



**University of Jember**  
Faculty of Teacher Training and Education



UNIVERSITAS  
JEMBER

# PROCEEDINGS

## 3rd ICEGE 2020

The Third International Conference on Environmental Geography  
and Geography Education

September 12<sup>th</sup> - 13<sup>th</sup>, 2020

at Faculty of Teacher Training and Education, University of Jember

PAPER • OPEN ACCESS

## Preface

To cite this article: 2021 *IOP Conf. Ser.: Earth Environ. Sci.* **747** 011001

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The Electrochemical Society

Advancing solid state & electrochemical science & technology

The ECS is seeking candidates to serve as the **Founding Editor-in-Chief (EIC) of ECS Sensors Plus**, a journal in the process of being launched in 2021

The goal of ECS Sensors Plus, as a one-stop shop journal for sensors, is to advance the fundamental science and understanding of sensors and detection technologies for efficient monitoring and control of industrial processes and the environment, and improving quality of life and human health.

*Nomination submission begins: May 18, 2021*



## The Third International Conference on Environmental Geography and Geography Education (ICEGE) 2020

### **Sumardi**

Editor in Chief of International Conference on Environmental Geography and Geography Education 2020

E-mail: [sumardi.fkip@unej.ac.id](mailto:sumardi.fkip@unej.ac.id)

We would like to express our gratitude to all participants joining “The International Conference on Environmental Geography and Geography Education” (ICEGE). The 3<sup>rd</sup> International conference held by the Department of Social Science Education held by FKIP-University of Jember on 12-13 September 2020. The participants of this ICEGE 2020 are research students, academicians and researchers, scholars, scientist, teachers and practitioners from many countries.

Due to Covid-19, this conference was held in dual-mode, namely online and face to face. For those invited speakers from abroad who have travel restrictions presented their research topics through zoom cloud meeting. Likewise, participants who stay outside Jember city joined the conference virtually. Meanwhile, participants from within Jember city joined conference in person by complying the Covid-19 protocol.

Two hundred forty-eight participants attended this conference. The number of submitted papers were 219 and papers sent to the reviewers were 198. Two reviewers reviewed one paper. Each reviewer reviewed maximum 8 papers. Based on reviewer recommendations, finally the number of accepted papers is 130. Thus, the acceptance rate is 59,4 %.

In the plenary season, each invited speaker presented their presentations for 1 hour and 15 minutes for Q/A session. In the parallel session, each participant made the presentation for maximum 15 minutes and 5 minutes for Q/A session. The technology used in the parallel session is zoom cloud meeting with 13 breakout rooms.

This conference becomes a dissemination forum for scientists working on theoretical and empirical research of environmental geography, transportation geography, geography education, social science and its application. This conference's mission is to become an annual international forum in the future, where civil society organization and representative research students, academics and researchers, scholars, scientists, teachers, and practitioners from all over the world could meet and exchange an idea to share and discuss about research. The aim of the second conference is to present and discuss the latest research that contributes to the new ontological, epistemological and axiological knowledge and



to a better understanding in the area as follows:(1) Environmental Geography; (2) Geography Information System and Remote Sensing; (3) Geomorphology; (4) Natural Disaster; (5) Economics; (6) History; (7) Education; (8) Humanities; (9) Social Sciences and (10) Global Science and Studies.

On behalf of the organizing committee, finally we gratefully acknowledge the support from the FKIP-University of Jember of this conference. We would also like to extend our thanks to all lovely participants who have been joining this unforgettable and valuable event.

Assoc. Prof. Dr. Sumardi, M.Hum



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The committees of the Third International Conference on Environmental Geography and Geography Education would like to express gratitude to all Committees for the volunteering support and contribution in the editing and reviewing process.

