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Learning Style Construct in Student's Learning

ABSTRACT: This study is to analyze the literature about nature and importance of learning style construct to overall human learning and especially school learning. A certain research interest group raises questions about the credibility, validity, and usefulness of this construct in school learning. Applicability, usefulness, financial aspects, and lack of cohesive theory were the basic criticisms for supporting school learning environment to adopted individual student learning style, especially when there are some other options, such as effective teaching and school environment that can also enhance and affect students' learning. The criticisms on learning style construct need to be assessed on the basis of these premises. This explorative study focuses on the literature that supports the issues of validity, effectiveness, and applicability of learning style construct in school learning and general learning. The relationship of learning styles to academic achievements, attitudes toward learning, and multimedia technology was identified as the important element. There are clear and marked differences between cognitive and learning style. But, we have seen massive research to support the validity and usefulness of learning style construct in general and in school learning situations.

KEY WORD: Learning Style; Cognitive Style; Student's Learning; Academic Achievements, Classroom Learning.

ABSTRAKSI: "Konstruk Gaya Pembelajaran dalam Pembelajaran Pelajar". Kajian ini menganalisis literatur mengenai sifat dan kepentingan konstruk gaya pembelajaran bagi pembelajaran manusia secara am dan khususnya pembelajaran di sekolah. Satu kumpulan minat penyelidikan tertentu membangkitkan pemerihalan tentang kredibiliti, kesahan, dan kegunaan konstruk ini dalam pembelajaran sekolah. Kebolehgunaan, kegunaan, aspek kewangan, dan kekurangan teori yang padu merupakan kritikan asas untuk menyokong persekitaran pembelajaran sekolah dengan gaya pembelajaran pelajar individu, terutamanya apabila terdapat beberapa pilihan lain, seperti pengajaran yang berkesan, persekitaran sekolah yang juga boleh meningkatkan dan memberi kesan kepada pembelajaran pelajar. Kritikan terhadap konstruk gaya pembelajaran harus dinilai berasaskan premis ini. Kajian penerokaan ini memberi tumpuan kepada literatur, yang menyokong isu-isu sah, keberkesanan dan kesesuaian konstruk gaya pembelajaran dalam pembelajaran sekolah dan pembelajaran secara am. Hubungan gaya pembelajaran dengan pencapaian akademik, sikap terhadap pembelajaran dan teknologi multimedia telah dikenal pasti sebagai satu elemen penting. Terdapat perbezaan yang jelas dan ketara antara gaya kognitif dan pembelajaran. Tetapi, kita telah melihat banyaknya maklumat penyelidikan yang menyokong kesahihan dan kegunaan konstruk gaya pembelajaran dalam situasi pembelajaran secara am dan di sekolah.

KATA KUNCI: Gaya Pembelajaran; Gaya Kognitif; Pembelajaran Pelajar; Pencapaian Akademik; Pembelajaran Bilik Darjah.

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INTRODUCTION

The best and fruitful practices in education are utmost priority of researchers, politicians, school administrators, and of course parents. There are many constructs that play the role in child education. One considered and contending construct is learning style. There are certain researchers and groups of interest who do not consider the learning style worth to be researched and they have certain reservations.

The current study was focused to answer following question: (1) What do differentiate learning style from cognitive style construct?; (2) What is the credibility and validity of reservation and objection from opposers of learning style notion?; and (3) What is the potential and contribution of learning style to school learning?

RELATED LITERATURES

The related literature was traced and approached on line JSTOR (Journal Storage) data base. The research terms used to find were learning style, importance of learning style. The studies having theoretical mature and process oriented were selected to answer the comments by the certain group of researchers.

The Boundaries of Learning Style. Individuals show differences in ways they interact with their learning environment. These individual differences comprise and range from, initial or superficial stage of mere interact with the learning material behaviorally to a final storage and deep processing of information cognitively, for future reference or use. Generally, these learning differences are regarded as learning styles. E. Bird, F. Romanelli & M. Ryan (2009) defined the learning styles as, “the distinctive psychosocial, affective and cognitive behaviors that give rise to relatively stable measures about the perception, interaction and response to the surrounding learning environment” (Bird, Romanelli & Ryan, 2009). The learning style with unique,

individualized nature remain relatively stable, even when encountered different tasks/situations (Vorhaus, 2010).

In other words, when people face a learning situation (a stimulus) in a learning environment, they respond into their own way (Bakar & Ali, 2014). So, we can inferred that a learning style is the way of receiving and responding to a learning stimulus with unique psychological, affective, and cognitive composition. So, if we have to differentiate between cognitive and learning style, then to describe learning style, we have to extend learning style boundary from a learning style referred as “individual’s preferred mode of receiving and processing information” to further characteristics, if individual learning such as affective and psychological dimensions of individual learning. Then, we can apart cognitive style from learning style. The Cognitive style and learning style concepts detach from each other in aspects; that “cognitive style involves cognition based process, whereas learning style is rooted in exterior behavior and response to learning situation” (Doorn, McManus & Yiend, 2012).

