

## Comparative Analysis of Student Learning Outcomes of Conventional Learning with Genetic Intelligence-Based Learning

Asriana Kibtiyah<sup>1</sup>, Siti Rofi'ah<sup>2</sup>, Khoirul Umam<sup>3</sup>,  
Ariga Bahrodin<sup>4</sup>, Khoirotul Idawati<sup>5</sup>, Haris Supratno<sup>6</sup>  
<sup>1,2,3,4,5</sup>Universitas Hasyim Asy'ari Tebuireng Jombang, Indonesia  
<sup>6</sup>Universitas Negeri Surabaya, Indonesia  
asrianakibtiyah@unhasy.ac.id

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### Abstract

This study compares the learning outcomes between two groups from equivalent schools. One group underwent an assessment to identify the genetic intelligence types of both teachers and students. Teachers in this experimental group, having become familiar with their own and their students' genetic intelligence types, received additional training tailored to these intelligence types. The results indicated a significant difference in learning outcomes between the experimental and control groups, as evidenced by an Independent Samples t-Test yielding a two-tailed p-value of 0.001 ( $p < 0.05$ ). Furthermore, the experimental group's average post-test score was 73, compared to 69.62 in the control group.

**Keywords:** Comparison, Learning Outcomes, Conventional Learning, Genetic Intelligence

## INTRODUCTION

In the context of education, the teaching and assessment framework for a learning process is called competency-based learning (Kusnandar et al., 2020). This type of learning is based on learning performance known as the actual competency of students in real terms. Zhang (2022) stated that learning that uses competency as a measure of learning achievement success is the easiest to observe.

This competency-based learning is guided by the learning process, assessment and academic reporting of students based on what has been learned, both knowledge and actual skills from time to time during education (Kumar & Sharma, 2021). In this regard, Scott (1982) emphasized that the concept of competency-based learning is an innovative educational paradigm that emphasizes empowering students to master certain knowledge and skills. In this context, competency refers to the skills, knowledge, and understanding that must be mastered by students (Gervais, 2016).

In public schools, this system refers to national standards in determining academic achievement or competency in a question in subjects or fields of study at a certain level (Setiyaningsih et al., 2020). Elementarily, the concept of competency-based learning is actually very simple, namely how an effective learning process is determined by indicators that describe the mastery of knowledge or skills by students compared to the hours used for the learning process.

At the basic education stage, the introduction of basic knowledge concepts is more emphasized in the learning process. This is due to the age of students ranging from 7-12 years old, where children's curiosity is very high. According to Piaget's theory, children in this age range are at a concrete operational stage, which means they need knowledge that is based on real-life conditions (Juwantara, 2019).

Elementary school students are at a developmental age level that has a high curiosity (Erlangga, 2022), and where every piece of information they absorb requires strategies, media and activities that are under their learning style. In presenting learning materials, teachers should use various strategies and methods as well as media that are in line with students' learning styles (Chatib, 2016). The alignment of the teacher's teaching style with the student's learning style is the key to success and the realization of learning effectiveness (Saefiana et al., 2022).

For teachers to be able to use various teaching strategies and methods, and for teachers to be able to align their teaching style with the student's learning style (Simanjuntak et al., 2022), teachers must know the potential possessed by each student. Similar things are reinforced by the opinion of Danim & Khairil (2015) Who stated that in teaching, teachers should try to understand the teaching materials, recognize students, and determine teaching strategies. As mandated in Article 3 and Article 4 of Law No. 20/2003 concerning the National Education System (SISDIKNAS) which indirectly requires teachers to understand students' potential so that it can be developed according to educational goals. If teachers can understand their students' potential, then in fact the teacher has also understood the type of tendency (intelligence) of each student, because according to Poniman (2018) One of the manifestations of self-potential is intelligence.

The learning process that views that each student has uniqueness and different types of intelligence is a paradigm that forms a pattern of differentiated learning actions. This means that teachers must realize that the potential of each student is diverse and unique, so it must be touched in a variety of ways and avoid standardizing the way teachers teach and forcing students to do activities in the same way.

