Regression Analysis Video Tutorials to Improve College Students' Data Analysis Skills

Widya Noviana Noor¹, Widi Wulansari²* iD

¹ Tadris Bahasa Inggris, UIN Sultan Aji Muhammad Idris, Samarinda, Indonesia
² PG PAUD, Universitas Nusantara PGRI, Kediri, Indonesia

A B S T R A K

Guna meningkatkan kualitas pendidikan dari segi analisis data, diperlukan suatu inovasi pembelajaran. Apalagi dalam pembelajaran statistika, kebutuhan perhitungan yang rumit membutuhkan suatu produk inovatif yang dapat mengatasi permasalahan tersebut. Tujuan dari penelitian ini adalah mengembangkan video tutorial analisis regresi untuk meningkatkan kemampuan analisis data siswa. Jenis penelitian yang dilakukan menggunakan penelitian RnD (Research and Development) dengan pendekatan kuantitatif. Subyek penelitian ini adalah mahasiswa di dua universitas sebagai tempat uji coba terbatas, dan dua universitas sebagai tempat uji coba kelompok besar. Analisis menggunakan 2 desain yaitu desain kelompok pretest-posttest dan desain posttest-only dengan kelompok nonequivalent. Hasil penelitian ini menunjukkan bahwa video tutorial cocok untuk mahasiswa dalam melakukan analisis regresi linier sederhana, dan penelitian ini berimplikasi bahwa mahasiswa yang menggunakan video tutorial dalam melakukan analisis regresi linier sederhana memiliki keterampilan yang lebih baik daripada mereka yang tidak. Dengan demikian dapat disimpulkan bahwa video tutorial analisis regresi mampu meningkatkan kemampuan analisis data siswa.

A B S T R A C T

To improve the quality of education in terms of data analysis, a learning innovation is needed. Moreover, in learning statistics, the requirements for complicated calculations require an innovative product that can overcome these problems. The purpose of this research is to develop video tutorials on regression analysis to improve students' data analysis skills. The type of research that has been carried out uses RnD (Research and Development) research with a quantitative approach. The subjects of this study were students in two university as the site for the limited trial, and two university as the site for the large group trial. The analysis uses 2 designs: a pretest-posttest group design and a posttest-only design with a nonequivalent group. The results of this study indicate that video tutorials are suitable for students in carrying out simple linear regression analysis, and this research implies that students who use video tutorials in carrying out simple linear regression analysis have better skills than those who do not. Thus it can be concluded that video tutorials on regression analysis are able to improve students' data analysis skills.

1. INTRODUCTION

Education functions as a tool and facility that facilitates and is able to direct, develop, and guide towards a better life, not only for oneself but also for other human beings. Education plays an important role in improving the quality of human resources (Magasi et al., 2022; Setyawan, 2020). In this case, one of the pillars of improvement in education is lecturers or teaching staff. The University is one of the formal educational institutions that becomes one of the secondary schools after high school (Senior High School) for students who want to gain expertise in a certain field. Education is a conscious and planned effort to create a learning atmosphere and learning process. So that students actively develop their potential to have religious spiritual power, self-control, personality, intelligence, and noble character, as well as the necessary skills for themselves, society, nation, and state (Ghofur & Youhanita, 2020; Huang et al., 2019).

The renewal of the education system to improve the quality of education, the relevance of education, and curriculum changes are necessary so that the development of education can keep up with the times. Certain courses, in this case, necessitate certain innovations, one of which is statistics. Statistics

is a set of methods and rules related to the collection, processing (analysis), and drawing of conclusions from data in the form of numbers using certain assumptions. Statistics are very important in the daily activities of human beings (Astuti et al., 2021; Sosibo, 2019). Learning Educational Statistics is a process to gain knowledge or experience learning how to obtain, organize, summarize, present, analyze, interpret, and draw conclusions from an educational data (Sangila & Jufri, 2018; Zulfikri, 2016).

Analytical ability is the ability to analyze or divide something into its parts and be able to explain the relationship between the parts. Every student does not necessarily have the same analytical ability. In the analytical ability, the ability to interpret is also needed. Interpretation ability is one thing that is very important in the current era of knowledge and technology because various information related to science, economics, and even demographics is often presented quantitatively in the form of graphs, tables, texts, and images, so interpretive ability is needed to interpret these forms of information (Cholifah et al., 2019; Mustain, 2015). The opinion is reinforced by previous study that student analysis will certainly affect a student in the learning process because analysis is a person's ability to detail or describe a material or situation according to smaller parts and be able to understand the relationship between one part or factors with other factors which will certainly ber influenceon the final learning outcome (Wiranata et al., 2019).

One of the important processes in the research process is data analysis. The data obtained from the study's results will be meaningless without an analysis of the data. Data analysis is carried out according to the type of research, research objectives, and research methods used. Both quantitative research and quality research require a data analysis process (Khadijah et al., 2021; Marcus et al., 2012). Data analysis is a process that aims to answer research problems, prove research hypotheses, compile and interpret data (quantitative) both descriptively and inferentially, and produce conclusions so as to make it easier for readers to understand the research results. Data analysis by applying descriptive methods is expressed as simple statistical analysis, or the simplest. However, the results of descriptive statistical analysis can be an invaluable input for decision-making, depending on the form and way of presenting the results of the analysis (Bhirawa, 2015; Sangila & Jufri, 2018).

