

Appendix Criteria 5. Quality Management: Quality Assessment and Development

Each Learning Outcome Program (PLO) has several courses that are charged so that each course has several PLO loads. The PLO load given in each course is percentaged to ensure the load for each PLO in the course.

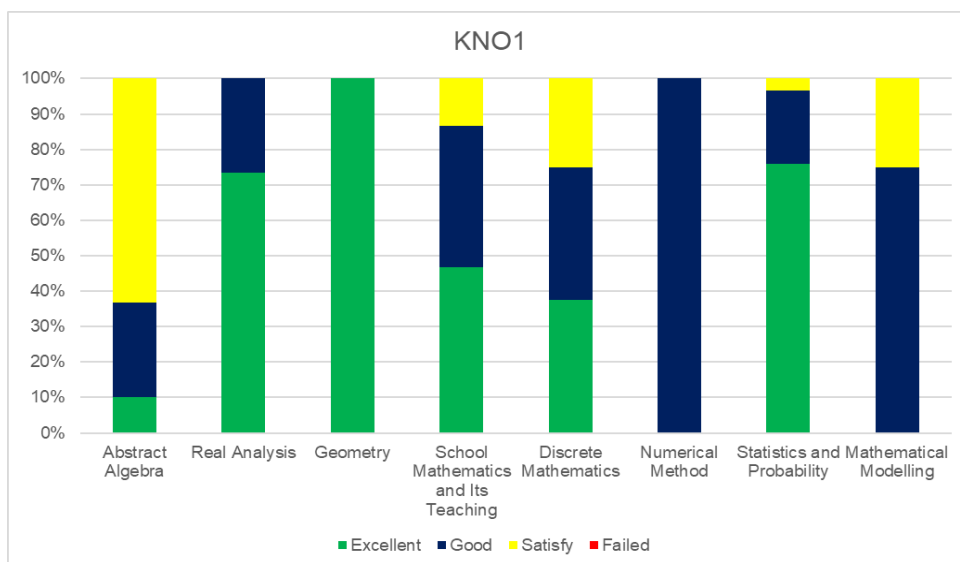
The PLO calculation is carried out through the assessment of several of these courses. Each course is assessed based on the Course Learning Outcome (CLO) of the course through several methods. From the results of each assessment component an evaluation of the success criteria in the course is carried out. The success criteria used are excellence ≥ 85 ; $85 > \text{good} \geq 70$; $55 > \text{satisfy} \geq 70$; failed > 55 .

From the standard criteria above, the percentage of achievement for each PLO in each course can be obtained. To determine the achievement of each PLO, it can be seen from the percentage of achievement of several courses assigned to the PLO. Assessment was also carried out on the Expected Outcome (PEO) Program in the same way.

Magister Program of Mathematics Education (MPME)

