even actors who have no connection at all with the other actors in a network (*isolate*) [1].

In this study context, the freshmen create a communication network or a technical network to reduce uncertainty that they encounter during their interaction and throughout their study. Indonesians are used to interact on mobile phones through instant messaging platform such as WhatsApp dan LINE. The same case also occurs to university students. Based on the results of a survey to high school students in Jakarta, Line is the most-used instant messaging platform among students, followed by WhatsApp, BBM, and WeChat [12]. After graduated from high school, students still use the same platform to communicate with friends. Through these platforms, the university students created a network to share information with each other.

Based on the foregoing backgrounds, the research questions of the current study are as follows: *first*, how do individuals create a communication network to reduce uncertainty? *second*, what are the roles of actors in those communication?

This research aims to understand how individuals use communication network to reduce uncertainty, as well as the role of actors in the network. The individuals in the current study refer to freshmen.

## 2. METHODOLOGY

The current study will apply both qualitative and quantitative methods, or usually referred to as a mixed method. The researcher will apply the procedure of *sequential mixed methods* in which the researcher will elaborate or expand the findings from one method with those of another method. The first procedure of this mixed method research is to collect the data in order to gather information about the participants’ behavior. The data collection is also carried out by visiting the research location and observing the participants’ behaviour against predetermined questions, or by doing an interview in which the interviewees are allowed to speak

openly about a topic [13]. The current study begins by applying a quantitative method in which the theory or the concept will be tested. The theory used is the Uncertainty Reduction Theory, and the concept will be a communication network. The communication network will act as an independent variable or the cause of a behavior or trait, or the factor that drives the emergence of a phenomenon.

The current research uses a communication network analysis method to describe and explains a social network and a network structure. Network analysis has perspective, assumption, a data collection technique that differ from other methods. A communication network is viewed as a research strategy in understanding phenomenon or reality. The position of an actor is defined from the position of the other actors in a structure. The actors can take a different position if they are in a certain structure [14]. This study aims to examine the network structure of a friendship among freshmen in the same class, and who the dominant actors in the network are.

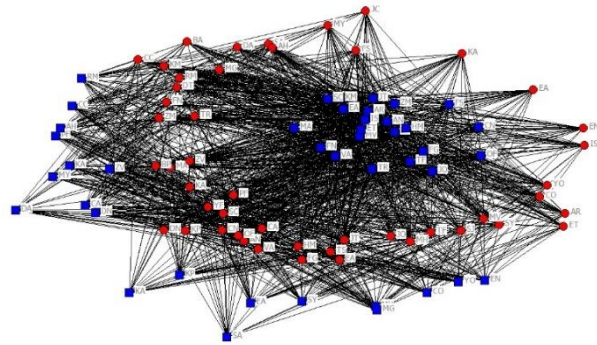
Based on the theoretical framework, the researcher selects the population by using a nominalist approach. Adhering to the uncertainty reduction theory, the network members in the present study are limited to freshmen in the same class. The population in this research are the freshmen at Universitas Tarumanagara in Jakarta, Indonesia. The sampling is drawn from the population by taking the whole members of a small group (small group sampling).

The participants of this research are the freshmen of 2019/2020 academic year, class A from Communication Science Faculty. The participants consist of 46 students with 13 males and 33 females. The questionnaire was distributed on Friday, November 15<sup>th</sup> 2019. Then the social network data processing was conducted using UCINET software. The networks analysis was performed to analyze the relation or network from the research objects.

After collecting the quantitative data, the researchers collected the qualitative data using interview, observation, and documentary method. The interview was done by raising an open-ended question and collecting in-depth responses about the participants' experience, perception, opinions, feeling, and knowledge. Observation was done by observing the participants' activities, behavior, actions, conversations, interpersonal interactions, organization, or community processes, or other visible aspects of their experience. Documentary data was obtained from materials or another documents from the program's organisation, clinic, or records; memorandum and correspondence; official publications and reports; personal notes, letters, artistic works, photos and memorabilia; and the responses from the open-ended survey [15].