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## Peer review statement

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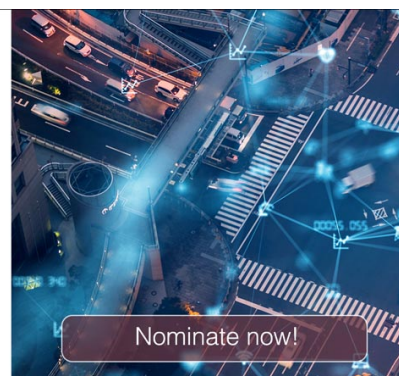
### The Electrochemical Society

Advancing solid state & electrochemical science & technology

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*Nomination submission begins: May 18, 2021*



## Peer review statement

All papers published in this volume of IOP Conference Series: Earth and Environmental Science have been peer reviewed through processes administered by the Editors. Reviews were conducted by expert referees to the professional and scientific standards expected of a proceedings journal published by IOP Publishing.

- **Type of peer review:** Double-blind review. The authors and the reviewers do not know each other. The managing editor send the papers to the reviewers by hiding the authors' name and their affiliation.
- **Describe criteria used by Reviewers when accepting/declining papers. Was there the opportunity to resubmit articles after revisions?** There were 13 aspects of assessment for accepting/declining papers, i.e. Clarity of abstract, Significance of research, Sufficiency state of the art, Contribution to the field (novelty), Research objective, Appropriateness of the research method, Relevance and clarity of drawings, graphs and tables, Experimental/evidential support, Quality of data or findings, Discussion and conclusions, Direction for future research and recommendations, Clarity of English, Writing style (according to EES format). There are no opportunities to resubmit papers after rejection. For the revised papers regarding to reviewer comments, they should resubmit their papers.
- **Conference submission management system:**  
<https://easychair.org/conferences/?conf=icege2020>
- **Number of submissions received:** 219
- **Number of submissions sent for review:** 198
- **Number of submissions accepted:** 130
- **Acceptance Rate (Number of Submissions Accepted / Number of Submissions Received X 100):** 59,4 %
- **Average number of reviewers per paper:** 2
- **Total number of reviewers involved:** 50
- **Any additional info on review process (ie. plagiarism check system):** We used TURNITIN software to check the plagiarism issue during the review process.



- **Contact person for queries:**  
Assoc. Prof. Sumardi, M.Hum.  
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2021

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3rd International Conference on Environmental Geography and Geography Education, 12 September 2020, East Java, Indonesia

Accepted papers received: 12 April 2021

Published online: 12 May 2021

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### Papers

**OPEN ACCESS** Coastal Community Resilience Planning Toward Disaster: A Case Study on Coastal Area in Malang Regency, East Java, Indonesia 012001

Coastal Community Resilience Planning Toward Disaster: A Case Study on Coastal Area in Malang Regency, East Java, Indonesia

L Y Irawan, Sumarmi, S Bachri, M M Rosbella Devy, R Faizal and W E Prasetyo

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Landslides susceptibility mapping based on geospatial data and geomorphic attributes (a case study: Pacet, Mojokerto, East Java)



L Y Irawan, Sumarmi, S Bachri, D Panoto, I H Pradana and R Faizal

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Strategic Value of Marble Mine Management for Community Economic Improvement and Challenges Keeping Sustainable Environmental Support in Tulungagung Regency

Sumarmi and N Wahyuningtyas

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Forming spatial thinking skills of social studies students in phenomenon analysis geosphere through the Geographic Information System (GIS)

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Ecotourism Development Strategies of Pulau Merah Beach, Banyuwangi, Indonesia

Sumarmi, S Bachri, L Y Irawan, A W Sholeha and M Aliman

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**OPEN ACCESS** Development of Supplementary Contextual Teaching Materials Based on Ecotourism and Natural Resource Management 012007

Development of Supplementary Contextual Teaching Materials Based on Ecotourism and Natural Resource Management

A Z Ensiyawati, Sumarmi and I K Astina

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P H Witono, A Prasojo and C Megawati

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Geographical and Historical Potential of Merjosari Water Site, Malang City and Its Utilization as Learning Resources