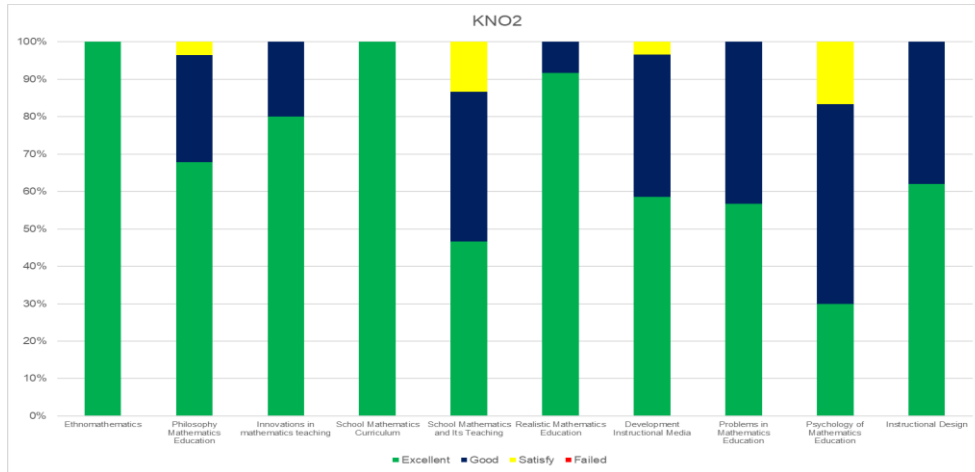
MPME Annex

PLO 1



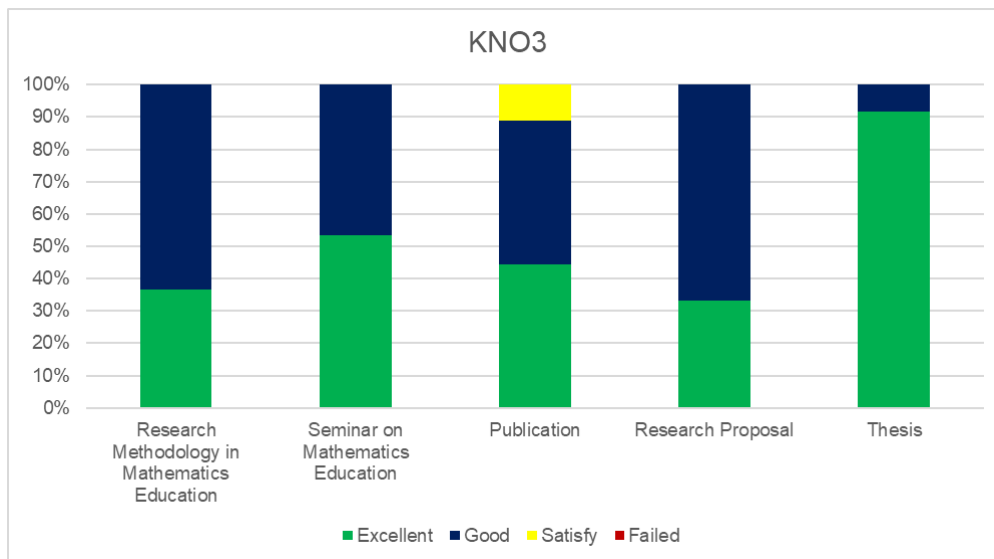
Annex Figure 5.10 Programme Learning Outcome (PLO) 1 of MPME

PLO 2



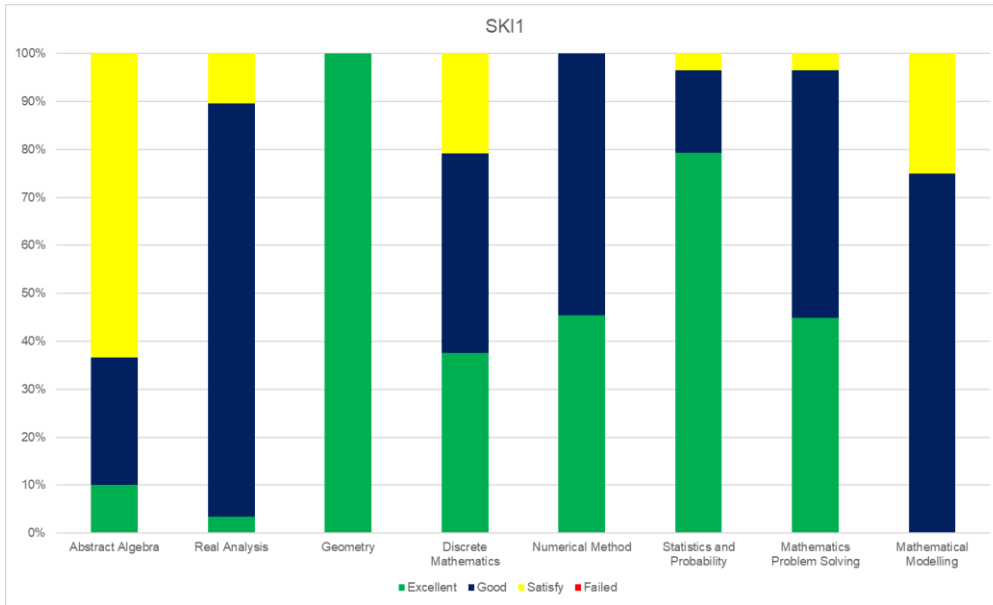
Annex Figure 5.11 Programme Learning Outcome (PLO) 2 of MPME