The researcher conducted the interview to confirm the findings of the network analysis. The selection of the university students and the number of students selected depend on the analysed quantitative data. The interview was carried out face to face.

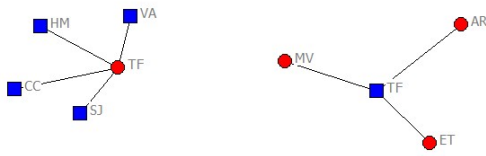
### 3. RESULTS AND DISCUSSION



**Figure 2** A communication network of 46 students of 2019/2020 academic year, class A from Communication Science Faculty, Universitas Tarumanagara, Indonesia.

Figure 2 shows 48 freshmen/actors (nodes) and the relation (link) among them within one week. Nodes refer to individuals. The actors' relation can be seen from the questionnaire item "During 5 days of lectures, how many times do you interact with the following friends (write 0-5)?" Figure 2 shows that there are 1,578 relations in total. The form of the relation is undirected, meaning that there is no sender and recipient as both actors have similar roles. The examples of such relations are group discussion, group learning, outdoor activities, so there is no subject and object. Based on network analysis results, the researcher classifies the network based on five network patterns, namely: 1) a communication network in giving information about lectures, 2) a communication network in reminding course assignments, 3) a communication network in dealing with the difficulty of lecture materials, 4) a communication network in going to the canteen, 5) a communication network in hanging out together (outside the university); choosing a friendship network (continuing/staying in the network, or exiting the network).

After being processed, the data is presented in the form of frequency distribution of relations (ties) in a descending order of 1-5 with 1 being the pattern with the largest number of ties. From the relations of the actors, the researcher conducted an interview to three actors: TF, HM, and SJ.



**Figure 3** A network of actor TF in going to the canteen

### 3.1. Relation Intensity

The results of this study show that actors – or in this case, university students – who have high relation intensity in a network are characterised by several traits. The researcher classifies the traits as follows:

- a. Attractive personality: easy to get along with, friendly, easy to mingle, be the first to greet their network members or friends, caring, frequent sharing of positive feedback and opinions
- b. Similarities: similar friends, similar route to their residence, similar activities
- c. Acquaintance of one another.

In addition, actors with high relation intensity in a network have a personality of frequently sharing their thoughts.

### 3.2. Dominant Actors in Reducing Information Uncertainty

The results of this research show that in order for information to be effectively delivered to network member, someone/parties of interest in the network can rely on to the actors who occupy an important position in the network as the actor’s role is to give information.

The actors who occupy an important position in the network have different goals they wish to achieve. In this case, the researcher classifies the goals as follows:

- a. Dominant actors whose aim to distribute information, such as: 1) actors who have the role or act as leaders, e.g. class president, class vice president; 2) actors who are actively engaged in non-academic activities; 3) actors who constantly visit the faculty’s official accounts (website, social media); 4) actors who always take notes in class, make notes on exam schedule, and share information.
- b. Dominant actors whose aim is to remind others of information, such as: 1) actors who are tech-savvy and frequently check the university’s website for information- especially about e-learning courses; 2) actors who have close relationship with the parties of interest (the professors) – as the ask questions frequently; 3) actors who have a position (class presidents) or have experience as a leader; 4) actors who are active and trusted by their clique to provide them with information.

- c. Dominant actors whose aim is to help the implementation of information. In this case, dominant actors are asked for help to ensure that the information is well implemented or to reduce uncertainty of information in a network. Such actors are: 1) actors who always take notes, 2) actors who always ask questions, and 3) actors who have ability/skill on certain courses. On the other hand, there are actors who have never been asked for help, such as 1) actors who have a job, 2) actors who change their network (e.g. actors who have just changed their faculty/major), 3) passive actors or actors who rarely gather with network members (e.g. actors who frequently skip classes), and 4) actors who frequently ask for help from their network members.