However, many teachers do not understand the potential of their students properly and correctly. As a result, when teaching, teachers do not vary in using teaching strategies that are appropriate to the student's learning style. Finally, teachers return to using conventional methods in teaching students with various intelligences. Teaching with conventional patterns has a relatively small chance of learning success (Yamin, 2013), and indicates a lack of teacher creativity in teaching<sup>15</sup>. Even the impact that arises is a condition that suppresses all parties, both students and teachers, who end up stressed in facing all of this (Mahmudah et al., 2018).

One of the reasons for learning boredom that occurs in students is due to less creative teachers, and teachers' ability to teach (Wulandari et al., 2020). According to Hidayat (2022) Teachers' success in teaching is highly determined by how the achievement of student learning outcomes is highly determined by a fun and not boring learning process. Mustiko & Trisnawati (2021) research confirms that teachers' increasingly varied and dynamic teaching skills determine better student learning outcomes. This is where the effectiveness of learning lies, from how to orchestrate classroom learning with a variety of activities, but still to achieve the learning goals (Chatib, 2015).

On the other hand, students have diverse potentials, including intelligence that is carried since birth or genetic intelligence. Genetic intelligence is the basic potential possessed by individuals that is formed from the womb until the end of life, which is permanent and dominant in patterns of attitude, way of thinking, and behavior (Poniman & Amalia, 2020). This genetic intelligence also makes each student have a diverse learning style and tendency in responding to stimulants (Najah et al., 2023).

Teachers' understanding of students' potential will be very helpful and make it easier for teachers to interact and communicate in various learning situations (Gunadi, 2021). Students are considered successful in learning when they achieve optimal results, indicated by a conducive classroom atmosphere, and motivate students to learn actively (Amrina et al., 2022; Noer et al., 2021).

Realizing that a quality education process must lead to optimal learning outcomes, this research is very important to do, considering that many schools make learning a routine (Niswah, 2020) and are carried out with patterns that are not based on student needs (Fakhrudin et al., 2022). Practices like this occur massively in various schools throughout Indonesia, and must be stopped immediately so that there is no more stress on students and teachers (Yanti & Nurwulan, 2021).

This study aims to measure the learning aspects of Islamic Religious Education (PAI) subjects in teachers in two different schools but still under the umbrella of the same Foundation. Not a few teachers teach without preparation and use a variety of learning strategies. Teachers who teach with preparation and use varied learning strategies will be different from those who do not. Teachers are still fixated on following the previous learning.

## **METHODS**

This study uses a quantitative approach with a quasi-experimental method where there are two groups observed. One experimental group from one school received (Jaedun, 2011) were (1) a genetic intelligence assessment of PAI teachers and 13 grade 5 of elementary school students, and (2) PAI teachers received a brief training on the concept of genetic intelligence and learning strategies. Meanwhile, there was a control group in a different school consisting of PAI teachers and 13 grade 5 students who did not receive the same treatment as the experimental group.

The study involved field research that included multiple observations of PAI (Pendidikan Agama Islam) learning sessions and the collection of students' initial (Pre-test) and final (Post-test) exam scores to assess their academic performance. These field observations were conducted over five weeks between April and May 2024 at two schools.

On this basis, a research hypothesis was established:

H<sub>0</sub>: Teachers' knowledge of students' genetic intelligence does not affect the achievement of learning outcomes in PAI lessons.

H<sub>1</sub>: Teachers' knowledge of students' genetic intelligence affects the achievement of learning outcomes in PAI lessons.

## RESULTS

Based on the observation results obtained in the two groups studied, it can be shown in the following Table 1.

