

PAPER

An Exploratory Study on Measuring Teachers' and Students' Motivation for Craftsman Spirit in Higher Vocational Colleges

Ying Tang¹(✉), Ziyang Wang², Yang He³

¹Rajamangala University of Technology Tawan-ok, Bangkok, Thailand

²University of Bristol, Bristol, United Kingdom

³NORTHCO GROUP Inner Mongolia First Machinery Group Co., Baotou, China

ying.tan@rmutto.ac.th

ABSTRACT

Skilled people with craftsman spirit are a high-quality human resource for companies. This is described in detail in Chinese government documents and there is a growing body of local research, but there has been very little research in the international academic arena. This study traces the origins of craftsman spirit and what it involves in research. A literature review of the connotations and dimensions of craftsman spirit is conducted to explore the empirical research methodology of craftsman spirit. In the manufacturing sector, semi-structured interviews were conducted with 11 professional leaders with the title of “craftsman,” and the data collected were analysed in Qualitative Analysis Software. The study concludes with the development of a measurement concept to motivate teachers and students to develop craftsman spirit, which is applicable to Chinese higher vocational colleges.

KEYWORDS

craftsman spirit, stewardship theory, engagement, professional commitment, innovative behaviour, qualitative analysis of interview data

1 INTRODUCTION

According to the “Planning Guide for the Development of Manufacturing Talents” jointly released by the Ministry of Education, the Ministry of Human Resources and Social Security and the Ministry of Industry and Information Technology, the shortage of skilled personnel in the ten key areas of manufacturing will be close to 30 million in 2025. Skilled personnel are an important foundation to support the development of the manufacturing industry. Quality, application-oriented, technically skilled personnel are chronically in short supply and are in demand by companies as quality human capital. The craftsman spirit has become a hot topic of concern for the times and society. The Chinese government report points out that craftsman

Tang, Y., Wang, Z., He, Y. (2023). An Exploratory Study on Measuring Teachers' and Students' Motivation for Craftsman Spirit in Higher Vocational Colleges. *IETI Transactions on Data Analysis and Forecasting (iTDAF)*, 1(1), pp. 66–83. <https://doi.org/10.3991/itdaf.v1i1.38131>

Article submitted 2023-01-16. Resubmitted 2023-02-01. Final acceptance 2023-02-01. Final version published as submitted by the authors.

© 2023 by the authors of this article. Published under CC-BY.

spirit is persistence and focus, excellence, meticulousness and the pursuit of excellence. Some scholars believe that craftsman spirit is a kind of professional spirit, reflecting professional ethics, professional competence and professional quality, and is the professional value orientation and behavioural performance of practitioners, which includes dedication, perfectionism, concentration and innovation [1]. In China, some scholars believe that craftsman spirit can inspire employees to be dedicated to their work and to their organization, to innovate and improve their products, to continuously improve quality and effectiveness, and to promote the development of the company and gain more benefits [2]; some scholars believe that the connotations of professionalism of skilled personnel and craftsman spirit overlap [3], [4].

The main institution for the training of skilled personnel in China is the higher vocational and technical colleges. Higher vocational and technical colleges systematically train students to become skilled personnel in terms of both cultural knowledge and skills and techniques. The career growth path of skilled people is shown in Figure 1. Craftsman spirit helps skilled operatives to grow into quality or advanced skilled talents.

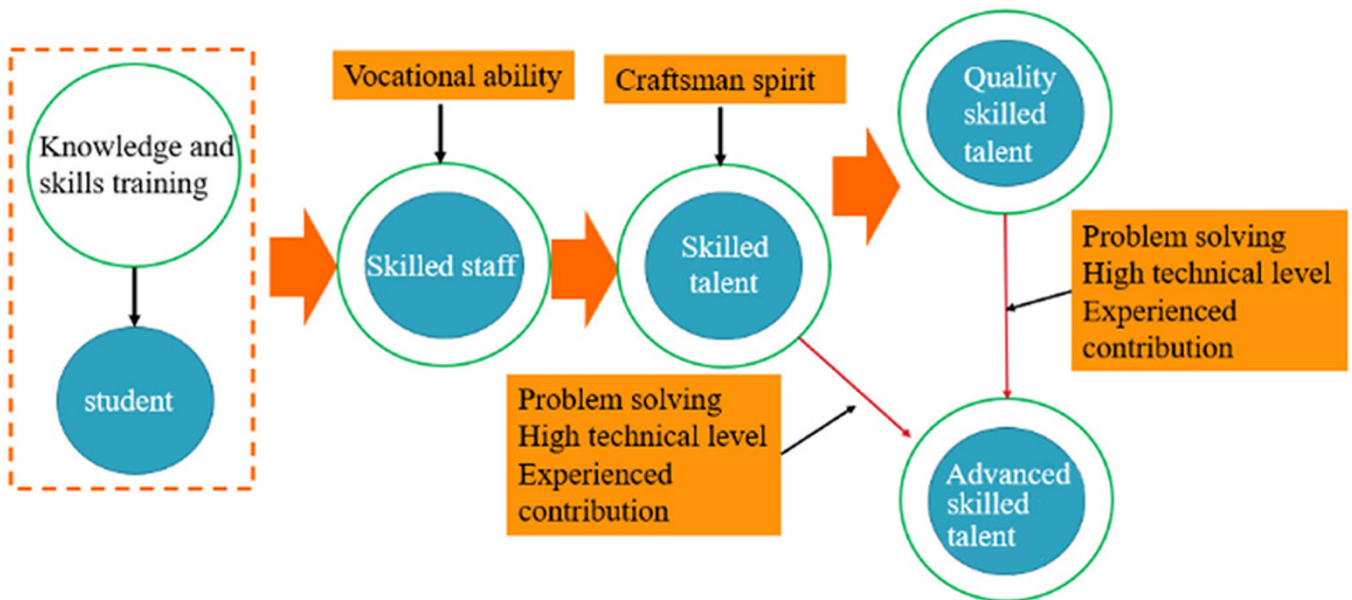


Fig. 1. Roadmap for the cultivation and development of skilled talents

Skilled people are the human capital of enterprises, and if skilled people are motivated to generate craftsman spirit, it is beneficial for enterprises to improve the level of return on human capital investment. From 2016 onwards, scholars have started to focus on research related to craftsman spirit. A search from CNKI, the largest literature database in China, shows that articles on craftsman spirit have rapidly increased and become one of the hotspots of academic research, as shown in Figure 2.

