

# Investigating Virtual Learning on Students' Learning Outcomes Mediated by Motivation: A Comparative Study Between Urban and Rural Areas

## Investigating Virtual Learning on Students' Learning Outcomes Mediated by Motivation

**Nunuk Hariyati 1\***, Universitas Negeri Surabaya, Indonesia,  
nunukhariyati@unesa.ac.id

**Wagino 2**, Universitas Negeri Surabaya, Indonesia

**Mudjito 3**, Universitas Negeri Surabaya, Indonesia

\* Corresponding Author

**Corresponding Author's Institutional Address: Jalan Lidah Wetan  
Surabaya 60213**

**Abstract:** This present study aims at investigating the implementation of virtual learning on students' learning outcomes mediated by motivation and to compare its effectiveness between urban and rural areas. This study employed quantitative design by means of path analysis approach. It involved 362 college students. To determine the sample, it employed Slovin's formula. The data were collected by using three instruments, specifically Virtual Learning Effectiveness, Learning Outcomes, and Motivation. The findings of this research confirm that the virtual learning is effective to improve students' learning outcomes which was mediated by motivation. In addition, it was found that the motivation of students from urban areas is higher than those from rural areas. It suggests that the native location of students influences their motivation.

Comment[S1]: Sebutkan teori yang digunakan

Comment[S2]: Analisis data menggunakan apa?

Comment[S3]: Apakah saran yang diperlukan

**Keywords:** virtual learning, learning outcomes, motivation, urban areas, rural areas, distance learning, learning technology

## Introduction

Recently, we are encountering a global crisis which affects most of human being life aspects. The current Covid-19 pandemic which spread all over the world in the beginning of 2020 has distracted every single element, including education. This unpredictable global pandemic enforces us to be able to make proper adjustment of learning approaches and strategies since the condition limits us to perform a face-to-face meeting to stop a wider spread of the virus. As a result, all activities that allows people to gather in a one place within a one certain time is being limited, or, we commonly called it as physical distancing. In the educational setting, as expected, a conventional classroom learning which allows students to gather in one place within certain time is extremely prohibited. This condition forces us to remain staying at home, work from home, worship from home, and even study from home. Therefore, it is important to proceed to other alternative learning approach that does not require a face-to-face meeting. In other words, virtual learning these days is the most within reach approach to exchange face-to-face learning (Setiawan & Iasha, 2020).

To be able to conduct teaching and learning process, it is important to consider an alternative approach. The most possible alternative approach is by carrying out a virtual learning. Virtual learning, according to Moore et al., (2011), is an approach of learning that provides students or learners to access learning materials remotely without being presented physically in classroom. Most experts such as Benson (2002), Carliner (2004), and Conard (2002) define online learning as a learning experience that employ current technology. Furthermore, Conard (2002) and Benson (2002) classify online learning as a modern and brand-new variation of distance learning that improves access to learning materials for learners. By the same token, other experts confirm that online learning, in addition to improve the accessibility of learners, it offers superlative connectivity, flexibility, and ability to promote diversified interactions between learners and educators (Ally, 2004; Hiltz & Turoff, 2005; Oblinger & Oblinger,

Comment[S4]: Teori apakah yang digunakan?

2005). On that account, the most possible approach to be taken into account to temporarily substitute conventional face-to-face learning is by employing virtual or online learning.

On the basis of the regulation of the Indonesian Minister of Education and Culture No. 3 of 2020 concerning on the Prevention of Covid-19 in the Education Unit, all educational institution including higher education in Indonesia should adopt an aggressive move by obliging all staffs, educators, and learners to carry out their activities in home. This measure, according to Wahyudi (2020), brings significant impact to both teachers and students, particularly in carrying out remote teaching and learning process. In addition, this aggressive measure triggers an uneasiness on some educational institutions that are not ready to carry out online teaching and learning process, despite the fact that the information technology in these days has developed significantly. Irfan et al., (2019) have reported that the development of information technology in higher education attracts special attention of researchers and experts, specifically in terms of its infrastructures.