The lack of quantitative data analysis skills in students, as well as the lack of data analysis skills and skills, and the fact that they are also less able to use computer devices to help them in analyzing data, make students experience many difficulties if they carry out the data processing process. Not only in terms of learning but in terms of doing students' final projects. Based on the observation and identification of problems in the field, several problems were obtained, including the lack of motivation of students in participating in statistical learning, media made with brief points and considered by students to have no examples of their use and application, the lack of understanding and skills of Data Analysis in Students. The lack of teaching materials for Regression Analysis video media to improve data analysis skills in students, and optimal use of online learning in statistics courses (Basri, 2018; Putra, 2014; Syilfi et al., 2012).

In fact, according to orevious study technology-related skills to facilitate learning activities are important for learning (Sailer et al., 2021). Therefore, it is necessary to develop video tutorials that provide direct, practical examples of data analysis processing for computer-aided students. Therefore, we as researchers and educators who have expertise in the field of Data Analysis participate in seeking the development of data analysis video tutorials for students to improve regression data analysis skills. Video Tutorial is one of the computer-based media used to explain practical materials, which requires complete steps and can be repeated step by step (Tyas, 2015; Warasasmita & Putra, 2017). Learning media is very effective because it uses a media projector (LCD/viewer), which has a fairly large transmit range. Video Tutorial Media as a computer-free learning media can visualize motion images that can make it easier for students to observe and imitate the steps that are asked in the learning video show (Sanurdi et al., 2020; Syafi'i, 2018). Video tutorials are visual presentations combined with interesting images, audio, and animations designed to help teachers display the subject matter so that students can understand the materialwell.

Problem-solving of the problems that have been previously presented in the form of creative ideas will be made in the Development of Regression Analysis Video Tutorials to Improve Data Analysis Skills in Students at the Universities of East Kalimantan and Nusantara University PGRI Kediri. Development of Video Media Regression Analysis Tutorials, Learning can be carried out anywhere, online or offline (where students and lecturers interact directly with each other and each can exchange information about teaching materials), independent learning (learning with various modules that have been provided). The tutorial media method is a type of learning that is traditionally used in conjunction with online learning, both independently and collaboratively, using YouTube videos. This study aims to develop regression analysis video tutorials to improve students' data analysis skills. The urgency of this research is that using Regression Analysis Video Tutorials can improve data analysis skills in students, especially regression analysis.

2. METHOD

This research is a type of RnD (*Research and Development*) research developed with a quantitative approach (Borg et al., 2003). RnD research has a series of procedures to be pursued that include 10 general steps including: 1) Research and Information Collection, 2) Planning, 3) Development of the initial draft of the Product, 4) Evaluation, 5) Trial of the initial draft of the product, 6) Revision of the main product, 7) Trial of the main product, 8) Final revision, 9) Final product and 10) Dissemination.

In addition to the RnD model, we use the 3 stages used in this video tutorial. These stages include: (1) research and information collection, (2) planning, and (3) developing the initial form of the product (Wati & Wulansari, 2021). All the stages described can be described in Figure 1.
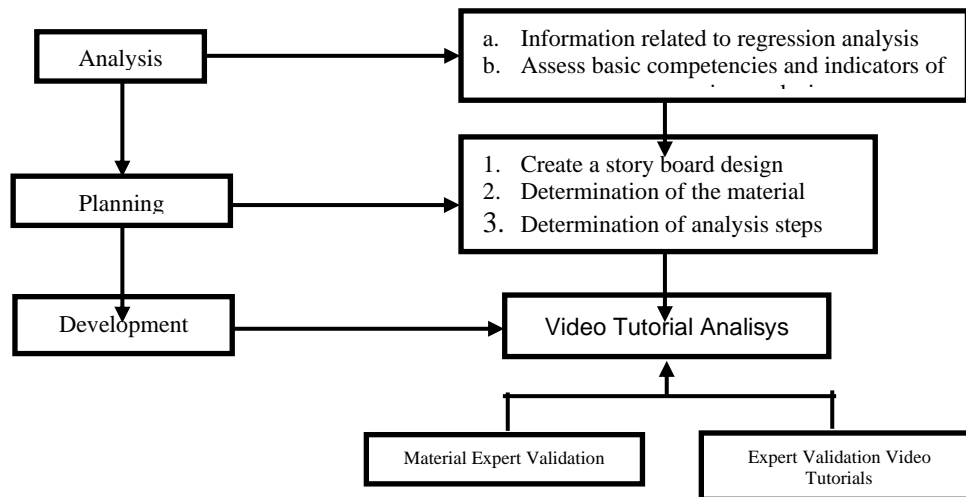

Figure 1. Video Tutorial Development Model

In the next stage, subjects in this research are students at Nusantara University PGRI Kediri as a limited or small group trial site and UINSI Samarinda and Universities in East Kalimantan as large group trials site or field tests. Data collection uses observation, documentation, and test delivery techniques. The analysis used 2 designs including one group pretest-posttest design and a randomized control group-only design.

3. RESULT AND DISCUSSION

Result
Regression Analysis Video Development Tutorial

The results of the product development of the Regression Analysis Video Tutorial can be seen in the Figure 2, and Figure 3.

