Learning Styles and Learner Diversity: Contemporary Perspectives for Higher Education

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***Abstract*—Learning styles and individual differences have received considerable attention in higher education because of their potential to explain variations in students' learning experiences and outcomes. This review examines the conceptual foundations of learning styles, major theoretical models, their relevance to higher education, and their implications for teaching and learning. Individual differences, including cognitive abilities, prior knowledge, affective characteristics, and sociocultural factors, significantly influence students' engagement with educational experiences. Prominent models such as Kolb's Experiential Learning Theory, the VARK model, and Honey and Mumford's framework are discussed to understand their contributions to educational practice. Although these models have increased awareness of learner diversity and encouraged reflective learning, contemporary research provides limited empirical support for matching instruction to learners' self-reported learning styles. The review also considers the assessment of learning styles and highlights concerns regarding their reliability, validity, and ethical use in educational settings. Greater emphasis is placed on evidence-based approaches that acknowledge learner variability through inclusive, multimodal, and flexible instructional practices. The findings suggest that higher education should move beyond rigid learning style classifications and instead promote metacognition, self-regulated learning, Universal Design for Learning principles, and diverse teaching strategies that support the success of all learners.**

***Index Terms*—Metacognition, learner diversity, multimodal instruction, experiential learning, educational psychology**

I. INTRODUCTION

Individual differences in learning refer to natural variations in how students acquire, process, retain, and apply information, influencing their responses to instructional methods and educational

experiences. Recognizing learner variability enables educators to create accessible and inclusive environments that enhance motivation, engagement, and academic achievement (Pashler et al., 2008). These differences encompass cognitive abilities, prior knowledge, affective factors, and sociocultural backgrounds. Variations in intelligence, memory, attention, information-processing speed, motivation, self-efficacy, attitudes, and emotional states affect learning performance and persistence (Chamorro-Premuzic et al., 2007; Schunk & DiBenedetto, 2020). Likewise, learners' existing knowledge, experiences, socioeconomic status, cultural values, language backgrounds, and social contexts shape educational opportunities and participation (Ambrose et al., 2010; Gay, 2018).

Addressing learner diversity is particularly important in higher education, where classrooms comprise students with diverse ages, cultures, abilities, and experiences. Inclusive practices promote equitable access, foster belonging, enhance motivation, and improve engagement (CAST, 2018; Tomlinson, 2017). Diverse instructional approaches, including collaborative learning, visual representations, discussions, and experiential activities, also facilitate knowledge retention and real-world application (Bransford et al., 2000).

Learning styles represent preferred ways of perceiving, processing, organizing, and retaining information and should be viewed as tendencies rather than fixed determinants of learning ability (Kolb, 1984). Common preferences include visual, auditory, read/write, kinesthetic, and active or reflective approaches (Fleming & Mills, 1992). However, evidence supporting instructional matching based solely on learning styles remains limited (Pashler et al., 2008). Consequently, educators are encouraged to adopt flexible, multimodal, and evidence-based practices that accommodate learner variability and promote lifelong, self-directed learning (CAST, 2018; Tomlinson, 2017).

II. CONCEPTUAL UNDERSTANDING OF LEARNING STYLES

Learning styles refer to theories and frameworks suggesting that individuals differ in how they perceive, process, organize, and retain information during learning activities (Coffield et al., 2004). The concept has attracted considerable attention because it attempts to explain why learners respond differently to similar instructional experiences. However, despite its popularity, research has found limited evidence supporting the claim that matching teaching methods to students' self-reported learning styles improves academic achievement (Pashler et al., 2008).

Learning styles are generally defined as individuals' characteristic approaches to learning tasks, reflecting habitual patterns of information processing and interaction with educational environments (Entwistle, 1981). They have been conceptualized from perspectives including sensory modalities, cognitive processing tendencies, and personality-related characteristics.

III. NATURE AND CHARACTERISTICS OF LEARNING STYLES

Learning styles are characterized by preference-based tendencies, context-dependent flexibility, and multidimensional influences. They are often described as preferred ways of learning, including visual, auditory, read/write, and kinesthetic modalities, as well as cognitive orientations such as active and reflective learning (Fleming & Mills, 1992; Felder & Silverman, 1988). Contemporary perspectives emphasize that these approaches are not fixed traits; learners may adapt their preferences according to subject matter, learning objectives, and educational contexts (Coffield et al., 2004). Furthermore, learning styles encompass cognitive, affective, and physiological dimensions that shape interactions with learning environments (Keefe, 1979).

IV. HISTORICAL DEVELOPMENT

The concept of learning styles has evolved substantially over time.

- Early foundations: Early twentieth-century research explored individual differences in sensory processing and mental imagery, providing the basis for later learning style theories (Coffield et al., 2004).
- Experiential and cognitive approaches (1960s–1970s): Increased attention was given to experiential learning and cognition, leading to frameworks such as Kolb's Experiential Learning Theory (1984) and Dunn and Dunn's model (1978).
- Expansion of models (1980s–1990s): Numerous inventories emerged, including the VARK model, which categorized preferences into visual, auditory, read/write, and kinesthetic modalities (Fleming & Mills, 1992).
- Contemporary perspectives (2000s onwards): Systematic reviews questioned the effectiveness of instructional matching based on learning styles. Pashler et al. (2008) found insufficient evidence supporting the "meshing hypothesis," and recent scholarship advocates varied, evidence-based teaching practices that benefit diverse learners (Riener & Willingham, 2010).

