Universitas Negeri Surabaya
Faculty of Mathematics and Natural Sciences
Bachelor of Science Education Study Program

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Research methodology	8420103094		**T=3**	**P=0**	**ECTS=4.77**	5	July 18, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	....	....	Prof. Dr. Erman, M.Pd.

Learning model	Project Based Learning

Program Learning Outcomes (PLO)	**PLO study program that is charged to the course**	
	PLO-5	Demonstrate scientific, critical, and innovative attitudes in integrated science learning, laboratory activities, and professional-related tasks
	PLO-7	Communicate ideas and research results effectively both in oral and written form
	PLO-11	Design and conduct research about learning of integrated science, and acquire, analyze, and interpret the research data
	PLO-15	Demonstrate knowledge related to science education research
	Program Objectives (PO)	
	PO - 1	• Apply research methods to solve educational problems according to the related field of study.
	PO - 2	• Master the concepts of educational research including research paradigms, types of research, review of the latest research articles, variables, research designs, research instruments, research techniques, data analysis and interpretation of research results, as well as steps for preparing research proposals and reports .
	PO - 3	Have skills in preparing educational research proposals according to the field of study by utilizing science and technology
	PLO-PO Matrix	

P.O	PLO-5	PLO-7	PLO-11	PLO-15
PO-1				
PO-2				
PO-3				

PO Matrix at the end of each learning stage (Sub-PO)

P.O	Week															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PO-1																
PO-2																
PO-3																

Short Course Description	This course examines research paradigms, research approaches, types of research, study of the latest research articles, hypotheses, variables, research designs, research instruments, research techniques, data analysis and interpretation of research results, as well as steps for preparing proposals and research report. This course is presented theoretically and the assignment is to prepare an educational research proposal as the final product of the course

References	Main :	
	1. Creswell, J.W. 2008. Educational Research: Planning, Conducting, and Evaluating Quantitative Research. 3rd Edition.New Jersey: Pearson Prentice Hall.Fraenkel, J.R., Wallen, N.E., Hyun, H. H. 2012. How to Design and Evaluate Research in Education. New York: McGraw-Hill Companies, Inc. Cohen, Louis., Manion, Lawrence., Morrison, Keith. 2007. Research Methods in Education. Sixth Edition. New York: Routledge	
	Supporters:	

Supporting lecturer	Prof.Dr. Wahono Widodo, M.Si. Dr. Elok Sudibyo, S.Pd.,M.Pd. Prof. Dr. Erman, M.Pd.

Week-	Final abilities of each learning stage (Sub-PO)	Evaluation		Help Learning, Learning methods, Student Assignments, [Estimated time]		Learning materials [References]	Assessment Weight (%)
		Indicator	Criteria & Form	Offline (*offline*)	Online (*online*)		

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Analyze the nature and examples of science education research	1.Analyzing the nature of science education research 2.Analyze examples of science education research	**Criteria:** 1.4: correct description 2.3: the description is generally correct, there is one aspect where the explanation is incorrect 3.2: the description is generally correct, there is more than one aspect where the explanation is incorrect 4.1: the description is wrong **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Discussing the nature, approach, ethics and examples of educational research (Presentation and questions and answers, presenter: lecturer) 3 X 50	Assignment: analysis of 3 research journal articles related to students' interests (3 weeks). National and international journals subscribed to by Unesa Eric DOAJ JPPIPA, PPII, Pensa, etc. 6 x 50	**Material:** The nature of research **References:** *Creswell, JW 2008. Educational Research: Planning, Conducting, and Evaluating Quantitative Research. 3rd Edition.New Jersey: Pearson Prentice Hall.Fraenkel, JR, Wallen, NE, Hyun, HH 2012. How to Design and Evaluate Research in Education. New York: McGraw-Hill Companies, Inc. Cohen, Louis., Manion, Lawrence., Morrison, Keith. 2007. Research Methods in Education. Sixth Edition. New York: Routledge* **Material:** **Reference** examples : *1. Widodo, Wahono & Sudibyo, Elok & Suryanti, Suryanti & Sari, Dhita & Inzanah, I. & Setiawan, Beni. (2020). The Effectiveness of Gadget-Based Interactive Multimedia in Improving Generation Z's Scientific Literacy. Indonesian Science Education Journal. 9. 248-256. 10.15294/jpii.v9i2.23208.* **Material:** Essence and examples **Reader:** *Sugiyono. 2019. Research and Development Methods. Bandung: Alphabeta.*	5%
2		1.Describe the philosophical worldview in educational research 2.Describe the paradigm background and general characteristics of quantitative, qualitative and mixed research	**Criteria:** 1.4: correct description 2.3: the description is generally correct, there is one aspect where the explanation is incorrect 3.2: the description is generally correct, there is more than one aspect where the explanation is incorrect 4.1: the description is wrong **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Discuss positivistic, naturalistic views and their implications for various educational research (quantitative, qualitative, mixed) 3 X 50	Continuing the assignment: analysis of 3 research journal articles related to student interests (3 weeks). National and international journals Sciencedirect.com Eric DOAJ 3 x 50	**Material:** Philosophical world view of educational research **References:** *Creswell, JW 2008. Educational Research: Planning, Conducting, and Evaluating Quantitative Research. 3rd Edition.New Jersey: Pearson Prentice Hall.Fraenkel, JR, Wallen, NE, Hyun, HH 2012. How to Design and Evaluate Research in Education. New York: McGraw-Hill Companies, Inc. Cohen, Louis., Manion, Lawrence., Morrison, Keith. 2007. Research Methods in Education. Sixth Edition. New York: Routledge* **Material:** Types of research **References:** *Fraenkel, J. & Wallen, N. 2003. How to Design and Evaluate Research in Education (Fith Edition) Book 1. Boston: McGraw Hill.*	9%

