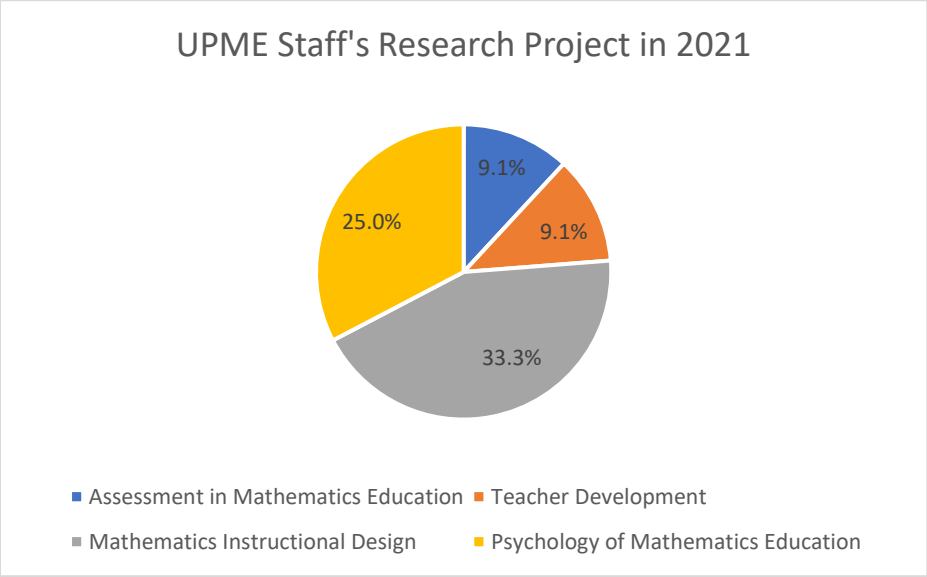
RESEARCH PROJECTS IN 2021



Assessment in Mathematics Education

- Development of Assessment Course Textbooks for Mathematics Learning

Teacher Development

- Developing Teacher Professional Development to Reduce Lower Secondary Teachers' Errors and Misconception on School Mathematics
- Exploring Preservice Teachers' Mathematics Content Knowledge and Pedagogical Content Knowledge

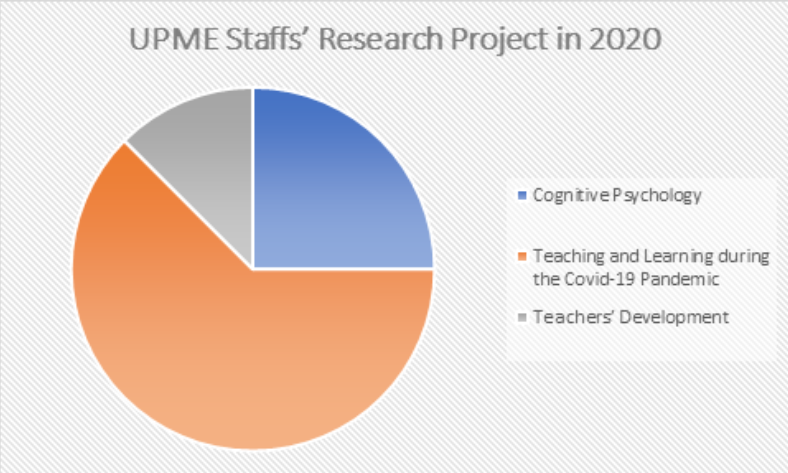
Mathematics Instructional Design

- Development of Mathematics Learning Media Textbooks to Increase Student Creativity
- Development of Textual Textbooks for Contextual Mathematics with Digital Content
- Development of Innovative Student-Centered Learning Textbook for Teaching Mathematics

Psychology of Mathematics Education

- Investigating Graduate Mathematics Education Students' Critical Thinking in Abstract Algebra Tasks
- Exploring Student Teacher' Numeracy in the Context of the COVID-19 Pandemic
- Eye tracking System for Cognitive Analysis of Children with Learning Disabilities in Formal Education
- Effects of Numeracy of Prospective Elementary School Teacher Students' Self Efficacy

RESEARCH PROJECTS IN 2020



Cognitive Psychology

- Eye tracking System for Cognition Analysis of Children with Learning Disabilities in Formal Education
- Application of Catastrophic Theory in Cognition and Mental Work Analysis to Improve Mathematics Performance

Teaching and Learning during the Covid-19 Pandemic

- E-learning-Based Task Design to Develop Mathematics Learning Tools Containing 4Cs in the Covid-19 Handling Period
- Development of Digital Learning Resources for Realistic Mathematics Learning in the Middle of the Covid-19 Pandemic
- Development of HOTS questions for Middle School Students Based on the Covid-19 Phenomenon
- Development of a STEM-based Science Mathematics Module during the Covid-19 pandemic to Support Student Independent Learning
- The Development of Edunesa in E-Learning Applications

Teacher Development

The Development of Teaching Material Supplements to Overcome Misconception of Mathematics of Elementary School Teachers