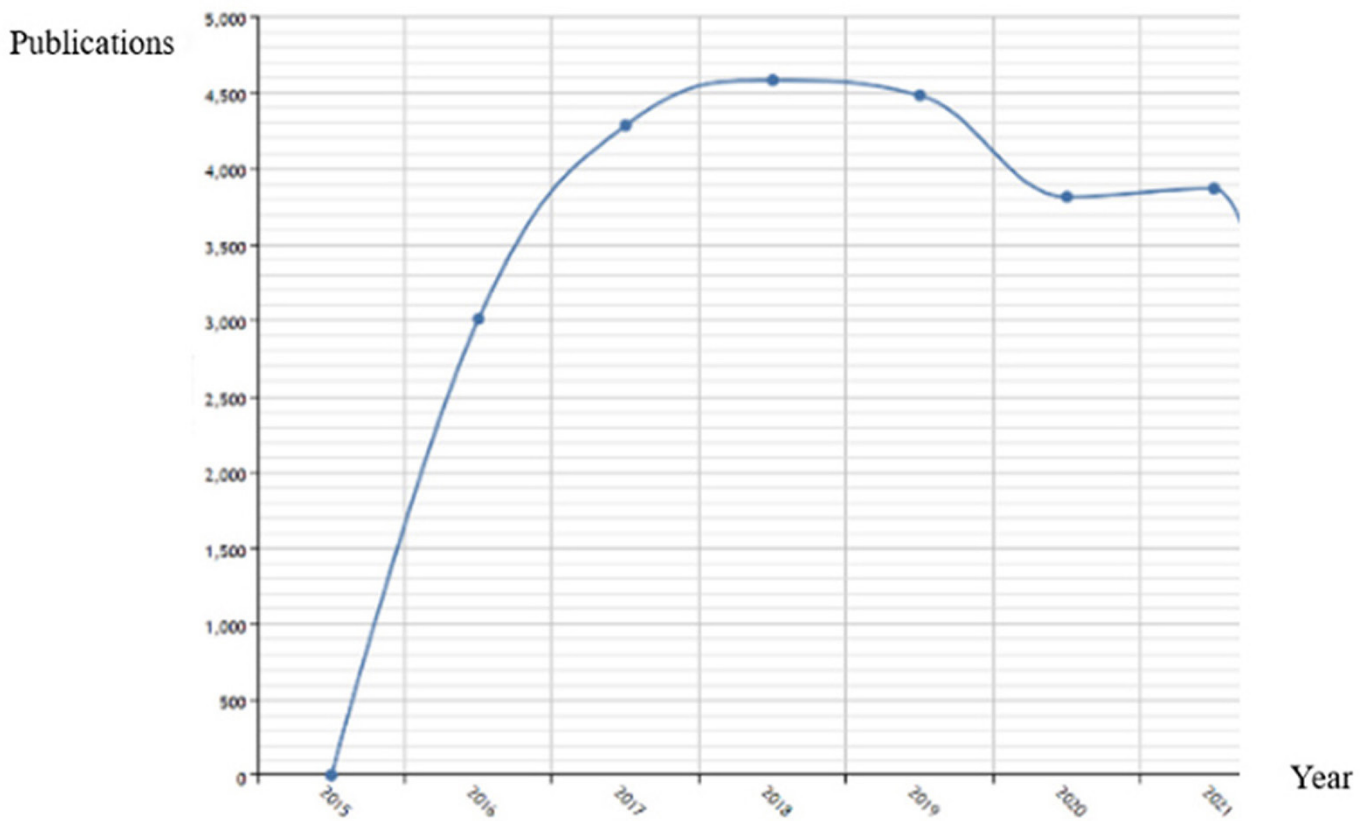


Fig. 2. Number of craftsman spirit-related papers published

In terms of research on craftsman spirit, one approach is to study the factors influencing the stimulation of craftsman spirit among new migrant or skilled workers from enterprises [2], [5]; the other is to study how to stimulate craftsman spirit among students in vocational education [6], [7], [8]. Research on craftsmanship in vocational education mainly focuses on, firstly, agreeing with the influence of cultural systems on people; secondly, agreeing that inspiring craftsman spirit is the cultivation of professionalism; thirdly, interpreting the connotation and dimensions of craftsmanship to cultivate students' professional ideals and professional habits; and fourthly, establishing a talent-training system by combining engineering [7], [9]. In Chinese higher vocational colleges and universities, the motivation to inspire teachers and students to generate craftsman spirit is about the practice and cultivation of craftsman spirit, and such research needs to be supported by data studies that are more practically relevant.

Therefore, based on existing scholars' empirical research on craftsman spirit, the concept of measurement in empirical research methods on the motivation of craftsman spirit is explored, using teachers and students in higher vocational colleges as research subjects.

2 TRACING CRAFTSMAN SPIRIT

Originating in the ancient Greek period, craftsman spirit is a purely skills-only spirit that seeks to achieve the ultimate and perfection of the product itself, to the exclusion of profit. The skills and spirit of craftsmen are recorded and evaluated in many ancient Chinese books. An artisan, a person who has expertise in his or her craft, has a corresponding professionalism in the spirit of craftsmanship—an ideal spiritual pursuit of professional and technical excellence. Artisans were considered

to have a craft that would provide more security for their livelihoods than money in hand. As can be seen from the books written by Japanese scholars, the study of craftsmanship in Japan focuses on two aspects: first, the connotation of craftsman spirit, which is a craftsman with high human qualities and professional skills [10] or a worker with both professionalism and professional skills, who is “intelligent, dedicated, devoted, innovative, and full of desire, enthusiasm and devotion to work” [11]; and second, discussion of the actual individuals and companies with craftsman spirit [12]. These studies have also shed some light on Chinese scholars.

3 DEFINITION AND DIMENSIONS OF CRAFTSMAN SPIRIT

Combined with the research on craftsman spirit and the explanation of craftsman spirit in government documents, the definition of craftsman spirit contains the dedication of love and dedication, the attitude of excellence and the spirit of innovation to overcome difficulties [13]. In a simple summary, craftsman spirit is love of work, dedication, excellence, pursuit of perfection, pioneering and innovation, and continuous focus [14]. Guo et al. studied the impact of capitalisation of craftsman spirit using the KSAOs human capital resource model, based on a sample of eight traditional manufacturing “century-old shops” and rooted in a naturalistic qualitative research paradigm [15]. Guo argues that craftsman spirit is the integration and externalisation of Knowledge, Skills, Abilities and Other Characteristics (KSAOs). The KSAOs Human Capital Resource Model is used to define craftsman spirit more in line with the management of talent development and is consistent with the description of craftsman spirit in the Chinese government’s reporting documents. Craftsman spirit is the motivation for professional excellence, the motivation for innovative skills, the motivation for dedicated and realistic work, and the motivation for dedication.