| 3 | Formulate science education research problems | 1. Analyzing national education standards, especially SKL and CP IPA
2. Identifying problems in the field of science education
3. Formulate the problem | **Criteria:**
1.4: correct description
2.3: the description is generally correct, there is one aspect where the explanation is incorrect
3.2: the description is generally correct, there is more than one aspect where the explanation is incorrect
4.1: the description is wrong
5. Breadth, depth, accuracy of problem background, problem formulation, and objectives

Forms of Assessment : Participatory Activities, Project Results Assessment / Product Assessment, Tests | Answering leading questions Discussion Chapter 2 Book 5 (1): The Research Problem Discussing standards, thinking skills, problems in science education based on the results of literature searches (articles and books)
3 X 50 | Starting the Project: determine the title, formulate the background of the problem, and formulate the
6 x 50 problem | **Material:** formulating the problem
References: *Creswell, JW 2008. Educational Research: Planning, Conducting, and Evaluating Quantitative Research. 3rd Edition.New Jersey: Pearson Prentice Hall.Fraenkel, JR, Wallen, NE, Hyun, HH 2012. How to Design and Evaluate Research in Education. New York: McGraw-Hill Companies, Inc. Cohen, Louis., Manion, Lawrence., Morrison, Keith. 2007. Research Methods in Education. Sixth Edition. New York: Routledge*

Material: formulating the problem
Reader: *Suharsimi Arikunto. 2011. Research Procedures: a practical approach. Jakarta : Rineka Cipta.*

Material: formulating research problems and objectives
References: *Fraenkel, J. & Wallen, N. 2003. How to Design and Evaluate Research in Education (Fith Edition) Book 1. Boston: McGraw Hill.*

Material: Examples of research problems and objectives related to scientific literacy
References: *1. Widodo, Wahono & Sudibyo, Elok & Suryanti, Suryanti & Sari, Dhita & Inzanah, I. & Setiawan, Beni. (2020). The Effectiveness of Gadget-Based Interactive Multimedia in Improving Generation Z's Scientific Literacy. Indonesian Science Education Journal. 9. 248-256. 10.15294/jpii.v9i2.23208.* | 5% |
| 4 | Analyze theories relevant to the problem and formulate hypotheses | 1. Describe how to carry out theoretical analysis
2. Describe plagiarism and propose techniques to prevent plagiarism
3. Applying quotations, references, and writing bibliography
4. Formulate a hypothesis | **Criteria:**
1.4: correct description
2.3: the description is generally correct, there is one aspect where the explanation is incorrect
3.2: the description is generally correct, there is more than one aspect where the explanation is incorrect
4.1: the description is wrong
5. Breadth, depth, accuracy of literature review and hypothesis formulation

Form of Assessment : Project Results Assessment / Product Assessment, Test | Discusses how to conduct theoretical studies, how to quote, how to write a bibliography, and plagiarism.
3 X 50 | Advanced project: Make a theoretical study relevant to the 3 x 50 problem | **Material:** Literature review, plagiarism
References: *Fraenkel, J. & Wallen, N. 2003. How to Design and Evaluate Research in Education (Fith Edition) Book 1. Boston: McGraw Hill.*

