

LEARNING PROCESS IN ANALYTIC GEOMETRY COURSE USING IGNATIAN PEDAGOGICAL PARADIGM

PROSES PEMBELAJARAN MATA KULIAH GEOMETRI ANALITIK DENGAN MENGUNAKAN PARADIGMA PEDAGOGI IGNASIAN

Sara Sarita Agustin*

Universitas Sanata Dharma,

ssarita365@gmail.com

** Corresponding author*

Eko Budi Santoso

Universitas Sanata Dharma,

ekobudisantoso@usd.ac.id

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ABSTRAK

Studi ini mengkaji penerapan Paradigma Pedagogi Ignatian (PPI) dalam pengajaran Geometri Analitik dan menilai hasil belajar mahasiswa setelah penerapannya. Mengingat pentingnya pendidikan yang holistik dalam pengajaran matematika, studi ini mengeksplorasi bagaimana PPI dapat meningkatkan perkembangan kognitif sekaligus afektif mahasiswa. Pendekatan kualitatif digunakan, dengan pengumpulan data melalui lembar evaluasi yang mengukur kompetensi, kasih (compassion), hati nurani (conscience), dan komitmen pada 14 mahasiswa program sarjana di Universitas Sanata Dharma. PPI diterapkan melalui lima tahapannya: konteks, pengalaman, refleksi, aksi, dan evaluasi. Temuan menunjukkan bahwa PPI mendorong keterlibatan konseptual yang lebih mendalam, perkembangan etis, dan kerja sama tim melalui sikap yang mendukung pembelajaran holistik. Namun, ditemukan tantangan dalam menilai kedalaman refleksi mahasiswa, khususnya dalam mengevaluasi kemampuan mahasiswa untuk menganalisis pengalaman belajarnya secara kritis serta dalam mengukur konsistensi komitmen individu dalam kegiatan kelompok. Studi ini memberikan kontribusi bagi penelitian dan praktik pendidikan dengan menyajikan gambaran komprehensif tentang penerapan PPI dalam pembelajaran Geometri Analitik, serta menunjukkan potensinya dalam membina pendidikan yang bermakna dan holistik, sekaligus mengidentifikasi area yang perlu ditingkatkan dalam praktik penilaiannya.

Kata kunci: *geometri analitik, paradigma pedagogi Ignatian, pembelajaran holistik*

ABSTRACT

This study examines the implementation of the Ignatian Pedagogical Paradigm (IPP) in Analytic Geometry instruction and assesses student outcomes following its application. Given the importance of holistic education in mathematics instruction, this study explores how IPP can



enhance both cognitive and affective student development. A qualitative approach was employed, with the data collected through evaluation sheets measuring competence, compassion, conscience, and commitment among 14 undergraduate students at Universitas Sanata Dharma. The IPP was implemented through its five stages: context, experience, reflection, action, and evaluation. The findings suggest that IPP fosters deeper conceptual engagement, ethical development, and teamwork through attitudes that promote holistic learning. However, challenges were encountered in assessing the depth of student reflections, particularly in evaluating students' ability to critically analyze their learning experiences and in measuring the consistency of individual commitment within group activities. This study contributes to educational research and practice by providing a comprehensive overview of the application of IPP in Analytic Geometry learning and demonstrating its potential to foster meaningful, holistic education while identifying areas for improvement in assessment practices.

Keywords: analytic geometry, holistic learning, Ignatian pedagogical paradigm

1. INTRODUCTION

The learning methods currently applied in both formal and non-formal education commonly use a group-based approach, focusing on material delivery, assignments (exercises), and final exams to evaluate students' understanding (Novianti et al., 2022). However, these methods often encourage students to study primarily for grades, as educators frequently do not directly supervise the task completion process. Consequently, many students resort to copying answers from others instead of engaging in authentic learning.