Local scholars have defined the dimensions of craftsman spirit according to the scope of their research. Craftsman spirit is divided into two dimensions: love of work and excellence; three dimensions: dedication, learning and innovation; four dimensions and five dimensions: dedication, learning, innovation, focus and rigour, etc. Liu Yuanyuan collated the dimensions in scholars’ research on craftsman spirit [16], and the current study has simplified and collated them on the basis of this, translating them at the same time, as shown in Table 1. Our study tends to classify craftsman spirit into four dimensions: dedication, focus, learning, and innovation, which is also in line with the KSAOs human capital resource model.

Table 1. The dimension of craftsman spirit

Dimension	Scholar	Main Idea
Two dimensional	Li Hongwu, Zhao Yan (2017)	Dedication and learning
	Cao Jing (2017)	Learning, focus on persistence
	Yang Liu (2018)	Dedication and innovation
Three dimensional	Gao Fenglin (2015)	Dedication, innovation, learning
	Wang Xiaofeng (2016)	Dedication, professionalism, devotion
	Yu Wende (2016)	Dedication, focused, rigorous
	Qi Shanhong (2016)	Learning, dedication, focus
	Yu Jian (2016)	Learning, dedication, continuous commitment

(Continued)

Table 1. The dimension of craftsman spirit (*Continued*)

Dimension	Scholar	Main Idea
Four dimensional	Lv Guoquan, Li Yi (2016)	Professionalism, commitment, dedication
	Xia Fan (2017)	Dedication, focused, learning
	Fang Yangchun (2018)	Dedication, learning, innovation
	Qiao Wenqi (2018)	Professional commitment, learning, innovation
	Dong Zhiyong (2016)	Perfectionism, focus, dedication, innovation
	Yao Xianguo (2016)	Conscientiousness, commitment, action and dedication
	Chow Yuwan (2016)	Lean, focused, professional commitment, innovation
	Chen Liping (2017)	Refinement, beauty, innovation, performance
	Zeng Hao, Zhao Shuming (2017)	Dedication, perfectionism, focused (commitment), innovation
	Xing Xiulan (2017)	Dedication, innovation, pursuit of perfection, perfectionism
	Xu Yaoqiang (2017)	Dedicated, perfectionism (commitment), focused, innovative
	Xu Jin, Miao Yong (2018)	Professional commitment, focus, perfectionism, dedication to work
	Zhan Xingfang (2018)	Dedication, focus on rigorous, perfectionism, innovation
Five dimensional	Zhao Aodong, Lu Rong (2018)	Dedication, perfectionism (commitment), innovation, focus on details
	Li Dongxia (2018)	Focus (commitment), the pursuit of excellence, refined, perfectionism
	Wang Liyuan (2014)	Rigorous, dedicated, perfectionism, focus on persistence (commitment), attention to details
	Huang Junlu (2016)	Dedication, team spirit, innovation, pursuit of quality, meticulous devotion
	Li Hongwei, Bie Yinglong (2016)	Respect for teachers, knowing and acting in unison, meticulousness (commitment), seeking wealth and virtue, creating spirit
	He Huimin (2017)	Perfectionism (commitment), professional dedication, focus, rigor, indifference to fame and wealth
Li Ping (2018)	Love and dedication to work, strict discipline, innovation, perfectionism, dedication to research	

4 EMPIRICAL RESEARCH ON CRAFTSMAN SPIRIT LITERATURE

There are two main approaches to empirical research on craftsman spirit among Chinese scholars: firstly, developing new scales on their own; and secondly, the integration of measurement concepts based on the definition and dimensions of craftsman spirit, using alternative measures such as management and psychological scales to prove that craftsman spirit is necessarily linked to human resource management.

In the paper “Artisan Spirit Scale Development and Validation of New-Generation Migrant Workers in Manufacturing Industry,” Li Qun et al. (2020) developed and validated a scale on craftsman spirit, with 8 questions from 2 dimensions, $\alpha = 0.919$, and surveyed new migrant workers in the manufacturing industry [17]. The eight questions cover the following topics: “mastering job knowledge and skills,” “attention to detail management,” “choosing effective ways of working,” “persevering in the study of existing skills and processes,” “pursuing product perfection and excellence,” “existing work as a lifelong career and value pursuit,” “proactive suggestions to improve product quality,” and “proactive meeting or exceeding customer demand for products” [17]. Li Qun (2021) applied this scale to do a study on manufacturing

employees practicing craftsman spirit, with inclusive leadership and job satisfaction as factors of study [2].

In the paper "Influence of inclusive leadership on skilled talent's craftsman spirit," Ye Long et al. (2018) found a combination of scales to measure the meaning of craftsmanship according to its connotation and dimensions [5]. In this thesis, according to the three dimensions of craftsman spirit and their meanings, the employee dedication scale developed by Saks was selected to measure dedication, with five items; the multidimensional perfectionism scale developed by Zi Fei and Zhou Xu was selected to measure perfection, with 10 items; the innovative behaviour of employees was selected from George and Zhou's Creativity Scale, with 13 items [5]. Using these three scales together to measure craftsman spirit, the final significance was high. The impact of inclusive leadership on motivating employees to be craftspeople is also explored in this paper.

5 STEWARDSHIP THEORY AND CRAFTSMAN SPIRIT

Stewardship theory is derived from psychology and sociology and emphasises that people have self-esteem and a need for self-fulfilment, and that growth and achievement are more important. When the manager becomes the steward of the company, the manager's motivation and behaviour will be in the best interests of the principals (shareholders) [18]. In stewardship theory, people will become stewards of the firm, will develop orderly behaviour, and will also exhibit pro-organisational collectivist behaviour; this behaviour has higher utility than individualistic self-interested behaviour. In day-to-day management, stewards would see cooperative behaviour as a primary value [19], [20]. Stewardship theory assumes that managers are intrinsically motivated by the desire for achievement and external recognition; managers are more interested in the self-satisfaction that comes with good performance and in gaining the respect of others for their profession [18], [21]. Stewards' utility is maximised when their interests are aligned with the company's goals [22].

The core elements of stewardship theory are pro-organisational collectivist behaviour, orderliness, gaining external recognition and professional respect, self-satisfaction and self-growth after good performance. According to Davis et al. (1997), stewardship theory assumes that individuals seek to fulfill higher-order needs through pro-organizational behavior and thus will naturally align their interests with those of the organization (and therefore its principals) [19]. The connotations and dimensions of craftsman spirit are dedication, focus, learning and innovation. These four words are explained according to the Chinese Modern Chinese Dictionary. Dedication is the attitude of a person who takes responsibility for the work he or she does and for his or her studies, and who strictly adheres to the norms of behaviour agreed for the collective good. Focus is a person who does something or acts with concentrated attention and mental concentration. Perfectionism refers to an extreme or a tendency of things, indicating the attitude and behavioural process of people who are constantly striving for excellence in what they do. Innovation is the act of using existing knowledge and materials in an unusual way of thinking to improve or create something new that can be profitable in order to meet the needs of society.