Material: Literature review Reference
: *Sugiyono. 2019. Research and Development Methods. Bandung: Alphabeta.*

Material: Example of "literature review" in a **Library article:** *2. Widodo, Wahono & Sari, Dhita & Martini, Martini & Suyanto, Totok. (2019). Strengthening Pre-service Teachers' Character: The application of ALLR Learning Model in Basic Science Subject. 10.2991/iceshum-19.2019.59.* | 8% |

| 5 | Identify variables and formulate operational definitions of variables | 1. Identifying research variables 2. Defining research variables operationally | **Criteria:** 1. 4: correct description 2. 3: the description is generally correct, there is one aspect where the explanation is incorrect 3. 2: the description is generally correct, there is more than one aspect where the explanation is incorrect 4. 1: the description is wrong 5. Breadth, depth, accuracy of literature review and hypothesis formulation 6. Variable precision and DOV **Form of Assessment** : Project Results Assessment / Product Assessment, Test | Discuss research variables, formulate variables and formulate operational definitions of 3 X 50 variables | Advanced project: Make a theoretical study relevant to the problem followed by variable identification and DOV 3 x 50 | **Material:** Literature review, plagiarism **References:** *Fraenkel, J. & Wallen, N. 2003. How to Design and Evaluate Research in Education (Fith Edition) Book 1. Boston: McGraw Hill.* **Material:** Literature review Reference : *Sugiyono. 2019. Research and Development Methods. Bandung: Alphabeta.* **Material:** Reference examples : *2. Widodo, Wahono & Sari, Dhita & Martini, Martini & Suyanto, Totok. (2019). Strengthening Pre-service Teachers' Character: The application of ALLR Learning Model in Basic Science Subject. 10.2991/iceshum-19.2019.59.* **Material:** DOV **Reader:** *Sugiyono. 2019. Research and Development Methods. Bandung: Alphabeta.* | 10% |

| 6 | Implement the research design | 1. Describe and apply quantitative research designs
2. Describe and apply a qualitative research design
3. Describe and apply the development research design
4. Describe and apply mixed methods research designs | **Criteria:**
1. 4: correct description
2. 3: the description is generally correct, there is one aspect where the explanation is incorrect
3. 2: the description is generally correct, there is more than one aspect where the explanation is incorrect
4. 1: the description is wrong
5. Breadth, depth, accuracy of research design

Forms of Assessment : Participatory Activities, Project Results Assessment / Product Assessment, Tests | Discusses research variables and various science education research designs: Quantitative Research:
- Experimental
- Correlational
- Causal-Comparative
- Survey Research

Qualitative Research in education::
- Biography
- Case Study
- Phenomenology
- Ethnography
- Grounded Theory

Development Research

Mixed Methods
3 X 50 | Advanced project: Formulate a research design that is relevant to the research idea for the
3 x 50 thesis | **Material:** Reference examples : *2. Widodo, Wahono & Sari, Dhita & Martini, Martini & Suyanto, Totok. (2019). Strengthening Pre-service Teachers' Character: The application of ALLR Learning Model in Basic Science Subject. 10.2991/iceshum-19.2019.59.*

Material: various types of research
Bibliography: *Fraenkel, J. & Wallen, N. 2003. How to Design and Evaluate Research in Education (Fith Edition) Book 1. Boston: McGraw Hill.*

Material: various types of research
References: *Creswell, JW 2008. Educational Research: Planning, Conducting, and Evaluating Quantitative Research. 3rd Edition.New Jersey: Pearson Prentice Hall.Fraenkel, JR, Wallen, NE, Hyun, HH 2012. How to Design and Evaluate Research in Education. New York: McGraw-Hill Companies, Inc. Cohen, Louis., Manion, Lawrence., Morrison, Keith. 2007. Research Methods in Education. Sixth Edition. New York: Routledge*

Material: various types of research
Reader: *Sugiyono. 2019. Research and Development Methods. Bandung: Alphabeta.*