**Table 1.** Field Data Recapitulation

Num	Students	PG	Experiment Group		Num	Students	PG	Control Group	
			Pre-test	Post-test				Pre-test	Post-test
1	AFA	In	67	71	1	ANS	unknown	72	71
2	AZA	Ie	66	70	2	BZA	unknown	68	69
3	MAM	Te	71	73	3	DHN	unknown	65	67
4	ZA	Fi	68	71	4	HAC	unknown	70	70
5	HN	Te	73	77	5	HES	unknown	69	70
6	MJA	Ii	68	73	6	MAM	unknown	73	72
7	AMM	Ii	70	70	7	MAR	unknown	71	73
8	UHS	Ii	69	70	8	MFA	unknown	69	70
9	FSB	Se	71	75	9	MZA	unknown	69	67
10	SZB	Te	72	73	10	NAH	unknown	72	71
11	FZM	Te	69	75	11	RAP	unknown	71	69
12	ZNA	Ie	74	74	12	WAF	unknown	66	67
13	ZAB	In	74	77	13	KAS	unknown	70	69

Source: Field observation data (processed)

Before using the analysis tool according to the procedure, it is necessary to first determine the normality of the data by testing the normality (Wicaksono, 2022) whose results (in Table 2) all the significant values of Kolmogorov-Smirnov and Shapiro-Wilk in all tests in both groups are all above the value of  $\alpha$  ( $=0.05$ ), and that means that the data is distributed NORMAL.

**Table 2.** Data Normality Test Results

Test and Group		Kolmogorov-Smirnov			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Student Learning Outcomes	Pre-Test Experiment	0.132	13	0.200	0.955	13	0.670
	Post-Test Experiment	0.171	13	0.200	0.906	13	0.161
	Pre-Test Control	0.165	13	0.200	0.950	13	0.595
	Post-Test Control	0.147	13	0.200	0.935	13	0.399

Since it is known that the data is normally distributed, it is continued with the Paired Sample t-Test whose results are as described in Table 3.

**Table 3.** Paired Sample t-Test Results

	Means	Std. Deviation	Std. Error Mean	t	df	Sig One-Side p	Sig Two-Side p
Paired I (Pre-test - Post-test Experiment)	-2.846	1.908	0.529	-5.378	12	<0.001	<b>&lt;0.001</b>
Paired II (Pre-test - Post-test Control)	0.000	1.414	0.392	0.000	12	0.500	<b>1.000</b>

Table 3 informs the Experimental Group where the significant value is 0.001 (less than 0.05) which means there is a difference in learning outcomes. Meanwhile, in the control group, the significant value = 1 (more than 0.05) which means that there is no difference in learning outcomes.

In terms of data homogeneity, it is also proven in Table 4 that the data is homogeneous as shown by the significant value (Sig) of 0.314 (more than 0.05).

**Table 4.** Homogeneity Test Results

	<b>Levene Statistic</b>	<b>df1</b>	<b>df2</b>	<b>Sig.</b>
Based on mean	1.058	1	24	<b>0.314</b>
Based on median	1.097	1	24	0.305
Based on Median and adjusted df	1.097	1	23.370	0.306
Based on trimmed mean	1.120	1	24	0.300

Furthermore, an Independent Sample t-Test was carried out where a significant value  $\alpha$  two-sided was obtained of 0.001 (where  $< 0.05$ ) which means that there was a difference in the average learning achievement of the experimental group students and the learning outcomes of the control group students.

**Table 5.** Independent Sample t-Test Results

	<b>Levene's Test</b>		<b>t-test for Equality Means</b>					
	<b>F</b>	<b>Sig.</b>	<b>t</b>	<b>df</b>	<b>Significance</b>		<b>Mean Difference</b>	<b>Std. Error Difference</b>
					<b>One-Side p</b>	<b>One-Side p</b>		
<b>Data homogeneity</b>	1.058	0.314	3.874	24	0.000	0.001	3.385	0.874

The difference can also be seen from the results of the descriptive analysis where the average value of the two groups (Z. Arifin, 2021) is as shown in Table 6 below.

