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AN ASSESSMENT OF PERSONALITY TRAITS AND THEIR IMPLICATION FOR CREATIVITY AMONGST INNOVATION DESIGN ENGINEERING MASTERS STUDENTS USING THE MBTI AND KTS INSTRUMENTS

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ABSTRACT
Creativity and its realisation are vitally important to industry as identified, for example, by the Capitalizing on Complexity report undertaken by IBM. The scope of this study is to explore masters level design engineering students' creativity in terms of personality correlation. A personality survey conducted on Innovative Design Engineering (IDE) masters students by applying the MBTI and Keirsey Temperament Sorter (KTS) to investigate individual creativity is reported.
The results reveal that intuition, which is suggested to potentially strongly link with creativity, is quite prominent among the IDE students. That extraversion is positively correlated with creativity in the engineering domain is modestly confirmed. Contrary to expectation, perceptors did not outnumber judgers. From KTS theory, although Idealists and Rationals account for a small part of the whole population, they mark exceptional appearances in IDE sample. It is reasonable to speculate that more creative potentials, which lead to better creative outcomes, exist among people who belong to those personality groups and possess certain personality traits in the design engineering fields where creativity is desired.

Keywords: creativity, personality traits, personality type, design engineering, intuition

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1 INTRODUCTION

In response to the ever-changing mature market, more and more companies are realising the importance of creativity for competitive advantages. Industries, in particular engineering industries, have begun to focus on the lack of creative thinking and innovation in engineering graduates. This is highlighted in the call for a focus on creativity among world leading commercial enterprises in the IBM survey, capitalising on creativity (IBM, 2010). Universities expect qualified engineering design students to be capable of using their intellectual abilities, applying scientific knowledge and designing effective solutions to problems whilst permitting manufacture and meeting social needs. Engineering design can be regarded as the total activity necessary to establish and define solutions to problems not solved before, or new solutions to problems, which have previously been solved in a different way (e.g. see Pahl et al., 1996). Creativity is widely recognized as being essential part of engineering design (e.g. see Thompson and Lordan, 1999).

Creativity had not attracted much attention by many scholars until 1950, when the president of American Psychological Association J.P. Guildford addressed the need for research on creativity. Creativity is often regarded as 'an act of making new relationships from old ideas' (Koestler, 1964) or 'the ability to imagine or invent something new of value' (see Childs et al., 2006). An idea or work that is considered being creative is composed of two components: novelty and appropriateness. Creativity must represent something different, new, or innovative (Amabile, 1983), but also be appropriate to the task at hand.

Creativity is central to designers' thinking and it is of great significance in the design engineering domain. The published literature supports the general view that each person is born with creative potential, but to varying degrees. Increasing consensus suggests creativity in the individual is reliant upon multiple components, such as cognitive ability and personality factors (Feist, 1998). Indeed recent evidence reveals that personality has trumped intelligence as a predictor of lifetime creative achievement (Feist and Barron, 2003). A personality approach has evolved over time as an indispensable aspect of creativity research which can offer a unique perspective on creativity, one advantage of which over many other approaches is that standardized assessment techniques are available; allowing an assessment of the reliability and validity of the empirical findings (Runco, 2007). Feist (1998) claimed that: "creative personality" exists; personality traits, which are enduring and relatively stable over time (London, 1978), are manifested in creative behaviours and affect creative thought, which points to the possibility of creative performance; personality dispositions do regularly and predictably relate to creative achievement.

An alternative to personality trait, which enjoyed popularity in the past and is presently receiving renewed attention, is personality type. Dating back to the book of Ezekiel and subsequently ancient Greece, personality type refers to the psychological classification of different types of individuals. The type theories classify people into a limited number of mutually exclusive personality types. Although these two personality concepts differ from each other in some aspects, they coexist and contribute to the study of prediction and forecast of creativity using personality correlation. In order to measure and determine an individual's creativity, one commonly adopted method is to use personality instruments, which are designed to measure personality correlating to creative behaviours. Examples of such instruments include the widely applied Myers-Briggs Type Indicator® (MBTI®) and Keirsey Temperament Sorter ®-II (KTS ®-II). Both of these psychometric self-report personality assessment instruments are employed together in this study to identify students' creative personality traits and determine their personality types.