RESEARCH PROJECTS IN 2019



1. **Instructional Design**
   - Development of Professional Models of Junior High School Teachers to Improve Students' Creative Thinking Ability and Mathematical Literacy
   - Developing Enactivism Learning Module to Support Mathematics Education Psychology Lectures
   - Development of Reversible Problem Based Learning Model to Improve Students' Reversible Thinking Ability to Mathematics Teacher Candidates
   - Geometry Learning Design Based on Problem Solving History of Mathematics to Support Students' Understanding of Mathematical Literacy
   - Improving the Learning Process through Transcript Eased Lesson Analysis (TBLA) in Science Learning
   - Development of a Guidebook for Microteaching Implementation for STEM-Based Learning at FMNS Unesa
   - Learning-Based Task Design to develop critical, creative and creative thinking skills
   - Effectiveness of English courses to improve the English language skills of superior class students
2. **Blended Learning**
   - Blended Learning Lectures on Differential Calculus for Mathematics Department Students

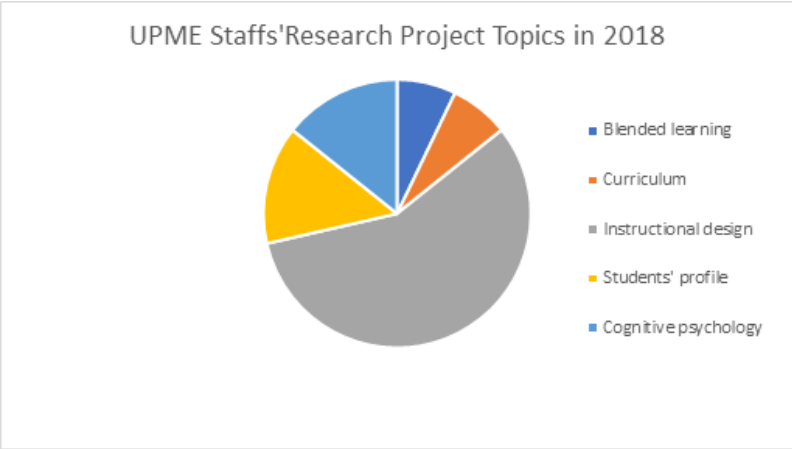
- Development of Blended Learning-Based Teaching Materials in Foundation of Mathematics Course

Developing Hybrid Learning on Differential Calculus Teaching Materials to Prepare Students for 21st Century Learning

3. **Cognitive Psychology**
   - The Development of Postgraduate Student Covariational Reasoning of Mathematics Education Master's degree in Solving Hots Problems
   - Cognition Process Analysis in Understanding Mathematical Concepts Based on Eye Movement Using an Eye-tracker
   - Identification of Elementary School Teacher Misconceptions on Mathematics Learning
4. **Students' Cognitive Profile in Mathematical Thinking**
   - Students' abilities in developing instructional tools that improve students' critical thinking skills using discussion learning models in innovative learning courses
   - Research profile in the topic of Realistic Mathematics Education in the Mathematics Department of Unesa
   - Profile of the ability of undergraduate students in mathematics education in Mathematics instructional tools
5. **Ethnomathematics**

   East Java Cultural Ethnomathematics
6. **Cognitive Psychology**
   - The Development of Postgraduate Student Covariational Reasoning of Mathematics Education Master's degree in Solving Hots Problems
   - Cognition Process Analysis in Understanding Mathematical Concepts Based on Eye Movement Using an Eye-tracker
   - Identification of Elementary School Teacher Misconceptions on Mathematics Learning
7. **Curriculum**
   - Curriculum Knowledge for Prospective Teacher Students in Designing Algebraic Learning Based on the International Curriculum
   - Restructuring of Study Program Curriculum Doctoral Programme in Postgraduate Mathematics Education, Universitas Negeri Surabaya

RESEARCH PROJECTS IN 2018



1. **Blended Learning**

   Development of Blended Learning in Mathematical Subjects

2. **Curriculum**

   Evaluation of the Implementation of Mathematics Education Curriculum

3. **Instructional Design**

   - Inquiry-Based Learning to Train Junior High School Students' Ability to Solve Math Problems
   - Development of Mathematics Learning Tools Based on Higher Order Thinking Skills (HOTS) for Elementary School Students
   - Development of Elliptic and Hyperbolic Geometry Teaching Methods to Reduce the Occurrence of Cognitive Conflict
   - Application of Online Lectures (Virtual Learning) in Mathematics Basics Subject
   - Development of Basic Mathematics Student Activity Sheets (LKM) for Learning in Biology Education Classrooms
   - Development of Professional Models for Junior High School Teachers to Improve Students' Creative Thinking Ability and Mathematical Literacy (First Year, 3-year Plan)
   - Development of Student Worksheets (LKM) to Improve Student's Critical Thinking Skills and Independence

- Development of the XXI Century MIPA Education Graduates Competency Test Model and KKNI Needs

4. **Students' Cognitive Profile in Mathematical Problem-solving**
    - Identification of Students' Ability in Designing Mathematical Problems with the Reasoning Category
    - Students' Ability in Developing Learning Tools Using Discovery Learning in Innovative Teaching II Subject
5. **Cognitive Psychology**
    - Cognition Process Analysis in Understanding Mathematical Concepts Based on Eye Movement Using an Eye-Tracker
    - Covariational Reasoning for Undergraduate and Master Students of Mathematics Education