# ASPECTS OF LEARNER DEVELOPMENT BASED ON CHARACTERISTICS

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**ABSTRACT**

**Research Objectives -** This study aims to analyze learner development based on individual characteristics through the integration of cognitive, affective, and psychomotor aspects within a modified Bloom's Taxonomy framework.

**Method -** This research employs a qualitative approach using systematic literature analysis and non-participant observation. Data were analyzed through thematic analysis and framework analysis to develop a holistic evaluation model.

**Research Findings -** The results indicate that a characteristics-based personalized learning approach (visual-auditory-kinesthetic learning styles and multiple intelligences) enhances learner engagement across all three Bloom's Taxonomy domains. The affective aspect improves through increased self-efficacy and self-acceptance, while psychomotor development shows progress in movement creativity and skill adaptation. However, the main challenge lies in teachers' limitations in implementing differentiated instruction.

**Theory and Practical Implications -** These findings reinforce neuroscience theories on neuroplasticity and the importance of adaptive learning. From a policy perspective, the study recommends teacher training in integrating holistic assessment tools and developing inclusive curricula.

**Novelty -** The novelty of this research lies in developing an evaluation model that combines modified Bloom's Taxonomy with individual characteristics analysis and multidimensional assessment tools.

## INTRODUCTION

Contemporary education no longer focuses solely on cognitive aspects but also emphasizes the development of learners' attitudes (affective) and skills (psychomotor), which serve as crucial foundations for building competitive human resources in a knowledge-based economy (World Bank, 2018). However, educational practices in many institutions remain dominated by traditional approaches that prioritize rote memorization and neglect students' individual characteristics (Zubaidah, 2016). Recent research indicates that education systems adaptive to students' needs can significantly enhance learning outcomes, both in academic achievement and preparedness for socio-economic challenges (OECD, 2019). Therefore, this study focuses on characteristics-based learner development to address global challenges in creating inclusive and equitable education.

Bloom's Taxonomy (Bloom et al., 1956) has long been a cornerstone of educational evaluation, yet its implementation is often limited to measuring cognitive aspects through standardized tests, while affective and psychomotor domains are overlooked (Marzano & Kendall, 2007). Research by Hattie (2009) reveals that teacher-centered learning approaches are less effective in accommodating students' diverse abilities. Additionally, Dweck (2006) criticizes conventional assessment systems for inhibiting the development of learners' growth mindsets. Another gap is highlighted in Tomlinson's (2014) study, which shows that many teachers struggle to implement differentiated instruction due to

limited training and resources. Thus, a disparity exists between holistic education theory and practical implementation.

Traditional educational approaches tend to disregard variations in learner characteristics, including learning styles, interests, and socio-economic backgrounds (Suprayogi & Valcke, 2016). Yet, findings from educational neuroscience (Tokuhama-Espinosa, 2018) confirm that each individual's brain processes information uniquely, rendering uniform learning methods ineffective. For instance, kinesthetic learners are often neglected in lecture-dominated classrooms (Gardner, 1983). This criticism is reinforced by PISA data (OECD, 2019), which shows that education systems unresponsive to student diversity risk exacerbating socio-economic inequalities.

This study offers novelty by integrating an analysis of learner characteristics (including learning styles and multiple intelligences) into a modified Bloom's Taxonomy framework. Unlike prior studies that evaluated only a single aspect, this research develops a holistic evaluation model encompassing cognitive, affective, and psychomotor domains through personalized learning. This approach aligns with the concept of multiple intelligences (Gardner, 1983) and recent findings on neuroplasticity (Tokuhama-Espinosa, 2018). Furthermore, the study introduces a new assessment tool combining behavioral observation, self-assessment, and qualitative analysis to evaluate affective and psychomotor development more objectively.

The study aims to analyze characteristics-based learner development across the three Bloom's Taxonomy domains and formulate policy recommendations for inclusive education. However, it has limitations, including a sample restricted to primary and secondary education levels and reliance on teacher participation for data collection. Despite this, the findings are expected to serve as a foundation for developing more adaptive curricula and further research on educational equity.