2 CREATIVITY AND PERSONALITY CORRELATION

Investigations by many researchers on acclaimed highly creative individuals in different domains have suggested that these people share a number of personality traits, such as independence, confidence, assertiveness (Chavez-Eakle et al., 2006; Fiest, 1999), self-efficacy (Bandura, 1986), persistence, drive, ambition, and impulsiveness (Feist, 2010). However, diverse personal characteristics were also observed in these studies. For instance, creative people in both art and science domains are relatively more autonomous, introverted, open to new experiences and norm-doubting compared to non-creative people; creative artists are inclined to be more affective, anxious, emotionally spontaneous, impulsive, while creative scientists are more conscientious (Feist, 1998). There is little research on creative personality relating specifically to the design engineering domain. Studies using a personality

typological approach have provided insights to individual creativity. Designers' creativity seems inextricably bound up with their particular personality types (During, et al., 1996). Being fully aware of designers' personality types can shed light on their creative potentials and assist more fully exploring them. The most widespread and accepted personality type theories are the Myers-Briggs Type Indicator (MBTI) developed by Isabel Briggs Myers, as well as the Keirsey Temperament Sorter (KTS) proposed by David Keirsey and are described briefly in Sections 2.1 and 2.2 respectively. Both theories are based on Carl Jung's theory of psychological types and are closely associated with each other although significant and theoretical differences exist between them.

2.1 Myers- Briggs Type Indicator (MBTI)

The MBTI instrument identifies four cognitive functions: Sensation (S), Intuition (N), Feeling (F) and Thinking (T), together with two attitudes that individuals orient towards the outer world, namely Extraverted (E) or Introverts (I), it consists of three dichotomies that Jung identified (Jung, 1971). Myers and Briggs added a fourth dimension of Judging (J) and Perceiving (P), which describes an individual's approach to their life. The interplay of these four scales generates a total of 16 personality types. A brief description of these four dichotomies is given in Table 1.

Table 1. Myers-Briggs model of personality based on four preferences

Attitudes	Extraversion (E)	Introversion (I)
	Outer world	Inner world
Information Gathering	Sensing (S)	Intuition (N)
	Five senses; Here and now	Sixth sense; Future possibilities
Decision Making	Thinking (T)	Feeling (F)
	Logic and objective Cause-effect	Value-based Person-centred, harmony
Approach to life	Judging (J)	Perceiving (P)
	Planned and organized Have things settled	Flexible and spontaneous Keep options open

2.2 Keirsey Temperament Sorter (KTS)

The Keirsey Temperament Sorter (KTS) is another widely used self-assessed personality instrument that can be used as an alternative to MBTI. KTS employs four dichotomous pairs of preferences as the basis and forms four fundamental temperament groups that describe human behaviour based on individuals' preference on word usage (Concrete versus Abstract) and tool usage (Cooperative versus Utilitarian) (Keirsey.com, 2012) (see Figure 1). These four temperaments, known as Guardian, Artisan, Idealist and Rational, can be further subdivided and forms 16 intelligence roles (Table 2).

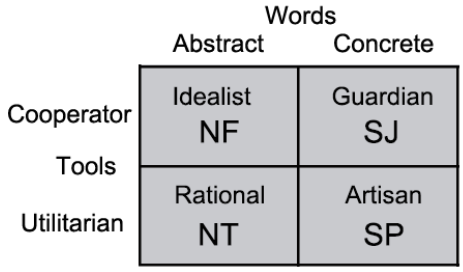

Figure 1. Keirsey's Temperament Model

Table 2. Keirsey's 16 Intelligence Roles

Guardians	ISTJ (Inspector)	ISFJ (Protector)	ESTJ (Supervisor)	ESFJ (Provider)
Artisans	ISTP (Crafter)	ISFP (Composer)	ESTP (Promoter)	ESFP (Performer)
Idealists	INFJ (Counselor)	INFP (Healer)	ENFJ (Teacher)	ENFP (Champion)
Rationals	INTJ (Mastermind)	INTP (Architect)	ENTJ (Fieldmarshal)	ENTP (Inventor)