Material: example of an article containing a research design
References: *1. Widodo, Wahono & Sudibyo, Elok & Suryanti, Suryanti & Sari, Dhita & Inzanah, I. & Setiawan, Beni. (2020). The Effectiveness of Gadget-Based Interactive Multimedia in Improving Generation Z's Scientific Literacy. Indonesian Science Education Journal. 9. 248-256. 10.15294/jpii.v9i2.23208.* | 7% |

| 7 | Implement the research design | 1. Describe and apply quantitative research designs
2. Describe and apply a qualitative research design
3. Describe and apply the development research design
4. Describe and apply mixed methods research designs | **Criteria:**
1. 4: correct description
2. 3: the description is generally correct, there is one aspect where the explanation is incorrect
3. 2: the description is generally correct, there is more than one aspect where the explanation is incorrect
4. 1: the description is wrong
5. Breadth, depth, accuracy of research design

Form of Assessment : Project Results Assessment / Product Assessment, Test | Discusses research variables and various science education research designs:
Quantitative Research:
- Experimental
- Correlational
- Causal-Comparative
- Survey Research

Qualitative Research in education::
- Biography
- Case Study
- Phenomenology
- Ethnography
- Grounded Theory

Development Research

Mixed Methods
3 X 50 | Advanced project: Formulate a research design that is relevant to the research idea for the
3 x 50 thesis | **Material:** Reference examples : *2. Widodo, Wahono & Sari, Dhita & Martini, Martini & Suyanto, Totok. (2019). Strengthening Pre-service Teachers' Character: The application of ALLR Learning Model in Basic Science Subject. 10.2991/iceshum-19.2019.59.*

Material: various types of research
Bibliography: *Fraenkel, J. & Wallen, N. 2003. How to Design and Evaluate Research in Education (Fith Edition) Book 1. Boston: McGraw Hill.*

Material: various types of research
References: *Creswell, JW 2008. Educational Research: Planning, Conducting, and Evaluating Quantitative Research. 3rd Edition.New Jersey: Pearson Prentice Hall.Fraenkel, JR, Wallen, NE, Hyun, HH 2012. How to Design and Evaluate Research in Education. New York: McGraw-Hill Companies, Inc. Cohen, Louis., Manion, Lawrence., Morrison, Keith. 2007. Research Methods in Education. Sixth Edition. New York: Routledge*

Material: various types of research
Reader: *Sugiyono. 2019. Research and Development Methods. Bandung: Alphabeta.*

Material: example of an article containing a research design
References: *1. Widodo, Wahono & Sudibyo, Elok & Suryanti, Suryanti & Sari, Dhita & Inzanah, I. & Setiawan, Beni. (2020). The Effectiveness of Gadget-Based Interactive Multimedia in Improving Generation Z's Scientific Literacy. Indonesian Science Education Journal. 9. 248-256. 10.15294/jpii.v9i2.23208.* | 5% |

| 8 | | All indicators confluence 1-7 | **Criteria:**
1. .4: correct description
2. .3: the description is generally correct, there is one aspect where the explanation is incorrect
3. .2: the description is generally correct, there is more than one aspect where the explanation is incorrect
4. .1: the description is wrong
5. Breadth, depth, accuracy of research design

Form of Assessment : Test | UTS
3 X 50 | Advanced project: Formulate a research design that is relevant to the research idea for the
3 x 50 thesis | **Material:** Reference examples : *2. Widodo, Wahono & Sari, Dhita & Martini, Martini & Suyanto, Totok. (2019). Strengthening Pre-service Teachers' Character: The application of ALLR Learning Model in Basic Science Subject. 10.2991/iceshum-19.2019.59.*

Material: various types of research
Bibliography: *Fraenkel, J. & Wallen, N. 2003. How to Design and Evaluate Research in Education (Fith Edition) Book 1. Boston: McGraw Hill.*

Material: various types of research
References: *Creswell, JW 2008. Educational Research: Planning, Conducting, and Evaluating Quantitative Research. 3rd Edition.New Jersey: Pearson Prentice Hall.Fraenkel, JR, Wallen, NE, Hyun, HH 2012. How to Design and Evaluate Research in Education. New York: McGraw-Hill Companies, Inc. Cohen, Louis., Manion, Lawrence., Morrison, Keith. 2007. Research Methods in Education. Sixth Edition. New York: Routledge*

Material: various types of research
Reader: *Sugiyono. 2019. Research and Development Methods. Bandung: Alphabeta.*