The Ignatian Pedagogy Paradigm (IPP) provides a more holistic approach to learning, guiding students not only toward academic understanding but also fostering their ethical, spiritual, and social dimensions (Widiyanti et al., 2016). IPP originates from the teachings of Ignatius Loyola, founder of the Society of Jesus in 1540 (Wahana, 2016). This paradigm seeks to cultivate reflective, competent, and integrity-filled individuals, ensuring that the learning process yields cognitive understanding and shapes whole persons capable of contributing positively to society (Suparno, 2015). The central point of IPP is the emphasis on deep reflection, enabling students to connect acquired knowledge with personal experiences and real-world contexts.

The IPP consists of three core elements: experience, reflection, and action (Hasudungan, 2022; Prakash & Subagya, 2010). Additionally, IPP emphasizes the significance of the pre-learning element (context) and the post-learning element (evaluation) as part of its holistic approach to education. Consequently, the full implementation of IPP follows a complete cycle encompassing five key elements: context, experience, reflection, action, and evaluation. Below is

a visualization of the IPP cycle, illustrating its comprehensive process (Rahardi & Setyaningsih, 2020).

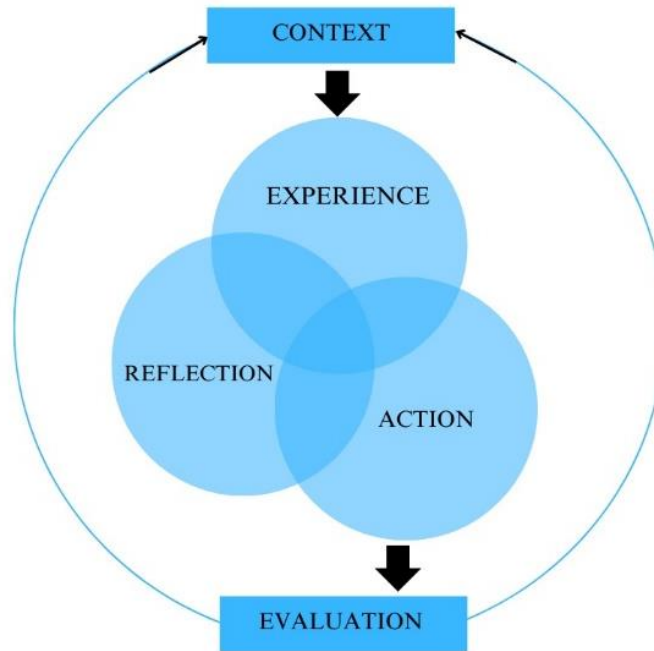


Figure 1. Dynamics of Ignatian Pedagogical Paradigm

In the context of the Analytic Geometry course, implementing the IPP offers an innovative approach that goes beyond enhancing students' mathematical abilities to foster strong faith and character. This approach aligns with previous research demonstrating IPP's positive and significant impact on students' emotional intelligence, particularly in managing emotions (Pranyoto, 2014). The course demands that students grasp abstract spatial and graphical concepts and apply this understanding to broader contexts (Imswatama & Nur'aini, 2016). By incorporating a learning cycle that includes context, experience, reflection, action, and evaluation, IPP is well-suited to help students achieve a deeper and more holistic understanding of Analytic Geometry. Furthermore, the IPP integrates the 4C principles—conscience, competence, compassion, and commitment—which enhance the learning experience in Analytic Geometry (Secretariat for Education of the Society of Jesus, 2017). IPP encourages students to move beyond a mechanical understanding of mathematical concepts, fostering an awareness of how geometric principles apply to real-life contexts and contribute to the common good.

The spirit of *cura personalis*, which emphasizes attention to students' holistic development—both academic and non-academic—forms a vital foundation for the application of the IPP (Triyana, 2019; Tarigan et al., 2024). This approach promotes personalized and inclusive learning, where educators address students' individual needs, especially in challenging subjects like Analytic Geometry. By adopting this method, students are expected to develop a deeper and more comprehensive understanding of the material, along with the ability to apply mathematical concepts to various real-life situations.