2.3 The relationship of personality traits and creativity

MBTI and KTS tests have been used in a wide range of fields such as psychology (Chamorro-Premuzic and Furnham, 2003), Electrical Engineering (Chang and Chang, 2000). MBTI tests have

been used to investigate individual's personality preferences, as well as their association with academic performances in the design and engineering fields (During et al., 1996; O'Brien et al., 1998; Rosati, 1998). Of the four scales, Sensing-Intuition dimension bears the most significant relation to creativity. A number of studies found that Intuition in the MBTI test is highly related to creativity (During, 1996). Obrien et al. (1998) conducted research on engineering students to explore the relationship between personality types and academic achievement and found that students with intuitive personality types achieved significantly higher end-of-course grades than students with sensing styles. Engineers and designers both show a strong level of intuition compared to the normal population (Shen et al., 2008). Highly creative individuals also have strong preference for perception (During, 1996). Cheng et al. (2010) found that students who have intuitive and/or perceiving personality types might have more creative potential than students who have sensing and/or judging personality types in a study among American and Taiwanese college students. Individuals that possess a preference for intuition and perceiving were found in a study to outperform their counterparts in planning and construction in engineering and architectural professionals (Carret et al., 2002).

Regarding whether extraverts or introverts are more creative is unclear. Feist (1998) found that introverted people tend to be more creative in both art and science fields. But in the area of engineering, extraversion is positively correlated with creativity (Ohnmacht, 1970). There is no strong evidence in previous studies indicating whether thinking styles or feeling styles are more creative so far, but Gautam and Singh (2010) claimed that thinking is the weakest trait in design engineers and most of them are feelers.

Of course the trends from the research reported here are generalisations. Any statistically significant group will have individuals who demonstrate digression from the general trend.

3 RESEARCH OBJECTIVES

The primary aim of this study is to investigate the relationship of personality correlations with creativity among Innovative Design Engineering (IDE) masters students. Specifically, it is intended to identify the personality traits of IDE students, which can be indicative of their creative potential. The dominant preference for intuition of MBTI among IDE students is anticipated. They are also expected to show more inclination for perceiving and extraversion than judging and introversion. The prominent and cohort personality type of IDE sample will also be determined, which can shed light on the selection of creativity training program and creativity tools to stimulate IDE students' creativity, and guide the formation of design engineering teams to deal with problems more effectively in following studies. The outcome from this study will help educators better understand IDE masters students' approach to creativity and improve the curricula for the future.

4 METHOD

4.1 Participants

The participants are Innovation Design Engineering (IDE) postgraduate students enrolled in 2010/2011 and 2011/2012 from the Royal College of Art and Imperial College London. The IDE programme is a full-time two-year MA and MSc double masters jointly run by Imperial College London and the Royal College of Art that involves experimentation, design, engineering and enterprise activities. The programme requires that a wide range of design skills and thinking are utilised (industrial design techniques, manufacturing, mechanical engineering, design research, user-centred design and sustainability, among others). These postgraduates are from diverse design and engineering backgrounds as well as other disciplines where the applicants have demonstrated an aptitude for design. The majority have a background in mechanical engineering and industrial design, electronic engineering and product design, while the programme has also admitted applicants with a background in economics, fashion, fine art, medicine, physics, construction and enterprise. There is an entrance exam for IDE students with the aim of investigating their creative potentials. The consensual assessment technique (CAT) (Amabile, 1983) is applied in assessing students attainment in creativity in each of the 9 major modules in the first year of the IDE programme and also for the two major projects in the second year. CAT relies upon the assembly of a panel of experts within the domain concerned and has a long heritage for its ability to assist in ranking relative performance. Because these students were enrolled after an admission process and their CAT assessment outcomes applied in all critique sessions are satisfying or better, they can therefore be equivalently considered to possess

more creative potential and subsequently be more creative. There were 77 IDE students in the cohort total, 67 of which responded fully. The cohort included 22 females and 45 males. The cohort comprised diverse ethnicity encompassing Asian, Black, Indian, and white students across multiple nationalities.