**Table 6.** Descriptive Statistics of Student Learning Outcomes

<b>Groups</b>	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Std Error Mean</b>
<b>Post-Test Kel. Eksperimen</b>	13	<b>73.00</b>	2.517	0.698
<b>Post-Test Kel. Kontrol</b>	13	<b>69.62</b>	1.895	0.525

The data in Table 7 shows a substantial increase in average score for the Experimental Group from pre-test to post-test, while the control group showed no change

**Table 7.** Results of Descriptive Statistical Analysis

		N	MIN Value	MAKS Value	Mean	Std. Deviation
Experiment Group	Pre-test	13	66	74	<b>70.15</b>	2.609
	Post-test	13	70	77	<b>73.00</b>	2.517
Control Group	Pre-test	13	65	73	<b>69.62</b>	2.329
	Post-test	13	67	73	<b>69.62</b>	1.895
Sum of Students		13				

## DISCUSSION

### 1. Aspects of Learning Readiness

The success of a learning is largely determined by the initial condition phase called student learning readiness. A teacher needs to deeply understand the various aspects that affect student learning readiness to create an effective learning environment and support the optimal development of students (Suralaga, 2021). The aspect of student learning readiness includes a variety of factors that affect their ability to engage in the learning process effectively. Learning readiness in students is a multifaceted state, encompassing physical, mental, and emotional factors, as well as prior learning experiences (Hidayanti et al., 2021). According to Fathoni & Sobandi (2020), knowledge of these contributing factors assists educators in developing enhanced learning tactics and promoting students' ideal development within their education.

Many variables deserve attention by teachers in terms of student learning readiness, which are closely related to physical and non-physical ones (Mufidah et al., 2021). Based on various studies, aspects of student learning readiness can be grouped into several categories, including:

#### a. Physical Aspects

A student's physical well-being provides a crucial base for successful learning. Optimal physical condition not only affects concentration and endurance (Hasina et al., 2021), but also positively correlates with students' cognitive, emotional, and social development (Supriyani & Alawiyah, 2019). More than just not getting sick, physical health involves balanced aspects of nutrition, sleep, and physical activity. More than adequate nutrition will be the energy reserve that the brain needs to function optimally. Lack of nutrients, especially iron and vitamin B12, can lead to anemia that impacts concentration and memory (Afif et

al., 2022). Adequate sleep is essential for the process of memory consolidation and energy recovery. Chronic sleep deprivation can interfere with cognitive function, increase the risk of obesity, and trigger behavioral problems. Regular physical activity improves blood circulation to the brain, stimulates the production of mood-boosting endorphins, and reduces stress (Ratna Supradewi, 2010).

Supportive learning environment conditions greatly affect students' motivation and ability to learn. Adequate lighting, comfortable room temperatures, and low noise levels create a conducive learning atmosphere (Maulita et al., 2022). In addition, a classroom design that is flexible and allows for a variety of learning activities is also important. The availability of adequate facilities, such as libraries, laboratories, and open spaces, enriches the student learning experience.

Then what are the implications for educational practices in schools? By understanding the importance of the physical aspect of learning readiness (Sapbrina et al., 2021), teachers can take some concrete steps. First, teachers need to establish good cooperation with parents to monitor students' physical health. Second, teachers can create a comfortable and conducive learning environment by paying attention to physical factors such as lighting, temperature, and ventilation. Third, teachers can integrate physical activity into learning to improve students' concentration and motivation.

Consequently, the physical component of student learning readiness must be considered. By understanding how physical health influences academic success, teachers can take proactive measures to establish a learning environment that supports students' full potential. Effective collaboration among teachers, parents, and schools is vital for this endeavor.

## **b. Psychological Aspects**

The learning process heavily relies on the psychological aspect. Psychological factors such as motivation, interest, attention, and emotions significantly affect how active and effective students are in absorbing the subject matter. Motivational factors are the driving force that moves individuals to act. In the context of learning, Alafgani & Purwandari (2019) stated that internal motivation such as curiosity, desire to achieve, and personal values are very important factors. External motivations such as rewards, praise, or avoiding punishment can also affect students' learning behavior.