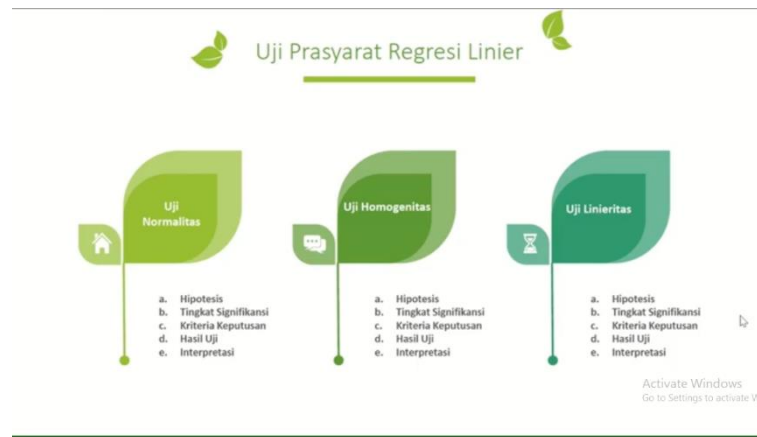**Figure 2.** Case Examples in Regression Analysis

Figure 3. Linear Regression Prerequisite Test

Base on Figure 2, and Figure 3, the explanation of the prerequisite test, students are given information that before analyzing with linear regression. In the steps of a simple linear regression test, it is explained how to perform an analysis using the SPSS program and also read the table of SPSS results and their interpretation, so that it is very helpful for students in conducting a simple linear regression test analysis.

Eligibility of Regression Analysis Video Tutorials

The assessment of the feasibility of the material is carried out by 3 experts, namely statisticians. The aspects assessed include: (1) suitability of the material, (2) attractiveness of presentation, (3) accuracy of language use, (4) ease of understanding of the material, (5) attractiveness of visualization, (6) interest in media, (7) ease of use, (8) effectiveness of learning. The following results from expert validation of the material are presented in the Table 1.

Table 1. Regression Material Expert Validation Results

Items	V (Aiken Values)	Description
Item 1	0.89	Valid
Item 2	0.89	Valid
Item 3	0.67	Valid
Item 4	0.78	Valid
Item 5	0.78	Valid
Item 6	0.89	Valid
Item 7	0.67	Valid
Item 8	0.78	Valid

Based on Table 1, it can be seen that the expert assessments for the material in the regression analysis tutorial video are all valid in all the aspects that have been previously spelled out. Thus, it can be said that the material in the regression analysis video tutorial is appropriate and feasible for students to use as a reference in conducting simple linear regression analysis.

The media feasibility assessment was carried out by 3 experts and 1 Video Tutorial Expert Lecturer. The aspects assessed are (1) ease with 4 questions, (2) attractiveness with 4 questions, (3) effectiveness with 1 question item, and (4) accuracy/conformity with 2 question items. The following results from the expert validation video tutorial are presented in Table 2.

Table 2. Expert Validation Results of Video Tutorial

Items	V (Aiken Values)	Decription
Item 1	0.89	Valid
Item 2	0.78	Valid
Item 3	0.89	Valid
Item 4	0.78	Valid
Item 5	0.78	Valid
Item 6	0.67	Valid
Item 7	0.89	Valid

Items	V (Aiken Values)	Decription
Item 8	0.89	Valid
Item 9	0.78	Valid
Item 10	0.78	Valid
Item 11	0.89	Valid

Based on Table 2, it can be seen that the expert assessments for the media in the regression analysis tutorial videos are all valid in all the aspects that have been previously spelled out. Thus, it can be said that the regression analysis tutorial video is appropriate and worthy of being used by students as a guide in conducting simple linear regression analysis.

Test Analysis Prerequisites

The prerequisite test analysis carried out includes normality and homogeneity tests for pretest and post-test values with the aim of whether the sample data is feasible to be hypothesized with parametric statistics, namely *the Paired t-test*. The results of the assumption test on the pretest and posttest scores with a sample of 20 students is show in Table 3.

Table 3. Test Results of Normality and Homogeneity Pretest and Posttest

Test	Normality		Homogeneity		Hypothesis
	Score	*Sig.*	Score	*Sig.*	
Pretest	1.163	0.134	2.737	0.067	H_0 diterima
Posttest	0.707	0.700	1.008	0.416	(*Sig > 0,05*)

Based on Table 3, it can be concluded that the sample taken meets the assumption testing so that further hypothesis testing can be carried out.

Hypothesis Testing

Hypothesis test was carried out to see if there were differences in pretest and posttest values in the ability of data analysis skills in students after the application of regression analysis video tutorials. Hypothesis test results are presented in Table 4.

Table 4. Hypothesis Test Results with *Paired t-test*

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pretest - Posttest	-2.150	1.927	.431	-3.052	-1.248	-4.990	19	0.000

Based on the Table 4, it can be seen that the sig value is 0.0001 so that it can be interpreted that the *sig* value is less than the set alpha value of 0.05. The conclusion is that Ho is rejected and Ha is accepted.