If employees have the quality of dedication, then the condition is that they have to safeguard the interests of the collective and be responsible for their own work. Employees who focus on their own work will inevitably achieve orderly

work; employees who treat their work with dedication and focus will think about what they can do better, they will pursue excellence, and they will continue to learn and train, solve problems and innovate. This leads to self-fulfilment, professional growth opportunities, organisational and industry recognition, and the growth of organisational interests. This is in line with the logic of stewardship theory, which states that people will constantly seek higher self-esteem and greater self-fulfilment; employees as stewards are not motivated by reward and supervision but are given full trust and a platform to develop their talents. Table 2 provides a comparison of the core elements of stewardship theory with those of craftsman spirit.

Table 2. Comparison of the core content of stewardship theory and craftsman spirit

The Core Content of Stewardship Theory	The Core Content of Craftsman Spirit
Pro-organizational collectivist behaviour	Dedicated
Ordered	Focus
Gain external recognition and professional respect	Perfectionism
Self-satisfaction after a good performance	Innovation

Most of the relevant research from stewardship theory has been in family firms, looking at the motivations of top managers, and the scope of power of agents. Craftsman spirit, on the other hand, is an expectational demand placed on those being managed, where managers expect employees to be motivated and behave in a positive and orderly, pro-organisational way that will lead to greater performance for the organisation. Craftsman spirit is an emphasis on the individual's motivation and behaviour being positive, and also on the benefits that positive employee behaviour can bring to the organisation; there is no emphasis on the benefits that employees can bring to themselves by having craftsman spirit, which can also be interpreted as not measuring the value of craftsman spirit in monetary terms. Jensen (1994) also points out that self-interest is not necessarily inconsistent with other interests and that people respond to incentives of all types, not just money [23]. The stewardship literature implicitly suggests that shared leadership, collective responsibility, and intrinsic rewards will allow pro-organizational individuals to both navigate and overcome bounded rationality and information asymmetry problems and to naturally align their interests to the organization once they become part of it [24]. This also explains the pro-organisational behaviour of employees. Stewardship theory can be used as a theoretical basis for the study of craftsman spirit for subsequent research on related topics.

6 RE-EXAMINING THE MEASUREMENT OF CRAFTSMAN SPIRIT BASED ON THE MOTIVATION OF HIGHER VOCATIONAL COLLEGES TO STIMULATE CRAFTSMAN SPIRIT IN TEACHERS AND STUDENTS

The measurement of craftsman spirit in this study applies a proxy measure of proven scales from management and psychology. It needs to be re-evaluated whether the measure of motivation to inspire craftsman spirit can be standardised for teachers and students in Chinese higher vocational colleges, for example. Based on the four dimensions of craftsman spirit: dedication, focus, perfectionism, and innovation. Through the relevant literature, this study argues that teachers' and students'

measures of craftsman spirit can be aligned, using engagement, professional commitment and innovative behaviour to measure teachers' and students' motivation for craftsman spirit.

6.1 Engagement (Dedication & Focus)

Some studies of engagement indicate that it is somewhat related to commitment. In the current research, engagement is explained as a positive, fulfilling, work-related state [25] and Kahn (1990) first defined engagement as the state in which members of an organisation are able to fully integrate into their work role and express themselves physically, cognitively and emotionally [26]. Macey et al. (2011) argue that engagement is not only psychological in terms of feeling enthusiastic, focused and energized, but also behavioural in terms of motivation, role expansion and work [27]. Both work engagement and student learning engagement are derived from engagement. In everyday life engagement means involvement, commitment, passion, enthusiasm, focus, effort and energy. Schaufeli has studied both work engagement and learning engagement and argues that both work engagement and learning engagement contain features of vigour, dedication and absorption [28].

6.2 Professional commitment (Focus & Perfectionism)

Commitment is an individual's positive identification with an object, willingness to take on role responsibilities and fulfill role obligations, and is not only an internal psychological state, but can also be expressed through external behaviour [29]. Professional commitment describes one's loyalty to one's chosen profession, to the colleagues who do similar work, and to the professional norms agreed to by this group of colleagues [30]. Professional commitment is often used by students to measure their motivation and attitudes towards learning their profession. Research on professional commitment is generally directed within a particular, highly specialised profession [31], such as teaching and nursing. Morrow and Wirth (1989) define professional commitment as the degree of identification with and involvement in a profession [32]. Some scholars have proposed an "attitude & behaviour" perspective on students' commitment to their major(s), suggesting that commitment to a major is mainly expressed in the transformation of attitudes into behaviours [33].

In terms of expressions of professional commitment, teachers' and students' attitudinal characteristics of stability, normativity, liking and recognition of their profession can influence and lead to corresponding behaviours; if teachers' and students' professional commitment is more positive, they will pursue personal growth and professional advancement, leading to behaviours that focus on their profession and allow for perfection and more exceptional professional improvement. The higher the student's professional commitment, then the more motivated he will be to learn, and the harder he will study and in turn achieve better professional results [33]. Positive and good professional commitment of teachers and students in higher vocational institutions may also indicate that they will continue in their profession and will increase the likelihood of professional perfection. Therefore, this study argues

that it is more appropriate to use professional commitment to measure focus and perfectionism in the craftsman spirit dimension.

6.3 Innovative behaviour (Innovation)

Within the connotation of craftsman spirit is the human capacity for innovation, which plays a very important role in the career development of skilled people. Human innovation can be measured in terms of innovative behaviour or innovative performance. From the connotation of craftsman spirit, the innovative motivation and behaviour of skilled people can be regarded as having innovative ability; in order to align the criteria of craftsman spirit of teachers and students, innovative performance is mostly used in business management, while innovative behaviour can measure the innovative ability of a wide range of people. The act of individual innovation involves not only generating creative ideas, but also successfully implementing them [34]. Scott & Bruce found that individual innovation begins with the identification of a problem by the individual, which leads to an innovative idea or solution to the problem, and the search for support or allies to “productise” or “institutionalise” the innovative idea or solution [35]. Zhou & George (2001) also agree with Scott & Bruce that the manifestation of individual innovative behaviour should not be limited to the innovative idea itself, but should also cover the promotion, development and implementation of the innovative idea in order to ensure its effective implementation [36]. Therefore, this study argues that innovative behaviour can be selected to measure the innovative ability of teachers and students.

6.4 Formulating the research hypothesis

From the above related conceptual elaboration, and using teachers and students in higher vocational colleges, this study hypothesises that the measurement concepts of motivation for craftsman spirit are engagement, professional commitment and innovative behaviour.