Current studies, particularly related to online learning implementation during Covid-19, have reported both benefits and drawbacks of online learning (Dhawan, 2020; Rapanta et al., 2020; Baber, 2020; Nambiar 2020; Dutta, 2020;). According to Lestari and Gunawan (2020), the implementation of online learning during the COVID-19 pandemic is capable of encouraging the learning process to be more efficient, particularly in the current global age, where the transfer of knowledge is very rapid. In addition, they confirm that online learning has a variety of positive effects. Similar argument is elaborated by Lie et al., (2020) who confirm that in times of global pandemic, carrying out online learning is essential to facilitate students' learning access since it provides students a wider chance to independently access for learning materials. At the same time, however, they explained that to provide satisfactory online learning, it is important to consider the adequate infrastructures.

However, current studies only reported the benefits and drawbacks of online learning qualitatively and descriptively from the perspective of students and/or teachers' perception. Particularly in Indonesia setting, most studies explain the perception of students and teachers during online learning (Zhafira et al., 2020; Dewi, 2020; Ningsih, 2020; Agung, Surtikanti, & Quinones, 2020; Harsasi, 2015). There is a limited study that focus on the examination of online learning effectiveness on students' learning outcomes quantitatively. Therefore, this study intends to comprehensively examine the effectiveness of online or virtual learning on students' learning outcomes. In specific, this study aims at answering how the implementation of online or virtual learning affect students' learning outcomes which is presumably mediated by students' motivation. In addition, this study compares two group of students from two different areas, urban and rural areas.

## Methodology

To answer the formulated questions, this study employed quantitative design by using path analysis approach with JASP. This study involved 362 students of Faculty of Education in UNESA. To determine the sample, it employed Solvin's formula. The data were obtained by using three instruments, specifically, Virtual Learning Effectiveness, Learning Outcomes, and Motivation. The assessment on the distributed instrument was used Likert scale 1-4 with the following details: 1: strongly disagree; 2: moderately disagree; 3: agree; and 4: strongly agree. At the end of the data collection, however, only 266 filled the questionnaires. This study consisted of three variables, one independent variable, one dependent variable, and one mediating variable. To see the difference of virtual learning on learning outcomes mediated by motivation based on student's location, path analysis was performed twice by separating the data into two kinds of groups. The first group contains student's data that lived in an urban area. The second group contains student's data that lived in a rural area.

Comment[S5]: Masing-masing variabel jelaskan indikatornya

Comment[S6]: Analisis data menggunakan apa?

## Findings / Results

To answer the questions raised within this present research, the data collected were examined through path analysis. The path analysis in this study was performed twice, specifically, a path analysis for rural area group and a path analysis for urban area group. Both path analysis results aim at comparing whether, the location of the students might contribute the mediating factor which affect the correlation between the effectiveness of virtual learning and students' learning outcomes. The following explain both path analysis for urban and rural areas group.

Comment[S7]: Deskripsikan dulu setiap variabel variabel manakah yang tinggi dan rendah

Table 1. The Result of Direct Effect of Virtual Learning on Learning Outcomes of Urban Area Group

		Estimate	Std. Error	z-value	p	95% Confidence Interval	
						Lower	Upper
Total X	→ Total Y2	0.084	0.052	1.606	0.108	-0.018	0.185

Note. Delta method standard errors, normal theory confidence intervals, ML estimator.

Based on the statistical analysis result presented in Table 1, it obtained that the value of direct effect of virtual learning on learning outcomes is 0.084. It further means that there is no significant effect of virtual learning on students' learning outcomes (p value:  $0.108 > 0.05$ ).

Comment[S8]: Artinya hipotesis diterima, jelaskan dukungan teorinya!

**Table 3. The Results of Total Effect of Urban Area Group**

	Estimate	Std. Error	z-value	p	95% Confidence Interval	
					Lower	Upper

*Note.* Delta method standard errors, normal theory confidence intervals, ML estimator.