Previous studies have explored the implementation of the IPP in university settings. Pratini (2016) found that IPP enhances three key aspects of learning: competence, conscience, and compassion. The study also highlighted the potential of IPP to foster holistic student development across these dimensions, including social care. Similarly, research by Anugrahana and Hasthiolivia (2023) demonstrated that reflective pedagogy-based learning in university courses improves students' understanding of numerical concepts while also enhancing their ability to develop compassion. However, in practice, particularly at the university level, educators often face challenges in assessing aspects such as compassion, conscience, and commitment. Unlike competence, which can be more readily evaluated through quizzes, midterm exams, or final exams, these dimensions require tailored and nuanced approaches to assessment.

This study explores the implementation of the Ignatian Pedagogy Paradigm in an Analytic Geometry course. It then assesses students' learning outcomes following their participation in classes conducted under this approach. By doing so, it contributes to educational research and holistic education practice.

2. METHOD

This research was a qualitative study. The research adopted a post-positivist approach, examining objects in their natural settings with the researcher serving as the primary instrument (Sugiyono, 2013). The method was descriptive, emphasizing processes over final outcomes. Data collection involved the use of the Daily Learning Plan (RPH) and learning evaluation sheets. Learning evaluations focused on 4C principles—competence, compassion, conscience, and commitment—using a Learning Management System (LMS). To supplement observation data, peer evaluations were distributed via Google Forms and completed by all students. The data were then

presented in detailed descriptions. The research subjects were 14 first-year students of the Department of Mathematics of Universitas Sanata Dharma, from the academic year 2024/2025.

3. RESULTS AND DISCUSSION

3.1. Implementation of the Ignatian Pedagogical Paradigm in Analytic Geometry Course

The lecture based on the Ignatian Pedagogical Paradigm was conducted by fully implementing the IPP cycle, which consists of five stages: context, experience, reflection, action, and evaluation.

3.1.1. Context

Students had previously attended classes on the fundamentals of Analytic Geometry, equipping them with sufficient prior knowledge to engage with more complex Higher-Order Thinking Skills (HOTS) problems. This foundational understanding was essential, as the questions required in-depth analysis and advanced conceptual comprehension. During this phase, the lecturer played a pivotal role in ensuring students thoroughly grasped the previously covered material.

To verify their understanding, the lecturer began the class by reviewing earlier topics, prompting students to recall the forms of ellipse equations they had studied. The lecturer then bridged this prior knowledge to the current session's topic: general second-degree equations. This method helped students connect previously learned concepts to new material, fostering a deeper understanding.

Throughout this process, the lecturer demonstrated the spirit of *cura personalis*—a personalized care for each student. This was evident in the lecturer's attentiveness to students' abilities and comprehension levels. Rather than introducing new material immediately, the lecturer first revisited prior content to ensure students' readiness, thereby strengthening their grasp of foundational concepts.

3.1.2. Experience

Students were given Higher Order Thinking Skill (HOTS) questions to solve in groups. Within each group, students were expected to collaborate, integrate their understanding, and address the problems collectively. However, in practice, some groups divided tasks among members, which deviated from the lecturer's expectations. The lecturer had intended for students

to engage in joint problem-solving rather than merely splitting tasks for individual completion. Observing this, the lecturer reminded students to collaborate as a team without dividing the work.

During the problem-solving process, some students demonstrated diligence by reviewing previous lecture notes, consulting relevant literature, or seeking additional information online. This reflected the spirit of *magis*—a commitment to putting forth maximum effort to overcome challenges and achieve excellence. Additionally, some students showed exceptional care for their group members by helping peers understand the problems and explaining the steps involved in solving them. This behaviour exemplified the spirit of *cura personalis*, as students demonstrated mutual care and support throughout the learning process.

While students worked, the lecturer actively engaged with each group, observing their progress and ensuring they approached the problems effectively. During these interactions, the lecturer identified mistakes, provided guidance, and emphasized correct problem-solving procedures. This approach reflected the lecturer's discernment, thoughtfully assessing each group's needs and offering tailored support to enhance their understanding and collaboration.