A communication network reveals the position of each actor, including the most powerful and decisive position which acts as a trusted source of information for the whole network members. Actors who take a certain position in a network structure will play a certain role. These actors are what we call dominant actors or actors who can reach out to the whole network. The domination is created through the relations among actors that cause one actor to be seen as more important than the other actors. The current research shows that the more active an actor is, the more central his/her role will be.

### 3.3. Reducing Uncertainty through Clique

Cliques are defined as a subsystem containing elements that interacts with each other more frequently than the other members in one communication network. Some network experts treat the terms “group” and “clique” as a synonym. In a group, individuals share common identification, tend to be direct, and communicate through face-to-face interaction [1].

The current research finds out that there are some criteria, whether purposeful or not, that cause actors to join a certain clique. The criteria are:

- a. A clique is formed when two actors meet. Then one of the actor asks another actor to join, and the other actor is now in the same clique.
- b. In this digital communication era, cliques are formed out of the similarities of responses/opinions in a virtual group. These similar response prompt the formation of cliques in a virtual network, which will later extend to a face-to-face communication network.
- c. Cliques are formed out of similarities. For instance, having a similar family culture that can make an interesting conversation, taking the same way home, having mutual friends, high school buildings in the same area, having similar socio-economic status, all can lead to the formation of cliques.
- d. Cliques are formed because of personalities, such as, easy to get along with, humorous, simple, supportive, and productive.

Despite being in the same clique, clique members might not share the same closeness and approach. For instance, in a clique with actor A, B, C, and D, actor A may talk more about assignments with actor B, but actor A may talk more about a person that he/she likes with actor C, and more about his personal life with actor D.

### **3.4. The Search for Information in reducing Information Uncertainty**

Uncertainty reduction theory highlights information searching strategies as the main mechanism to reduce the uncertainty in interpersonal communication [16]. Such uncertainty raises individuals' need for networking. As a result, Berger considers shared networks as one of the main variables in developing a relation. Shared communication network can reduce uncertainty, whereas lack of shared communication network can increase uncertainty [2].

In the current study, after conducting the observation, the researcher interviewed the actors in one clique about the reasons why the network members maintained or stopped their relation with each other. The results also reflect the three phases of communication development. The first phase is when actors identify the similarities that they have in common, the second phase is when actors predict whether the relationship will develop into a higher level, and the third phase is when the actors appraise the value and decide whether to continue or to exit the relationship [16].

- a. Continuing the relation  
The actor in the network decides to continue a relation if the network members: 1) bring positive impacts on the actor's social life, study, or personality; 2) have similar socio-economic status; 3) have responses or opinions which fulfil the actor's expectancy (empathizing, trustful, not demanding, not judging)
- b. Leaving the relation  
The actor in the network decides to leave a relation if the network members: 1) have the same traits of the past network members who bring negative impacts on the actor; 2) bring negativity to the actor (turning them to become lavish, undisciplined, and noisy in the class); 3) has no similarity in socio-economic status or personality.

## **4. CONCLUSION**

In a new environment, where individuals have not recognised each other, the information uncertainty is high. The information uncertainty can be reduced by creating online and offline networks. The member in the network will have the same positions. Nonetheless, there are still dominant actors playing important roles in the network. The central/dominant actor has three roles in reducing the uncertainty in a network, which are to distribute information, to remind others of information, and finally to

help the implementation of information. This central actor tends to have a good performance. The relation built by such actor not only builds communication, but also influences the other members.

The current research also brings a conclusion to how important friendship is in a smaller group. This group is formed by many factors, such as being invited by friends, having similar opinions in an online or virtual communication network that extends to an offline communication network, having similarities (culture, way home, friends, socio-economic status, school), and possessing matching personalities. Nonetheless, group members might not have the same closeness and approach as the other members. Based on the observation results, network members will eventually decide whether to continue or leave the relation.

The present study can be further researched by focusing on a network which is centralised in some actors or in one actor (ego network). If communication network analysis at the actor level (single) is to be performed, the center of the attention should be the actor of a network.

## **ACKNOWLEDGMENT**

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