Table 5. Descriptive Statistics Results

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest	77.10	20	1.252	0.280
	Posttest	79.25	20	1.713	0.383

The results from Table 5 show that the average posttest score is higher than the pretest score for data analysis skills in college students. Based on the results of the hypothesis test, it can be concluded that there are differences in pretest and posttest values for data analysis skills in students after the use of regression analysis video tutorials and data analysis skills in students that have increased. Thus it can be interpreted that the implementation of Regression Analysis Video Tutorials on student data analysis skills provides positive and significant results.

Test Analysis Prerequisites

The prerequisite test analysis carried out includes normality and homogeneity tests for posttest values from control groups and experiments with the aim of whether the sample data is feasible to be hypothesized with parametric statistics, namely *the Independent t-test*. The results of the assumption test of posttest values from the control group and experiments with a sample of 30 students each is show in Table 6.

Table 6. Normality and Homogeneity Test Results of Control and Group Experiments

Group	Normality		Homogeneity		Hypothesis
	Score	*Sig.*	**Score**	*Sig.*	
Control Group	1.229	0.098	2.227	0.086	H_0 diterima
Eksperimental Group	0.727	0.666	0.735	0.542	(*Sig > 0,05*)

Based on Table 6, it can be concluded that the samples taken meet the assumption testing so that further hypothesis tests can be carried out.

Hypothesis Testing

Hypothesis testing was carried out to see if there were differences in posttest values from the control group and experiments on data analysis skills in college students after the use of Regression Analysis Video Tutorials. The following hypothesis test results are presented in Table 7.

Table 7. Hypothesis Test Results with Independent t-Test

		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Skills_Analysis	Equal variances assumed	0.383	0.538	-6.215	58	0.000	-2.433	0.392	-3.217	-1.650
	Equal variances not assumed			-6.215	57.45	0.000	-2.433	0.392	-3.217	-1.649

From the results of the Levene test, the equal variances assumed are chosen. Based on Table 7, it can be seen that the sig value is 0.0001 so it can be interpreted that the *sig* value is less than the *set alpha* value of 0.05. The conclusion is that Ho i rejected and Ha is accepted. Descriptive statistics results is show in Table 8.

Table 8. Descriptive Statistics Results

	Group	N	Mean	Std. Deviation	Std. Error Mean
Skills_Analysis	Control Group	30	77.17	1.440	0.263
	Eksperimental Group	30	79.60	1.589	0.290

The results from Table 8 show that the average student data analysis skills in the group experiment are higher than the group control. Based on the results of the hypothesis test, it can be concluded that there are differences in student data analysis skills in group control and group experiments after the use of Regression Analysis Video Tutorials and improved student data analysis skills. Thus it can be interpreted that the implementation of Regression Analysis Video Tutorials on student data analysis skills provides positive and significant results.

Discussion

Regression Analysis Video Development Tutorial

The development stage of this regression analysis video tutorial is carried out to the product validation stage. In this stage, use a few steps in developing a Regression Analysis Video Tutorial. The first step taken in this study is Analysis: analytical activities are carried out by conducting surveys of various

universities through interviews with students who have or are taking statistics courses. This interview is conducted to obtain information related to situations and conditions as well as problems in regression analysis. Planning: planning steps begin with the creation of the design and concept of the tutorial video that is included in the product draft. The draft video that has been made is then presented in a focus group discussion (FGD) with several material and video experts in the field of data analysis. This is so that the video to be made can function and be in accordance with the steps of data processing and analysis.

The implementation of the FGD resulted in the creation of a storyboard and material that became the content of the tutorial video. This video tutorial includes (1) the Normality Test, (2) Homogeneity Test, (3) Linearity Test, and (4) Simple Linear Regression Test. Development: the development stage is the development of the draft into a ready-made video tutorial. The finished video is then presented again in a *focus group discussion* (FGD) with several materials and video experts in the field of data analysis. Through FGD, the video will be validated before being tested on a small and large scale.. In accordance with the research that has been carried out that this development research produces products in the form of learning video media (Priantini & Manu, 2020). The resulting media learning is first assessed by several experts, such as content experts, learning design experts, and learning media experts.

After carrying out the development process and going through the expert validation stage, it can be known that the developed Video Tutorials are worth using. In addition, video tutorials have many benefits. The benefits of using video tutorials include being able to make learning effective anywhere and anytime (Bustanil S et al., 2019; Mahlianurrahman & Syamsu, 2019; Rasyid et al., 2022). Furthermore, previous study stated that theuse of video tutorials has a positive impact on students (Pritandhari & Ratnawuri, 2015). This is because students are more interested in learning that is directly practiced. Video tutorials also make it easier for lecturers to guide students directly, because if students understand the material being studied, lecturers only need to repeat the part of the material that is not clear so that learning time can be used efficiently.

Based on the presentation of the data above, the application of the regression analysis video tutorial developed by researchers is good and suitable for use for students, judging from the aspects of validity, reliability, success indicators, and assessment criteria. This is revealed based on the results of the analysis that has been carried out. The results show that all developed indicators meet validity and reliability tests. All indicators also contribute usefulness to the factors in each data analysis skill, especially simple linear regression analysis, so that it can be interpreted that the product in the form of a Regression Analysis Video Tutorial is proven to be usable. The learning video developed is said to be valid and feasible to be applied to the learning process if it has passed the expert test (content, media, and learning design) (Andriyani & Suniasih, 2021; Wahyuni et al., 2021; Wisada et al., 2019).

