

Learning and Personality: A Review

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ABSTRACT: This review focuses on the effect of personality on learning styles of students and also briefly discusses the relationship between learning styles and culture. A review of the current literature reveals that there has been a lot of research on the effect of personality on learning processes in different age groups and at different circumstances. Personality plays an important role that affects academic achievement. Modern research has shown that individuals differ in specific human characteristics such as memory, motivation, decision-making, and learning. In the last two decades, a lot of studies have been done to examine the relationship between learning styles, learner's personality, and performance in academic settings. The reviewed studies substantiate that there is a relationship between personality types and/or traits of the learners, the way they establish their learning styles, and their academic success in school and university both at an undergraduate and postgraduate level. Therefore, learners depending on the type of their personality resort to different learning styles or preferences which, in turn, affect their learning performance. Learning style assessment can provide the basis for a more personalized approach to student's advisement and placement, instructional strategy, and evaluation of learning. The concept of learning styles is based on the theory that an individual responds to educational experiences with consistent behavior and performance patterns. The complexity of the construct, the psychometric problems related to its measurement, and the enigmatic relationship between culture and the teaching and learning process means that the body of research on learning styles must be interpreted and applied carefully. These studies have served as the basis for a follow-up teaching improvement of teachers. Results of these studies are also useful in helping faculty better understand and improve the teaching and learning process for students. Additional studies involving the personality type and learning style profiles of students and faculty of different cultural backgrounds and in larger scales are recommended. In this article, we focus on the effect of personality on learning styles of students and also briefly discuss the relationship between learning styles and culture.

Key words: Personality, Learning styles, Culture

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INTRODUCTION

Personality and Learning

A review of the current literature reveals that there has been a lot of research on the effect of personality on learning processes in different age groups and at different circumstances. The following studies are a few examples of such research work:

Ariani (2013); Bayram et al., (2008); Blickle (1998); Caspi et al., (2006); Felder et al., (2002); Furnham et al., (1999); Johnston and Orwig (1999); Hakimi et al., (2011); Hashim et al., (2014); Jessee et al., (2006); Kamarulzaman (2012); Matangi (2013); Miller (2010); Molinuevo and Torrubia (2013); Pornsakulvanich et al., (2012); Sadeghi et al., (2012); Salehi et al., (2014); Sharp (2008); Verešová (2015); Wu and Lai (2010); Yanardöner et al., (2014); Zimmerman et al., (2006).

The word "personality" originates from the Latin "persona", which means mask. Personality also refers to the pattern of thoughts, feelings, social adjustments, and behaviors consistently exhibited over time that strongly influences one's expectations, self-perceptions, values, and attitudes (Winnie and Gittinger, 1973; Krauskopf and Saunders, 1994). The study of personality has a broad and varied history in psychology with an abundance of theoretical

traditions. The major theories include dispositional (trait) perspective, psychodynamic, humanistic, biological, behaviorist, evolutionary, and social learning perspective.

Background and History

The study of personality started with Hippocrates' four humors and gave rise to four temperaments (Storm, 2006). The explanation was further refined by his successor Galen during the second century CE. The "Four Humors" theory held that a person's personality was based on the balance of bodily humors; yellow bile, black bile, phlegm and blood (Carlson et al., 2010).

Sir Francis Galton in 1884 made the first major inquiry into a hypothesis that by sampling language it is possible to derive a comprehensive taxonomy of human personality traits: the lexical hypothesis (Shrout and Fiske, 1995). Personality is usually broken into components called the Big Five, which are openness to experience, conscientiousness, extroversion, agreeableness, and neuroticism (or emotionality). These components are generally stable over time, and about half of the variance appears to be attributable to a person's genetics rather than the

effects of one's environment (Krauskopf and Saunders, 1994; Briley and Tucker-Drob, 2014).