7 EVIDENCE FROM INTERVIEW DATA ON MOTIVATION FOR CRAFTSMAN SPIRIT

A total of 11 professional leaders with the titles of “craftsman,” “model worker” and “skilled expert” were contacted and interviewed for this study. The 11 interviewees were from higher vocational institutions and enterprises; 9 were male and 2 were female, and their occupational level was senior. The reasons for selecting professionals with high professional competence and ranking in their profession were, firstly, that their professional competence and work achievements were recognised by the organisation, leaders and colleagues as authoritative; and secondly, that these interviewees’ understanding of craftsman spirit was representative. Each interview in this study lasted between 10 and 20 minutes and was conducted in person or by telephone. In the process of collating the data at a later stage, the interviewees were asked follow-up questions about any areas of doubt.

7.1 Qualitative research software

The qualitative research software allows the interview data to be categorised and analysed. The interview data was analysed by setting up the nodes, i.e., by coding the interview data manually or automatically, after word frequency queries and matrix queries. This study also conducted a semantic analysis of the interview data.

7.2 Analysis process

Word frequency analysis of the interview material. The interview data collected for this study were in Chinese; after the data were collected and recorded, two English majors were asked to work with the researcher to translate the interview data. The translated interview data were imported into Qualitative Research Software for word-frequency analysis. The word frequency query analysis of all the data resulted in the word cloud shown in Figure 3. This is the result of the word-frequency queries obtained after grouping synonyms in the interview data.



Fig. 3. Word cloud diagram

From the word cloud, the most obvious words include “work,” “profession,” “leaders,” “environment,” “craftsman,” “commitment,” “innovative,” “responsibility,” “perfection.” This indicates that these words appear frequently in the interviewees’ narratives and that the interviewees care about work, professionalism, responsibility and the external environment (leadership and work environment), etc. Further analysis in the software ranked the high and low word frequencies to obtain a rectangular-style tree structure diagram, as shown in Figure 4. In the diagram, the words are arranged in ascending order of frequency from left to right, and the area occupied by the squares indicates the weighted percentage, with a higher weighted percentage indicating that the word appears more often in the conversation; it also demonstrates that the word is important to the interviewee. Among these high-frequency words, it is clear that “leader,” “profession,” “environment,” “craftsman,” “job,” “love,” “behaviour,” “commitment,” “spirit,” “innovative,” “responsibility,” “motivate,” “develop” and “satisfied” are high in frequency. This provides directions and factors for research on craftsman spirit.

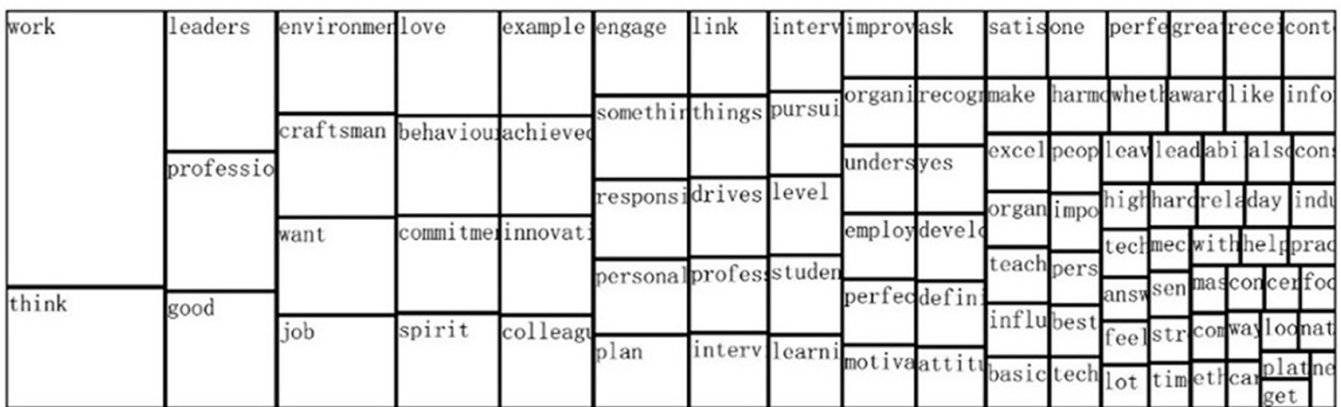


Fig. 4. Rectangular-style tree structure

Analysis of the clustering of the interview data. The purpose of coding all the interview data in Qualitative Research Software was that after categorising the content of the interviewees’ conversations, the weighting of the different categories would reflect the tendency of the interviewees’ concerns. Based on the interview outline, the premise of categorising the research content for this study was to create a category cluster mind map, as shown in Figure 5. The three aspects of craftsman spirit are categorised in terms of their connotation, influencing factors and quality of performance. In the interview material, the interviewees mentioned attitudes at work, such as (1) love for the profession, love for one’s work, perseverance and a realistic attitude to work, some of which do psychological building aspects before and during work; and (2) positive behavioural manifestations, such as striving for excellence, pursuit of excellence, good thinking, continuous learning of professional knowledge and techniques, etc., which are already present in the workplace and lead to better results. Influencing factors are divided into direct and indirect influencing factors. Direct influencing factors in research are certain characteristics or qualities that exist in a person themselves, such as character, responsibility, integrity, rigour, conscientiousness, etc. Indirect influencing factors are those that have an impact on a person’s motivation and behaviour when external conditions change, such as leadership, work environment, relationships between colleagues, job satisfaction, etc.