D.A. Kolb (1984) and P. Honey & A. Mumford (1986), and as cited also in P.F. Cuthbert (2005), portrayed learning style as, “individual’s preference for understanding his/her experiences and transforming” (Kolb, 1984; Honey & Mumford, 1986; Baker, Jensen & Kolb, 2002; and Cuthbert, 2005). J. Vermunt & Y. Vermetten (2004) used the term “learning style” in more elaborative way; and regarded it as “a superordinate concept in which the cognitive and affective processing of subject matter, the metacognitive regulation of learning, conceptions of learning, and learning orientations are united” (Vermunt & Vermetten, 2004). We can frame learning style as a relative consistency of preference in interacting, receiving, processing, and responding cognitively and affectively to a learning situation, independent of the task encountered.

The Importance of Learning Style. A few researchers and practitioners criticized and underestimated the value and applicability of learning style construct in school and general learning. C. Riener & D. Willingham (2010) considered learning styles practically inapplicable and useless and called these a myth. W.L. Leite, M. Svinicki & Y. Shi (2010) evaluated the VARK learning style inventory (Visual, Aural, Read/Write, and Kinesthetic); and reported some flaws like poor item selection and construction (Leite, Svinicki & Shi, 2010). D. Rohrer & H. Pashler (2012) opposed tailoring instruction to students' different learning styles. They argued that there is no empirical support for an expensive tailoring of instruction to learning styles (Rohrer & Pashler, 2012). G. Norman (2009) claimed that learning style is an obsolete concept; and it does very little with learning (Norman, 2009).

These recent studies have raised many doubts and reservations. The opposition gave an impression that learning style research has no validity and is unable to help the researchers in improving the learning in an overall scenario, but when we validate the validity of their claims, it was surprising that they pointed flaws mostly in one aspect, a concept or a dimension of learning styles. G. Norman (2009) studied *visual, verbal, taxonomy*; C. Riener & D. Willingham (2010) discussed *visual, kinesthetic, and auditory*; and W.L. Leite, M. Svinicki & Y. Shi (2010) checked *visual, aural, read/write, and kinesthetic*. They neglected a massive literature support for learning style notion and movement (Norman, 2009; Leite, Svinicki & Shi, 2010; and Riener & Willingham, 2010).

Here, we will present some literature that supports the movement. D.A. Kolb & R.E. Boyatzis (2000) indicated the potential of research in learning style; and indicated that that only experiential learning theory and learning style inventory contributed 990 publications from 1971-1999 (Kolb

& Boyatzis, 2000). There were many studies supporting the claim, that learning outcomes increased as a result of a match between learning style and teaching methods (Dunn, 1984).

A learning style is a characteristic just like other developmental and biological characteristic (Dunn, 1989); therefore, it cannot be neglected. There are significant differences in learning styles in students of different disciplines (Jones, Reichard & Mokhtari, 2003). In certain situations, learning patterns alone can explain the variance in academic performance. M.D. Threton & R.A. Walter (2009) identified that learning styles are related to personality; therefore, cannot be neglected in the school success (Threton & Walter, 2009).

Learning style matching to teaching methods increased retention ability in students (Slack & Norwich, 2007). J. Vermunt & Y. Vermetten (2004) described that learning outcomes are affected by learning orientations. Y. Akbulut & C.S. Cardak (2012) claimed that adaptive educational hypermedia models based on learning styles, helped students in their success and satisfaction, same is in normal classes, an educational process appropriate to students' learning styles increases their satisfaction (*cf* Lurea *et al.*, 2011; and Akbulut & Cardak, 2012). L.M. Miller (2005) identified 40 publications that reported significant effect on learning with relation to scales in GSD or Gregorc Style Delineator (Miller, 2005).

A computer based instruction in reference to a learning style (GSD), improved students' learning. On the other hand, a mismatch situation posed problems to students in their interaction with courses in learning situations (Kinshuk, Liu & Graf, 2009). S.D. Ozgur, S. Temel & A. Yilmaz (2012) confirmed the relationship of problem solving abilities to assimilators and converges' styles on Kolb LSI (Learning Style Inventory). A.G. Mehrdad & M. Ahghar (2012) found

a relationship between an individual's visual orientation/style and use of learning strategies. A.F.M. Huang *et al.* (2012) developed portfolio-based programming learning style diagnosis system for Felder's learning style.

Also A. D'Amore, S. James & E.K. Mitchell (2012) found a relationship between learning styles on D.A. Kolb (1984) learning styles and demographic data. D.C.S. Law & J.H.F. Meyer (2010) credited ILS (Bakar & Ali, 2014) for differentiation in students' learning styles. K. Hurst-Wajszczuk (2010) argued in favor of learning style research, that teachers can shape their teaching in order to minimize the negative effect of their own learning styles (Hurst-Wajszczuk, 2010).