Lewis Goldberg proposed a five-dimension personality model, nicknamed the "Big Five" (Albert et al., 2009): (a) Openness to Experience: The tendency to be imaginative, independent, and interested in variety vs. practical, conforming, and interested in routine. (b) Conscientiousness: The tendency to be organized, careful, and disciplined vs. disorganized, careless, and impulsive. (c) Extraversion: The tendency to be sociable, fun-loving, and affectionate vs. retiring, somber, and reserved. (d) Agreeableness: The tendency to be softhearted, trusting, and helpful vs. ruthless, suspicious, and uncooperative. (e) Neuroticism: The tendency to be anxious, insecure, and self-pitying vs. calm, secure, and self-satisfied (Santröck, 2008). Personality can be determined through a variety of tests, such as the Minnesota Multiphasic Personality Inventory (MMPI-2), Rorschach Inkblot test, Neurotic Personality Questionnaire KON-2006 or Eysenck's Personality Questionnaire (EPQ-R) (Aleksandrowicz et al., 2009).

Education and Academic Achievement

Personality plays an important role that affects academic achievement. Komarraju et al. (2011) conducted a study with 308 undergraduates who completed the Five Factor Inventory Processes and offered their GPA suggested that conscientiousness and agreeableness have a positive relationship with all types of learning styles (synthesis analysis, methodical study, fact retention, and elaborative processing), whereas neuroticism has an inverse relationship with them all. Moreover, extraversion and openness were proportional to elaborative processing. The Big Five personality traits accounted for 14% of the variance in GPA, suggesting that personality traits make some contributions to academic performance. Furthermore, reflective learning styles (synthesis-analysis and elaborative processing) were able to mediate the relationship between openness and GPA. These results indicate that intellectual curiousness has significant enhancement in academic performance if students can combine their scholarly interest with thoughtful information processing (Komarraju et al., 2011).

Studies conducted on college students have concluded that hope, which is linked to agreeableness, has a positive effect on psychological well-being. Individuals high in neurotic tendencies are less likely to display hopeful tendencies and are negatively associated with well-being (Singh, 2012). Personality can sometimes be flexible and measuring the big five personality for individuals as they enter certain stages of life may predict their educational identity. Recent

studies have suggested the likelihood of an individual's personality affecting their educational identity (Klimstra, 2012).

Learning Styles

Although there is no evidence that personality determines thinking styles, they may be intertwined in ways that link thinking styles to the Big Five personality traits (Zhang, 2001). There is no general consensus on the number or specifications of particular learning styles, but there have been many different proposals. Smeck et al. (1997) defined four types of learning styles namely synthesis analysis, methodical study, fact retention, and elaborative processing. When all four facets are implicated within the classroom, they will each likely improve academic achievement (Komarraju, 2011).

This model asserts that students develop either agentic/shallow processing or reflective/deep processing. Deep processors are more often than not found to be more conscientious, intellectually open, and extraverted when compared to shallow processors. Deep processing is associated with appropriate study methods (methodical study) and a stronger ability to analyze information (synthesis analysis), whereas shallow processors prefer structured fact retention learning styles and are better suited for elaborative processing (Komarraju, 2011). The main functions of these four specific learning styles are as follow:

Openness has been linked to learning styles that often lead to academic success and higher grades like synthesis analysis and methodical study. Because conscientiousness and openness have been shown to predict all four learning styles, it suggests that individuals who possess characteristics like discipline, determination, and curiosity are more likely to engage in all of the above learning styles (Komarraju, 2011). According to the research carried out by Komarraju et al. (2011), conscientiousness and agreeableness are positively related with all four learning styles, whereas neuroticism was negatively related with those four. Furthermore, extraversion and openness were only positively related to elaborative processing, and openness itself correlated with higher academic achievement (Komarraju et al., 2011). Recent studies suggest that Big Five personality traits combined with learning styles can help predict some variations in the academic performance and the academic motivation of an individual which can then influence their academic achievements (De Feyter et al., 2012).

This may be seen because individual differences in personality represent stable approaches to information processing. For instance, conscientiousness has consistently emerged as a

stable predictor of success in exam performance, largely because conscientious students experiences fewer study delays (Klimstra et al., 2012). The reason conscientiousness shows a positive association with the four learning styles is because students with high levels of conscientiousness develop focused learning strategies and appear to be more disciplined and achievement-oriented. However, the American Psychological Society recently commissioned a report whose conclusion indicates that no significant evidence exists to make the conclusion that learning-style assessments should be included in the education system. The APA also suggested in their report that all existing learning styles have not been exhausted and that there could exist learning styles that have the potential to be worthy of being included in educational practices (Pashler et al., 2008).