PLO3



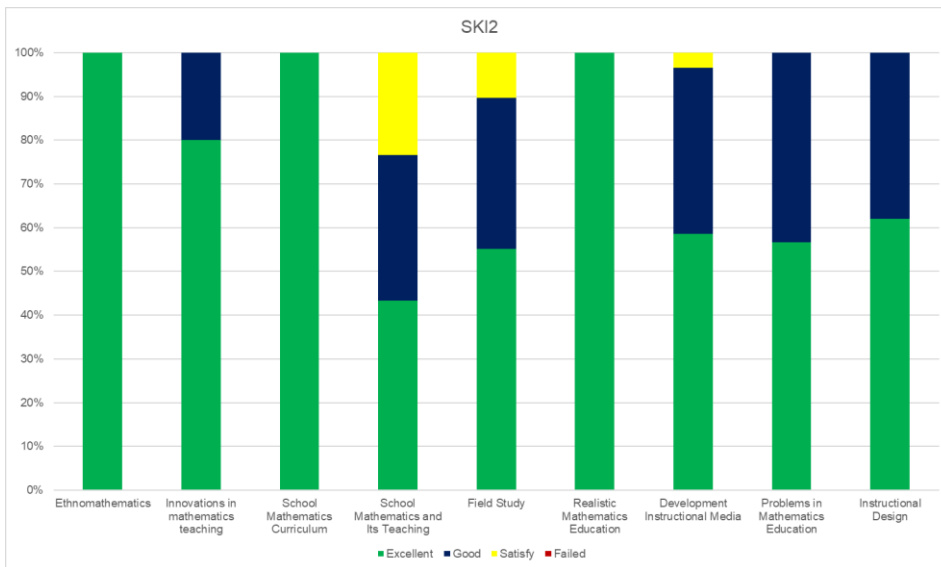
Annex Figure 5.12 Programme Learning Outcome (PLO) 3 of MPME

PLO4



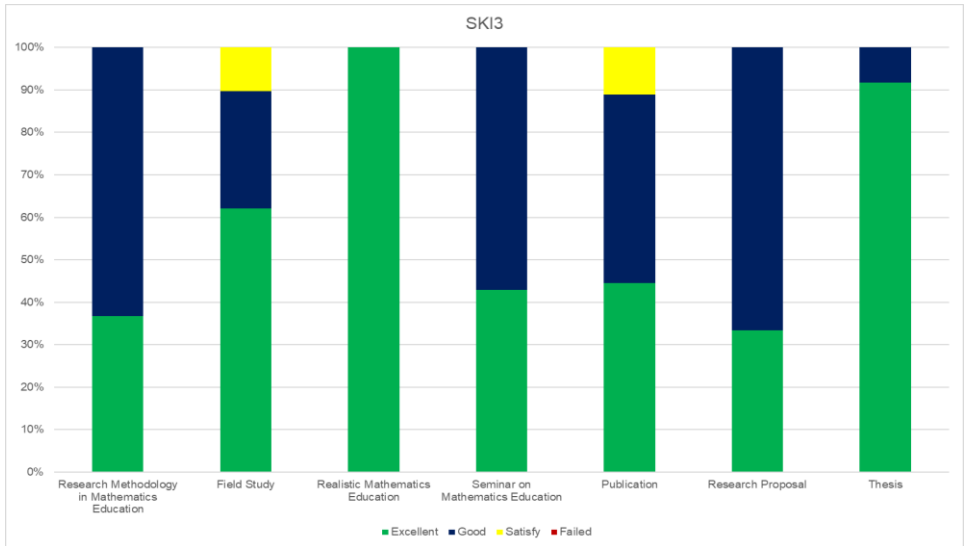
Annex Figure 5.13 Programme Learning Outcome (PLO) 4 of MPME