Material: example of an article containing a research design
References: *1. Widodo, Wahono & Sudibyo, Elok & Suryanti, Suryanti & Sari, Dhita & Inzanah, I. & Setiawan, Beni. (2020). The Effectiveness of Gadget-Based Interactive Multimedia in Improving Generation Z's Scientific Literacy. Indonesian Science Education Journal. 9. 248-256. 10.15294/jpii.v9i2.23208.* | 0% |

| 9 | Implement the research design | 1. Describe and apply quantitative research designs
2. Describe and apply a qualitative research design
3. Describe and apply the development research design
4. Describe and apply mixed methods research designs | **Criteria:**
1. 4: correct description
2. 3: the description is generally correct, there is one aspect where the explanation is incorrect
3. 2: the description is generally correct, there is more than one aspect where the explanation is incorrect
4. 1: the description is wrong
5. Breadth, depth, accuracy of research design

Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment | Discusses research variables and various science education research designs:
Quantitative Research:
- Experimental
- Correlational
- Causal-Comparative
- Survey Research

Qualitative Research in education::
- Biography
- Case Study
- Phenomenology
- Ethnography
- Grounded Theory

Development Research

Mixed Methods
3 X 50 | Advanced project: Formulate a research design that is relevant to the research idea for the
3 x 50 thesis | **Material:** Reference examples
: *2. Widodo, Wahono & Sari, Dhita & Martini, Martini & Suyanto, Totok. (2019). Strengthening Pre-service Teachers' Character: The application of ALLR Learning Model in Basic Science Subject. 10.2991/iceshum-19.2019.59.*

Material: various types of research
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Material: various types of research
Reader: *Sugiyono. 2019. Research and Development Methods. Bandung: Alphabeta.*

Material: example of an article containing a research design
References: *1. Widodo, Wahono & Sudibyo, Elok & Suryanti, Suryanti & Sari, Dhita & Inzanah, I. & Setiawan, Beni. (2020). The Effectiveness of Gadget-Based Interactive Multimedia in Improving Generation Z's Scientific Literacy. Indonesian Science Education Journal. 9. 248-256. 10.15294/jpii.v9i2.23208.* | 5% |

| 10 | Implement the research design | 1. Describe and apply quantitative research designs
2. Describe and apply a qualitative research design
3. Describe and apply the development research design
4. Describe and apply mixed methods research designs | **Criteria:**
1. 4: correct description
2. 3: the description is generally correct, there is one aspect where the explanation is incorrect
3. 2: the description is generally correct, there is more than one aspect where the explanation is incorrect
4. 1: the description is wrong
5. Breadth, depth, accuracy of research design

Form of Assessment : Project Results Assessment / Product Assessment, Test | Discusses research variables and various science education research designs:
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- Survey Research

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- Biography
- Case Study
- Phenomenology
- Ethnography
- Grounded Theory

Development Research

Mixed Methods
3 X 50 | Advanced project: Formulate a research design that is relevant to the research idea for the
3 x 50 thesis | **Material:** Reference examples
: *2. Widodo, Wahono & Sari, Dhita & Martini, Martini & Suyanto, Totok. (2019). Strengthening Pre-service Teachers' Character: The application of ALLR Learning Model in Basic Science Subject. 10.2991/iceshum-19.2019.59.*

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References: *Creswell, JW 2008. Educational Research: Planning, Conducting, and Evaluating Quantitative Research. 3rd Edition.New Jersey: Pearson Prentice Hall.Fraenkel, JR, Wallen, NE, Hyun, HH 2012. How to Design and Evaluate Research in Education. New York: McGraw-Hill Companies, Inc. Cohen, Louis., Manion, Lawrence., Morrison, Keith. 2007. Research Methods in Education. Sixth Edition. New York: Routledge*

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Reader: *Sugiyono. 2019. Research and Development Methods. Bandung: Alphabeta.*

Material: example of an article containing a research design
References: *1. Widodo, Wahono & Sudibyo, Elok & Suryanti, Suryanti & Sari, Dhita & Inzanah, I. & Setiawan, Beni. (2020). The Effectiveness of Gadget-Based Interactive Multimedia in Improving Generation Z's Scientific Literacy. Indonesian Science Education Journal. 9. 248-256. 10.15294/jpii.v9i2.23208.* | 5% |

| 11 | Implement the research design | 1. Describe and apply quantitative research designs
2. Describe and apply a qualitative research design
3. Describe and apply the development research design
4. Describe and apply mixed methods research designs | **Criteria:**
1. 4: correct description
2. 3: the description is generally correct, there is one aspect where the explanation is incorrect
3. 2: the description is generally correct, there is more than one aspect where the explanation is incorrect
4. 1: the description is wrong
5. Breadth, depth, accuracy of research design

Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment | Discusses research variables and various science education research designs: Quantitative Research:
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- Correlational
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- Survey Research

Qualitative Research in education::
- Biography
- Case Study
- Phenomenology
- Ethnography
- Grounded Theory

Development Research

Mixed Methods
3 X 50 | Advanced project: Formulate a research design that is relevant to the research idea for the 3 x 50 thesis | **Material:** Reference examples : *2. Widodo, Wahono & Sari, Dhita & Martini, Martini & Suyanto, Totok. (2019). Strengthening Pre-service Teachers' Character: The application of ALLR Learning Model in Basic Science Subject. 10.2991/iceshum-19.2019.59.*

Material: various types of research
Bibliography: *Fraenkel, J. & Wallen, N. 2003. How to Design and Evaluate Research in Education (Fith Edition) Book 1. Boston: McGraw Hill.*

Material: various types of research
References: *Creswell, JW 2008. Educational Research: Planning, Conducting, and Evaluating Quantitative Research. 3rd Edition.New Jersey: Pearson Prentice Hall.Fraenkel, JR, Wallen, NE, Hyun, HH 2012. How to Design and Evaluate Research in Education. New York: McGraw-Hill Companies, Inc. Cohen, Louis., Manion, Lawrence., Morrison, Keith. 2007. Research Methods in Education. Sixth Edition. New York: Routledge*

Material: various types of research
Reader: *Sugiyono. 2019. Research and Development Methods. Bandung: Alphabeta.*

Material: example of an article containing a research design
References: *1. Widodo, Wahono & Sudibyo, Elok & Suryanti, Suryanti & Sari, Dhita & Inzanah, I. & Setiawan, Beni. (2020). The Effectiveness of Gadget-Based Interactive Multimedia in Improving Generation Z's Scientific Literacy. Indonesian Science Education Journal. 9. 248-256. 10.15294/jpii.v9i2.23208.* | 5% |
| 12 | Apply sampling rules | 1. Describe the meaning of population and sample
2. Apply sampling rules | **Criteria:**
1. Performance Assessment (Product)
2. Research proposal
3. Prepare a science education research proposal that you will present, using the following steps:
4. 1. Pay attention to the format of the research proposal by taking chapters 1 to chapter 3 according to the results you downloaded at www.guidelines for thesis.unesa.ac.id
5. 2. Study the guidelines for writing a research proposal by relating it to the concepts in research methodology
6. 3. Study several | Review teaching materials and discuss population, samples, and 3 X 50 sampling techniques | Advanced project: formulating population and sampling techniques, or informants for qualitative research 3 x 50 | **Material:** Population and sample
References: *Creswell, JW 2008. Educational Research: Planning, Conducting, and Evaluating Quantitative Research. 3rd Edition.New Jersey: Pearson Prentice Hall.Fraenkel, JR, Wallen, NE, Hyun, HH 2012. How to Design and Evaluate Research in Education. New York: McGraw-Hill Companies, Inc. Cohen, Louis., Manion, Lawrence., Morrison, Keith. 2007. Research Methods in Education. Sixth Edition. New York: Routledge* | 5% |

				previous research results as material for consideration in writing a research proposal.				

7.4. Find a problem/idea for research in the field of science education that you can implement.

8.5. Do analysis

9.6. Organize it into a proposal

10. Rubric:

11. Score

12. Rubric

13. 4

14. The research proposal is in accordance with the template format www.pedoman sistik writing guide.unesa.ac.id, each component is written according to the rules according to the guidelines for chapters 1 to chapter 3, has up-to-date value, there is evidence of consultation at least 3 times.

15. 3

16. The research proposal is in accordance with the template format www.pedoman sistik writing guide.unesa.ac.id, each component is written according to the rules according to the guidelines for chapters 1 to chapter 3, the up-to-date value is low, there is evidence of consultation at least 3 times.

17. 2

18. The research proposal is in accordance with the template format www.pedoman sistik writing guide.unesa.ac.id, each component is written according to the rules according to the guidelines for chapters 1 to chapter 3, has no up-to-date value, there is evidence of consultation at least 3 times.

19. 1

20. The research proposal does not comply with the template format www.pedoman sistik writing guide.unesa.ac.id, it does not have up-to-date value.