The relationship between this research and previous research is that it is able to produce learning media in the form of videos and is developed to make it easier for students to understand statistics courses. Based on the results of the feasibility test, it is also included in the decent category and this shows that video development has been good and has received a positive response from students. In line with the research conducted that found the development of learning videos has a positive impact on student learning activities such as material demonstration, motivation, tutorials, and time effectiveness (Agustini & Ngarti, 2020; Gae et al., 2021). Other benefits of developing learning videos according to previous study can increase the enthusiasm and activeness of students in the learning process (Arthur et al., 2021; Suantiani & Wiarta, 2022). Learning media products in the form of videos are very helpful for lecturers in the learning process. The development of learning videos also has an impact on making students more active in learning, creating a more pleasant learning atmosphere, more independent, and able to understand learning materials by connecting them with daily life (Kusuma et al., 2021; Sumampan et al., 2022).

Effectiveness of Using Video Tutorials Analisis Regression to Improve Data Analysis Skills in Students at Universities of East Kalimantan and Nusantara University PGRI Kediri

Based on the process of small group trials and field trials that have been tested on students at the Universities of East Kalimantan and Nusantara University PGRI Kediri, it shows that the average data analysis skills of students in the experimental group are higher than the control group, and in the results of the hypothesis test, it can be concluded that there are differences in student data analysis skills in group control and group experiments after the existence of the use of Regression Analysis Video Tutorials as well as improved student data analysis skills. Thus, it can be interpreted that the implementation of Regression Analysis Video Tutorials on student data analysis skills provides positive and significant results, besides that it can also be known that no research develops products in the form of Regression Analysis Video Tutorials. Based on the results of the hypothesis test, it can also be concluded that there are differences in student data analysis skills in group control and group experiments after the use of Regression Analysis Video Tutorials and improved student data analysis skills. Thus, it can be interpreted that the

implementation of Regression Analysis Video Tutorials on student data analysis skills provides positive and significant results.

The results of this study provide information that the implementation of the use of regression analysis video tutorials on students in learning provides positive and significant results. These results can be seen from the differences in student data analysis skills in group control and group experiments after the use of Regression Analysis Video Tutorials and improved student data analysis skills. In addition, the results of the small group trial process and field trials that have been tested on students at the Universities of East Kalimantan and Nusantara University PGRI Kediri, show that the average student data analysis skills in the experimental group are higher than the control group, and in the hypothesis test results, it can be concluded that there are differences in student data analysis skills in group control and group experiments after the use of Regression Analysis Video Tutorials and improved student data analysis skills. Thus, it can be interpreted that the implementation of the Regression Analysis Video Tutorial on student data analysis skills provides effectiveness and efficiency in terms of improving data analysis skills in students.

In accordance with the research results which states thatthe use of statistical software and analyzing research data can improve students' understanding of the basic concepts of statistics, data and statistics, descriptive statistical analysis, and inferential statistical analysis (Syafriandi et al., 2018). In addition, the use of video tutorials can improve the skills of the participants in conducting data analysis using statistical software and interpreting the results of the analysis. Several other studies also state that the use of video tutorials in appropriate learning can attract students' interest in the learning process so that students can easily understand and can also directly practice well according to the directions in the tutorial video (Batubara & Batubara, 2020; Mahlianurrahman & Syamsu, 2019; Pratama et al., 2021). This finding is reinforced by the results of previous penel itianwhich stated that learning videos are effectively used in the learning process (Agustien et al., 2018; Indriyani & Putra, 2018; Rahmawati & Atmojo, 2021). The use of video tutorials IS effective to improve learners' understanding of concepts (Aryanata et al., 2020; Gusmania & Wulandari, 2018). Learning videos have a positive impact on student learning activities such as material demonstrations, motivation, tutorials and time effectiveness (Agustini & Ngarti, 2020; Efanudin & Wibawa, 2017).

The implications of this study provide evidence that the use of video tutorials can improve students' data analysis skills. The results of this study can be used as a guideline for educational institutions to improve data analysis learning by using video tutorials. However, this research has some limitations. This research only measures students' data analysis skills with one test and does not consider data analysis skills that are more complex and contextual, so the results may not represent data analysis skills as a whole. This study also did not consider other factors such as motivation, learning environment, and students' initial abilities, which could also affect their data analysis skills. So it is hoped that future research will be able to continue this research or conduct similar research by including other factors that have not been included in this study.

4. CONCLUSION

The development of Regression Analysis Video Tutorials to improve Data Analysis Skills in Students at the Universities of East Kalimantan and Nusantara University PGRI Kediri which has been carried out by researchers has been declared good and feasible. The results of the application of the Regression Analysis Video Tutorial developed to have a positive and significant influence on improving data analysis skills in students at the Universities of East Kalimantan and Nusantara University PGRI Kediri. This is revealed based on the results of analysis from hypothesis tests on small-scale trials and large-scale trials that have been carried out that students who use video tutorials in performing simple linear regression analysis have better skills than those who do not use tutorial videos. Thus it can be said that the use of video tutorials for students is able to provide positive and significant results.

