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A STUDY ON THE DIGITAL COMPETENCE CHARACTERISTICS OF VOLUNTEER CHINESE LANGUAGE TEACHERS IN SECONDARY SCHOOLS IN THAILAND BASED ON O*NET JOB ANALYSIS METHOD

Zhulin[1], Abdul Talib Mohamed Hashim[2*]

[1] Department of Account, Universiti Pendidikan Sultan Idris, Malaysia
    Email:P20231000051@siswa.upsi.edu.my
[2] Department of Account, Universiti Pendidikan Sultan Idris, Malaysia
    Email:abdul.talib@fpm.upsi.edu.my
[*] Corresponding Author

Article Info:

Abstract:

This study uses the O*NET job analysis questionnaire to investigate the work skills and work styles required for volunteer Chinese language teachers in secondary schools in Thailand. The analysis results of 265 subjects show that: (1) The important work skills of volunteer Chinese language teachers in secondary schools in Thailand include digital technology operation ability, digital teaching problem-solving ability, digital teaching strategy thinking ability, digital teaching guidance and evaluation ability, and digital teaching integration and application ability, and (2) The important work styles of volunteer Chinese language teachers in secondary schools in Thailand are basic professional characteristics and teacher social cognitive style.

Keywords:

O*NET Analysis; Volunteer Chinese Language Teachers; Competence

Introduction

The O*NET Teacher Digital Work Competency Questionnaire consists of 35 questions, which are used to investigate teachers' ability to successfully complete their current job duties in a digital education environment. This questionnaire is divided into six categories of job skills (Peterson et al., 2001): basic skills, social skills, system skills, complex problem-solving skills, technical skills, and resource management skills. Similar to the original questionnaire in the O*NET job analysis system, the specific meaning of each skill is defined. During the test, each skill item uses a 5-level Likert scale, with scores assigned from 1 to 5 in order, where 5 is the most important. The subject's score is used to evaluate its importance to job performance.

The O*NET Teacher Digital Work Style Questionnaire includes 16 questions. Its purpose is to assess the personal characteristics of teachers in relation to their work performance in a digital education environment. The questionnaire is divided into seven work styles: responsibility, achievement orientation, independence, social influence, self-adjustment, practical Chile, and human-computer influence. In this questionnaire, the specific meaning of each work style has also been defined. A 5-level Likert scale is used to measure the importance of this style in teachers' digital work.

Literature Review

Xu and Song (2006) focused on the field of informatization of Chinese teaching as a foreign language and explored the specific connotation of information literacy of Chinese teachers as a foreign language. They attempted to develop an evaluation system for the information literacy of Chinese teachers, focusing on foreign languages, based on international standards, and proposed a targeted training path. Since then, the research perspective has no longer been limited to the scope of classroom application. However, it has gradually expanded to encompass the level of teacher ability. For example, Wang (2010) pioneered the development of digital Chinese teaching from a new perspective, sorted out and summarized the digital Chinese teaching products in China at that time into four major types, and analyzed their respective characteristics and advantages in detail. Subsequently, Xu (2012) provided a clear definition of the connotation of digitalization in Chinese teaching as a foreign language and systematically elaborated on the current status and future trends of teaching tools, courseware, websites, and resource construction, as well as courseware production technology.

In recent years, many international organizations and government agencies have begun to focus on promoting the global governance of digital education. The latest data from the 2024 World Digital Education Conference highlighted that the open sharing of educational resources and the enhancement of teachers' digital literacy have become key issues (Ma et al., 2022). These policies provide a solid support framework for digital education in developing countries and lay the foundation for building digital competence among volunteer teachers in Thailand.

In China, Xiao Yun (2012) surveyed the competence of teachers in the field of distance education by drawing on and adapting the O*NET questionnaire. Li et al. (2014) constructed a competency characteristic model for teachers based on the integration of BEI and O*NET. Li & Yu (2022) researched the selection of innovative and entrepreneurial talents among college students based on O*NET. Zhao et al. (2023) studied the competency characteristics of teachers in high school technical education based on the O*NET job analysis method. Therefore, the O*NET questionnaire is widely and maturely used in the field of education in China.