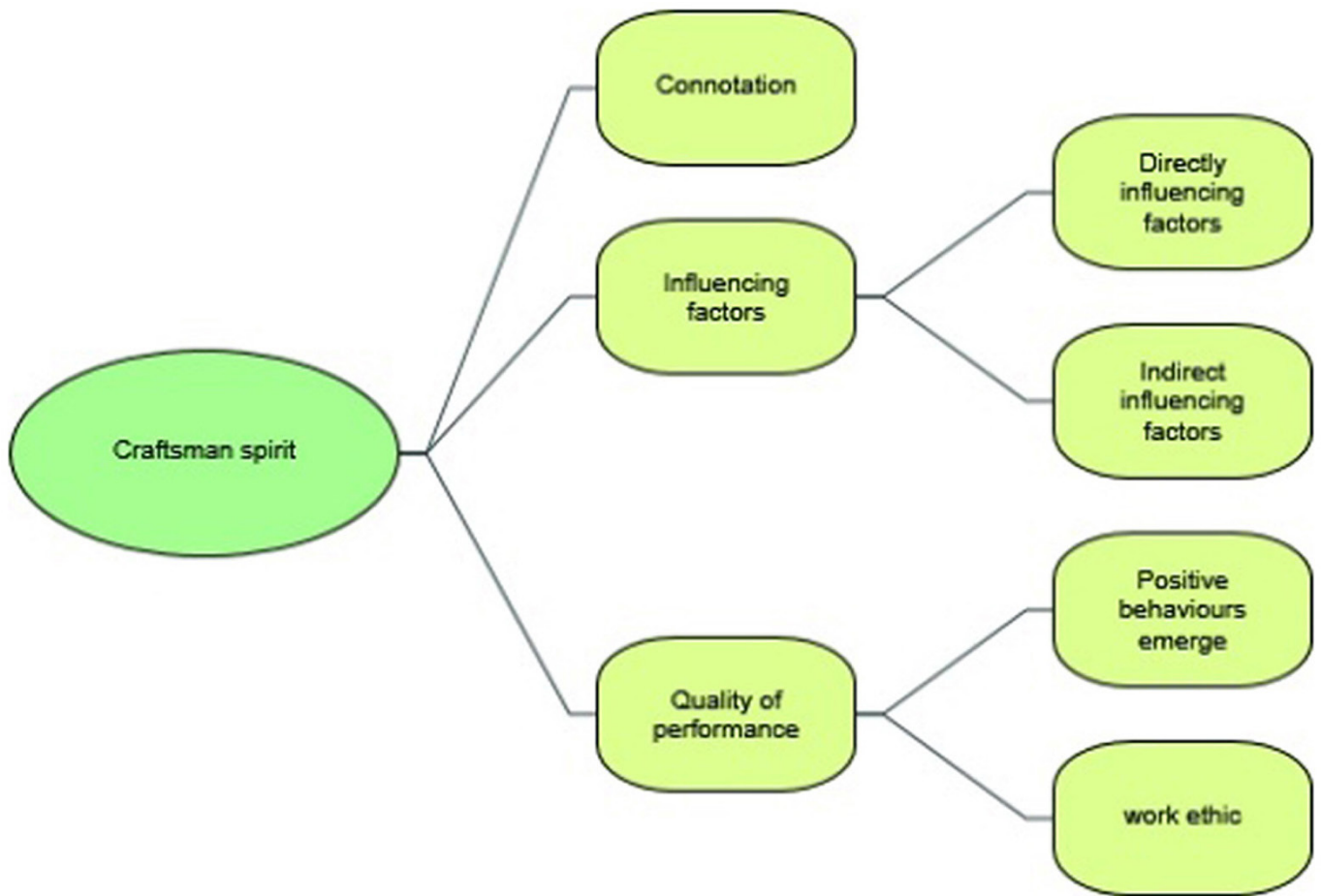


Fig. 5. Mind map of taxa directly derived

After a matrix coding query in the software, a number for interview content in each category was obtained for each interviewer. This reflects which aspect of the interviewer's talk was most involved. Table 3 shows the number for talk content in the categories for the 11 interviewees. The conversation content with the highest number was about the direct and indirect influencing factors in the influencing factors. In terms of statistical quantities, the number for direct and indirect influences is almost equal, indicating that motivating craftsman spirit is related to the qualities one possesses as well as to external factors such as leadership and environment. Among the qualities manifested, the number of words related to work attitudes is higher compared with the words related to positive behaviour. This shows that the interviewees attach more importance to work attitudes, which can also be said to be a prerequisite for the emergence of positive behaviour.

Table 3. Results of matrix coding queries for all interviews

	CS	CT	IF	DIF	IIF	QP	PBE	WE
No. 1	1	1	2	5	4	0	2	4
No. 2	0	1	0	4	4	1	4	6
No. 3	1	1	1	3	5	0	5	1
No. 4	0	1	0	4	4	1	0	0
No. 5	0	1	1	4	4	0	1	2
No. 6	0	1	0	4	4	0	1	1
No. 7	1	1	1	4	5	0	1	1
No. 8	0	1	0	8	4	1	1	5
No. 9	0	1	1	7	7	0	3	5
No. 10	0	1	1	3	4	0	1	4
No. 11	0	1	1	1	4	0	2	2

Notes: CS: Craftsman Spirit; CT: Connotation; IF: Influencing Factors; DIF: Directly Influencing Factors; IIF: Indirect Influencing Factors; QP: Quality of Performance; PBE: Positive Behaviours Emerge; WE: Work Ethic.

Semantic analysis of the interview data. All 11 interviewees offered their own perceptions of what craftsman spirit entails. All of them mentioned excellence, responsibility, focus, pursuit of excellence, and fondness. A collation of words on the connotations of craftsman spirit is shown in Figure 6. These words were categorised according to their semantic meaning, and this study found that the connotations of craftsman spirit in the “craftsman” conversation were consistent with the literature review. In the interview data, most of the interviewees mentioned perfectionism as a connotation of craftsman spirit, which occurred seven times; the pursuit of progress, which occurred six times; words with the meaning of focus and dedication, which occurred eight times; words with the meaning of innovation, which occurred four times; words with the meaning of careful and meticulous, which occurred six times; words with the meaning of dedication and responsibility, which occurred four times; and words with the meaning of love and affection, which occurred six times. It has been discussed in the literature review that work commitment is love, dedication and energy [25]; professional commitment is divided into three dimensions: emotional commitment, normative commitment and continuing commitment [29]; and creative behaviour is the expression of innovation. Love and commitment to the profession, conscientiousness and rigour in one’s work, and both the pursuit of excellence and excellence in the profession can all be expressed as professional commitment. It is reasonable to use engagement, professional commitment and innovative behaviour to measure the motivation to inspire craftsman spirit in teachers and students.

Interviewee number	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9	No. 10	No. 11
Connotation of craftsman spirit	Lean, persistence, perseverance	Practical and innovative, good at thinking, lean and pursuing the best.	Lean, focused excellence and the pursuit of progress.	Dedication, perseverance, research, and a knack for summing things up	Lean, accumulation and innovation, continuous improvement	Persistent focus, meticulousness and lean	Love and dedication; continuous focus, pioneering; lean, the pursuit of excellence; pushing the boundaries of innovation, passing on the flame	Meticulous, hard-working, conscientious, persistent, loving, researching	Persistent, careful and responsible, with a love of the profession	Enjoyable, conscientious, meticulous, rigorous and responsible	Lean, the pursuit of excellence, conscientiousness, rigour and detail

Fig. 6. Semantic categorisation of the connotations of craftsman spirit

In the interview material, the researcher also asked the interviewees questions about personality influencing craftsman spirit or craftsman behaviour. The conversations were collated and distilled, and the results were tabulated in the software as shown in Figure 7. 72% of the interviewees considered leadership to be important; 45% considered the environment to be important; 45% considered work attitude to be important; and 36% considered the development platform to be important. The influencing factors are multiple in composition, with almost all respondents believing that it is important that the organisation provide opportunities for development, which here includes trust by the leadership and a good environment.