PLO5



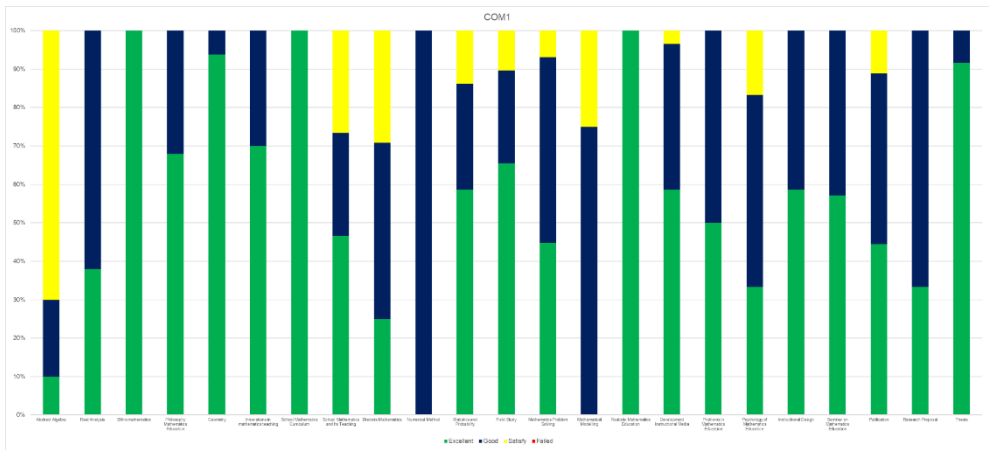
Annex Figure 5.14 Programme Learning Outcome (PLO) 5 of MPME

PLO6



Annex Figure 5.15 Programme Learning Outcome (PLO) 6 of MPME

PLO7



Annex Figure 5.16 Programme Learning Outcome (PLO) 7 of MPME

PLO8

Magister Program of Mathematics Education (MPME)

PLO 1

KNO-1 demonstrates mathematical knowledge and understanding. This PLO is supported by seven courses which are assessed by using several methods to obtain the achievement result (see figure 1 Annex). Based on the KNO-1 achievement, students' mathematical knowledge and understanding in several courses ranges in excellent, good, and satisfy categories. There is no student who is considered as fail criteria in this outcome. Geometry, Real analysis, and statistics & probability are courses which have more than 50% students in excellent categories. Meanwhile, school mathematics, abstract algebra and mathematical discrete are only below 50% students who are excellent. In contrast, numerical methods and mathematical modelling are two courses which have no students in excellent categories. Furthermore, there are three courses which have 25% of students falling into satisfy category. This result might occur due to students finding difficulties in understanding the content and lack of practice. Several improvements have been made by giving more exercise and strengthening the deductive thinking of students in the mentioned courses.

PLO 2

KNO2 demonstrates mathematics pedagogical content knowledge and understanding. This PLO is supported by ten courses which are assessed by using several methods to obtain the achievement result (see figure 2 Annex). According to the achievement result, at least 30% of students of all courses have excellent and good criteria. The Ethnomathematics and school curriculum course showed good results with 100% of students falling into excellent categories. However, this could not be found in School mathematics and psychology of mathematics education courses due to students' difficulties in completing assignments, therefore both courses only have less than 50% students who are considered as excellent category and more than 15% students considered as satisfy category.

PLO3

KNO3 is the ability of students to demonstrate knowledge and understanding of mathematics education research. This PLO is supported by five courses which are assessed by using several methods to obtain the achievement result (see figure 3 Annex). The graph reveals that there are 5 courses that support KNO3, namely, research methodology, Seminar, Publication, Proposal, and thesis. Overall, students' performance within all courses belong to excellent and good criteria. There were no students who were classified as fail for all courses and Thesis became the most percentages of students who are categorized as excellent with slightly above 90% students. However, there are 10% students who are considered to satisfy criteria in the publication course.

PLO4

SKI-1 demonstrates the ability of students using mathematical ideas to solve mathematics problems. This PLO is supported by eight courses which are assessed by using several methods to obtain the achievement result (see figure 4 Annex). Overall, the ability of students to solve mathematics problems by using mathematical ideas is dominantly considered as excellent and good criteria. Meanwhile, abstract algebra and real analysis courses only have below 10% students in the excellent category and more than half of the courses contribute to a small amount of satisfy category. These are due to students finding difficulties in applying their knowledge to solve problems related to discrete mathematics.

PLO5

SKI-2 demonstrates the ability of students to design, implement, and evaluate an effective and innovative mathematics instruction. This PLO is supported by nine courses which are assessed by using several methods to obtain the achievement result (see figure 5 Annex). In this area, Majority of students are able to activate their creative thinking for designing, implementing, and evaluating mathematics instruction. It is shown on the graph that above 50% of students belong to excellent criteria. This phenomenon might be the result of guidance by an expert or lecturer in instructional design learning areas.