Findings

Demand Analysis of Teachers' Digital Work Competence

Exploratory factor analysis

The exploratory factor analysis of the teacher digital work ability questionnaire data showed that the Kaiser-Meyer-Olkin (KMO) value was 0.899, the $\chi2$ value of the Bartlett's sphericity test was 2787.674 (degrees of freedom was 378), and $p = 0.000 < 0.001$. It indicates that there was a significant difference at the 0.001 level. This also showed that the structural validity of the questionnaire was good and the data were suitable for the next step of exploratory factor analysis. Since a correlation was determined between the project variables of "teacher digital work ability," the maximum variance method was selected for rotation based on principal component analysis. As shown in Table 5-1, a total of five common factors were extracted, and 28 abilities with factor loadings greater than 0.45 were obtained. The cumulative explanatory variables were 56.266%.

Table 1: Summary Of Factor Analysis Results Of "Teachers' Digital Work Ability" (N=265)

Digital Work Capability Variables	Component					Commonality
	1	2	3	4	5	
Digital Design and Production	0.577					0.389
Software and Hardware Installation	0.654					0.475
Programming	0.703					0.508
Quality Control Analysis	0.701					0.511
Operation and Monitoring	0.722					0.57
Digital Application	0.648					0.479
Digital Equipment Maintenance	0.653					0.503
Digital Equipment Repair	0.692					0.524
System Analysis	0.674					0.472
Data Information Management	0.611					0.447
Digital Active Learning		0.744				0.611
Digital Learning Strategy		0.712				0.584
Negotiation		0.72				0.552
Complex Problem Solving		0.675				0.514
Fault Identification and Troubleshooting		0.672				0.526
Digital Supervision				0.773		0.644
Persuasion				0.755		0.638
System Evaluation				0.76		0.672
Digital Decision Making				0.759		0.65
Mathematics ability			0.722			0.616
Critical Thinking			0.675			0.531
Operational Analysis			0.718			0.582
Time Management			0.675			0.515
Personnel Management			0.73			0.635
Digital Insight					0.753	0.693

Instruction					0.708	0.601
Digital Resource Selection					0.758	0.672
Digital Resource Management					0.741	0.639
Eigenvalue	4.741	2.95	2.901	2.646	2.517	
% of Variance	16.932	10.535	10.359	9.45	8.99	
Cumulative %	16.932	27.467	37.826	47.276	56.266	

Descriptive Statistical Analysis

The mean value of "digital technology operation ability" (M = 3.48, SD = 0.86) is lower than the four ability dimensions of "digital teaching problem-solving ability", "digital teaching strategy thinking ability", "digital teaching guidance and evaluation ability" and "digital teaching integration and application ability". This result shows that in the digital teaching context, Thai Chinese volunteer teachers perform relatively weakly in the basic technical operation level and may not have fully mastered or proficiently used various digital teaching tools. This suggests that teachers are more inclined to invest time and effort in developing effective teaching strategies, providing guidance on assessments, and integrating teaching methods, while there is still room for improvement in basic digital skills. It can be seen that teachers pay more attention to teaching design and process management capabilities in digital teaching, rather than simply focusing on technical operation capabilities.