Interview Title	Indirect influencing factors	Whether or not they believe that job engagement and professional commitment will lead to innovation.	Is craftsman behaviour related to personality	Can employees be influenced to develop craftsman behaviour	Whether motivating employees (or students) to develop craftsman behaviour (spirit) is necessarily linked to the leadership (teachers), the environment of the organisation	Whether they agree that improving job satisfaction (learning satisfaction) can motivate employees (students) to develop craftsman spirit
No. 1	External conditions, own conditions, recognition by leaders and colleagues	Yes	There must be a connection.	There will be an impact, provided that one is in a position to develop with the opportunities.	Yes	Yes
No. 2	Style and attitude of doing things; platform for development; asserting oneself	Yes	There is some relationship	Yes	Yes	Yes
No. 3	Leadership, working environment, colleagues	Yes	Somewhat related	Yes	Yes	Yes
No. 4	Leadership, working environment, colleagues	Yes	Yes	Yes	Yes	Yes
No. 5	Competitions, opportunities, development platforms, teams	Team and job engagement are factors	Not very relevant	Yes	Yes	Yes
No. 6	Own work ethic, leadership, environment	Yes	Part of the reason	Yes	Yes	Yes
No. 7	Enjoyment, learning, industry prospects, leadership, environment	Yes	Not very relevant	Has some impact	Yes	Yes
No. 8	Love, work ethic, learning, commitment, leadership	Yes	Yes	Yes	Yes	Yes
No. 9	Development platform, attitude, love, learning, dedication, leadership, colleagues, environment	Yes	Yes	Yes	Yes	Yes
No. 10	Development platform, leadership, good mentors, love, work ethic	Yes	Not	Yes	Yes	Yes
No. 11	Work ethic, love, professionalism	If you want to change, you will innovate	Related to personality, but not determinative	Yes	Yes	Yes

Fig. 7. Collated results on factors influencing craftsman spirit craftsman behaviour

Interviewees' questions can influence of personal character on craftsman spirit. As seen in Figure 7, 27% of the interviewees expressed complete agreement; 36% of the interviewees expressed a neutral attitude and thought there was some relationship; 27% of the interviewees expressed a denial attitude and thought there was little relationship; and 9% of the interviewees thought there was no relationship. All respondents agreed that artisanship or artisan behaviour can be influenced, inspired and changed. And 82% of the respondents agreed with their commitment to the profession. Therefore, it is more appropriate to use professional commitment to measure the motivation of craftsman spirit in this study. Figure 7 also shows the effect of work commitment and professional commitment on innovative behaviour, with the aim of speculating on the relationship between the three concepts of work commitment, professional commitment and innovative behaviour; 82% of the respondents agreed that work commitment and professional commitment could motivate them to innovate at work. The concept of measuring motivation for craftsman spirit, as argued in this study, is proven to be feasible.

8 CONCLUSION

Stewardship theory can be used as a background or theoretical support. Craftsman spirit is, in fact, a management tool to enhance human resources. In the empirical study of craftsman spirit, this study found two ways to measure craftsman spirit: firstly, to develop its own scale with good reliability and validity, supplemented by subsequent research; and secondly, to conduct alternative measures using well-established scales from management and psychology. This study favours the second method of measurement and proposes a re-evaluation of the three concepts of engagement, professional commitment and innovative behaviour to measure the motivation for craftsman spirit, using teachers and students in Chinese higher vocational colleges and universities as examples.

In this study, word frequency analysis, cluster analysis and semantic analysis were conducted on the recovered interview data by applying Qualitative Research Software. The following conclusions are obtained.

1. Research content and research trends on craftsman spirit are proposed.
2. It is reasonable to measure the motivation of craftsman spirit by using a combination of three concepts: engagement, professional commitment and innovative behaviour.
3. There is a link between the concepts of measurement of motivation for craftsman spirit: engagement, professional commitment and innovative behaviour.
4. Some respondents believed that employees who strive for perfection are prone to become craftsmen; others questioned this view, arguing that the pursuit of perfection is more likely to be stereotypical and hinder innovation. This provides a realistic basis for this study not to use perfectionist personality to measure the motivation of craftsman spirit.
5. All respondents believe that employees' motivation for craftsman spirit can be influenced. The majority of respondents believe that their achievements are directly related to the development platform, organisation and leadership. All respondents agreed that satisfaction can motivate the emergence of craftsman spirit (can motivate employees or students to develop craftsman behaviour).

9 LIMITATIONS

The concept of measuring motivation for craftsman spirit also needs to be placed in specific populations and empirically studied in relation to other influencing factors.

10 REFERENCES

- [1] Zhao Haijun & Xu Huiyan. (2018). On the connotation of craftsman spirit. *Modern Economic Information*, 21, 56.
- [2] Li Qun, Yan Menghan, Tang Wenjing & Zhang Hongru. (2021). The cross-level impact of inclusive leadership on the practice of craftsman spirit in manufacturing employees. *Soft Science*, 7, 98–103. <https://doi.org/10.13956/j.s.1001-8409.2021.07.15>
- [3] Shi Huili. (2017). Technical and skilled talents in the era of industry 4.0: Connotation, ability and training. *Vocational and Technical Education*, 16, 29–33.
- [4] Qi Yan. (2018). Professionalism of skilled talents in the new era: Interpretation, logic and cultivation. *Vocational and Technical Education*, 13, 28–32.
- [5] Ye Long, Liu Yuanyuan & Guo Ming. (2018). The influence of inclusive leadership on the craftsman spirit of skilled talents. *Economics of Technology*, 10, 36–44.
- [6] Zhang Hong, Sun Hongxing, Xu Tao & Zhao Binyu. (2018). Research on factors influencing the cultivation effect of craftsman spirit among higher vocational college students. *China Vocational and Technical Education*, 9, 36–42.
- [7] Miao Xuemei. (2019). The connotation, deficiency and cultivation of modern craftsman spirit – Based on the research of hybrid spiral progressive cultivation model. *Exploration of Higher Vocational Education*, 4, 8–12.
- [8] Feng Baojing. (2021). Necessity and main path of strengthening the cultivation of craftsman spirit in higher vocational and technical colleges. *Education and Occupation*, 14, 108–111. <https://doi.org/10.13615/j.cnki.1004-3985.2021.14.018>
- [9] Miao Xuemei. (2020). Research on the effectiveness of modern craftsman spirit cultivation from the perspective of industry-education integration. *Modern Education Science*, 5, 56–64 + 70.
- [10] Akiyama Lihui. (2017). *Craftsman spirit*. Translated by Chen Xiaoli. Beijing: CITIC Publishing House.
- [11] Fauci, Y. (2014). *The power of craftsmanship to create a great legend*. Translated by Chen Jin. Hangzhou: Zhejiang People's Publishing House.
- [12] Maekawa Yoichiro. (2017). *Craftsmanship of old shops—The secret to the prosperity of 750 century-old shops in Japan*. Translated by Chen Chen. Beijing: People's Posts and Telecommunications Press.
- [13] Fang Yangchun & Chen Chaoying. (2018). The influence of inclusive talent development model on employee craftsmanship. *Scientific Research Management*, 3, 154–160. <https://doi.org/10.19571/j.cnki.1000-2995.2018.03.016>
- [14] Liu Yuming. (2018). A Study on Craftsmanship from the Perspective of Chinese Traditional Ethics (Master's Thesis, Northeast Normal University).
- [15] Guo Huibin, Zheng Zhan, Shan Qiuduo, Liang Ziyang & Yang Junping. (2018). The capitalization mechanism of craftsmanship: A multi-level configuration interpretation based on eight "Centennial Stores". *Nankai Management Review*, 2, 95–106.
- [16] Liu Yuanyuan. (2020). Research on the Influence of Inclusive Leadership on Employee Craftsman Spirit (Master's Thesis, Beijing Jiaotong University).