## METHOD

This study employs a qualitative approach using literature study and content analysis methods to develop a characteristics-based holistic evaluation model for learners. The qualitative approach was selected due to its ability to deeply explore the complexity of cognitive, affective, and psychomotor development through theoretical and empirical examination (Creswell, 2014). Similar studies by Tomlinson (2014) and Suprayogi & Valcke (2016) also used qualitative approaches to analyze differentiated learning, demonstrating this method's effectiveness in revealing gaps between educational theory and practice. The primary rationale for this approach lies in its flexibility to integrate the multidimensional aspects of Bloom's Taxonomy with neuroscience findings (Tokuhama-Espinosa, 2018), as well as its capacity to provide context-based policy recommendations.

Data were collected through three main techniques: (1) systematic literature review of books, journals, and educational policy documents (Government Regulation No. 19 of 2005); (2) non-participant observation of learner behaviors at primary and secondary levels; and (3) document analysis of Lesson Plans (Rencana Pelaksanaan Pembelajaran/RPP) and teacher assessment instruments. These techniques follow Miles et al.'s (2014) qualitative data collection guidelines emphasizing source triangulation to enhance validity. Recent studies by Hattie (2017) also demonstrate that combining observation and document analysis is effective for evaluating pedagogical practices.

This study utilizes three main analytical tools to systematically process qualitative data. First, thematic analysis (Braun & Clarke, 2006) was applied to categorize research findings into three main aspects: cognitive, affective, and psychomotor, facilitating the identification of patterns and interrelationships. Second, framework analysis (Ritchie & Spencer, 1994) was used to map learner characteristics, such as learning styles and multiple intelligences, into the modified Bloom's Taxonomy framework, resulting in a more holistic evaluation model. Third, NVivo 12 software was employed to efficiently organize qualitative data, from coding to pattern visualization, ensuring analysis consistency and depth. The combination of these tools not only strengthens findings' validity but also facilitates evidence-based recommendations for inclusive education practices.

## RESULTS AND DISCUSSION

**Cognitive Development of Learners**. The cognitive aspect serves as the primary component in many educational curricula and functions as a benchmark for assessing children's developmental progress. Derived from the Latin term "cognitio," meaning "knowledge" or "recognition," cognition refers both to the process of knowing and to the knowledge itself. The cognitive domain encompasses all mental (brain) activities, meaning any effort involving cerebral functions falls within this realm.

The cognitive aspect comprises six hierarchical levels. The first is knowledge (knowledge), which represents the most fundamental level of cognitive function. This aspect refers to the ability to recognize and recall learned material, ranging from simple facts to complex theories requiring deep thought, including the retention of concepts, processes, methods, and structures. The second level is comprehension (comprehension), a more advanced skill than mere knowledge. It involves demonstrating understanding of facts and ideas through grouping, organizing, comparing, describing, and interpreting learned material. This includes three forms of understanding: translation (changing forms), interpretation (explaining or summarizing), and extrapolation (extending the meaning of material). The third level is application (application), whose objective is to implement learned material by applying its rules and principles to new or real-world situations. This also includes the ability to employ abstract concepts and specific theories or ideas. Application represents a higher cognitive level than both knowledge and comprehension. The fourth level is analysis (analysis), which involves examining and breaking down information into components, determining relationships between parts, identifying motives or causes, and drawing conclusions with supporting evidence. This analytical process consists of three characteristics: element analysis, relationship analysis, and organizational analysis. The fifth level is synthesis (synthesis), which includes identifying previously unrecognized structures or patterns and explaining obtained data or information. In other words, synthesis involves the ability to integrate concepts or components to form new structural patterns. This level requires creativity from the learner. The sixth and highest level is evaluation (evaluation), defined as the capacity to think critically and make judgments about the value of materials for specific purposes. This evaluative process is conducted based on both internal and external criteria, representing the pinnacle of cognitive development.

The purpose of the cognitive aspect focuses on thinking skills that encompass simpler intellectual abilities, such as remembering, up to problem-solving skills that require students to connect and combine several ideas, concepts, methods, or procedures they have learned to solve problems. Thus, the cognitive aspect is a subtaxonomy that reveals mental activities that often start from the level of knowledge up to the highest level, namely evaluation.

As children grow older, their cognitive development follows. According to Jean Piaget (1981), there are four stages of a child's cognitive development: (1) the sensorimotor stage (ages 0-2 years); (2) the preoperational stage (ages 2-7 years); (3) the concrete operational stage (ages 7-11 years); and (4) the formal operational stage (age 11 and above) (Adisusilo, 2014). These four developments cannot be separated because they occur continuously.