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## Learning environment technology-based in improving students' independent learning

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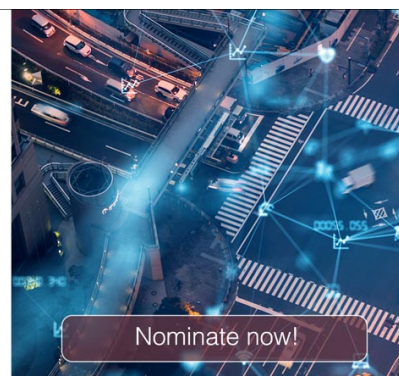
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# Learning environment technology-based in improving students' independent learning

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**Abstract.** Immense technology development in the Industrial Revolution 4.0 has to get rapid. Transformative technology requires educators to equip themselves with digital capacity in applying technology utilization in learning. Currently, learning environment technology-based has become a major trend upon education. Technology provides opportunities for everyone to improve endlessly in enhancing students' learning independence. Technology plays a significant aspect in providing various learning sources that encourage students to be more active, creative, innovative, and independent. Research sample being studied was 34 students of SMA in Jember district. Data collection technique used was the questionnaire. Data processing was engaged SPPSS for windows. The research results of students' independent learning during pretest obtained average score of 51.29 and students' learning rate during a post-test obtained average of 60.18, it means students' autonomous learning between pretest and post-test experienced inclination at 8.89. This study recommendation is that learning environment technology-based needs to be intensified, since it brings new possibilities upon education field. Technology utilization towards education has a significant part in providing ability as part of life skills, students undoubtedly need that. There are numerous learning sources alternatives being offered with technology which optimizes students potential to become independent learning and success as life long learner.

## 1. Introduction

The Industrial Revolution 4.0 resulted in a fusion between digital and physical sense through technological advances namely ICT and IoS (Internet of Services) [1]. The industrial revolution 4.0 does not only affect business, governance, and society, but also in term of education, encouraging the emergence of the term 4.0 education [2]; [3]. The industrial revolution 4.0 frames people's lives within the center of technological progress. The revolution enhanced an extremely decent society called society 5.0 [4]. Society 5.0 examines to place humans towards the center of innovation and actively utilize technology in various aspects of life [5].

The rapid development of technology within the era of industrial revolution 4.0 brought several conveniences, including for educators [6]. Transformative technology requires educators to equip themselves with technological skills in an effort to meet the students learning needs upon digital era [7]; [8]; [9]; [10]. Digital era proposed students who are were born between 1995-2012, known as generation z or "digital natives" [11]. Generation z is quite unique and distinctive, which have tendency to think practically and independently by utilizing technology [12]; [13]. Mastery of technology makes z generation process information very quickly, so it has the opportunity to be more innovative [14]. Generation Z was born in an era of advancement and easy access to technology in everyday life.

Covenient access upon information through the internet has substituting books and as part of information sources [15]. The role of information technology with establishing decent learning resources encourages students to be more active, creative, innovative, and independent [16]. Technology utilization allows one educators to formulate a learning process that accompanies more innovative and enhances students to study optimally [17]; [18]. Technology encourages students to be independent learners and be responsible towards their own learning [19]; [20]. The interactive



relationship between technology utilization and learning process establishes and empowers students to boost individual responsibility as well as educators are not always the main source of providing information, hence students become more active, motivated, and able to examine knowledge independently.

Independence is one of the main values in the sense of character education of the Indonesian nation, in accordance upon 2013 Curriculum objectives to propose students as independent human beings and life-span learners [21]. The goals of character education will be easily achieved if educators have the flexibility of mindset, innovation, and ingenuity to accommodate between lesson content, educational goals, and character values [22]. History learning obtains a role upon character building, through understanding and reaffirming the prominent values of a nation struggle, that is expected the heroism spirit will be continued towards next generation. Indonesian history has illustrated a picture which shows persistence, independence, mutual respect, and the spirit of unity as the main features of shaping the nation. Students are expected to be able to acquire the values of the past events to be implemented in present and future times [23]. In this sense, history subjects obtains a role in establishing students independence character.