3.1.3. Reflection

At the end of the session, students engaged in self-reflection using guided questions prepared in advance. This reflection focused on key aspects, including competence (identifying challenges and strategies to overcome them), awareness (demonstrating honesty and discipline), compassion (providing support within the group), and commitment (developing plans for ongoing learning). The goal of this reflection was to evaluate how effectively students internalized the knowledge and attitudes that supported their learning process.

3.1.4. Action

In the learning process, students were given opportunities to present their solutions to the class. A group representative would write their problem-solving steps and final answers on the board, allowing the entire class to see their approach. By presenting their answers on the board, students could clarify their problem-solving processes and receive direct feedback from the lecturer and peers. This activity not only reinforced students' understanding of the material but also enhanced communication skills, confidence, and their ability to articulate their thought processes to others.

3.1.5. Evaluation

The evaluation was conducted based on students' work and assessed using behavioral rubric that included aspects such as honesty, discipline, cooperation, care, perseverance, and integrity. Students who scored below 80 were given the opportunity to revisit and redo the problems, allowing them to enhance both their understanding of the material and their learning outcomes. This evaluation aimed to measure not only academic progress but also the development of students' attitudes, with a particular emphasis on the 4C principles: conscience, competence, compassion, and commitment.

3.1.6. Analysis of Evaluation Results

Evaluation in learning was conducted to measure the 4C principles. The detailed analysis is described as follows.

- Competence

The evaluation of competence emphasized students' intellectual abilities and their capacity to understand, apply, and integrate the knowledge acquired during the learning process. This assessment was carried out through group tasks designed to gauge the level of concept mastery and students' skills, particularly in solving problems related to general second-degree equations. During the learning session, students were given the opportunity to solve problems using the Learning Management System (LMS). They were assigned two specific problems, as detailed below.

1. Determine the new equation after axis rotation of a given conic equation $2x^2 - xy + 2y^2 - 30 = 0$ ($\theta = 45^\circ$)!
2. Investigate whether the following equation represents an ellipse, hyperbola, or parabola. $6x^2 + 43 - \sqrt{xy} + 2y^2 - 9x + 93 - \sqrt{y} - 63 = 0$.

Based on the evaluation results, nearly all students achieved perfect scores. This success was attributed to the strong interaction between the lecturer and the students. Although students initially faced difficulties solving the problems, the lecturer promptly provided guidance to each group, helping them overcome their challenges. During these interactions, students actively

listened and quickly corrected their mistakes. This process exemplified the lecturer's *spirit of cura personalis*, reflecting genuine care for students' difficulties and a commitment to facilitating their learning. This supportive approach motivated students to stay dedicated to completing their tasks, fostering an enthusiastic and collaborative learning environment despite the challenges encountered.

- Compassion

The evaluation of compassion was conducted through observations of students' processes in completing group assignments and the results of peer assessments. This evaluation focused on students' collaboration within their groups, contributions to discussions, and demonstrations of empathy toward their team members. The assessment was guided by the following criteria.

Table 1. Criteria for Compassion Assessment

10	20	30	40	50	60	70	80	90	100
Poor		Acceptable			Good			Very Good	
Does not show active participation in solving problems, only present physically.		Present in the discussion but showed minimal participation.			Actively involved and showing initiative to participate in solving the problems.			Highly engaged, consistently takes initiative, and supports the success of the group in solving problems.	

The assessment results show that the majority of students achieved scores that met the "good" criteria. During the observation process, it was clear that students were actively helping one another overcome challenges faced by their group members. Some students demonstrated remarkable patience, providing thorough explanations to peers struggling with the problems. Those receiving assistance appeared to appreciate these efforts by attentively listening to the explanations, fostering a positive and constructive collaborative atmosphere. This behavior reflects the *spirit of cura personalis* among the students, where those who are academically stronger make an effort to embrace and support their peers in need, thus preventing indifference in group interactions.