Form of Assessment : Project Results Assessment / Product Assessment

| 13 | 1. Utilizing science and technology as a tool to help solve problems in science education research. Designing science education research proposals based on concepts in research. Making strategic decisions based on data and information (including the results of input/ideas/ideas from colleagues/references) and providing ideas in selecting science education research.
2. Determine data collection techniques and research instruments | 1. Formulate research problems, research objectives, hypothesis formulation, variables, samples, populations as materials in preparing research proposals. Utilizing ICT to carry out literature searches Developing preliminary study instruments. Perform analysis
2. Describe data collection techniques
3. Determine relevant data collection techniques
4. Describe the data collection instruments | **Criteria:**
1. Rubric:
2. Score
3. Rubric
4. 4
5. The research proposal is in accordance with the template format www.pedoman sistik writing guide.unesa.ac.id, each component is written according to the rules according to the guidelines for chapters 1 to chapter 3, has up-to-date value, there is evidence of consultation at least 3 times.
6. 3
7. The research proposal is in accordance with the template format www.pedoman sistik writing guide.unesa.ac.id, each component is written according to the rules according to the guidelines for chapters 1 to chapter 3, the up-to-date value is low, there is evidence of consultation at least 3 times.
8. 2
9. The research proposal is in accordance with the template format www.pedoman sistik writing guide.unesa.ac.id, each component is written according to the rules according to the guidelines for chapters 1 to chapter 3, has no up-to-date value, there is evidence of consultation at least 3 times.
10. 1
11. The research proposal does not comply with the template format www.pedoman sistik writing guide.unesa.ac.id, it does not have up-to-date value.

Form of Assessment : Project Results Assessment / Product Assessment | Discuss and determine research techniques and instruments and how to meet the requirements for validity and reliability of the instruments.
3 X 50 | Advanced project: creating research instruments and proposals | **Material:** data collection methods and instruments
References: *Creswell, JW 2008. Educational Research: Planning, Conducting, and Evaluating Quantitative Research. 3rd Edition.New Jersey: Pearson Prentice Hall.Fraenkel, JR, Wallen, NE, Hyun, HH 2012. How to Design and Evaluate Research in Education. New York: McGraw-Hill Companies, Inc. Cohen, Louis., Manion, Lawrence., Morrison, Keith. 2007. Research Methods in Education. Sixth Edition. New York: Routledge*

Material: Describe data collection instruments
References: *Fraenkel, J. & Wallen, N. 2003. How to Design and Evaluate Research in Education (Fith Edition) Book 1. Boston: McGraw Hill.*

Material: examples
References: *1. Widodo, Wahono & Sudibyo, Elok & Suryanti, Suryanti & Sari, Dhita & Inzanah, I. & Setiawan, Beni. (2020). The Effectiveness of Gadget-Based Interactive Multimedia in Improving Generation Z's Scientific Literacy. Indonesian Science Education Journal. 9. 248-256. 10.15294/jpii.v9i2.23208.* | 10% |