**Learner Development in the Affective Aspect**. The affective aspect is a domain related to attitudes and values. The affective domain includes behavioral traits such as feelings, interests, attitudes, emotions, and values. Additionally, a person's affective state is reflected in their attitudes and feelings, which include: (1) self-concept and self-esteem; (2) self-efficacy and contextual efficacy; (3) attitude of self-acceptance and acceptance of others (Syah, 2007).

Self-concept or self-concept is the totality of a person's attitudes and perceptions about themselves. Meanwhile, self-esteem is the level of a person's view and assessment of their own quality based on their achievements. This attitude reflects a person's true understanding of themselves, leading to self-respect as a human being.

Self-efficacy or self-efficacy is a person's belief in the effectiveness of their own abilities to inspire and motivate others. Meanwhile, contextual efficacy is a person's ability to deal with external limitations at a given time. This attitude illustrates that a person's behavior can influence others, so the attitude displayed by someone can be imitated and evaluated by others.

Attitude of self-acceptance is a person's emotional tendency, whether positive or negative, toward themselves based on an honest assessment of their talents and abilities. Meanwhile, acceptance of others is the ability to accept the existence of others, which is highly influenced by the ability to accept oneself. This attitude is reflected when a person honestly understands their own abilities, allowing them to accept the existence of others who have different talents from themselves.

The affective aspect is further detailed into five levels: a) Receiving or attending, which refers to the ability to pay attention and respond to appropriate stimuli, as well as the ability to show attention or respect for others. In the affective domain, receiving is the most basic learning outcome. For example, listening to others' opinions; b) Responding or active participation, which is one level above receiving and becomes evident when students become engaged and interested in a subject. Children demonstrate the ability to actively participate in learning and are consistently motivated to react and take action. For example: participating in class discussions about a lesson; c) Valuing, which refers to the importance of values or personal attachment to something, such as acceptance, rejection, or abstaining from expressing opinions. It also includes the ability to distinguish between good and bad aspects of an activity or event and express this through behavior. For example: proposing group activities for a lesson topic; d) Organization, whose purpose is to unify values and differing attitudes, making children more consistent and helping them form their own internal value systems while resolving arising conflicts. It also involves harmonizing various existing value differences and reconciling disparities; e) Characterization by a value or value complex, which focuses on a person's character and vitality. All of this is reflected in behavior related to personal, social, and emotional regulation. Values have developed to the point where behavior becomes more predictable.

**Learner Development in the Psychomotor Aspect.** The psychomotor aspect is a domain related to skills or the ability to act after receiving certain learning experiences. These psychomotor learning outcomes are actually an extension of cognitive learning outcomes (understanding something) and affective learning outcomes (which initially appear as behavioral tendencies). The psychomotor domain is associated with physical activities such as running, jumping, painting, dancing, hitting, and so on.

Loree states that there are two main types of universal psychomotor behaviors that every individual must master during infancy or early childhood: walking and grasping objects. These two psychomotor skills form the basis for developing more complex skills known as playing and working. In contrast, Gessel explains that motor behavior includes body movements, coordination, and specific motor skills (Salkind, 2010).

Psychomotor learning outcomes can be measured through: (1) direct observation and assessment of learner behavior during practical learning processes, (2) after completing instruction by administering tests to measure knowledge, skills, and attitudes, and (3) some time after completing instruction and later in their work environment.

The psychomotor domain encompasses movement behaviors and physical coordination, motor skills, and physical abilities. Skills that develop through frequent practice can be measured based on distance, speed, technique, and execution methods. The psychomotor aspect consists of seven categories ranging from lowest to highest: a) Imitation: occurs when a child can translate stimuli or sensations into motor movements, observing movements and beginning to respond by imitating, though the imitation is not yet specific or perfect; b) Readiness: a child's preparedness to move includes mental, physical, and emotional aspects, where the child performs actions according to given instructions rather than just imitating, demonstrating chosen movements mastered through practice and determining responses to specific situations; c) Guided response: the initial stage in learning complex movements including imitation and trial movements, with successful performance achieved through continuous practice; d) Mechanism: an intermediate stage in learning complex skills where learned responses become habitual and movements can be performed with some confidence and precision; e) Complex overt response: skilled motor movements involving complex patterns, with proficiency indicated by accurate, highly coordinated performance with minimal effort, including steady, automatic movements without hesitation; f) Adaptation: the stage where motor mastery reaches a level allowing modification and adjustment of skills to develop in various different

situations; and g) Origination: creating various modifications and new movement patterns to adapt to situational demands, producing new movements through creativity based on highly developed abilities.