However, it cannot be denied that some students still show less engagement. This was reflected in their limited participation in group discussions. On occasion, some students worked

independently at separate desks, although they later returned to rejoin their teams for discussions. These observations were consistent with the peer assessments conducted among the students. In the peer evaluations, some students gave maximum scores to acknowledge the care and cooperation of their group members. However, there were also students who received low scores, perceiving certain individuals as less caring and contributing within the group.

- Conscience

The evaluation of conscience is based on observations of students' honesty and discipline in completing group assignments. It includes the results of students' reflections submitted through the Learning Management System (LMS), as well as researcher observations and peer assessments. Below is a list of guiding questions that students used to write their reflections.

1. What is your difficulty in solving the problem, and how do you face the difficulty?
2. How did your group solve the problem? Do you uphold the attitude of honesty by not discussing with other groups?
3. Did you have the opportunity to help your groupmate who was struggling with the problem? How did you feel after doing so?
4. What concrete steps will you take to ensure that today's learning remains beneficial in the future?

Based on the reflection written by the students, some students still show a lack of depth in reflecting on their learning experiences in exploring values relevant to their lives. Some evidence shows the tendency of students to provide superficial answers to the guiding questions, as seen in Figure 2, where students only wrote brief responses without providing in-depth explanations regarding the events that occurred during the learning process. This condition may be influenced by several factors, such as students not being accustomed to writing deep reflections, a hurried attitude in writing reflections, and the assumption that reflection is not important, leading them to focus solely on submitting reflections on time according to the guidelines provided by the instructor.

Hai teman-teman mahasiswa, setelah mengikuti perkuliahan hari ini, saya mengajak kalian untuk menuliskan refleksi. Refleksi ini bertujuan untuk menggali pengalaman belajar kalian selama berproses dalam kelompok sehingga kalian dapat menemukan makna dari pengalaman tersebut. Gunakanlah pertanyaan penuntun di bawah ini sebagai panduan dalam menuliskan refleksi kalian:

Pertanyaan:

Apa kesulitan selama kamu mengerjakan soal dan bagaimana kamu mengatasinya?

saya kurang paham dan tidak terlalu mengerti saat mengerjakan soal.
saya biasanya beratanya pada teman jika ada soal yang tidak saya paham dan mengerti.

Figure 2. Student Reflection Results 1

Therefore, it is beneficial for instructors to provide constructive feedback on the reflections written by students. This can motivate them to improve the quality of their reflections. Additionally, it is also important for instructors to help students understand the significance of reflection as a tool for developing self-awareness and enhancing learning. This can be done by explaining the benefits of reflection at the beginning of the course, such as how reflection helps identify strengths, weaknesses, and valuable lessons from learning experiences.

However, some students are already able to write reflections that are both thorough and insightful, as illustrated in Figure 3. They can describe their learning experiences in a well-organized manner, provide detailed explanations of the events they encountered, and express their emotions regarding these experiences.

Hai teman-teman mahasiswa, setelah mengikuti perkuliahan hari ini, saya mengajak kalian untuk menuliskan refleksi. Refleksi ini bertujuan untuk menggali pengalaman belajar kalian selama berproses dalam kelompok sehingga kalian dapat menemukan makna dari pengalaman tersebut. Gunakanlah pertanyaan penuntun di bawah ini sebagai panduan dalam menuliskan refleksi kalian:

Pertanyaan:

Apakah kamu sempat membantu teman satu kelompok yang mengalami kesulitan dalam mengerjakan soal? Bagaimana perasaanmu setelah melakukannya?