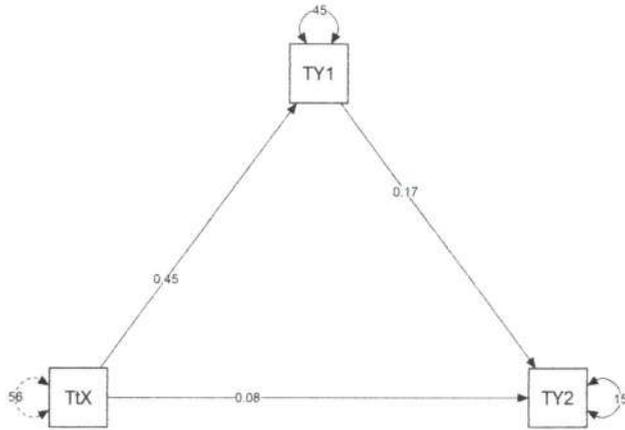
Based on the statistical analysis result presented in Table 3, it obtained that the overall value of direct effect of virtual learning on learning outcomes is 0.160. It further means that there is a significant effect of virtual learning on students' learning outcomes ( $p$  value < 0.005).

**R-Squared**

	R <sup>2</sup>
Learning outcomes	0.156
Motivation	0.202

Based on the R-squared table, it can be concluded that the variation in the value of learning outcomes that can be explained by virtual learning effectiveness is as much as 15,6%. As in motivation variable, it can be concluded that the variation in the value of learning outcomes that can be explained by motivation is as much as 20,2%.

**Path plot**



Annotation:

TtX: Virtual Learning Effectiveness

TY2: Learning Outcomes

TY1: Motivation (mediating variable)

**Table 4. The Result of Direct Effect of Virtual Learning on Learning Outcomes of Rural Area Group**

Comment[S9]: Tabel dibawah

				95% Confidence		Interval	
		Estimate	Std. Error	z-value	p	Lower	Upper
Total X	→ Total Y2	0.136	0.048	2.808	0.005	0.041	0.230

**Table 4. The Result of Direct Effect of Virtual Learning on Learning Outcomes of Rural Area Group**

Comment[S9]: Tabel dibawah

	Estimate	Std. Error	z-value	p	95% Confidence Interval	
					Lower	Upper

*Note.* Delta method standard errors, normal theory confidence intervals, ML estimator.

Based on the statistical analysis result presented in Table 1, it obtained that the value of direct effect of virtual learning on learning outcomes is 0.136. It further means that there is a significant effect of virtual learning on students' learning outcomes (p value < 0.05).

**Table 2. The Result of Indirect Effect of Virtual Learning on Learning Outcomes Mediated by Motivation of Rural Area Group**

	Estimate	Std. Error	z-value	p	95% Confidence Interval	
					Lower	Upper
Total X → Total Y1 → Total Y2	0.079	0.026	3.052	0.002	0.028	0.130

*Note.* Delta method standard errors, normal theory confidence intervals, ML estimator.

Based on the statistical analysis result presented in Table 2, it obtained that the value of direct effect of virtual learning on learning outcomes mediated by motivation is 0.079. It further means that there is a significant effect of virtual learning on students' learning outcomes which was mediated by motivation of students (p value < 0.05).

**Table 3. The Results of Total Effect of Rural Area Group**

	Estimate	Std. Error	z-value	p	95% Confidence Interval	
					Lower	Upper
Total X → Total Y2	0.214	0.044	4.822	<.001	0.127	0.302

*Note.* Delta method standard errors, normal theory confidence intervals. ML estimator.

Based on the statistical analysis result presented in Table 3, it obtained that the overall value of direct effect of virtual learning on learning outcomes is 0.214. It further means that there is a significant effect of virtual learning on students' learning outcomes (p value < 0.05).