While the interest factor is the tendency of individuals to be interested in an object or activity. A high interest in a subject matter will encourage students to actively seek information, relate

the material to personal experiences, and process information in depth. Interest can also improve students' memory and understanding of the subject matter.

Moreover, attention, the mental act of concentrating on a specific stimulus, is a critical component. Students' capacity to focus on the subject matter is vital for absorbing relevant information and filtering out distractions. Several factors influence attention, including motivation, interest (Nasir, 2021), physical condition, and the learning environment (Hendriati & Santoso, 2020). Finally, emotions significantly impact learning: positive emotions like joy, enthusiasm, and confidence enhance motivation and performance, while negative emotions such as fear, anxiety, or anger impede the learning process (Harianja et al., 2023; Prihatiningsih & Wijayanti, 2019).

Concerning the learning process, by understanding the psychological aspects of learning readiness, teachers can create a conducive learning environment and motivate students. Some strategies that can be applied by teachers in learning include:

- Build positive relationships. To build positive relationships, it is vital to establish a safe and comfortable classroom setting. This step is designed to counteract any potentially tense atmosphere that may have developed before the learning session (Puspita, 2023).
- Generate interest. To arouse students' interest in learning, teachers carry out strategies such as using relevant examples, materials that are connected to daily life, or designing interesting media. Students' interest will arise when teachers use techniques in opening material with a context that is closely related to students' daily lives in the form of scene setting (Chatib, 2016).
- Provide constructive feedback. In the material part that is important to understand, it is good for teachers to give feedback on the activities and learning processes carried out by students. Positive and specific feedback can increase student motivation and confidence. According to Costa (2022), positive feedback will reinforce what students are doing right.
- Set up a fun learning atmosphere. Teachers can create a fun learning atmosphere by using a variety of varied activities and actively engaging students (Ma'rifah et al., 2021).

### **c. Cognitive Aspects**

The cognitive aspect is a crucial determinant of student learning readiness (Syafi'i et al., 2018). By recognizing students' existing knowledge, thinking abilities, and learning

strategies, educators can design a learning environment that effectively fosters optimal cognitive development (Kristiani, 2020).

The cognitive aspect refers to mental processes that involve knowledge, understanding, and thinking skills. According to Kulsum (2021), this aspect is very crucial in students' learning readiness, because good cognitive abilities allow students to process information, solve problems, and build new knowledge.

### 1) Prerequisite Knowledge

Prerequisite knowledge is the foundation for understanding more complex concepts. When students already have basic knowledge relevant to the new material, they can easily connect the new information with existing knowledge. This allows students to build a deeper and more meaningful understanding (Rivalina, 2020).

### 2) Thinking Skills

Learning requires critical, creative, and analytical thinking. Critical thinking aids in information evaluation and logical conclusions, creative thinking fosters new ideas, and analytical thinking supports systematic problem-solving (Ong et al., 2023).

### 3) Learning Skills

Learning skills are a set of abilities that allow students to learn independently and effectively. These skills include the ability to manage time, find relevant learning resources, develop learning strategies, and evaluate learning outcomes (Rodhiyah, 2021). Good study skills enable students to become active and independent learners.

Understanding the cognitive aspects of learning readiness, teachers can design effective and meaningful learning. Some things that can be done include:

- Perform diagnostic assessments. Teachers need to conduct assessments to identify students' prerequisite knowledge before starting the learning (Rosnaeni, 2021).
- Teachers can promote easier understanding by constructing cognitive pathways that connect new content to students' current knowledge base (Snijders et al., 2020).
- A variety of teaching strategies are employed by teachers to enable students to think critically, creatively, and analytically (Mahananingtyas, 2019).
- Teaching learning skills. Teachers can explicitly teach students study skills, such as effective reading techniques, note-taking, and compiling study schedules.