14	1.Utilizing science and technology as a tool to help communicate ideas for solving problems in science education. Making presentations on research proposals that have been made 2.Perform data analysis and interpretation of results	1.Describe descriptive analysis 2.Describe inferential analysis 3.Describe analysis in qualitative research 4.Interpret analysis results	**Criteria:** Breadth, depth, accuracy of data analysis methods **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Discusses descriptive and inferential analysis techniques as well as 6 X 50 qualitative analysis	Advanced projects: drawing up analysis plans, drafting proposals	**Material:** Data analysis **Reader:** *Sugiyono. 2019. Research and Development Methods. Bandung: Alphabeta.* **Material:** Data analysis **Bibliography:** *9. Fraenkel, J. & Wallen, N. 2003. How to Design and Evaluate Research in Education (Fith Edition) Book 2. Boston: McGraw Hill.* **Material:** Examples of data analysis **References:** *1. Widodo, Wahono & Sudibyo, Elok & Suryanti, Suryanti & Sari, Dhita & Inzanah, I. & Setiawan, Beni. (2020). The Effectiveness of Gadget-Based Interactive Multimedia in Improving Generation Z's Scientific Literacy. Indonesian Science Education Journal. 9. 248-256. 10.15294/jpii.v9i2.23208.*	10%
15	1.Utilizing science and technology as a tool to help communicate ideas for solving problems in science education. Making presentations on research proposals that have been made 2.Perform data analysis and interpretation of results	1.Describe descriptive analysis 2.Describe inferential analysis 3.Describe analysis in qualitative research 4.Interpret analysis results	**Criteria:** Breadth, depth, accuracy of data analysis methods **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Discusses descriptive and inferential analysis techniques as well as 6 X 50 qualitative analysis	Advanced projects: drawing up analysis plans, drafting proposals	**Material:** Data analysis **Reader:** *Sugiyono. 2019. Research and Development Methods. Bandung: Alphabeta.* **Material:** Data analysis **Bibliography:** *9. Fraenkel, J. & Wallen, N. 2003. How to Design and Evaluate Research in Education (Fith Edition) Book 2. Boston: McGraw Hill.* **Material:** Examples of data analysis **References:** *1. Widodo, Wahono & Sudibyo, Elok & Suryanti, Suryanti & Sari, Dhita & Inzanah, I. & Setiawan, Beni. (2020). The Effectiveness of Gadget-Based Interactive Multimedia in Improving Generation Z's Scientific Literacy. Indonesian Science Education Journal. 9. 248-256. 10.15294/jpii.v9i2.23208.*	11%
16	Utilizing science and technology as a tool to help communicate ideas for solving problems in science education. Making presentations on research proposals that have been made	1.prepare proposals 2.present the proposal	**Criteria:** 1.rubric for preparing proposals 2.proposal presentation rubric 3.question and answer activity **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Presentation of proposals and instruments 3 X 50	upload proposals, instruments and PPT 3 x 50	**Material:** Data analysis **Reader:** *Sugiyono. 2019. Research and Development Methods. Bandung: Alphabeta.* **Material:** proposal **Bibliography:** *Creswell, JW 2008. Educational Research: Planning, Conducting, and Evaluating Quantitative Research. 3rd Edition.New Jersey: Pearson Prentice Hall.Fraenkel, JR, Wallen, NE, Hyun, HH 2012. How to Design and Evaluate Research in Education. New York: McGraw-Hill Companies, Inc. Cohen, Louis., Manion, Lawrence., Morrison, Keith. 2007. Research Methods in Education. Sixth Edition. New York: Routledge* **Material:** proposal **Reader:** *Sugiyono. 2019. Research and Development Methods. Bandung: Alphabeta.*	0%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage

1.	Participatory Activities	26.5%
2.	Project Results Assessment / Product Assessment	55.5%
3.	Test	18%
		100%

Notes

1. **Learning Outcomes of Study Program Graduates (PLO - Study Program)** are the abilities possessed by each Study Program graduate which are the internalization of attitudes, mastery of knowledge and skills according to the level of their study program obtained through the learning process.
2. **The PLO imposed on courses** are several learning outcomes of study program graduates (CPL-Study Program) which are used for the formation/development of a course consisting of aspects of attitude, general skills, special skills and knowledge.
3. **Program Objectives (PO)** are abilities that are specifically described from the PLO assigned to a course, and are specific to the study material or learning materials for that course.
4. **Subject Sub-PO (Sub-PO)** is a capability that is specifically described from the PO that can be measured or observed and is the final ability that is planned at each learning stage, and is specific to the learning material of the course.
5. **Indicators for assessing** abilities in the process and student learning outcomes are specific and measurable statements that identify the abilities or performance of student learning outcomes accompanied by evidence.
6. **Assessment Criteria** are benchmarks used as a measure or measure of learning achievement in assessments based on predetermined indicators. Assessment criteria are guidelines for assessors so that assessments are consistent and unbiased. Criteria can be quantitative or qualitative.
7. **Forms of assessment:** test and non-test.
8. **Forms of learning:** Lecture, Response, Tutorial, Seminar or equivalent, Practicum, Studio Practice, Workshop Practice, Field Practice, Research, Community Service and/or other equivalent forms of learning.
9. **Learning Methods:** Small Group Discussion, Role-Play & Simulation, Discovery Learning, Self-Directed Learning, Cooperative Learning, Collaborative Learning, Contextual Learning, Project Based Learning, and other equivalent methods.
10. **Learning materials** are details or descriptions of study materials which can be presented in the form of several main points and sub-topics.
11. **The assessment weight** is the percentage of assessment of each sub-PO achievement whose size is proportional to the level of difficulty of achieving that sub-PO, and the total is 100%.
12. TM=Face to face, PT=Structured assignments, BM=Independent study.