**R-Squared**

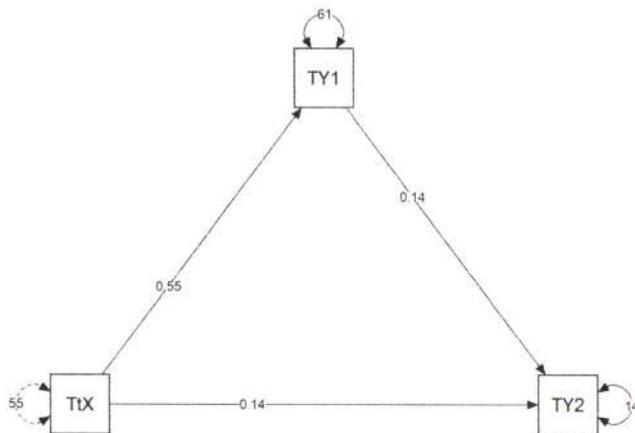
	R <sup>2</sup>
Learning outcomes	0.210
Motivation	0.219

### R-Squared

R <sup>2</sup>

Based on the R-squared table, it can be concluded that the variation in the value of learning outcomes that can be explained by virtual learning effectiveness is as much as 21%. As in motivation variable, it can be concluded that the variation in the value of learning outcomes that can be explained by motivation is as much as 21.9%.

### Path plot



### Annotation:

TtX: Virtual Learning Effectiveness

TY2: Learning Outcomes

TY1: Motivation (mediating variable)

Based on the result table, it shows that the effect of virtual learning effectiveness on learning outcomes mediated by motivation is stronger for student's that lived in a village area rather than those who lived in city area.

## Discussion

Based on the findings and path analysis performed, it confirms that the motivation as a mediating variable in the relation of virtual learning effectiveness and learning outcomes is significant. Motivation plays an essential role in activating students' encouragement to learn in virtual learning as the most possible alternative approach to substitute conventional face-to-face learning. This notion supports the argument elaborated by Wandler & Imbriale (2017) stating that the involvement of students in virtual or online learning activated students' self-regulation in a positive manner. Furthermore, the self-regulation drives students' motivation to achieve high academic performance.

Comment[S10]: Jelaskan efeknya indikator pada setiap variabel

It is believed that motivation frequently plays as a significant factor in learner success as affirmed by Knowles (1980). This students' motivation is also confirmed by some previous studies that influences academic performance in online learning strategy (Islam et al., 2018; Vanslambrouck, Lombaerts, & Philipsen, 2018; Alkis & Temizel, 2018, Zhang et al., 2019; and Francis, Wormington, & Hulleman, 2019). Thus, in general, when students demonstrate sufficient motivation in the learning process, including the online learning strategy, students' academic performance will also be enhanced. Vice versa, when students possess less motivation to carry online learning process, students' will not obtain any practical benefit during the learning process.

Furthermore, this study performed two path analysis that differentiate the location of the students, specifically, it distinguished between urban and rural areas. The two path analyzes

carried out were aimed at comparing whether students' native areas relate to the degree of motivation (as a mediating variable) of students who simultaneously influence student learning outcomes in the realization of virtual learning. Based on the results of the path analyses above, it obtained that the indirect effect of virtual learning implementation mediated by motivation among students from rural areas was 0.079 and among students from urban areas was 0.077. The results indicate that the effect of virtual learning implementation among students from rural areas is higher than the students from the urban areas.

It further confirms that students from the rural areas have stronger motivation to carry out virtual learning approach. These results support the findings reported by Rahmat & Akbar (2019). The findings confirm that there is a significant different of students' motivation based on geographical characteristics. Students from rural areas might have stronger motivation to learn and achieve higher since they are most likely difficult to have a sufficient access. Thus, when they obtain limited access to learn, including the online learning, they tend to maximize the learning process and it drives their motivation stronger to achieve higher. Likewise, Akpan & Offong (N.a) also reveal that the location of students' residence contributes to the encouragement of students during the process of learning. Motivation is a fundamental and essential contributor of learning process, as stated by Mo (2019).

Comment[S11]: Apakah implikasi penelitian ini secara konkrit.