S. Alaoutinen, K. Heikkinen & J. Porras (2010) utilized an intensive collaborative teaching concept, CODE CAMP, to demonstrate the effect of learning styles. The study indicated an increase in motivation to learn in reflective- intuitive students (Alaoutinen, Heikkinen & Porras, 2010). S. Graf, T. Lin & C. Kinshuk (2008) and S. Graf *et al.* (2009) demonstrated that the working memory capacity is connected to learning styles. D.A. Cook *et al.* (2009) found empirical support for the theoretical model of Vermunt learning style inventory. D.A. Cook & A.J. Smith (2006) found ILS (Index of Learning Styles), a valid instrument of learning styles and concluded that cognitive style and learning style scores may not be interchangeable, even for constructs with similar definitions, due to being different constructs (Cook & Smith, 2006).

Y.B. Azizi *et al.* (2011) discovered a significant relationship between teaching methods used and students learning style. L. Caulley, V. Wadey & R. Freeman (2012) noted that with an increase in age and post graduate education, the learning style changes from action oriented learning to more reflective learning (Caulley, Wadey & Freeman, 2012). J. Vermunt & Y. Vermetten (2004) recommended to incorporate

affective and social/collaborative learning the interplay between self-regulation and external regulation, promotion of more favourable learning patterns in different types of learning environments (Vermunt & Vermetten, 2004). C. Evans & E.E. Smith (2006) emphasized in a way:

The application of learning style theory and research continues to hold great promise for practitioners in both in education and training as a potentially powerful mechanism for enabling pupils, students and trainers to manage their own learning better throughout educational and working lives (Evans & Smith, 2006).

The above research findings lead us to the conclusion that role of learning style in the learning of an individual cannot be neglected in classroom settings as well as lifelong learning (Evans, Cools & Charlesworth, 2010). The findings in this exploratory study suggest and support the significance of learning style for a classroom based teaching and lifelong learning. Therefore, learning style construct may not be regarded as myth, its reality that massively affects an individual's course and way of learning in formal and informal learning settings.

FUTURE TREND ON COGNITIVE AND LEARNING STYLE CONSTRUCTS

Excess of different learning styles, definitions, and measurement instruments baffled the researchers and practitioners, policy makers, and a novice to the field and provide soft belly for attack to anti-style researchers. Better knowledge of learning styles accompanied with advancements in information technology can be beneficial for learning of different types of students in large size classes. The limited research confirming relationship between learning styles and learning outcomes has resulted in opposition and hesitation to apply learning style research beyond experiments to an actual classroom setting (Threeton & Walter, 2009). The learning style researchers should focus

on following aspects to make learning style research more practical and a valid field.

Theoretical Backgrounds of Learning Style Construct. The researchers had questioned about the theoretical validity of different learning styles. N. Slack & B. Norwich (2007) conducted a study about theoretical justification of L.M. Smith (1978)'s model. Pupil self-report inventory was used for the exploration of the pupil's learning styles. They claimed that this model lack theoretical background and justification for labeling into auditory, kinesthetic, and visual styles (Smith, 1978; and Slack & Norwich, 2007).

R.R. Schmeck ed. (1988) and M. Reynolds (1997), and as cited also in N. Slack & B. Norwich (2007), cautioned about overgeneralization of learning styles into mutually exclusive styles, that can lead to false and wrong expectations from pupils. Further arrangements on the base of these mutually exclusive styles can provide improper learning opportunities (Schmeck, 1988; Reynolds, 1997; and Slack & Norwich, 2007). L.M. Miller (2005) considered, LSI (Learning Style Inventory) a poor instrument in terms of measurement (Miller, 2005).

T.G. Reio (2006) examined the psychometric properties of the GSD (Gregoric Style Delineator) and found statistically little support for its theoretical basis/design and a concomitant accurate portrayal of one's cognitive learning style (Reio, 2006). H. Bergsteiner, G.C. Avery & R. Neumann (2010) applied standard modeling categorization criteria to Kolb's basic model, which alone was used in 990 studies from 1971-1999 (*cf* Kolb & Boyatzis, 2000; and Bergsteiner, Avery & Neumann, 2010). The researchers claimed to identify errors in fundamental graphic syntax, incapability to pass the modeler's graphic sufficiency and simplification tests, problems related to categorization and definitions, as seen detail in H. Bergsteiner, G.C. Avery & R. Neumann (2010).

There should be research to identify the ways to overcome these modeling flaws in fundamental, basic and leading learning style models. Suggestions and ways should be researched to improve the situation.