It is important to distinguish learning preferences, learning styles, and learning strategies. Preferences reflect favoured methods of learning, styles represent theoretical explanations of learner variability, and strategies are teachable, goal-oriented techniques that enhance learning effectiveness (Weinstein, Acee, & Jung, 2011). Contemporary higher education therefore emphasizes developing flexible learning strategies and providing inclusive, multimodal instruction rather than categorizing learners according to fixed learning styles.

V. MAJOR THEORIES AND MODELS OF LEARNING STYLES

Kolb's Experiential Learning Theory (1984) explains learning as a process through which knowledge is created through the transformation of experience. Influenced by Dewey, Lewin, and Piaget, Kolb proposed a four-stage learning cycle comprising Concrete Experience (feeling), Reflective Observation (watching), Abstract Conceptualization (thinking), and Active

Experimentation (doing). Although effective learning involves all stages, individuals often develop preferences that result in four learning styles: Diverging (feeling and observing), Assimilating (thinking and observing), Converging (thinking and doing), and Accommodating (feeling and doing). Kolb's model highlights the value of experiential activities such as simulations, reflective journals, case studies, internships, and project-based learning. However, concerns regarding the psychometric properties of the Learning Style Inventory suggest that the model should promote diverse learning experiences rather than rigid categorization (Coffield et al., 2004).

The VARK model, developed by Fleming and Mills (1992), identifies preferences for receiving information through four modalities: Visual, Aural, Read/Write, and Kinesthetic. Visual learners prefer diagrams and concept maps; aural learners benefit from discussions and lectures; read/write learners favour textual resources; and kinesthetic learners engage effectively through hands-on experiences. Learners may exhibit unimodal or multimodal preferences, and awareness of these preferences can encourage effective study strategies (Fleming, 2012). Nevertheless, evidence supporting instructional matching to VARK preferences remains limited (Pashler et al., 2008). Consequently, VARK is best viewed as a reflective framework supporting inclusive and multimodal teaching practices.

Honey and Mumford's Learning Styles model (1986), influenced by Kolb's work, identifies four styles: Activist, Reflector, Theorist, and Pragmatist. Activists prefer direct involvement and new experiences; Reflectors learn through careful observation and analysis; Theorists value logic and structured explanations; and Pragmatists focus on practical application. The framework encourages learners to reflect on their learning habits and supports pedagogical diversity through balanced educational experiences. However, concerns regarding the validity of the Learning Styles Questionnaire and the lack of evidence for instructional matching suggest that the model should be used primarily to foster learner awareness and instructional flexibility rather than fixed classification (Coffield et al., 2004). Overall, these models underscore the importance of varied and inclusive learning experiences that develop adaptability and support diverse learners.

VI. LEARNING STYLES IN THE CONTEXT OF HIGHER EDUCATION AND ASSESSMENT OF LEARNING STYLES

Higher education classrooms comprise students from diverse educational, cultural, and socioeconomic backgrounds, resulting in differences in prior knowledge, cognitive abilities, motivations, learning preferences, and study approaches. Although learning style frameworks have been used to explain these differences, current evidence suggests their value lies in promoting flexible, inclusive, and multimodal teaching practices rather than matching instruction to fixed learning styles (Coffield et al., 2004; Pashler et al., 2008).

Learning style models commonly identify visual, auditory, kinesthetic, read/write, and multimodal learners (Fleming & Mills, 1992). Recognizing such diversity encourages educators to provide varied learning opportunities that enhance accessibility and engagement. Student engagement,

encompassing behavioural, emotional, and cognitive dimensions, can be strengthened through diverse instructional methods, including lectures, discussions, collaborative tasks, multimedia resources, experiential activities, and technology-enhanced learning environments (Fredricks et al., 2004; Garrison & Vaughan, 2008). However, evidence does not support the assumption that engagement improves solely because instruction aligns with self-identified learning styles (Pashler et al., 2008).

Awareness of learning preferences may encourage self-reflection and effective learning habits. Intrinsic motivation can increase when students actively manage their learning processes (Ryan & Deci, 2020), while self-regulated learning involves selecting strategies, monitoring progress, and adapting approaches to achieve goals (Zimmerman, 2002). Varied learning opportunities may also strengthen academic self-efficacy (Bandura, 1997). Consequently, contemporary perspectives emphasize adaptive learning strategies and self-regulation rather than fixed learning style categories. Inclusive classrooms further support participation through active learning, collaborative projects, reflective activities, and flipped classroom approaches integrating visual, auditory, textual, and experiential elements (Bishop & Verleger, 2013). Academic success depends on multiple factors, including motivation, prior knowledge, teaching quality, and institutional support, rather than instructional matching to learning styles (Pashler et al., 2008).