PLO6

SKI-3 demonstrates the ability of students to design, implement, and critically evaluate contemporary mathematics education research. This PLO is supported by seven courses which are assessed by using several methods to obtain the achievement result (see figure 5 Annex). In terms of education research, the most number of students passed mentioned courses with excellent and good criteria. About 10% of students in field study and publication have passed both courses with a satisfied category. Moreover, the Realistic mathematics Education course is a course that achieves 100% excellent criteria for students.

PLO7

COM-1 demonstrates the ability of students to work on and present problems in mathematics and mathematics education. This PLO is supported by twenty three courses which are assessed by using several methods to obtain the achievement result (see figure 7 Annex). Overall, students' competencies for all courses vary dominantly into excellent and good criteria. There are three courses: ethnomathematics, school mathematics, and realistics mathematics education which experienced 100% students passing with excellent categories. However, there are two courses, discrete mathematics and abstract algebra, which have only about less than 30% students who are considered as excellent.

PLO8

COM-2 is related to the ability of students to to work independently on a complex problem in mathematics and mathematics education, present and scientifically discuss the results both orally and in writing. This PLO is supported by four courses which are assessed by using several methods to obtain the achievement result (see figure 8 Annex). Overall, competencies in this PLO are achieved by students with above 45% students considered to excellent criteria and the rest classified as good and satisfied categories. This result means the most number of students are able to work effectively and in groups to complete mathematics and mathematics education tasks.

PLO9

SOC-1 is related to the ability of students to Collaborate and be responsible professionally and ethically in completing mathematics and mathematics education tasks. This PLO is supported by four courses which are assessed by using several methods to obtain the achievement result (see figure 9 Annex). Overall, students have a good ability to collaborate and to be responsible in completing mathematics and mathematics education. This conclusion is obtained according to the percentage of SOC-1 of students which was dominantly ranged on excellent and good criteria.

Connection between Program Learning Outcome (PLO) with Program Education Objective (PEO) at MPME

The results of the PLO assessment at MPME are then examined in order to know the effectiveness of learning or the connection between PLO and program education objectives (PEO). Data of PLO achievement related to each PLO's are shown in figure C.5.2, figure C.5.3, and figure C.5.4 below. Overall, every PLO that supports PEO of MPME shows percentages more on excellent and good criteria. This indicates the characteristics of graduates that were formulated in PEO can be achieved.

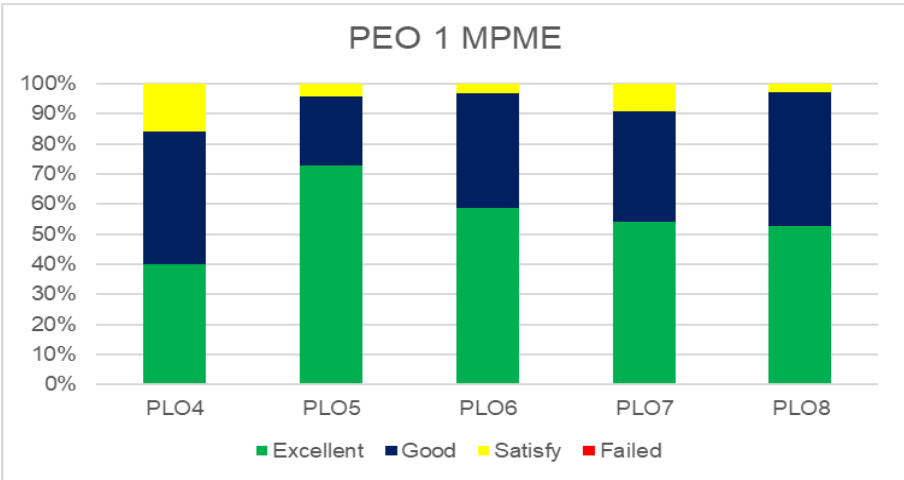


Figure C. 5. 2 PEO 1 achievement

PEO 1 MPME, being able to use their knowledge and skills to solve mathematics education problems with an inter- and multidisciplinary approach (Professional), is described in the achievement of PLO 4, PLO 5, PLO 6, PLO 7, and PLO 8. Figure C.5.2 describes the proportion of excellent categories for each PLO is more than 40% and good categories is more than 20%. This result indicates that PEO 1 achieved by the most number of graduates with a very good performance.