Table 2: Ranking Of Importance Of "Teachers' Digital Work Ability" (N=265)

Sequence	Competence	N	M	SD
1	Critical Thinking	265	3.73	1.128
2	Time Management	265	3.72	1.127
3	Digital Active Learning	265	3.72	1.193
4	Instruction	265	3.72	1.087
5	Persuasion	265	3.68	1.1
6	System Evaluation	265	3.66	1.072
7	Negotiation	265	3.66	1.131
8	Operational Analysis	265	3.63	1.121
9	Digital Decision Making	265	3.63	1.144
10	Digital Resource Selection	265	3.62	1.092
11	Digital Learning Strategy	265	3.62	1.179
12	Digital Insight	265	3.61	1.109
13	Digital Supervision	265	3.61	1.123
14	Personnel Management	265	3.6	1.167
15	Complex Problem Solving	265	3.59	1.115
16	System Analysis	265	3.59	1.19
17	Digital Design and Production	265	3.58	1.213
18	Software and Hardware Installation	265	3.56	1.183
19	Mathematics ability	265	3.51	1.21
20	Operation and Monitoring	265	3.5	1.274

21	Data Information Management	265	3.49	1.21
22	Fault Identification and Troubleshooting	265	3.49	1.194
23	Digital Equipment Repair	265	3.48	1.228
24	Digital Resource Management	265	3.45	1.193
25	Digital Equipment Maintenance	265	3.42	1.268
26	Quality Control Analysis	265	3.41	1.297
27	Digital Application	265	3.41	1.314
28	Programming	265	3.36	1.386

Demand Analysis Of Teachers' Digital Working Style

Exploratory Factor Analysis

The exploratory factor analysis of the data on teachers' digital work style showed that the KMO value was 0.933, the χ^2 value of Bartlett's sphericity test was 2373.722 (degree of freedom was 120), and $p = 0.000 < 0.001$, indicating that there was a significant difference at the 0.001 level. The data was suitable for subsequent factor analysis. Since a correlation was established between the variables of teachers' digital work style, the maximum variance method was selected for rotation based on principal component analysis. As shown in Table 5-4, two common factors were extracted, and a total of 16 digital work style items with factor loadings greater than 0.45 were obtained, with a cumulative explanatory variable of 61.871%.

Table 3: Summary Of Factor Analysis Results Of "Teachers' Digital Work Style" (N=265)

Teachers' digital work style variables	Common Factor(s)		Commonality
	1	2	
Achievement Motivation	0.834		0.7
Persistence	0.786		0.623
Initiative	0.755		0.582
Leadership	0.744		0.567
Social Orientation	0.742		0.572
Self-Control	0.654		0.452
Stress Tolerance	0.752		0.587
Attention to Detail	0.76		0.595
Integrity	0.743		0.568
Innovation	0.751		0.572
Cooperation		0.835	0.702
Concern for Others		0.858	0.747
Adaptability		0.807	0.662
Dependability		0.774	0.621
Independence		0.786	0.655
Analytical Thinking		0.821	0.693

Eigenvalue	5.779	4.120
% of Variance	36.119	25.752
Cumulative %	36.119	61.871

Descriptive Statistical Analysis

Through descriptive statistical analysis of the items involved in "Teachers' social cognitive style" and "Basic professional characteristics" of the Chinese language teacher in Thailand digital work style, it was found that the top 6 items were all related to "Teachers' social cognitive style" by sorting them from high to low according to the mean score.

Table 4: Ranking Of Importance Of "Teachers' Digital Work Style" (N=265)

Sequence	Competence	N	M	SD
1	Analytical Thinking	265	3.41	1.17
2	Dependability	265	3.39	1.122
3	Concern for Others	265	3.39	1.177
4	Cooperation	265	3.37	1.169
5	Independence	265	3.37	1.12
6	Adaptability	265	3.34	1.139
7	Self-Control	265	3.34	1.142
8	Integrity	265	3.23	1.152
9	Stress Tolerance	265	3.21	1.186
10	Innovation	265	3.21	1.217
11	Persistence	265	3.21	1.246
12	Attention to Detail	265	3.2	1.193
13	Achievement Motivation	265	3.2	1.204
14	Initiative	265	3.19	1.186
15	Social Orientation	265	3.19	1.217
16	Leadership	265	3.09	1.245

Conclusion

The above article uses the job analysis method based on the O*NET questionnaire to investigate the digital work ability requirements of Chinese language teachers in Thailand. The following data analysis results are discussed individually.