4.2 Instrument

In this study the KTS®-II was employed to assess IDE students' personality types. Compared to MBTI, KTS costs less and takes a short time to administrate. Scoring is also relatively easy and quick. More importantly, strong positive correlations (approximately .75 correlation efficiency) have been demonstrated between the concurrent KTS®-II (both pen-and-pencil test and online test) and MBTI® measures of psychological types (Kelly and Jugovic, 2011). In Kelly and Jugovic's study, a much higher correspondence of matches between the KTS and MBTI types was found than between other measures of psychological type and the MBTI in previous investigations (Karesh et al., 1994; Myers and McCaulley, 1985). It is suggested that KTS can be used as an alternative of the MBTI (Cheng et al., 2010). In this study, participants were administered mainly using both the paper-and-pencil version and online version of KTS®-II. The data obtained were analysed by both MBTI and KTS measures. The Keirsey Temperament Sorter®-II (KTS®-II) consists of 70 force-choice questions. The scoring template is on a separate form that was not part of the instrument administrated to the participants.

4.3 Procedure

The subjects were given the Keirsey Temperament Sorter®-II (KTS®-II) survey. This personality survey was conducted both by online and paper-and-pencil means under the administration of an instructor. IDE students could get access to the online questionnaire webpage, complete all the questions and submit their answers, or they could choose to complete the paper-and-pencil measure of KTS®-II under the administration of an instructor who could provide language assistance if needed. Before this survey, the instructor briefed the participants about the survey and the research goals, and obtained the permission from these participants to the use of data provided afterwards. Data were stored in a secure manner and an undertaking given that personal data would not be communicated to any third party. There was no time limit to this questionnaire.

When all the raw data had been obtained and analysed, the instructor contacted them individually providing the outcome of the KTS-II instrument using a readout of their indicated personality type to the individual concerned and also went through general findings in a group feedback session.

5 RESULTS

The MBTI personality type distributions of the IDE sample, as well as UK general population (OPP, 2007), design students (Durling et al., 1996) and mechanical engineers (Macdaid et al., 1986), which serve as references for comparison purposes in the next section, are presented in Figure 2. The reliability of the KTS®-II is acceptable with α coefficients (Cronbach's alpha) =.7509.The IDE chart revealed that the INFP type (introversion, intuition, feeling, perceiving) was quite prominent (16.4%), followed by INFJ and ENFP (each take up 10.4%). Surprisingly there were three personality types missing, namely ISTP, ESTP, and ISFP. ISFJ and ESFP also exhibited quite low percentages of the whole sample (both are 1.5%).

The KTS personality type distributions in all four samples are also provided in Table 3. In the IDE sample, Idealists constituted nearly half (43.2%) of the sample, Guardians took up only 1/3 and Rationals consist of almost 1/4 the sample. Surprisingly the Artisans barely appeared (merely 1.5%).

The MBTI personality traits in all the samples are shown in Table 4, the predominant trait in each scale is written in bold type. In the IDE sample there were slightly more extraverts (E) than introverts (I). In the S/N scale, the participants had dramatic preferences for intuition (N) (67.2%) over sensing (S) (32.8%). The same tendency was also found in the F/T scale, the IDE participants were drastically inclined to feeling (F) (61.2%) than thinking (T) (38.8%). In the J/P scale, the sample exhibited a fair preference for judging (J) over perceiving (P).

6 DISCUSSION

It is noticeable from the results that although design engineering attracts people from all personality types, certain traits are more represented than others in this field. The personality preferences of the IDE sample cluster in particular areas rather than evenly distributed across all 16 MBTI types. In order

to examine the unique personality inclination and identify individual characteristics, the IDE sample results are compared with previous studies (see Figure 2, Table 3 and 4).