The level of independence students is varied. Independence rate could be increased through learning activities that involves students to think creatively, hence students will be able to analyze and formulates hypotheses and be able to solve problems independently [24]; [25]. Independence requires self-awareness, habits and gradual practice of discipline. Independence could be encouraged by implementing a learning environment that suits students to take an active role within learning process, such as diagnosing their learning needs, formulating learning objectives, identifying learning resources or materials, implementing appropriate learning strategies, and evaluating learning outcomes [26]. Thus, the application of a learning environment that supports students to play an active role in the learning process can increase the independence of students.

Educator have to ensure that learners could achieve learning goals and develop technology skills to facilitate lifelong learning. Students need to be accustomed to have a lifelong enthusiasm for learning, because most aspects of life tend to experience major changes dynamically [27]. Significant factors to encourage the students' independent learning are their interests and passion to learn [28]. Students will be motivated to learn if the content gained is meaningful for themselves. Educators have a duty to facilitate students by designing a supportive learning environment to achieve learning goals [29]. Technology-based learning environments engagement provides a stimulus for reflective investigation and continuous intellectual development [30]. The role of technology with creating proper learning resources encourages active students.

Based on the background mentioned above, the urgency of technology in life and the needs of learning, this research focuses on technology-based learning environments utilization. Several rationales underlying this study are namely: (1) The rapid development of technology reaches people's lives in various fields, especially education. Students should be encouraged and empowered to engage technology as a mean of communication and collaboration in learning in an appropriate way to become knowledgeable, competent and up-to-date members of society [31]; (2) Technology-based learning environment is the latest manner of education within an active learning approach that focuses on the involvement of students in the learning process [32]; (3) technology-based learning environment encourages more effective learning by increasing the motivation and independence of students [33]; The application of a technology-based learning environment seems to be effective in encouraging students to be actively involved in the learning process, hence students become more creative, innovative, and independent in learning. Therefore, the focus of this study is to determine the role of a technology-based learning environment upon students independence. Specifically, the study aims to determine the differences in the level of independence of students prior and after engaging technology-based learning environments.

## 2. Methods

This study engages quantitative approach. This type of research is experimental research, which aims to determine whether there is a causal relationship between two or more variables. In this sense, researchers applied a technology-based learning environment towards independent variables, controlled other relevant variables, and observed their effects upon the dependent variable, namely the students independence. The research sample used in this study was 34 students of high school in Jember Regency.

This study employs the Steinberg independence variable which includes three aspects, namely: (1) Emotional Autonomy, which is an aspect of independence that states changes in the closeness of an individual's emotional relationship with parents or with other people; (2) Behavioral Autonomy, is an aspect of independence that has the ability to make decisions without depending or involving other people, so that it is able to be responsible for decisions that have been made; and (3) Cognitive Autonomy, which is an aspect of independence that has the ability to interpret the principles of right and wrong, as well as the principles of importance or insignificance [34]. The research instrument used in this study was a questionnaire. The following is a self-reliance instrument grid developed from Steinberg.

**Table 1.** Independence Questionnaire

Aspects	Indicators	Question number
<i>Emotional Autonomy</i>	<i>De-Idealized</i>	1
	<i>Parent as a people</i>	2
	<i>Non-dependency</i>	3 & 4
	<i>Individuation</i>	5 & 6
<i>Behavioral Autonomy</i>	<i>Make Decisions as Well</i>	7,8, & 9
	<i>Changes in Susceptibility to Influence</i>	10 & 11
	<i>Expectations for Autonomy</i>	12
<i>Cognitive Autonomy</i>	<i>Religious Beliefs</i>	13,14, & 15
	<i>Principal belief</i>	16
	<i>Independent belief</i>	17 & 18