Review of the Literature

A review of the current literature reveals that there has been a lot of research on the effect of personality on learning processes in different age groups and at different circumstances. The following studies are a few examples of such research work:

Ariani (2013) investigated the relationship between personality traits and learning motivations by correlating Big Five model of personality, Core self-evaluation, achievement and affiliation motivation, and intrinsic and extrinsic motivations for leaning. Regression analysis results indicated that extraversion, agreeableness, openness to experience, and conscientiousness were positively associated with intrinsic motivation, but neuroticism was positively associated with extrinsic motivation. Core self-evaluation was also positively related with intrinsic motivation and negatively related with extrinsic motivation (Ariani, 2013).

Bayram et al. (2008) investigated the relationships among personality traits and learners' academic achievement in a web-based environment and attitudes towards web-based education. A survey method was used for the study and the data were collected by Web Based Education Attitudes Scale and The Adjective Check List (ACL). At the end of the study, it was revealed that the students were successful in the web-based education environment. Also, significant relationships were found between learners' personality traits, academic achievement, and attitudes towards web-based education. The findings revealed that personality traits explain about 53.2% of the academic achievement, and 52.7% of the attitudes towards web-based education (Bayram et al., 2008).

Blickle (1996) analyzed the relationships between personality traits, learning strategies, and performance. Two multivariate studies were

conducted. In both studies, factor analyses of the learning strategies yielded two factors. One factor, labeled 'learning discipline', correlated highly with the Conscientiousness scale and the other factor, labeled 'elaboration', correlated with the Openness of Experience scale. In Study 1, about 17 per cent of the variance in college grades was accounted for by personality scales and learning strategies. In Study 2, learning strategies accounted for about 31 per cent of the variance in college grades. Path analyses showed that the relations between basic personality traits and grades were mediated by the learning strategies (Blickle, 1996).

Caspi et al. (2006) evaluated the impacts of the instructional environment (classroom vs. web-based instructional environment—WBIE) and personality differences on students' social participation were examined among university students. Students reported their attendance, willingness to participate, and actual participation in each instructional environment. Students' personality traits were measured by the Big Five Inventory. It was found that despite of frequent attendance to both educational environments, the classroom seems to enhance students' active participation whereas WBIE appears to inhibit it. Participants in class were more extroverted, open to new experiences, and emotionally stable, relative to non-participants. Such differences were not found between WBIE participants and non-participants. Students who actively participated only in WBIE were more introverted and more neurotic than students who participated in both environments, students who did not participate in either instructional environment, or students who participated exclusively in class. These results point to the psychological impact of the two instructional environments, and suggest viewing social participation as a result of educational context while individual differences play secondary role (Caspi et al., 2006).

Davis (2006) measured the learning style and personality type preferences of community development extension educators by using Witkin's Group Embedded Figures Test (GEFT) and Hogan and Champagne's Personal Style Inventory (PSI), respectively. GEFT scores were examined in relation to PSI scores. Both measures were examined in relation to age, gender and academic background. More than 56% of the community development extension educators involved in this study favored a field dependent learning style. Females were more field dependent. Subjects with academic backgrounds in the physical sciences were more field independent. Males were more than three times more likely to prefer gathering information using their senses (sensing) than females. Twice the number of female

subjects preferred gathering information through use of their unconscious (intuition) over males. Males preferred reacting to information with logic (thinking). Females preferred reacting to information with personal reflection and consideration for others (feeling). There was a negligible level of association between learning style and personality type subscales (Davis, 2006).

Felder et al. (2002) studied the effects of personality type on engineering student performance and attitudes. The Myers-Briggs Type Indicator (MBTI) was administered to a group of 116 students. Type differences in various academic performance measures and attitudes were noted as the students progressed through the curriculum. The observations were generally consistent with the predictions of type theory, and the experimental instructional approach appeared to improve the performance of MBTI types (extraverts, sensors, and feelers) found in previous studies to be disadvantaged in the engineering curriculum. The conclusion was that the MBTI is a useful tool for helping engineering instructors and advisors to understand their students and to design instruction that can benefit students of all types (Felder et al., 2002).