What is the Psychometric Validity and Reliability of Learning Style Instruments? Kolb's learning model, Felder and Solomon's Model are largely used in management and education for a wide range of applications. M. Platsidou & P. Metallidou (2009) investigated the psychometric strengths of Kolb learning style inventory and Felder and Solomon's Index of Learning Style. A Greek sample of LSI (Learning Style Inventory) revealed a satisfactory reliability and weak construct validity. There was strong preference for only accommodative and divergent learning styles (Platsidou & Metallidou, 2009).

ILS only achieved an acceptable level of reliability with an ability of discrimination and construct validity. The study suggested that these two cannot be used for grouping students in reference to their learning styles, but can only be allowed to encourage self-development of an individual. C.R. Brew (2002) reported about gender sensitivity of D.A. Kolb (1984)'s LSI for the sample of Australian university students (*cf* Kolb, 1984; and Baker, Jensen & Kolb, 2002).

T.G. Reio (2006) examined the psychometric properties of the GSD (Gregoric Style Delineator) and found little statistical support for GSD's theoretical basis/design and a portrayal of one's cognitive learning style (Reio, 2006). N. Slack & B. Norwich (2007) conducted a classroom study; and reported internal and retest unreliability of kinesthetic learning scale in auditory, kinesthetic, and visual learning style inventory (Slack & Norwich, 2007).

N.V. Zwanenberg, L.J. Wilkinson & A. Anderson (2000) researched the reliability of two famous learning style descriptors; Felder & Silverman's index of learning and Honey & Mumford's learning style questionnaire;

ILS had low internal reliability and also failed to predict, ILS found mixed with cognitive and learning style characteristics and measures absolutely none of both. They advised not to execute its application beyond engineering students for whom it was intended (Zwanenberg, Wilkinson & Anderson, 2000).

LSQ (Learning Style Questionnaire) found more reliable internally than ILS, but it was also unable to possess predictability and was also not up to the standard of psychometric instrument. V.V. Busato *et al.* (1998) claimed that Vermunt's learning styles do not have considerable evidence to tailor higher education to Vermunt's learning styles, and suggested further research to validate these styles (*cf* Busato *et al.*, 1998; and Vermunt, 2005).

What is the Influence of Culture and Environment on a Learning Style? A.F. Garsha (1990) and G. De Vita (2001), and also as cited in E. Bird, F. Romanelli & M. Ryan (2009) found a correlation between culture and learning style; and it is found that learning styles are not culturally structured but contextual (*cf* Garsha, 1990; De Vita, 2001; Wong, 2004; and Bird, Romanelli & Ryan, 2009). It may be inferred that learning styles tend to be modified by experience, context, and exposure. Personality, education, profession, a job role, and individual adaptive competencies are responsible for shaping a learning style along Kolb's learning style classification (Kolb & Boyatzis, 2000).

J.D. Vermunt (2005) found that a student's learning patterns on inventory of the learning style were associated with personal and contextual factors, such as academic discipline, prior education, age, and gender (Vermunt, 2005). Students learning styles have a significant relationship with teaching methods (Azizi *et al.*, 2011). Internationalization at higher education level requires research on culture specific styles of learning through reliable and valid measures

to develop an emerging field of international pedagogy (Eaves, 2011). E. Hall & D. Moseley (2005) gave directions for future research as follows:

The learning style research should help the individual to overcome a particular style so focus should be on strategies rather than labeling an individual with a style because it limits the learner's ambition, descriptions of learning style should be tools to break chains of habit and limitation (Hall & Moseley, 2005).

CONCLUSION

The future research should provide solid and valid theoretical grounds and workable suggestions to help students, teachers, and adults to progress in their learning environments. Based on these premises, the future researchers should consider learning style as processes in human life. The learning interaction should be regarded as a medium for students to navigate their learning direction. This is so because the learning itself are very much related to the individual differences, such the personality, the attitudes, motivation, intellectual ability, and emotional development.

Considering the individual differences as a major element in determining the learning activities, it is evidence that the future researchers should devise their studies by looking into the learning styles as development process. Without such understanding, the study on the learning activities among student will be problematic which sometimes lead to a wrong conclusion. It is best then to start with defining what are the learning styles and how it difference from one person to the other, so that the foundation of the study will be conducted on a clear definition.¹

¹**Statement:** We would like to declare that this article is our original work; so, it is not product of plagiarism and not yet also be reviewed and published by other scholarly journals.

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Students Have Different in Learning Styles
(Source: <https://www.oxfordlearning.com>, 2/3/2016)

Considering the individual differences as a major element in determining the learning activities, it is evidence that the future researchers should devise their studies by looking into the learning styles as development process. Without such understanding, the study on the learning activities among student will be problematic which sometimes lead to a wrong conclusion. It is best then to start with defining what are the learning styles and how it difference from one person to the other, so that the foundation of the study will be conducted on a clear definition.