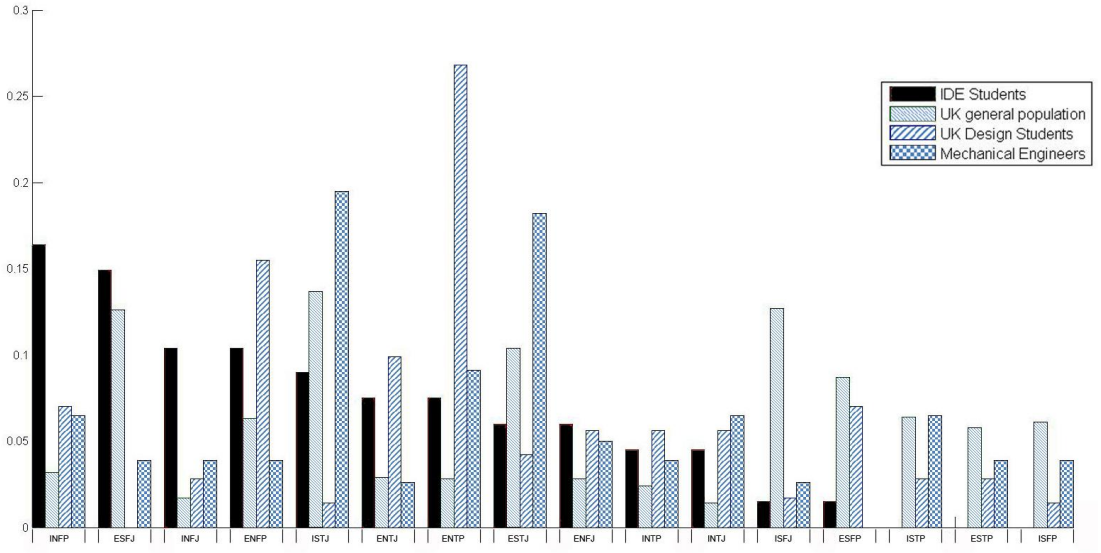

Figure 2． 16 personality types distribution among IDE students and 3 reference samples

Table 3． KTS distribution among IDE students and 3 reference samples

	IDE students	UK general population	Mechanical Engineers	Design Students
Guardians	31.4%	50.4%	44.2%	7.3%
Artisans	1.5%	27%	14.3%	14%
Idealists	43.2%	14%	19.3%	30.9%
Rationals	24%	9.5%	22.1%	47.9%

Table 4． Distribution of 4 personality preferences among IDE students and 3 reference samples

	E	*I*	*S*	*N*	*T*	*F*	*J*	*P*
IDE students	**53.7%**	46.3%	32.8%	**67.2%**	38.8%	**61.2%**	**59.7%**	40.3%
UK general population	**52.3%**	47.7%	**76.4%**	23.6%	45.8%	**54.2%**	**58.2%**	41.8%
Mechanical Engineers	46.6%	**53.4%**	**58.5%**	41.5%	**70.2%**	29.8%	**62.2%**	37.8%
Design Students	**71.8%**	28.2%	21.3%	**78.8%**	**59.1%**	40.9%	31.2%	**68.9%**

It is easy to detect that ISTJ is most common among the UK people, 1/5 or so fall into this category. A similar pattern can also be found in mechanical engineers. All of these fit with previous study, which states that ISTJ is the most common type in engineering professions (Macdaid et al., 1986; O'Brien et al. 1998; Rosati 1998). However, the appearance of ISTJ in IDE students can merely be considered as modest (9%). It is scarce among the UK design undergraduates (1.4%). ISTJ is representative of being practical and sensible and a preference to work in a systematic way. They have excellent logical and analytical skills. This is quite fitting for engineers since they, with strong analytical and technological skills, have a tendency to solve problems using standard formulaic approaches, fundamental principles, algorithms where the initial nature of a problem can be clearly described in a systematic way (Hall and Childs, 2009).

However, the most prevalent personality type among the IDE sample is INFP (16.4%), followed by INFJ and ENFP (each is 10.4%), all of which are Artisan (SPs). Looking back at the top 3 prevalent types of the four samples, which are almost taken over by Guardian (SJs) in the UK general people sample and mechanical engineers sample, while the most common types of design students sample are Rational(NTs) and Artisan, in this sense, it is easy to infer that IDE students are more similar to design students. INFP are sensitive and caring, loyal to their ideas. They are curious and creative, having long-run vision. Whereas such overwhelming inclination for INFP type is not unpredictable since IDE students are required to utilize design skills and design thinking to generate ideas in order to solve not only engineering problems but also more complex social and often wicked problems originally and

creatively. They tend to be more value-based and seeking harmony than engineers who can be characterized as logic-based and less involved in human interactions.