The survey found that Chinese language teachers in Thailand believe that the abilities required for digital education can be divided into five categories: digital technology operation ability, digital teaching problem-solving ability, digital teaching strategy thinking ability, digital teaching guidance and evaluation ability, and digital teaching integration and application ability. The demand recognition of technical operation ability is higher than the latter four. The work style required for digital teaching work of Chinese language teachers in Thailand can be divided into two categories: basic professional characteristics and teacher social cognitive

style. The demand recognition of "teacher social cognitive style" among the surveyed teachers is higher than that of "basic professional characteristics".

Acknowledgements

References

Giuliani, M. E., Papadakos, T., Coolens, C., Fregnani, J., Gebhardt, P., Julius, A., ... & Papadakos, J. (2023). Using a nominal group technique to develop a science communication curriculum for health professionals and clinical researchers. *Journal of Cancer Education*, *38*(5), 1459-1465.

Harison, E. (2024). Educating to Innovate: Fostering Innovation Through Interdisciplinary Collaboration Between Design and Engineering Students. *In Preconceptions of Policies, Strategies, and Challenges in Education 5.0* (pp. 51-62). IGI Global.

Harvey, N., & Holmes, C. A. (2012). Nominal group technique: an effective method for obtaining group consensus. *International journal of nursing practice*, *18*(2), 188-194.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and psychological measurement*, 30(3), 607-610.

Li, G.M., Niu, D. & Xiang, Z.Q. (2014). Construction of teacher competency model: Integration of BEI and O*NET. *Education measurement and evaluation (theory)* (05), 8 and 12. Doi: 10.16518 / j.carol carroll nki emae. 2014.05.007.

Li, J.L. & Yu, S.S. (2022). Research on the selection of college students' Innovation and Entrepreneurship talents based on O*NET. *Innovation and Entrepreneurship Education* (06),33-39.

Liu,B.W. (2015). Procedural construction of student participation in university decision-making. *Educational Development Research, 35(21),* 31-35. doi:10.14121/j.cnki.1008-3855.2015.21.008.

Mukhtar, S., Abd Razak, A. Z., & Khan, M. H. (2024). Enhancing School Performance through Instructional Leadership: Insights from the Nominal Group Technique in the Malaysian Context. *Asian Journal of Environment-Behaviour Studies*, *9*(28), 15-27.

O*NET Official website [EB/OL]. http://online onet-center org/find/descriptor

Pan,M.Y, Yang,L.J & Zhou,Y.Q. (2009). Design and application of remote action research practice teaching model. *China Audio-visual Education, (10),* 43-46.

Richey, R. W., Klein, J. D., & Nelson, W. A.(2004). Development research:Studies of instructional design and development. *Dalam Johassen, DH(Eds) Handbook of Research on Educational Communications and Technology.*

Toni, M., & Sudin, M. (2024). Research and Development (R&D) Interactive Media That is Effective, Efficient and Fun for Students. *Asian Journal of Social and Humanities*, 2(6), 1239-1252.

Xiao Y. (2012). Research on the structure of distance education teacher competency model. *Journal of Beijing Radio and Television University*, (3), 31-36.

Xiao Y. (2012). Research on the structure of distance education teacher competency model. *Journal of Beijing Radio and Television University,* (3), 31-36.

Xi,X.L. (2017). Action learning in undergraduate courses of preschool education in normal universities: taking "kindergarten courses" as an example. *Educational Theory and Practice, 37(27)*, 47-49.

Zhang,Y, Gao,H.R, Zhang,Y, Wu,H, Mo,W & Lin,L. (2021). Development and implementation of primary school STEM school-based curriculum oriented by teaching objectives: A case study of the course "Construction and Application of Little Red Eagle Weather Station". *China Audio-visual Education, (04),* 67-74.

Zhao, Y.H., Li, R.J. & Tang, Y.B. (2023). Competency of senior high school Technical education teachers based on O*NET job analysis. *Research on Education and Equipment* (03),3-12.