5. REFERENCES

Agustien, R., Umamah, N., & Sumarno, S. (2018). Pengembangan Media Pembelajaran Video Animasi Dua Dimensi Situs Pekauman di Bondowoso Dengan Model Addie Mata Pelajaran Sejarah Kelas X IPS. *Jurnal Edukasi*, *5*(1), 19. https://doi.org/10.19184/jukasi.v5i1.8010.

Agustini, K., & Ngarti, J. G. (2020). Pengembangan Video Pembelajaran Untuk Meningkatkan Motivasi Belajar Siswa Menggunakan Model R & D. *Jurnal Ilmiah Pendidikan Dan Pembelajaran*, *4*(1), 62–78. https://doi.org/10.23887/jipp.v4i1.18403.

Andriyani, N. L., & Suniasih, N. W. (2021). Development of Learning Videos Based on Problem-Solving Characteristics of Animals and Their Habitats Contain in Ipa Subjects on 6th-Grade. *Journal of*

Education Technology, *5*(1), 37. https://doi.org/10.23887/jet.v5i1.32314.

Arthur, R., Anisah, A., Wijayanti, I., & Sidik, J. (2021). Occupational Health and Safety Animated Learning Videos: Validity and Feasibility. *JPI (Jurnal Pendidikan Indonesia)*, *10*(1), 1. https://doi.org/10.23887/jpi-undiksha.v10i1.25192.

Aryanata, I. W. Y., Jampel, I. N., & Mahadewi, L. P. P. (2020). Media Video Pembelajaran Teknik Dasar Bermain Bola Voli Pada Pelajaran Penjaskes. *Jurnal Penelitian Dan Pengembangan Pendidikan*, *4*(2), 186–192. https://doi.org/10.23887/jppp.v4i2.27164.

Astuti, M., Arifin, Z., Mutohhari, F., & Nurtanto, M. (2021). Competency of Digital Technology: The Maturity Levels of Teachers and Students in Vocational Education in Indonesia. *Journal of Education Technology*, *5*(2), 254–262. https://doi.org/10.23887/jet.v5i3.35108.

Basri, H. (2018). Pemodelan Regresi Berganda untuk Data dalam Studi Kecerdasan Emosional. *DIDAKTIKA : Jurnal Kependidikan*, *12*(2), 103–116. https://doi.org/10.30863/didaktika.v12i2.179.

Batubara, H. H., & Batubara, D. S. (2020). Penggunaan Video Tutorial Untuk Mendukung Pembelajaran Daring Di Masa Pandemi Virus Corona. *Muallimuna : Jurnal Madrasah Ibtidaiyah*, *5*(2), 21. https://doi.org/10.31602/muallimuna.v5i2.2950.

Bhirawa, W. T. (2015). Proses Pengolahan Data Dari Model Persamaan Regresi Dengan Menggunakan Statistical Product and Service Solution (SPSS). *Statistika*, *7*(1), 71–83. https://journal.universitassuryadarma.ac.id/index.php/jmm/article/viewFile/528/494.

Borg, W. R., Gall, M. D., & Gall, J. P. (2003). *Education Research*. Allyn and Bacon.

Bustanil S, M., Asrowi, & Adianto, D. T. (2019). Pengembangan Media Pembelajaran Interaktif Berbasis Video Tutorial Di Sekolah Menengah Kejuruan. *JTP - Jurnal Teknologi Pendidikan*, *21*(2), 119–134. https://doi.org/10.21009/jtp.v21i2.11568.

Cholifah, E. N. U., Yamtinah, S., & Susanti VH, E. (2019). Hubungan Kemampuan Analisis dan Matematika dengan Prestasi Belajar Siswa pada Materi Larutan Penyangga Kelas XI SMA Negeri 4 Surakarta. *Jurnal Pendidikan Kimia*, *8*(2), 179–184. https://doi.org/10.20961/jpkim.v8i2.25340.

Efanudin, A. F., & Wibawa, S. C. (2017). Pengembangan Media Pembelajaran Berbasis Video Animasi Pada Mata Pelajaran Pemrograman Dasar untuk Siswa Kelas X Jurusan RPL di SMK Krian 1 Sidoarjo. *It-Edu*, *2*(2), 202–209. https://ejournal.unesa.ac.id/index.php/it-edu/article/download/22657/20779.

Gae, N. A., Ganing, N. N., & Kristiantari, M. R. (2021). Pengembangan Media Video Animasi Berorientasi Membaca Pemahaman Dengan Strategi Directed Reading Thinking Activity (DRTA) Pada Muatan Bahasa Indonesia. *Jurnal Penelitian Dan Pengembangan Pendidikan*, *5*(1), 100–108. https://doi.org/10.23887/jppp.v5i1.32453.

Ghofur, A., & Youhanita, E. (2020). Interactive Media Development to Improve Student Motivation. *IJECA (International Journal of Education and Curriculum Application)*, *3*(1), 1–11. https://doi.org/10.31764/ijeca.v3i1.2026.

Gusmania, Y., & Wulandari, T. (2018). Efektivitas penggunaan media pembelajaran berbasis video terhadap pemahaman konsep matematis siswa. *Pythagoras*, *7*(1), 61–67. https://doi.org/10.33373/PYTHAGORAS.V7I1.1196.