#### **d. Social Aspects**

Social elements are crucial to the learning process, shaping student motivation and their ultimate learning achievements. The social aspect in learning psychology shows that positive social interaction and strong social support can create a conducive learning environment (Saptandari et al., 2022).

To maximize students' learning potential, it is important for educators and parents to build relationships that support and encourage collaboration between students. Thus, students will not only acquire knowledge, but also the social and emotional skills necessary for future success. The two main components in the social aspect that need to be considered are social interaction and social support.

##### 1) Social Interaction

Social interaction encompasses the nature of the relationships students have with teachers and their fellow students

. In the context of learning, this social interaction includes a quality teacher-student relationship that will be able to increase student motivation. When students feel valued and supported by teachers, they will be more eager to learn (Wardani et al., 2022). According to Khairunnisa & Ain (2022), an interactive teaching approach, where teachers understand the needs and characteristics of students, can create a positive learning environment. In addition, peer interaction with fellow students also greatly affects the learning atmosphere (Maulida & Prawira, 2020). Peers can be a source of motivation, support, and collaboration. Group discussions and cooperation on projects can enrich the learning experience, facilitate the exchange of ideas, and help students develop social skills.

Similarly, the influence of a supportive social environment in schools, where students feel safe to express themselves and share ideas will be able to boost confidence. On the other hand, a competitive or oppressive environment can hinder students' active participation.

##### 2) Social Support

Social support includes emotional, informational, and instrumental assistance provided by people around the student, such as family, friends, and the community. Types of social support that have a significant impact on the learning process:

- a) Family Support. Families that actively participate in their children's education, through guidance and encouragement, can enhance students' feelings of security and self-

assurance (Kibtiyah et al., 2023). Good communication between parents and children also helps students in overcoming academic challenges (Wardani et al., 2022).

- b) **Friend Support.** Friends who provide support can act as motivators (Bell & Coleman, 2020). When students support each other in learning, they tend to feel more engaged and motivated, as well as feel less stressed and anxious.
- c) **Environmental Support.** A positive social environment, such as a community that supports children's education and development, can increase student resilience (Agung Wibowo et al., 2022). Students' social and emotional skills are enhanced through involvement in extracurricular programs and social activities (Ichsan & Hadiyanto, 2021).

## **2. Understanding the Potential of Genetic Intelligence**

In the modern era of education, understanding the potential of genetic intelligence is becoming increasingly relevant (Asbari et al., 2020). Genetic intelligence refers to an individual's predisposition determined by genetic factors, which affect various aspects of ability, including cognition, creativity, and social skills (Roslina, 2021). Through this understanding, educators can be more effective in designing learning experiences that suit each student's unique characteristics.

### **a. Objectives of Understanding the Potential of Genetic Intelligence**

- 1) **Identify Student Potential.** Teachers can more easily determine the unique potential of each student, including their strengths and weaknesses, when they understand genetic intelligence. By understanding this, according to Askuri et al.(2023), it is very possible for teachers to develop an approach that suits the needs of individual learning.
- 2) **Adaptive Curriculum Development.** Knowledge of genetic intelligence can be used to design more adaptive curricula and teaching methods, facilitating richer and more meaningful learning experiences for students (Kong et al., 2021).
- 3) **Increased Motivation and Engagement.** Students who feel that their potential is recognized and valued tend to be more motivated to learn. By harnessing their genetic strengths, teachers can increase student engagement in the learning process (Maryanti & Nandiyanto, 2021).
- 4) **Early Intervention.** Understanding the potential of genetic intelligence also allows for early intervention for students who may have learning difficulties. By knowing their

predispositions, teachers can provide appropriate and timely support (Z. Zhang et al., 2009).