**Analysis of Learner Characteristics**. Humans are created with various unique characteristics that distinguish one individual from another. Generally, these differences can be seen in variations of culture, ethnicity, religion, gender, social status, and other factors that allow for comprehensive analysis. Identifying student characteristics needs to be based on both juridical and theoretical foundations. First, Government Regulation No. 19 of 2005 concerning National Education Standards states that "learning development must consider students' demands, talents, interests, needs, and concerns" (Government Regulation, 2005). Second, theoretically students differ in many aspects including individual nature (Bhreisy, 1978), as well as differences in family background, social, cultural, economic, and environmental factors.

In analyzing learners, according to Muhammad Yaumi there are four key factors that determine student success: general characteristics, specific entry competencies, learning styles, and multiple intelligences (Yaumi, 2014). First, General characteristics essentially describe student conditions such as age, grade, occupation, and gender (Pribadi, 2011). Student characteristics refer to special traits possessed by students that can influence the level of success in achieving learning goals. These characteristics are special features of each student, both as individuals or groups, that serve as considerations in the learning organization process. Winkel associates student characteristics with initial conditions, where these initial conditions include not only realities about each student but also about each teacher (Winkel, 2014).

The following explains student development in terms of age, physical, psychomotor, and academic aspects for elementary school children: a) Physical development: the human body is a complex and remarkable organ system formed during the prenatal period (in the womb). Regarding physical development, Kuhlen and Thompson (Hurlock, 1956) state that individual physical development includes four aspects: (1) The nervous system, which greatly influences intelligence and emotional development; (2) Muscles, which affect strength and motor skill development; (3) Endocrine glands, which cause the emergence of new behavioral patterns, such as during adolescence when feelings of enjoyment for activities involving the opposite sex develop; and (4) Physical structure or body, including height, weight, and proportions (Sanjaya, 2013). b) Psychomotor development: two main developmental principles evident in all psychomotor behaviors are that development progresses from simple to complex, and from gross and global movements to fine and specific but coordinated movements; and c) Academic development: characteristics of academic development are explained using Piaget's stages of cognitive development (Riyanto, 2013). Academic abilities relate to brain function.

Second, specific entry competencies. Students' initial abilities are the actual capabilities they possess before participating in the teaching-learning process. Analyzing students' initial abilities is an activity conducted to find and obtain information or data about the abilities students have before participating in classroom learning activities. This activity is very useful for achieving the final outcomes students should possess (final abilities according to specific and general instructional objectives). The teaching-learning process must bridge students' initial abilities with these final abilities. For example: First-grade elementary students may be able to name numbers zero to nine (0-9), but they may not necessarily be able to add, subtract, or multiply.

Specific Entry Competencies refer to the knowledge and skills that students either possess or lack, including prerequisite knowledge, targeted abilities, and attitudes. Educators must understand students' initial competencies before delivering instruction, as students come to class with varying levels of knowledge, skills, beliefs, and attitudes that influence how they perceive, interpret, and manage information. Methods to assess these initial competencies include: a) informal questioning about specific topics in class; b) formal tests developed from previous material; and c) prerequisite tests to determine readiness for subsequent programs.

Third, Learning Styles. A learning style represents an individual's preferred method of learning - their optimal approach to thinking, processing information, and demonstrating knowledge. It encompasses the tools individuals select to acquire knowledge and skills, manifesting as consistent

learning habits, strategies, mental behaviors, or psychological traits that shape how learners perceive and respond to various instructional stimuli.

Learning styles can be classified according to an individual's tendencies and speed in processing specific types of information. The classification of learning styles is based on one's ability to comprehend particular information types, namely: (1) visual, (2) auditory, and (3) kinesthetic styles (De Porter & Hernacki, 2009). A more detailed explanation of these learning styles follows: Visual learners acquire knowledge most effectively through visual means. They experience difficulty absorbing information from verbal presentations that lack visual components and require visual aids or demonstrations they can directly observe. Their learning characteristics include: better recall of seen rather than heard information; a tendency to doodle; being fast and diligent readers; preferring reading over being read to; being neat and organized; valuing appearance; paying attention to detail; having good spelling skills; understanding diagrams better than written instructions; knowing what they want to say but struggling to find the right words; typically remaining undisturbed by noise; and remembering through visual associations.