## Conclusion

Based on the findings and discussion above, it is confirmed that motivation as mediating variable contribute to the influence of virtual learning implementation on students' learning outcomes. In addition, when it is compared from two different geographical characteristics, between rural and urban areas, students in rural areas tend to have higher motivation in carrying out virtual learning. Even though students from urban areas have smaller motivation in carrying out virtual learning, yet the motivation among students in urban areas remains contributing to improve students' learning outcomes. Therefore, it affirms that motivation plays an essential role in the process of virtual learning implementation. For future research, it is suggested that it is important to conduct comprehensive study that compare two or more groups of students from wider area such as cross-sectional study between countries or continent to reveal how the degree of motivation can be influenced by other important factors.

Comment[S12]: Apakah saran yang konkrit untuk meningkatkan variabel yang rendah?

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Comment[D1]: Tambahkan gap research tentang pembelajaran virtual (relevan dgn penelitian)

between learners and educators (Ally, 2004; Hiltz & Turoff, 2005; Oblinger & Oblinger, 2005). On that account, the most possible approach to be taken into account to temporarily substitute conventional face-to-face learning is by employing virtual or online learning.

On the basis of the regulation of the Indonesian Minister of Education and Culture No. 3 of 2020 concerning on the Prevention of Covid-19 in the Education Unit, all educational institution including higher education in Indonesia should adopt an aggressive move by obliging all staffs, educators, and learners to carry out their activities in home. This measure, according to Wahyudi (2020), brings significant impact to both teachers and students, particularly in carrying out remote teaching and learning process. In addition, this aggressive measure triggers an uneasiness on some educational institutions that are not ready to carry out online teaching and learning process, despite the fact that the information technology in these days has developed significantly. Irfan et al., (2019) have reported that the development of information technology in higher education attracts special attention of researchers and experts, specifically in terms of its infrastructures.

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Comment[D2]: Rujukan yang diwarnai kuning, mohon ditambahkan di daftar pustaka

However, current studies only reported the benefits and drawbacks of online learning qualitatively and descriptively from the perspective of students and/or teachers' perception. Particularly in Indonesia setting, most studies explain the perception of students and teachers during online learning (Zhafira et al., 2020; Dewi, 2020; Ningsih, 2020; Agung, Surtikanti, & Quinones, 2020; Harsasi, 2015). There is a limited study that focus on the examination of online learning effectiveness on students' learning outcomes quantitatively. Therefore, this study intends to comprehensively examine the effectiveness of online or virtual learning on students' learning outcomes. In specific, this study aims at answering how the implementation of online or virtual learning affect students' learning outcomes which is presumably mediated by students' motivation. In addition, this study compares two group of students from two different areas, urban and rural areas.

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Comment[D3]: Penentuan sampel dgn rumus Solvin, namun perlu dijelaskan Teknik/metode pengambilan sampel

Comment[D4]: Ditambahkan penjelasan: Berapa jumlah mhs yg tinggal di perkotaan maupun pedesaan yang mengisi angket.

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Based on the statistical analysis result presented in Table 2, it obtained that the value of direct effect of virtual learning on learning outcomes mediated by motivation is 0.077. It further means that there is a significant effect of virtual learning on students' learning outcomes which was mediated by motivation of students (p value < 0.05).

**Table 3. The Results of Total Effect of Urban Area Group**

	Estimate	Std. Error	z-value	p	95% Confidence Interval	
					Lower	Upper
Total X → Total Y2	0.160	0.048	3.305	< .001	0.065	0.255

**Table 3. The Results of Total Effect of Urban Area Group**

	Estimate	Std. Error	z-value	p	95% Confidence Interval	
					Lower	Upper

*Note.* Delta method standard errors, normal theory confidence intervals, ML estimator.