The questionnaire was given before and after learning activities in the form of pretest and posttest with the same number of questions and scores. The assessment of each question on the independence questionnaire utilized *Likert scale* which requires respondents to complete statements with the following answer choices: 1) Strongly disagree; 2) Disagree; 3) Agree; 4) Strongly Agree [35]. The scale value of each answer could be seen in the following table:

**Table 2.** value of the questionnaire scale

Statements	Value
Strongly disagree	1
Disagree	2
Agree	3
Strongly Agree	4

(Sumber: Gay *et al.*, 2012:567)

Independence is categorized into very suitable independence, moderate independence and low independence using the mean and standard deviation of the level categorization [36]. We can see the criteria for independence in the following table:

**Table 3.** independence criteria

Variable	Formula	Value Range	Category
Independence	$X > (\text{Mean} + 1 \text{ SD})$	$X > 54$	Tinggi
	$(\text{Mean} - 1 \text{ SD}) < X \leq (\text{Mean} + 1 \text{ SD})$	$36 < X \leq 54$	Sedang
	$X < (\text{Mean} - 1 \text{ SD})$	$X < 36$	Rendah

(Source: Ary *et al.*, 2010:114)

Data analysis in this study engaged a paired sample t-test using SPSS for windows. The paired sample t-test was used to compare the difference between the average of pretest and posttest of students' independence. Paired sample t-test could be used with the prerequisite that the data engaged must be normal. Normality test engaged Shapiro-Wilk using of SPSS. The decision making criteria in this study employed a significance level of 5%.

### 3. Results and Discussion

Initially, the data is tested for normality first. The results of the Shapiro-Wilk normality test showed that the pretest data were normally distributed ( $p = 0.154$ ). Hence, data is considered normal.

Pretest and posttest data of students learning independence could be seen below;

**Table 4.** Descriptive Result of Statistic Pretest and Post Test

	Mean	N	Std. Deviation
Pretest Independence	51.29	34	4.609
Posttest Independence	60.18	34	3.950

Based on table 4. It reveals that the pretest average value of learning independence is 51.29, indicates moderate independence category and the posttest average score of 60.18 indicates the high independence category. The average posttest score shows that the independence of students has increased after implementing a technology-based learning environment. The increase in the independence of students can be seen in Figure 1.

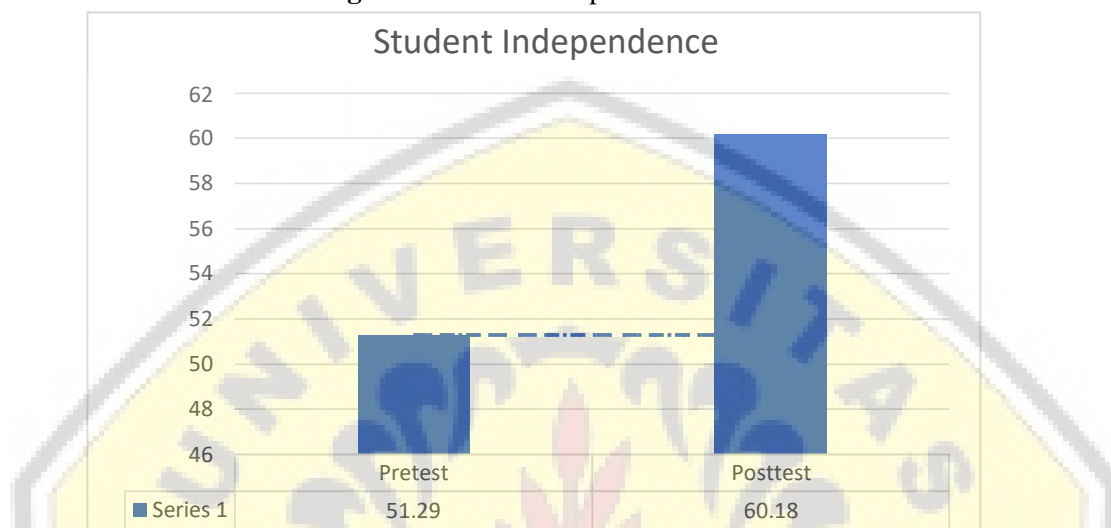
**Tabel 5.** Result of Paired Samples Test