Furnham et al. (1999) performed a study on personality, learning style, and work performance. Over two hundred participants completed the Eysenck's Personality Inventory (EPI) and Honey and Mumford's Learning Styles Questionnaire (LSQ). Extraversion was highly correlated both positively and negatively with three of the four LSQ measures. The lie scale from the EPI was also systematically correlated with the Activist and Reflector scales of the LSQ. Both the EPI and LSQ traits were modestly correlated with two criteria: ratings of Actual Performance and Development Potential. Personality variables (extraversion, neuroticism) and certain learning styles (reflector, pragmatist) were statistically significant predictors of rated performance. Their results concur with the recent meta-analytical studies that show personality variables account for a small but important amount of variance in measures of work performance (Furnham et al., 1999).

Hakimi et al. (2011) studied the relationships between personality traits and students' academic achievement. Results revealed that personality traits were significantly related to academic achievement. Stepwise regression analysis indicated personality characteristics accounted for 48 percent of variance in academic achievement. Results also showed that conscientious was the most important predictor variable. Finally, there was no significant gender differences in the personality characteristics and academic achievement (Hakimi et al., 2011).

Hashim et al. (2014) studied the relationship between teacher's personality, monitoring, learning environment, and students' EFL performance. They aimed to explore whether teacher's characteristics and environmental learning factors influence students' overall communication proficiency. Drawing on sociocultural theory, the authors assumed that EFL learning is bi-directional in nature. In addition to conceptualizing the direct impact of domain-specific determinants of communication proficiency, internal classroom conditions and external college facilities were assessed for possible moderating effects. All constructs demonstrated low levels of multicollinearity and measurement scales indicated sufficient reliability and validity. Results showed that teacher's personality is an important determinant of student proficiency in English. Monitoring efforts, however, did not have a direct influence on English proficiency but coupled with teacher's personality and college facilities, respectively, the coefficient interaction effects became significant. Results also revealed that classroom conditions do not interact with teacher's personality to improve student learning outcomes, nonetheless acts more predominantly as a predictor that directly enhances students' learning (Hashim et al., 2014).

Jessee et al. (2006) conducted a study entitled "matching student personality types and learning preferences to teaching methodologies". The objectives of the study were to (a) identify the most common personality types among first- and second-year undergraduate dental students using the Myers-Briggs Type Indicator (MBTI); (b) identify the learning preferences of these personality types; and (c) determine a more effective approach to teaching clinical dentistry based upon student personality types and learning preferences. Four common personality types were identified among respondents: ISTJ, ESFJ, ESTJ, and ISFJ, with a predisposition for Sensing (S) (desire for facts, use of senses) over Intuition (N) (look for possibilities, relationships) and Judging (J) (prefers decisiveness, closure) over Perceiving (P) (desire flexibility, spontaneity). The most common occurring personality type, ISTJ, represents an Introverted, Sensing, Thinking, and Judging individual. Specific clinical curricular techniques that would appeal to these common personality types are identified, and an explanation of their benefit is provided. Results of this study demonstrated the importance of faculty understanding and acknowledging different student personality types and related learning preferences as a way to initiate improvement of undergraduate dental education, promote student motivation, and allow for an expression of learning style preference (Jessee et al., 2006).

Kamarulzaman (2012) reviewed the effect of personality on learning styles. Costa and McCrae's Five-Factor Model of Personality (The Big 5) was explored against Kolb Learning Styles. The Big 5 factors are extraversion, neuroticism, openness, agreeableness, and conscientiousness, whereas Kolb Learning Styles are divergers, assimilators, convergers, and accommodators. The author discusses the Big 5 factors and Kolb Learning Styles, issues relating to personality and learning styles, and critical review of effect of the Big 5 factors and Kolb Learning Styles. It was concluded that personality has an effect on learning styles when it comes to the Big 5 factors and Kolb Learning Styles (Kamarulzaman, 2012). Major et al., (2006) investigated links between the Big Five, proactive personality, and motivation to learn. Results showed that proactive personality was, only in part, a composite of Big Five facets, which accounted for 26% of its variance. Structural equation modeling results demonstrated that proactive personality, openness, extraversion, and conscientiousness predicted motivation to learn. In addition, motivation to learn was positively related to objectively assessed development activity. Proactive personality, extraversion, and openness had significant indirect links to development activity. Results suggested that proactive personality had significant incremental validity in the prediction of motivation to learn over all relevant Big Five facets (Major et al., 2006).