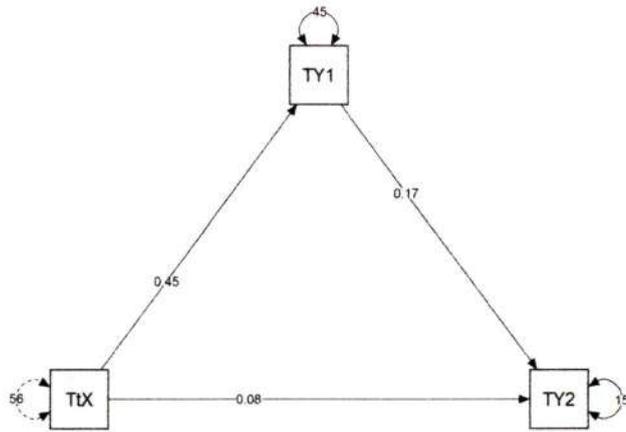
Based on the statistical analysis result presented in Table 3, it obtained that the overall value of direct effect of virtual learning on learning outcomes is 0.160. It further means that there is a significant effect of virtual learning on students' learning outcomes (p value < 0.005).

**R-Squared**

	R <sup>2</sup>
Learning outcomes	0.156
Motivation	0.202

Based on the R-squared table, it can be concluded that the variation in the value of learning outcomes that can be explained by virtual learning effectiveness is as much as 15,6%. As in motivation variable, it can be concluded that the variation in the value of learning outcomes that can be explained by motivation is as much as 20,2%.

**Path plot**



Annotation:

T1X: Virtual Learning Effectiveness

TY2: Learning Outcomes

TY1: Motivation (mediating variable)

**Table 4. The Result of Direct Effect of Virtual Learning on Learning Outcomes of Rural Area Group**

				95% Confidence			
				Interval			
		Estimate	Std. Error	z-value	p	Lower	Upper
Total X	→ Total Y2	0.136	0.048	2.808	0.005	0.041	0.230

**Table 4. The Result of Direct Effect of Virtual Learning on Learning Outcomes of Rural Area Group**

	Estimate	Std. Error	z-value	p	95% Confidence Interval	
					Lower	Upper

*Note.* Delta method standard errors, normal theory confidence intervals, ML estimator.

Based on the statistical analysis result presented in Table 1, it obtained that the value of direct effect of virtual learning on learning outcomes is 0.136. It further means that there is a significant effect of virtual learning on students' learning outcomes (p value < 0.05).

**Table 2. The Result of Indirect Effect of Virtual Learning on Learning Outcomes Mediated by Motivation of Rural Area Group**

	Estimate	Std. Error	z-value	p	95% Confidence Interval	
					Lower	Upper
Total X → Total Y1 → Total Y2	0.079	0.026	3.052	0.002	0.028	0.130

*Note.* Delta method standard errors, normal theory confidence intervals, ML estimator.

Based on the statistical analysis result presented in Table 2, it obtained that the value of direct effect of virtual learning on learning outcomes mediated by motivation is 0.079. It further means that there is a significant effect of virtual learning on students' learning outcomes which was mediated by motivation of students (p value < 0.05).

**Table 3. The Results of Total Effect of Rural Area Group**

	Estimate	Std. Error	z-value	p	95% Confidence Interval	
					Lower	Upper
Total X → Total Y2	0.214	0.044	4.822	< .001	0.127	0.302

*Note.* Delta method standard errors, normal theory confidence intervals. ML estimator.

Based on the statistical analysis result presented in Table 3, it obtained that the overall value of direct effect of virtual learning on learning outcomes is 0.214. It further means that there is a significant effect of virtual learning on students' learning outcomes (p value < 0.05).

**R-Squared**

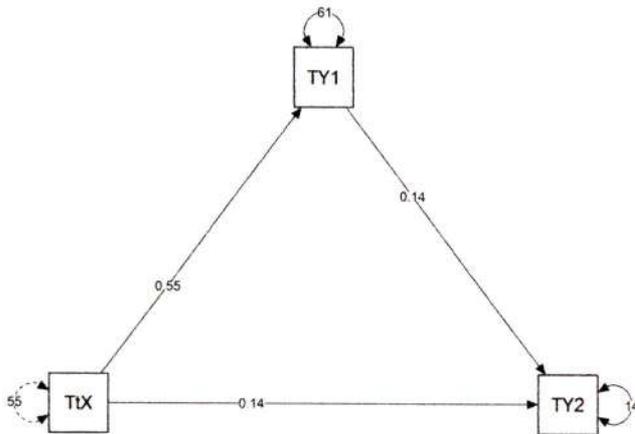
	R <sup>2</sup>
Learning outcomes	0.210
Motivation	0.219