Huang, T. C., Lin, W., & Yueh, H. P. (2019). How to cultivate an environmentally responsible maker? A CPS approach to a comprehensive maker education model. *International Journal of Science and Mathematics Education*, *17*, 49–64. https://doi.org/10.1007/s10763-019-09959-2.

Indriyani, & Putra, F. G. (2018). Media Pembelajaran Berbantuan Sparkol Materi Program Linier Metode Simpleks. *Desimal: Jurnal Matematika*, *1*(3), 353–362. https://doi.org/10.24042/djm.v1i3.3008.

Khadijah, Syukriani, A., Harjuna, H., & Muthahharah, I. (2021). Pembinaan Kemampuan Analisis Data Kuantitatif bagi Mahasiswa Calon Guru. *MATAPPA : Jurnal Pengabdian Kepada Masyarakat*, *4*(1), 1–7. https://doi.org/10.31100/matappa.v4i1.747.

Kusuma, W. M., Sudira, P., Hasibuan, M. A., & Daryono, R. W. (2021). The Perceptions of Vocational School Students of Video Animation-Based Learning Media to Operate Lathes in Distance Learning. *Journal of Education Technology*, *5*(2), 200–206. https://doi.org/10.23887/jet.v5i2.33139.

Magasi, C., Mashenene, R. G., & Ndengenesa, D. M. (2022). Service Quality and Students' Satisfaction in Tanzania's Higher Education: A Re-examination of SERVQUAL Model. *International Review of Management and Marketing*, *12*(3), 18–25. https://doi.org/10.32479/irmm.13040.

Mahlianurrahman, & Syamsu, F. D. (2019). Developing Tutorial Video for Enhancing Elementary School Students' Process Skills in Science. *Elementary: Jurnal Ilmiah Pendidikan Dasar*, *5*(1), 1–12. https://e-journal.metrouniv.ac.id/index.php/elementary/article/view/1359.

Marcus, G. L., Wattimanela, H. J., & Lesnussa, Y. A. (2012). Analisis Regresi Komponen Utama untuk Mengatasi Masalah Multikolinieritas dalam Analisis Regresi Linier Berganda. *BAREKENG: Jurnal Ilmu Matematika Dan Terapan*, *6*(1), 31–40. https://doi.org/10.30598/barekengvol6iss1pp31-40.

Mustain, I. (2015). Kemampuan Membaca dan Interpretasi Grafik dan Data: Studi Kasus Pada Siswa Kelas 8 SMPN. *Scientiae Educatia*, *4*(2), 1–11. https://doi.org/10.24235/sc.educatia.v4i2.493.

Pratama, I. K. D., Lanang, I. G., Parwata, A., & Suwiwa, I. G. (2021). Media Pembelajaran Teknik Dasar Passing Bolavoli Berbasis Video Tutorial. *Jurnal Penelitian Dan Pengembangan Pendidikan*, *5*(2), 263–269. https://doi.org/10.23887/jppp.v5i2.37774.

Priantini, O., & Manu, D. A. M. (2020). The Development Of Teaching Video Media Based On Tri Kaya Parisudha In Educational Psychology Courses. *Journal of Education Technology*, *4*(4), 448. https://doi.org/10.23887/jet.v4i4.29608.

Pritandhari, M., & Ratnawuri, T. (2015). Evaluasi Penggunaan Video Tutorial Sebagai Media Pembelajaran Semester IV Program Studi Pendidikan Ekonomi Universitas Muhammadiyah Metro. *PROMOSI (Jurnal Pendidikan Ekonomi)*, *3*(2), 11–20. https://doi.org/10.24127/ja.v3i2.329.

Putra, E. (2014). Pengaruh Harga Terhadap Kepuasan Konsumen Pada Citra Swalayan dengan Variabel Intervening Service Quality. *Jurnal Apresiasi Ekonomi*, *2*(2), 89–94. https://www.neliti.com/publications/40236.

Rahmawati, F., & Atmojo, I. R. W. (2021). Analisis Media Digital Video Pembelajaran Abad 21 Menggunakan Aplikasi Canva Pada Pembelajaran IPA. *Jurnal Basicedu*, *5*(6), 6271–6279. https://doi.org/10.31004/basicedu.v5i6.1717.

Rasyid, F. Al, Primawati, Irzal, & Rifelino. (2022). Penerapan Media Pembelajaran Video Tutorial Untuk Meningkatkan Hasil Belajar Siswa Pada Mata Pelajaran Pdtm Di Smk Negeri 1 Bukittinggi Application of Video Tutorial Learning Media To Increase Student Learning Outcomes in Pdtm At Smk Negeri 1 Bukittinggi. *VOMEK: Jurnal Vokasi Mekanika*, *4*(1), 65–69. https://doi.org/10.24036/vomek.v4i1.294.

Sailer, M., Stadler, M., Schultz-Pernice, F., Franke, U., Schöffmann, C., Paniotova, V., Husagic, L., & Fischer, F. (2021). Technology-Related Teaching Skills and Attitudes: Validation of a Scenario-Based Self-Assessment Instrument for Teachers. *Computers in Human Behavior*, *115*(1), 1–12. https://doi.org/10.1016/j.chb.2020.106625.