It is also worth noticing that there are three personality types missing, namely ISTP, ESTP and ISTP in the IDE sample. ISFJ and ESFP also exhibit low percentage of the whole sample; all of those personality types belong to Artisans or Guardians, which together take up more than 3⁄4 of the whole population. More data would be helpful in determining whether this is a coincidence due to fairly small sample size, or it reflects that people belong to such temperament groups may not be deliberately selected or apply for the IDE program, or whether other possible factors may be involved and affect the results.

From KTS theory, the contrast of personality type distribution between IDE and other samples is even more obvious and straightforward (see Table 3). More than half of the UK general population are Guardians, more than a quarter are Artisans, with the remaining minority are Idealists and Rationals. The distribution pattern is similar in the mechanical engineering sample, with Guardians comprising the majority but the other three groups are evenly distributed. However, the IDE sample bears little similarity with the above distribution. They are mainly comprised of Idealists; Rationals also stand out although they are relatively rare in the whole population. On the contrary, Guardians and Artisans, which are more frequent groups in the whole population, are not so overwhelming. The type arrangement in design students sample is alike. Such striking contrast implies that Idealists and Rationals are probably deliberately chosen in the IDE program, and also in design fields.

The sample's personal traits are shown in Table 4. One of the most important findings of this survey is that the participants have dramatic preferences for intuition (N), with its indicative link with creativity (Shen et al., 2008; Greenberg, 2008; Stephens, 1973; Guilford, 1966; Wilde, 2004; Durling, 1996; Soldz and Vaillant, 1999). It is likely that intuition is required in order to conceive original ideas during the design process. In the scale of T/F, an appreciable number of participants are of Feeling (F) type, which is consistent with Gautam and Singh's (2010) finding that design engineers were primarily feelers (83%), Gautam and Singh (2010) described that feeling is required to imagine original designs and design engineers demonstrate high measures in it. However, the reason that accounts for the sharp contrast in T/F scale in this case is not evident yet. It is probably that feeling the way in a complex or wicked problem area is a known formula for success, still further research will be necessary before any definitive conclusions can be made. There are slightly more extraverts (E) than introverts (I), which partially confirms previous findings that extraversion is positively correlated with creativity in the engineering domain. A larger investigation would be needed to be conducted on other engineering fields rather than design engineering to demonstrate the correlation exists in all or other engineering domains. Last but not least, in the J/P dichotomy, IDE students exhibited a preference for judging (J) over perceiving (P), which did not support the hypothesis that perceptors have more creative potential than judgers.

Another significant finding from this survey is that the most prevalent personality type is INFP, known as the Healer, and the cohort personality type of IDE students is ENFJ, dubbed as the Teacher from KTS theory. ENFJ is warm and empathetic, they are highly attuned to the emotions, needs and motivations of others, and are more capable than any other type of calling forth each learner's potential and to help them fulfil their potentials (Keirsy, 1998). This may indicate that IDE students are value-based and consider people the highest priority, they are unlikely to be stubborn and stick to their ideas in group work; on the contrary, it is the harmony of the whole group and everyone's feeling that matters the most, so they possibly come up with an integrated ideas or solutions that satisfy every team member. Group discussion is likely to be more effective and efficient than other groups since ENFJ value mutual cooperation when interacting with others. They do well in following hunches and developing their intuition naturally in ideation, but in decision-making, their use of logic may not be so sound. An understanding of the cohort personality type can help the course leader to formulate policies to satisfy the IDE students' need, such as improving their communication skills, which are largely essential to team project success, as well as arrange appropriate creativity training programs to provide quality education, with the aim of improving the IDE students overall creative productivity during group work in the future.