- [17] Li Qun, Tang Qinqin, Zhang, H., & Wang, M. (2020). Development and verification of the craftsman spirit scale for the new generation of migrant workers in manufacturing industry. *Journal of Management Research*, 1, 58–65.
- [18] Muth, M., & Donaldson, L. (1998). Stewardship theory and board structure: A contingency approach. *Corporate Governance: An International Review*, 6(1), 5–28. <https://doi.org/10.1111/1467-8683.00076>
- [19] Davis, J. H., Schoorman, F. D., & Donaldson, L. (1997). Toward a stewardship theory of management. *Academy of Management Review*, 22(1), 20–47. <https://doi.org/10.2307/259223>
- [20] Davis, J. H., Schoorman, F. D., & Donaldson, L. (2018). Toward a stewardship theory of management. In *Business Ethics and Strategy* (pp. 473–500). Routledge.
- [21] Tosi, H. L., Brownlee, A. L., Silva, P., & Katz, J. P. (2003). An empirical exploration of decision-making under agency controls and stewardship structure. *Journal of Management Studies*, 40(8), 2053–2071. <https://doi.org/10.1046/j.1467-6486.2003.00411.x>
- [22] Arthurs, J. D., & Busenitz, L. W. (2003). The boundaries and limitations of agency theory and stewardship theory in the venture capitalist/entrepreneur relationship. *Entrepreneurship Theory and Practice*, 28(2), 145–162. <https://doi.org/10.1046/j.1540-6520.2003.00036.x>
- [23] Jensen, M. C. (1994). Self-interest, altruism, incentives, and agency theory. *Journal of Applied Corporate Finance*, 7(2), 40–45. <https://doi.org/10.1111/j.1745-6622.1994.tb00404.x>
- [24] Chrisman, J. J. (2019). Stewardship theory: Realism, relevance, and family firm governance. *Entrepreneurship Theory and Practice*, 43(6), 1051–1066. <https://doi.org/10.1177/1042258719838472>
- [25] Schaufeli, W. B., Salanova, M., González-Romá, V., & Bakker, A. B. (2002). The measurement of engagement and burnout: A two sample confirmatory factor analytic approach. *Journal of Happiness Studies*, 3(1), 71–92. <https://doi.org/10.1023/A:1015630930326>
- [26] Kahn, W. A. (1990). Psychological conditions of personal engagement and disengagement at work. *Academy of Management Journal*, 33(4), 692–724.
- [27] Macey, W. H., Schneider, B., Barbera, K. M., & Young, S. A. (2011). *Employee engagement: Tools for analysis, practice, and competitive advantage*. John Wiley & Sons.
- [28] Schaufeli, W. B., Salanova, M., González-Romá, V., & Bakker, A. B. (2002). The measurement of engagement and burnout: A two sample confirmatory factor analytic approach. *Journal of Happiness Studies*, 3(1), 71–92. <https://doi.org/10.1023/A:1015630930326>
- [29] Meyer, J. P., Allen, N. J., & Smith, C. A. (1993). Commitment to organizations and occupations: Extension and test of a three-component conceptualization. *Journal of Applied Psychology*, 78(4), 538. <https://doi.org/10.1037/0021-9010.78.4.538>
- [30] Perry, S. J., Hunter, E. M., & Currall, S. C. (2016). Managing the innovators: Organizational and professional commitment among scientists and engineers. *Research Policy*, 45(6), 1247–1262. <https://doi.org/10.1016/j.respol.2016.03.009>
- [31] Wallace, J. E. (1993). Professional and organizational commitment: Compatible or incompatible? *Journal of Vocational Behavior*, 42(3), 333–349. <https://doi.org/10.1006/jvbe.1993.1023>
- [32] Morrow, P. C., & Wirth, R. E. (1989). Work commitment among salaried professionals. *Journal of Vocational Behavior*, 34(1), 40–56. [https://doi.org/10.1016/0001-8791\(89\)90063-8](https://doi.org/10.1016/0001-8791(89)90063-8)
- [33] Lian Rong, Yang Lixian, & Wu Lanhua. (2005). The relationship between professional commitment, academic burnout and scale development among university students. *Journal of Psychology*, 5, 632–636.
- [34] Amabile, T. M., Conti, R., Coon, H., Lazenby, J., & Herron, M. (1996). Assessing the work environment for creativity. *Academy of Management Journal*, 39(5), 1154–1184.

- [35] Scott, S. G., & Bruce, R. A. (1994). Determinants of innovative behavior: A path model of individual innovation in the workplace. *Academy of Management Journal*, 37(3), 580–607.
- [36] Zhou, J., & George, J. M. (2001). When job dissatisfaction leads to creativity: Encouraging the expression of voice. *Academy of Management Journal*, 44(4), 682–696.

11 AUTHORS

Ying Tang is a current PhD candidate in management at Rajamangala University of Technology Tawan-ok, Bangkok, Thailand. Main research interests: human resource management, organizational behaviour, educational management (email: ying.tan@rmutto.ac.th).

Ziyan Wang is a graduate with a Bachelor's degree in Economics and Finance from the University of Bristol, Bristol, UK. Main research interests: behavioral economics, economic analysis of political and legal institutions, game theory and micro-economic theory (email: suzywzy@126.com).

Yang He is Product Technical Developer at NORTHCO GROUP Inner Mongolia First Machinery Group Co. LTD., Baotou, China. Main research interests: mechanical engineering, automotive equipment, project management (email: hexi_2014@163.com).