Learning style assessments aim to identify preferred approaches to learning and include instruments such as the VARK Questionnaire, Kolb's Learning Style Inventory, the Felder-Silverman Learning Style Model, and the Myers-Briggs Type Indicator (Fleming & Mills, 1992; Kolb, 1984; Felder & Silverman, 1988; Myers et al., 1998). Nevertheless, concerns regarding construct validity and reliability have been widely reported, as individuals may receive different classifications over time (Coffield et al., 2004). Furthermore, the meshing hypothesis lacks empirical support, with research concluding that evidence for instructional matching remains insufficient (Pashler et al., 2008; Kirschner, 2017).

Ethical concerns include educational labeling, reinforcement of stereotypes, and the misallocation of resources toward unsupported practices rather than evidence-based approaches such as active learning and metacognitive instruction (Dunlosky et al., 2013). Therefore, learning style assessments should be used cautiously as tools for self-reflection rather than definitive guides for instructional design. Greater emphasis should be placed on inclusive teaching practices and the development of flexible learning strategies that support diverse learners in higher education.

Implications for Teaching and Learning

Contemporary higher education requires learner-centred approaches that recognize student variability. Rather than adapting instruction to presumed learning styles, educators should create flexible environments that offer multiple pathways for engagement, representation, and expression (CAST, 2018).

Designing Inclusive Instruction

Inclusive teaching involves anticipating learner diversity and reducing barriers to participation.

- Proactive accessibility: Providing accessible resources, organized course structures, assistive technology compatibility, and alternative formats benefits all learners (Meyer, Rose, & Gordon, 2014).
- Supportive environments: Respectful communication, collaboration, recognition of diverse perspectives, and constructive responses enhance belonging and persistence.
- Culturally responsive teaching: Incorporating diverse examples and connecting content to students lived experiences promotes relevance and inclusivity (Gay, 2018).

Multimodal Teaching Strategies

Presenting content through multiple formats acknowledges learner variability.

These include:

- visual representations,
- verbal explanations and discussions,
- written resources, and
- experiential activities such as simulations and demonstrations.

Educational technologies, including captioned videos, screen-reader-compatible materials, learning management systems, and collaborative digital tools, can further enhance accessibility and participation.

Flexible Assessment

Students should have varied opportunities to demonstrate achievement through written assignments, presentations, portfolios, multimedia projects, reflective journals, and authentic assessments. Such approaches prioritize learning outcomes while promoting equity.

Universal Design for Learning (UDL)

UDL, developed by CAST (2018), is based on the principle that learner variability is normal. It emphasizes:

- Multiple Means of Engagement ("why" of learning) to support motivation and self-regulation;
- Multiple Means of Representation ("what" of learning) through diverse methods of presenting information; and
- Multiple Means of Action and Expression ("how" of learning) by providing different ways for students to demonstrate understanding.

Promoting Metacognition

Metacognition involves awareness and regulation of one's learning processes (Flavell, 1979). Higher education should explicitly teach students how to monitor understanding, evaluate strategies, set goals, reflect on progress, and adapt approaches when necessary. Scaffolding and timely feedback gradually foster self-directed learning.

Implications for Higher Education Practice

Effective teaching extends beyond categorizing learners according to learning styles. Institutions should focus on designing inclusive curricula, employing multimodal teaching and assessment strategies, implementing UDL principles, and fostering metacognitive and self-regulatory skills. These evidence-based approaches equip all learners with the flexibility and support needed to succeed in diverse educational contexts.

VII. CONCLUSION

The study of learning styles has contributed significantly to educational discourse by drawing attention to the diversity of learners and the need for instructional approaches that acknowledge individual differences. Various theoretical models, including Kolb's Experiential Learning Theory, the VARK model, and Honey and Mumford's Learning Styles framework, have provided valuable insights into the ways learners may prefer to engage with information and educational experiences. These models have encouraged educators and students to reflect on learning processes and consider the importance of varied instructional approaches.

However, contemporary research consistently indicates that there is insufficient empirical evidence to support the practice of tailoring instruction exclusively to students' identified learning styles. The assumption that learners achieve better outcomes when teaching methods are matched to specific style categories has not been substantiated through rigorous scientific investigation. Moreover, concerns related to the reliability and validity of learning style assessments, as well as the potential for educational labeling and stereotyping, highlight the need for cautious interpretation and application of these frameworks.

Rather than viewing learning styles as fixed traits that determine educational success, higher education should recognize learner variability as dynamic and context dependent. Educators are encouraged to adopt inclusive, flexible, and evidence-based pedagogical practices that provide multiple pathways for engagement, representation, and expression. Strategies such as multimodal instruction, active learning, culturally responsive teaching, Universal Design for Learning, and flexible assessment can address diverse learner needs more effectively than rigid instructional matching.

Ultimately, the value of learning style theories lies in their capacity to promote reflection, self-awareness, and pedagogical diversity rather than serve as prescriptive tools for categorizing students. By fostering metacognitive awareness, self-regulated learning, and adaptive learning strategies, higher education institutions can create supportive learning environments that empower all students to achieve their academic potential and engage successfully in lifelong learning.

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