### R-Squared

R <sup>2</sup>

Based on the R-squared table, it can be concluded that the variation in the value of learning outcomes that can be explained by virtual learning effectiveness is as much as 21%. As in motivation variable, it can be concluded that the variation in the value of learning outcomes that can be explained by motivation is as much as 21,9%.

### Path plot



### Annotation:

TtX: Virtual Learning Effectiveness

TY2: Learning Outcomes

TY1: Motivation (mediating variable)

Based on the result table, it shows that the effect of virtual learning effectiveness on learning outcomes mediated by motivation is stronger for student's that lived in a village area rather than those who lived in city area.

### **Discussion**

Based on the findings and path analysis performed, it confirms that the motivation as a mediating variable in the relation of virtual learning effectiveness and learning outcomes is significant. Motivation plays an essential role in activating students' encouragement to learn in virtual learning as the most possible alternative approach to substitute conventional face-to-face learning. This notion supports the argument elaborated by [Wandler & Imbriale \(2017\)](#) stating that the involvement of students in virtual or online learning activated students' self-regulation in a positive manner. Furthermore, the self-regulation drives students' motivation to achieve high academic performance.

It is believed that motivation frequently plays as a significant factor in learner success as affirmed by Knowles (1980). This students' motivation is also confirmed by some previous studies that influences academic performance in online learning strategy (Islam et al., 2018; Vanslambrouck, Lombaerts, & Philipsen, 2018; Alkis & Temizel, 2018, Zhang et al., 2019; and Francis, [Wormington, & Hulleman, 2019](#)). Thus, in general, when students demonstrate sufficient motivation in the learning process, including the online learning strategy, students' academic performance will also be enhanced. Vice versa, when students possess less motivation to carry online learning process, students' will not obtain any practical benefit during the learning process.

Furthermore, this study performed two path analysis that differentiate the location of the students, specifically, it distinguished between urban and rural areas. The two path analyzes

carried out were aimed at comparing whether students' native areas relate to the degree of motivation (as a mediating variable) of students who simultaneously influence student learning outcomes in the realization of virtual learning. Based on the results of the path analyses above, it obtained that the indirect effect of virtual learning implementation mediated by motivation among students from rural areas was 0.079 and among students from urban areas was 0.077. The results indicate that the effect of virtual learning implementation among students from rural areas is higher than the students from the urban areas.

It further confirms that students from the rural areas have stronger motivation to carry out virtual learning approach. These results support the findings reported by Rahmat & Akbar (2019). The findings confirm that there is a significant different of students' motivation based on geographical characteristics. Students from rural areas might have stronger motivation to learn and achieve higher since they are most likely difficult to have a sufficient access. Thus, when they obtain limited access to learn, including the online learning, they tend to maximize the learning process and it drives their motivation stronger to achieve higher. Likewise, Akpan & Offong (N.a) also reveal that the location of students' residence contributes to the encouragement of students during the process of learning. Motivation is a fundamental and essential contributor of learning process, as stated by Mo (2019).

## Conclusion

Based on the findings and discussion above, it is confirmed that motivation as mediating variable contribute to the influence of virtual learning implementation on students' learning outcomes. In addition, when it is compared from two different geographical characteristics, between rural and urban areas, students in rural areas tend to have higher motivation in carrying out virtual learning. Even though students from urban areas have smaller motivation in carrying out virtual learning, yet the motivation among students in urban areas remains contributing to improve students' learning outcomes. Therefore, it affirms that motivation plays an essential role in the process of virtual learning implementation. For future research, it is suggested that it is important to conduct comprehensive study that compare two or more groups of students from wider area such as cross-sectional study between countries or continent to reveal how the degree of motivation can be influenced by other important factors.

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