		Paired Differences					
		Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
Pair 1	Pretest Independence - Posttest Independence	-8.89	4.531	0.777	-11.430	33	0.000

Based on table 6, it shows that the results of the paired samples test show that there is a very significant difference ( $p, 0.05$ ) between the independence of students before and after the technology-based learning environment is applied. The results of the paired samples test in the mean column obtained an average difference of -8.89 (posttest - pretest), negative numbers indicate that the mean value of independence of students in the posttest is greater than the average value of the pretest. This means that the magnitude of the difference in the average pretest and posttest independence of students shows that the posttest value after applying a technology-based learning environment is greater than

the pretest value. The increase in the independence of students at the pretest and posttest can be seen in the following figure.

**Figure 1.** Student Independence Results



Based on the diagram above, it could be seen that the pretest average value of students' independence is 51.29 indicating the category of moderate independence before the technology-based learning environment is applied and the posttest average score of students' independence is 60.18 indicating the category of high independence. The average posttest score shows that the independence of students has increased after utilizing a technology-based learning environment. The results of this study, as stated in the previous section, illustrate that the technology-based learning environment encourages students to be independent in learning and be responsible for their own learning by utilizing the use of information technology as a means of supporting learning activities. The results of this study strengthen the research findings conducted by Song & Hill in 2007 which states that a technology-based learning environment presents an interactive relationship between learning process and students' independence towards self-regulated learning namely planning, monitoring, and evaluating. The learning process depends on strategies, resources, ability to motivate themselves and be involved in the learning process [37]. The interactive relationship in learning rises and enhances students that learning is an individual responsibility. Students become more active, motivated, and can explore knowledge independently.

Technology plays an important role in 21st century learning. Technology serves as a useful means of realizing innovative constructivist learning in accordance with the needs of students in formulating literacy within an environment which possesses knowledge and technology [38]. Nowadays, students have learned to obtain relevant and necessary information to solve problems or meet their curiosity [39]. Technology-based learning environment brings outstanding notions for students towards learning process by engaging information technology that offers digital experiences and that is connected with literacy to increase the knowledge and skills needed in the digital era [40]. The learning environment that is involved with technology supports innovative and interactive learning, since resources can be easily obtained according to the basic needs of learning [41]. The results of research conducted by Geng *et al.*, in 2019 show that the application of a technology-based learning environment encourages the learning process to be more pleasant and encourages students to be independent in learning [42]. Technology provides impact and benefits for innovative learning. The research result conducted by Fletcher *et al.*, in 2020 indicates that technology can be utilized by educators as a

medium in planning the learning process and to increase the independence and self-management of students [43]. The flexibility of students in accessing information through the application of a technology-based learning environment could support the learning process, increases knowledge and understanding of the subject matter being studied as well as increases learning independence.

#### 4. Conclusions

The findings of this study represent the application of a technology-based learning environment to students independence learning. This study aims to determine the differences in the level of independence of students before and after being implemented using a technology-based learning environment. The results showed that the pretest average score for independence of students was 51.29 indicates moderate independence category and the posttest was 60.18 indicates high independence category with a difference in the average value of -8.89 (pretest-posttest), negative numbers indicate that there is an increase in the average value. independence of learners after applying a technology-based learning environment.

The level of independence of each student is varied. An independent attitude cannot grow easily. Independence requires self-awareness, habits and gradual practice of discipline. The independence of students can be improved by implementing a learning environment that supports students to take an active role in the learning process. Recommendations for practice and further research include the development of a technology-based learning environment to be applied in the learning process of students with a much broader scope.