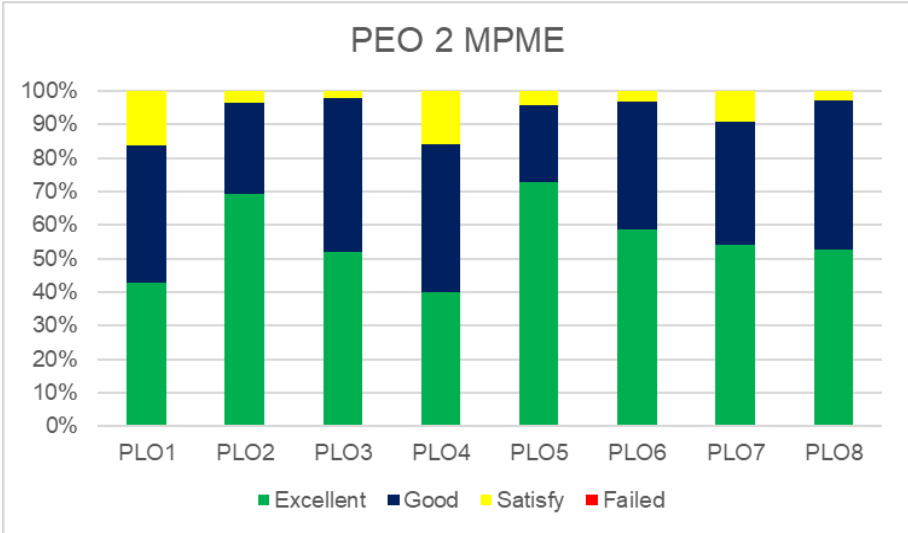


Figure C. 5. 3 PEO 2 achievement

PEO 2 MPME, being able to develop themselves through further studies, researches, and professional activities both at national and international levels (Academic), is described in the achievement of all PLOs except PLO 9. Figure C.5.3 describes the proportion of excellent, good, and satisfy categories whereas the percentage of those PLO have similar results with excellent categories as

the highest value, good categories in moderate, and satisfy in the small value. This result indicates that PEO 2 achieved by the most number of graduates with a very good performance.

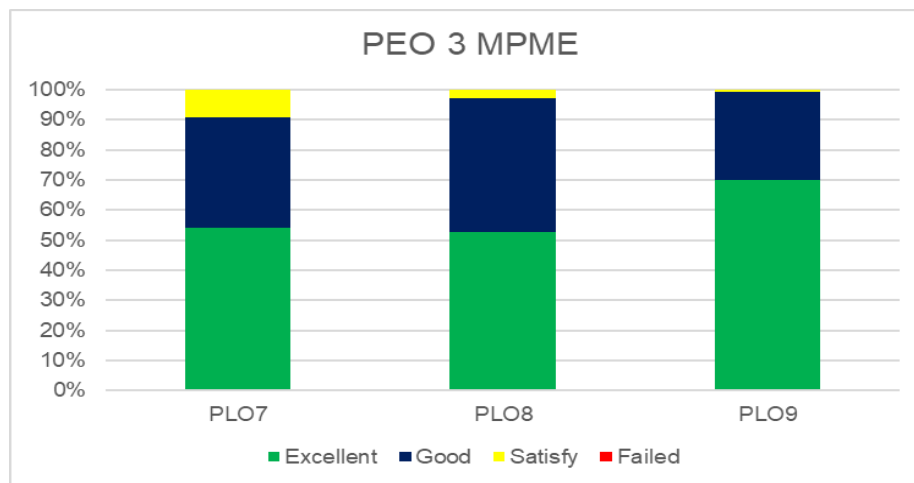


Figure C. 5. 4 PEO 3 achievement

PEO 3 MPME, Having professional and ethical responsibilities in carrying out their duties and works (Social) is described in the achievement of PLO 7, PLO 8, and PLO 9. Figure C.5.4 describes the proportion of excellent categories for each PLO is more than 50% and good categories is more than 30%. This result indicates that PEO 3 was achieved by the most graduates with a very good performance.