Saya sempat membantu teman satu kelompok. Dalam penjelasan yang saya lakukan, saya merasa saya harus memberikan penjelasan yang sangat mudah karena dengan penjelasan yang sangat mudah saya merasa mereka harusnya lebih paham. Dan benar saja mereka lebih paham. Dengan memberikan contoh yang mudah, khususnya dalam perhitungan saya mengusahakan agar mereka paham betul sebelum mereka menulis. Mereka harus mengetahui semuanya dapat dari mana. Setelah melakukan hal tersebut saya merasa bangga pada diri saya sendiri, karena dengan hal ini saya menyalurkan ilmu dan pastinya akan mendapatkan ilmu yang lebih banyak lagi.

Figure 3. Student Reflection Results 2

- Commitment

The assessment of *commitment focuses on students' dedication to participating in the series of lectures*. This evaluation is carried out through observations during the learning process, monitoring student attendance, and utilizing peer assessments. Commitment is assessed based on students' integrity and diligence in completing group assignments, as well as their class attendance. The evaluation of integrity and diligence begins by establishing clear assessment criteria, as outlined in Table 1. The average score is then calculated, and a grade code is assigned according to the guidelines in Table 2.

Table 2. Assessment Code for Commitment Aspect

Grade	Criteria
90-100	Very Good
60-80	Good
30-50	Acceptable
10-20	Poor

The observation results indicate that the majority of students arrive on time before the lectures begin, with some even arriving early before the instructor enters the classroom. However, there are still students who arrive more than 15 minutes late after the lecture has started. During the classroom learning process, all groups demonstrated excellent integrity. They adhered to the rules, such as not discussing with other groups. Students also actively worked to complete the tasks assigned by the instructor with their groups. If they encountered difficulties, they did not hesitate to ask the instructor or seek additional references to ensure a better understanding. However, a particular concern is related to students' diligence in attending lectures. During the problem-solving process, only a portion of the students appeared active in seeking answers by utilizing various references. Conversely, other group members tended to be passive, merely observing the activities of their peers or waiting for explanations from those who had found answers. Even in situations where they faced difficulties, students rarely proactively asked the instructor questions. Instead, the instructor often had to approach each group directly to identify the challenges they faced and guide further discussions. Based on peer assessments, more than 80% of students received scores categorized as excellent. However, this result seems to contrast with the

evaluations provided by the observers. This discrepancy is suspected to be caused by several factors, one of which is the tendency of students to give high scores to their peers as a form of solidarity or personal relationship, without considering a more objective assessment. Additionally, another possibility is the difference in perception regarding assessment criteria. Students tend to evaluate based on the overall participation of the group without paying close attention to individual contributions.

4. CONCLUSION

This study aimed to explore the implementation of the Ignatian Pedagogical Paradigm (IPP) in the Analytic Geometry course and to evaluate students' learning outcomes. The IPP was applied through its five key stages: context, experience, reflection, action, and evaluation. The findings revealed that the implementation of the IPP enhanced students' conceptual understanding, teamwork, and character development, particularly in the areas of competence, conscience, compassion, and commitment.

Nonetheless, several challenges were identified. In terms of reflection, difficulties arose as many students were still in their early stages of university study and had not yet developed the habit of engaging in deep reflection. Furthermore, students often lacked awareness of the importance of reflection as an integral part of the learning process, leading them to overlook reflective writing activities. Additionally, students were generally unaccustomed to exploring and articulating their personal feelings regarding their learning experiences.

Challenges were also encountered in collaborative work. Many students had not yet fully understood the purpose of group work as a process of collective learning; instead, they tended to solve problems individually and only compile their answers for submission, without engaging in meaningful discussion. Moreover, disparities in the level of commitment among group members were evident, with highly committed students sometimes becoming discouraged by peers who were less active or responsible. Students also demonstrated a lack of familiarity with expressing and exchanging ideas during collaborative problem-solving activities.

This study provides practical insights into the effective implementation of IPP-based learning, particularly in promoting collaborative problem-solving and reflective practices. It highlights both the benefits and the challenges of applying the IPP in the context of Analytic

Geometry courses and underscores the need for further strategies to cultivate deeper reflection and more effective collaboration among students.

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