Sangila, M. S., & Jufri, L. (2018). Deskripsi kemampuan mahasiswa fakultas tarbiyah dan ilmu keguruan kendari dalam menganalisis data statistika. *Jurnal Al-Ta'dib*, *11*(1), 109–126. https://doi.org/http://dx.doi.org/10.31332/atdb.v11i1.948.

Sanurdi, S., Syahril, Erizon, N., & Nabawi, R. A. (2020). Media Video Tutorial pada Pembelajaran Mata Diklat Bubut untuk SMK. *VOMEK: Jurnal Vokasi Mekanika*, *2*(4), 80–87. https://doi.org/10.24036/vomek.v2i4.145.

Setyawan, W. (2020). Qualified Lecturers Must Update By Educational Technology. In *Initiative of Thoughts from Indonesia to the World of the Covid 19 era* (pp. 175–181). novateurpublication.

Sosibo, Z. C. (2019). Self-assessment: A learner-centred approach towards transforming traditional practices and building self-directed learners. *South African Journal of Higher Education*, *33*(5), 76–97. https://doi.org/10.20853/33-5-3586.

Suantiani, N. M. A., & Wiarta, I. W. (2022). Video Pembelajaran Berbasis Pendekatan Kontekstual Pada Muatan Matematika. *Jurnal Penelitian Dan Pengembangan Pendidikan*, *6*(1), 64–71. https://doi.org/10.23887/jppp.v6i1.45455.

Sumampan, N. S., Sudarma, I. K., & Simamora, A. H. (2022). Animated Video Approaching Contextual Learning in Natural Science Subject Class VII. *Journal of Educational Research and Evaluation*, *6*(3), 431–438. https://doi.org/10.23887/jere.v6i3.48212.

Syafi'i, I. (2018). Pengaruh Penggunaan Media Pembelajaran Berbasis Video Tutorial Terhadap Motivasi Belajar dan Hasil Belajar Seni Budaya Pokok Bahasan Menggambar Desain Ragam Hias Kelas VIII SMP Negeri 2 Maesan Bondowoso Semester Ganjil Tahun Pelajaran 2016-2017. *Journal of Education Technology and Innovation (JETI)*, *1*(1), 24–32. http://jurnal.ikipjember.ac.id/index.php/jeti/article/view/94.

Syafriandi, Amalita, N., & Kurniawati, Y. (2018). Upaya Peningkatan Kemampuan Analisis Data Penelitian Menggunakan Software Statistik Bagi Guru-Guru Matematika SMA Kabupaten Pesisir Selatan. *Jurnal Eksakta Pendidikan (JEP)*, *2*(1), 1–8. https://doi.org/10.24036/jep/vol2-iss1/61.

Syilfi, Ispriyanti, D., & Safitri, D. (2012). Analisis Regresi Linier Piecewise Dua Segmen. *Jurnal Gaussin*, *1*(1), 219–228. https://doi.org/10.14710/j.gauss.v1i1.915.

Tyas, N. K. (2015). Penggunaan Video Tutorial untuk Meningkatkan Kemampuan Berbicara Bahasa Inggris Mahasiswa Sekolah Tinggi Elektronika dan Komputer (STEKOM) Semarang. *PIXEL: Jurnal Ilmiah Komputer Grafis*, *8*(1), 53–56. https://www.neliti.com/publications/158295.

Wahyuni, M., Hidayat, A., Zulhendri, Z., & Gistituati, N. (2021). Video Tutorials on Education Statistics Course Assisted with Screencastify: Validity and Feasibility. *Journal of Education Technology*, *5*(1), 86. https://doi.org/10.23887/jet.v5i1.33630.

Warasasmita, R. H., & Putra, Y. K. (2017). Pengembangan Media Pembelajaran Video Tutorial Interaktif Menggunakan Aplikasi Camtasia Studio dan Micromedia Flash. *EDUMATIC: Jurnal Pendidikan Informatika*, *1*(2), 35–43. https://doi.org/10.29408/edumatic.v1i2.944.

Wati, E. K., & Wulansari, W. (2021). LOP Game Development to Improve Early Childhood Mathematical-Logic Learning Ability. *JPI (Jurnal Pendidikan Indonesia)*, *10*(1), 68–78. https://doi.org/10.23887/jpi-undiksha.v10i1.28406.

Wiranata, A., Maskun, & Arif, S. (2019). Pengaruh Kemampuan Analisis dalam Model Pembelajaran Inkuiri terhadap Hasil Belajar Kognitif. *Prosiding Seminar Nasional Geotik*, *1*, 36–43. http://hdl.handle.net/11617/10795.

Wisada, P. D., Sudarma, I. K., & Yuda S, A. I. W. I. (2019). Pengembangan Media Video Pembelajaran Berorientasi Pendidikan Karakter. *Journal of Education Technology*, *3*(3), 140. https://doi.org/10.23887/jet.v3i3.21735.

Zulfikri. (2016). Pengaruh Mata Kuliah Statistik Terhadap Kemampuan Analisa Data Kuantitatif Mahasiswa Prodi S-1 Ilmu Perpustakaan Angkatan 2011-2012 Fakultas Adab dan Humaniora UIN Ar-Raniry. *Libria*, *8*(1), 111–128. https://doi.org/http://dx.doi.org/10.22373/1229.