During the feedback session, a large number of IDE students showed a high enthusiasm for this personality survey and were very interested in the implication of the results that could be helpful for their work. Personality has an impact on the development and fulfillment of creative potential, by knowing their personality traits and personality type, the IDE students can understand themselves and

their interaction with others, it will also be useful in reducing internal conflicts and improving group effectiveness in team work.

It could also be beneficial to for the IDE students to take advantage of their personality traits and improve their design skills and design thinking in their own design engineering activities. It could offer special insights if a feeler, for instance, who always tends to weigh human factors and view the harmony as a priority, put person-centered concerns aside and change perspective as a thinker, and make decisions logically and objectively based on impersonal analysis of the cause and effect. IDE students can also select suitable creativity tools based on their own personality preferences, such as brainstorming, which can facilitate the ideation and problem-solving process, to fully explore their creative potentials and improve performance and creative outcomes in their solo projects.

The outcomes of this research may prompt design engineering educators and academics to make better use of a personality approach to creativity, not only for boosting the individuals' creativity development and the selection and formation of design engineering groups, but integrating it in design engineering education settings. The most significant contribution of this study to the design engineering community is associated with the creative individual characteristics of design engineering students, with comparison to those of designers and engineers, which is of profound significance for both designers and engineers. The main differences between engineers and designers primarily lie in the information gathering and decision making process. Engineers, who are typically of Sensing type and tend to focus on the matters that they encounter immediately and being practical and sensible, are encouraged to trust hunches like designers do who are more likely of Intuition type, and consider the global picture and future possibilities when necessary. On the other hand, designers, who exhibit a tendency to spontaneity and flexibility, are stimulated to learn from engineers who are more structured, and manage their time more carefully and meet the time demands of projects. Design engineers, as a hybrid of designers and engineers, should make decisions taken into account both logic and objectivity and human considerations. The illuminating part of applying personality approach in the engineering design domain is that such information can guide both engineers and designers to make full use of his own advantages, and it would be even more favourable for them to think and act on the opposite way when appropriate and develop a balanced approach to problem solving and design activities. It is our vision that the benefits of personality correlation with creativity will be recognized and valued by the design engineering community in the near future.

Although some significant findings are revealed from this study, the investigation involved subjects with a relatively small sample size, 67 students, and therefore the results have limited generalizability. A large sample with more experimental powers will be needed in the future to verify some conclusions from this research. Moreover, some factors, such as the homogeneity of the participants' geographic distribution (primarily in the UK), will also influence the validity of the results. Further research will focus on the verification of the established link of personality correlation with creativity, the predictability of personality traits and personality types of individuals' creative potentials and subsequently the creative outputs in design engineering field will be examined. Concerning the prominent and cohort personality type of the IDE students, their overall creative performances and productivity in participating design engineering projects, either as individuals or as a group, will also be investigated and evaluated.

7 CONCLUSIONS

The results of this personality survey were reasonably consistent with the findings from previous research. In general, the hypothesis that intuition is closely associated with creativity is further supported. Intuition, with its strong associative link with creativity, is quite prominent among the IDE students. The positive correlation of extraversion with creativity in the engineering domain is also modestly confirmed. Contrary to expectation, perceptors did not outnumber judgers. From KTS theory, although Idealists and Rationals account for a small part of the whole population, they mark exceptional appearances in IDE sample. It is reasonable to speculate that more creative potentials, which lead to better creative outcomes, exist among people who belong to those personality groups and possess certain personality traits in the design engineering fields where creativity is desired. It is our intention to encourage educators and academics to understand the significance of using personality correlation in enhancing creativity in design engineering domain and making efforts to apply such approaches appropriately, although this effort may require adjustments to current curriculum and methodology in education. Having initially established the link between personality factors and

creative potentials which implies potential creativity, the research focus should turn to other important questions in future studies such as: how can creativity training programs/tools help in stimulating individuals' creativity? The challenges to answer such questions primarily lie in developing reliable approaches and adopting scientific analysis methods to assess overall effects that personality correlation has on creativity. Discreet investigation on this will have implications for practical issues such as adopting suitable creativity tools for individuals based on personality factors to explore creative potential and thereby enhance creativity.

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