Auditory learners acquire knowledge most effectively through listening. They prefer instructional delivery through lectures and discussions, typically focusing on one problem at a time. These learners are easily distracted, dislike large groups, and tend to avoid project-based tasks. Their learning characteristics include: faster absorption through listening while moving their lips and vocalizing text when reading; enjoying reading aloud and listening; being able to replicate tones, rhythms, and voice qualities; excelling in speaking and storytelling; speaking with rhythmic patterns; better remembering discussed content than visual material; frequently engaging in extended conversations and explanations; being better at spelling aloud than writing; enjoying music and singing; difficulty remaining still for long periods; and preferring group work activities.

Kinesthetic learners engage in physical movement, enjoying mobility during learning. They particularly value handwriting and bodily involvement in learning, often moving their heads, hands, or feet. These learners thrive in role-playing methods and excel in physical education, acting, and theater arts. Their learning approaches include: constant physical orientation and frequent movement; speaking slowly; preferring hands-on tools and media; touching others to gain attention; standing close during conversations; learning through practical experience; memorizing while walking and observing; using fingers as reading guides; employing extensive body language; inability to sit still for extended periods; wanting to physically engage with everything; and enjoying games and sports activities.

Fourth, Multiple Intelligences. Gardner proposed the concept of multiple intelligences that distinguishes learning tendencies and interests between individuals. According to Gardner, multiple intelligences comprise several aspects: (1) logical-mathematical intelligence, (2) visual-spatial intelligence, (3) bodily-kinesthetic intelligence, (4) musical-rhythmic intelligence, (5) verbal-linguistic intelligence, (6) interpersonal intelligence, (7) intrapersonal intelligence, and (8) naturalistic intelligence. These represent various abilities or talents for solving problems. Initially proposed by Howard Gardner (1983) as seven intelligences (verbal-linguistic, logical-mathematical, bodily-kinesthetic, visual-spatial, musical, interpersonal, and intrapersonal), he later added naturalistic intelligence (1999) and suggested the possibility of existential intelligence, termed "half intelligence" due to insufficient scientific evidence for its full inclusion. These multiple intelligences can be grouped into: a) Interactive Domain: Refers to interpersonal abilities using verbal-linguistic, interpersonal, and bodily-kinesthetic intelligences. Verbal involves oral/written expression ability, linguistic is language use ability, while bodily-kinesthetic entails whole-body expression and hand use for creation. Individuals lacking in this domain struggle with social interaction; b) Analytic Domain: Involves logical thinking through logical-mathematical, musical, and naturalist intelligences. Logical-mathematical covers reasoning and pattern recognition, musical involves musical thinking and pattern manipulation, while naturalist involves organism categorization; c) Introspective Domain: Requires natural affective processes, connecting current experiences with past emotions. It includes visual-spatial intelligence (accurate visual perception and transformation), intrapersonal intelligence (self-understanding and action based on it - an inner intelligence for problem-solving), and existential intelligence.

## CONCLUSION

The study addresses the research question regarding learner development based on characteristics by integrating three aspects of Bloom's Taxonomy (cognitive, affective, and psychomotor) through a personalized learning approach. Findings indicate that an adaptive approach to learning styles (visual, auditory, kinesthetic) and multiple intelligences significantly enhances learner outcomes. In the cognitive aspect, learners progress from the level of knowledge to evaluation, aligning with Piaget's stages. The affective aspect is evident through improvements in self-concept, self-efficacy, and value organization abilities, while psychomotor development ranges from imitation to movement creativity. Compared to prior studies focusing solely on a single aspect (Zubaidah, 2016; Suprayogi & Valcke, 2016), this research offers novelty through a holistic evaluation model combining behavioral observation, self-assessment, and qualitative analysis, consistent with neuroscience findings (Tokuhama-Espinosa, 2018) on the uniqueness of brain information processing.

The study's limitations lie in the restricted sample coverage at primary and secondary levels and reliance on teacher participation. However, the findings support recommendations for inclusive education policies with individualized characteristic-based curricula, contrasting traditional rigid approaches (OECD, 2019). Further research is needed to test this model's application in higher education and diverse socio-economic contexts. Practically, this study emphasizes the importance of teacher training in implementing differentiated instruction, addressing Tomlinson's (2014) critique regarding resource limitations. Thus, integrating learner characteristic analysis into a modified Bloom's Taxonomy framework not only bridges the theory-practice gap but also paves the way for more adaptive and equitable education.

## ACKNOWLEDGEMENTS

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