Matangi (2013) studied the personality and learning preference interactions of women in tertiary education. The dominating personalities were extrovert and openness, whilst the dominating learning styles were elaborative processing and methodical study. The students understood the most when the lecture teaching method was utilized and they recommended that attachment and e-learning be co-opted to improve their academic performance. Insignificant associations were exhibited between personality and learning style, and consequently with preferred teaching method, and expected academic qualification. This revealed diversity of students' personality and learning styles implying that the university's lecturers had to employ a variety of teaching methods to ensure high academic performance (Matangi, 2013).

Miller (1991) pointed out that attempts to broaden conceptions of learning styles to represent more adequately individual differences in motivation/emotion, as well as cognition, are limited by a paucity of relevant theory. Personality theories should, but do not, provide a satisfactory conceptual framework for this endeavor. In an attempt to remedy this situation, a new personality typology is outlined which, it is argued, provides a coherent system within

which to construe and conduct research upon learning styles. The implications of the theory for educational goals, couched in terms of learning styles, also are discussed (Miller, 1991).

Molinuevo and Torrubia (2013) aimed to determine whether personality is related to medical students' attitudes towards learning communication skills and self-ratings on communication skills. The students completed the Communications Skills Attitudes Scale and rated their own communication skills. Results revealed that medical students with higher scores on psychoticism or aggression-hostility showed worse attitudes. Students who tended to have a better self-image scored higher on extraversion, psychoticism, impulsive-sensation seeking, or aggression-hostility traits. The authors concluded that the findings support the consideration of personality traits for better student career guidance and counseling (Molinuevo and Torrubia, 2013).

Pornsakulvanich et al. (2012) performed an analysis of personality traits and learning styles as predictors of academic performance. They examined the influence of Big Five personality traits and learning styles on cognitive and affective academic performance, and gender differences in learning styles in Thailand. Results indicated that personality traits found to be better predictors of cognitive and affective academic performance than did learning styles. Conscientiousness was a significant contributor of academic performance. Among five personality traits, Conscientiousness, Openness, and Agreeableness significantly predicted cognitive academic performance, whereas Conscientiousness, Openness, Agreeableness, and Emotional Stability significantly predicted affective academic performance. Learning styles were also related to cognitive academic performance. Moreover, students in Business Administration reported higher scores in Conscientiousness, Agreeableness, and Emotional Stability than those in Communication Arts. Results showed no significant differences in learning styles between genders (Pornsakulvanich et al., 2012).

Rovai and Grooms (2004) studied the relationship of personality-based learning style preferences and learning among online graduate students enrolled in an online doctoral program that utilized the Blackboard e-learning system. Two measures of learning—course grades and perceived learning—were used. According to the Myers-Briggs Type Indicator, the majority of students in the sample were extraverts, intuitives, feelers, and judgers. This profile differed from that of the general population on two personality dimensions: sensing-intuition and judging-perceiving. The general population tends to be sensors rather than intuitives and to be equally

distributed between judges and perceivers. No significant differences in learning were found based on learning styles. The implication for practice is that an online course can achieve equity in learning for all personality-based learning styles provided the course is designed to include elements that appeal to students with different styles. However, what is not known are the roles of motivation to learn and volition for students to persist despite any incongruence between individual learning style and the course as presented (Rovai and Grooms, 2004).

Sadeghi et al. (2012) aimed at reviewing the relationship between learning styles, personality, and reading comprehension performance. Their research on learning styles, personality types, and L2 performance showed that there was a relationship between personality types of the learners, the way they establish their learning styles, and their success in language learning (Sadeghi et al., 2012).

Salehi et al. (2014) studied the effect of personality characteristics on the learning styles of students. Majority of the students had assimilator learning style; dimensions of personality traits including extraversion, agreeableness, conscientiousness, openness to experience, and neuroticism were in medium level. For the big five personality factors, except neuroticism, a consistent positive association with learning styles was found (Salehi et al., 2014).

Sepehri et al. (2013) discussed the legal aspects of determining personality, effectiveness of this action, and possibility of that in learning language. They concluded that learning how to learn is an empowering experience, and discovering one's learning style can lead to an increase in achievement and self-confidence. However, it is important to realize that no one style is better than another, although many language school programs favor certain types of learners over others (Sepehri et al., 2013).