b. Benefits of Knowing the Potential of Genetic Intelligence

- 1) Optimal self-development in students by maximizing their potential through discretion and learning opportunities in a way that suits their genetic intelligence (I. Arifin & Gunadi, 2017). This contributes to more holistic self-development.
- 2) Effective collaboration. Knowledge of genetic intelligence can encourage collaboration between teachers, parents, and students (Oktaviany & Halim, 2020). All parties can work together to support the overall development of students.
- 3) Improving learning outcomes through a more personalized and appropriate approach so that student learning outcomes can increase significantly. Similarly, learning independence and adaptability of students will also develop.

c. The Impact of Teachers' Ignorance on Students' Potential for Genetic Intelligence

Teachers' ignorance of the potential of students' genetic intelligence can result in several negative impacts, including:

- 1) Education that is not on target. Without a good understanding of genetic potential, teachers may apply teaching methods that do not suit the needs of students. This, according to Clarke & Munro (2021), can trigger and cause frustration and boredom among students.
- 2) Difficulties in overcoming learning problems. Students who have unrecognized potential may have difficulty in learning. Teachers' ignorance can result in delays in providing the necessary interventions, thus hindering students' academic development (Prior, 2022).
- 3) Decreased motivation and confidence. Students who feel that their abilities are not recognized or understood may lose motivation (Warniningsih, 2020). This can have an impact on their self-confidence, which results in low participation in learning activities.
- 4) Discrimination and Stigma. Ignorance about genetic potential can also lead to discrimination against students with special or different needs. According to Mohtarom (2021) This stigmatization problem can hinder students' social and emotional development.

So understanding the potential of a student's genetic intelligence is an important step in effective education (Diana & Sholehah, 2022). With clear goals and benefits, as well as awareness of the impact of ignorance, educators are expected to develop a more inclusive and adaptive approach to learning. This will not only improve learning outcomes, but also support the holistic development of students as individuals.

### **3. Implementation of Understanding Genetic Intelligence**

An understanding of genetic intelligence can be implemented in schools in a strategic way to improve the student learning experience. This implementation includes several steps and methods that can be adapted in daily learning activities.

#### **a. Initial Assessment of Student Potential**

The first step in implementation is to conduct an initial assessment to identify the genetic intelligence of the students. This can be done through:

- Initial assessment is the first step in recognizing the type of genetic intelligence of students. Because there are many tools/instruments for this assessment, schools should choose tools that are accurate, simple and valid. With the right choice of tools and concepts, schools do not experience repeated difficulties (Setiawan et al., 2021).
- Classroom Observation: Observing students' behavior and interactions during learning to understand their learning styles and strengths (Baruno, 2021).

#### **b. Flexible Curriculum Development**

After knowing the potential of students, in Najah et al.(2023) view, schools can develop a more flexible and responsive curriculum that includes:

- Interest-Based Learning Module. Structuring modules that allow students to choose topics that match their intelligence, such as art, science, or math.
- Differentiated Learning. Adapting teaching methods to suit students' learning styles (Naibaho, 2023). For example, using project-based learning for students with kinesthetic intelligence.

#### **c. Use of Varied Teaching Methods**

Educators can apply various teaching methods that suit the genetic intelligence of students. For examples:

- Cooperative Learning. Teachers organize students in groups to learn from each other and collaborate (Syamsuddin et al., 2022). It is effective for students who have interpersonal intelligence, where social interaction is key.
- Experiential Learning. Teachers hold practical activities that allow students to experience first-hand the concepts learned (Latifah, 2020), such as scientific experiments or art projects.

d. Providing Constructive Feedback

Delivering constructive and specific feedback is crucial. Therefore, teachers should: (1) emphasize the learning process by acknowledging effort and progress, not solely the final outcome, which, according to Aprilia et al. (2020), fosters a sense of value and encourages development; and (2) offer actionable improvement suggestions by providing clear guidance on how students can further enhance their potential.

## CONCLUSION

Learning will be effective if teachers prepare learning plans and implement them by adapting to students' conditions from time to time based on the potential of students' genetic intelligence. In addition, the psychological aspect of students also needs serious attention so that every student always achieves learning achievements according to their genetic potential.

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