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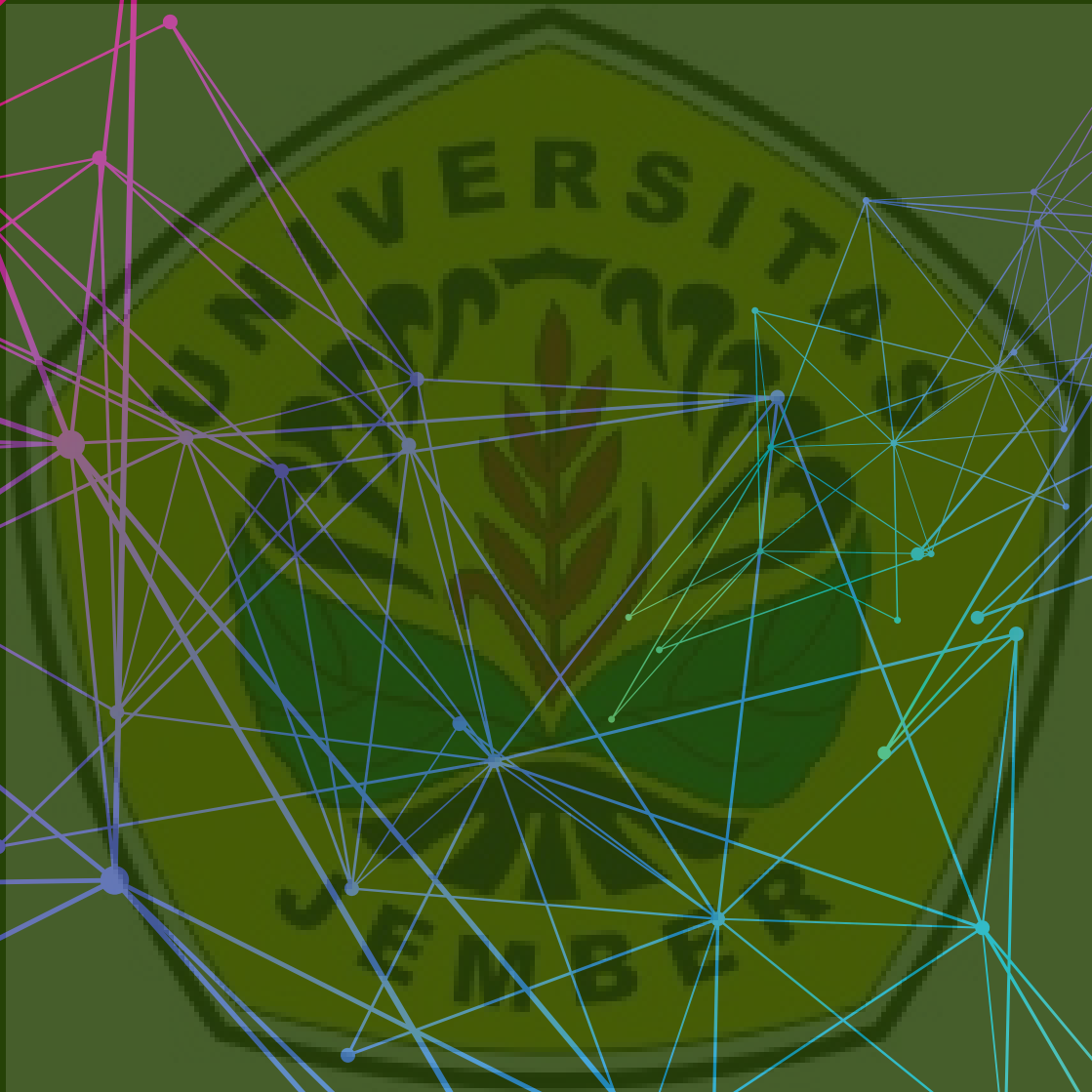
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