Sharp (2008) examined the relationships between personality and second language learning. The study placed emphasis on the importance of personality in learning success and examined research evidence on the issue, discussing some of the inconsistent results that have been obtained. No significant statistical relationships were found in this study (Sharp, 2008).

Verešová (2015) evaluated the learning strategy, personality traits, and academic achievement of university students. The author found a significant relationship between all four learning strategies with academic achievement and a positive relationship with personality traits Openness and Conscientiousness. Conscientiousness and Openness appear to facilitate a variety of effective learning strategies and may be

especially useful traits for attaining high levels of academic achievement (Verešová, 2015).

Wu and Lai (2010) studied the learning style and personality type profiles of hospitality undergraduate students of Taiwan and the United States. The participants completed a questionnaire that included demographic information, Kolb's Learning Style Inventory (LSI), and Personal Style Inventory (PSI). Results revealed that the learning styles of the participants from these two countries showed slight differences with the Taiwanese participants having more assimilators and fewer accommodators than their U.S. counterparts (Wu and Lai, 2010).

Yanardöner et al. (2014) investigated the dominant learning styles and personality traits, and their relationships. Results showed that the most frequently occurring learning style was 'assimilator', and there was no significant relationship between the various learning styles and gender, department, or Grade Point Average (GPA). Further findings showed that the most frequently occurring personality trait was 'agreeableness', and there was no significant relationship between their personality traits and gender, department, or GPA. Finally, there was no significant relationship between the students' learning styles and their personality traits (Yanardöner et al., 2014).

Zimmerman et al. (2006) investigated differences in learning styles and personality types among engineering students, agricultural systems management students, and faculty. Learning styles and personality types were evaluated using the Group Embedded Figures Test (GEFT) and Myers-Briggs Type Indicator (MBTI), respectively. Mean values for the GEFT for all three groups indicated a strong preference for the field-independent learning style. There were no significant differences in MBTI type preferences between engineering students and faculty. However, the agricultural systems management students differed significantly from faculty in their preference for Perceiving and from engineering students in their preference for Sensing. Results of the study are useful in helping faculty better understand and improve the teaching and learning process involving the two groups of students (Zimmerman et al., 2006).

Learning Styles and Culture

Jordan and Eleanor (1995) in the Chapter 27th of the book called "Handbook of Research on Multicultural Education, under "Learning Styles and Culturally Diverse Students: A Literature Review discussed in detail the relationship between learning styles and culture. The concept of learning styles is based on the theory that an individual responds to

educational experiences with consistent behavior and performance patterns. The complexity of the construct, the psychometric problems related to its measurement, and the enigmatic relationship between culture and the teaching and learning process means that the body of research on learning styles must be interpreted and applied carefully. Analyses suggest that the widespread conclusions in the literature that African American, Hispanic American, and Indian students are field-dependent learners who prosper academically when taught with field-dependent teaching strategies are premature and conjectural. Research does not support the supposition that members of a particular ethnic group have the same learning style. The body of research does have implications for enhancing the academic achievement of culturally diverse students by reminding teachers to be alert to individual students' learning styles as well as their own actions and methods in reference to their students' cultural experiences and preferred learning environments (Jordan and Eleanor, 1995). Allan (2003) in an article entitled frontier crossings cultural dissonance, intercultural learning, and the multicultural personality examined the process of intercultural learning in an international school, particularly the role played by peer-group interaction. It identified the affective as well as cognitive processes involved, and highlighted the importance of cultural dissonance in a model intercultural learning that showed how multiculturalism can be achieved, but also how the intermediate outcomes of ethnocentrism, adaptation and assimilation often result.

CONCLUSION AND RECOMMENDATIONS

This review of the current literature reveals that there has been a lot of research on the effect of personality on learning processes in different age groups and at different circumstances. Personality plays an important role that affects academic achievement. Modern research has shown that individuals differ in specific human characteristics such as memory, motivation, decision-making, and learning. Perhaps, the most important outcome of these studies is that they provide an opportunity for faculty to learn more about the teaching and learning process and to reflect on their own teaching styles and practices. These studies have served as the basis for a follow-up teaching improvement of teachers. Results of these studies are also useful in helping faculty better understand and improve the teaching and learning process for students. Additional studies involving the personality type and learning style

profiles of students and faculty of different cultural backgrounds and in larger scales are recommended.

Competing interests

The authors declare that they have no competing interests.

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