The Status and Inspiration of General School Teachers' Inclusive Education Literacy from an International Comparative Perspective

Jie Yang[1] & Zhiyao Liu[1]

[1] School of Educational Science, Lingnan Normal University, Zhanjiang, China
Correspondence: Jie Yang, School of Educational Science, Lingnan Normal University, Zhanjiang, China.

Abstract

Teachers in general schools with inclusive education literacy are one of the conditions for children with special needs to receive high-quality general education, as well as an essential guarantee for providing an excellent education to the people and building a solid education country. This paper uses data from the Teaching and Learning International Survey (TALIS 2018), use the hierarchical cluster method to investigate the characteristics of teachers' preparedness status for inclusive literacy in general schools from an international comparative perspective. The findings revealed that the inclusive literacy preparedness of general school teachers worldwide can be classified into three types: younger-highly inclusive literacy teachers, advanced age-medium inclusive literacy teachers, and highly educated-low inclusive literacy teachers. Younger-highly inclusive literacy teachers are characterized by rejuvenation, a high degree of undergraduate education, an emphasis on pre-service education, and an oversupply of professional development activities. Advanced age-medium inclusive literacy teachers are characterized by aging, incomplete pre-service education training, and the most urgent need for teachers' professional development in information technology. Highly educated-low inclusive literacy teachers are distinguished by highly educated, low levels of pre-service education, and an abundance of professional development opportunities for teachers. School administrators are advised to prioritize ongoing professional development activities for teachers to speed teacher education integration and increase teacher and educational quality.

Keywords: inclusion education, preparedness, TALIS 2018, hierarchical cluster method

1. Introduction

Students with Special Needs means pupils who are mentally, physically, or emotionally disadvantaged and have been formally identified as having special learning requirements, necessitating additional educational support (OECD, 2018). Since the concept of inclusive education was first proposed, an increasing number of students with special needs worldwide have been placed in general schools. Inclusive education has become an unavoidable trend in the growth of special education. As early as 2002, the United States enacted the "No Child Left Behind,

NCLB", which requires states to focus on the academic performance of children with disabilities and legally emphasize the rights of children with disabilities to participate in general education (Kortering, McClannon, & Braziel, 2008). Numerous countries have also implemented policies that have improved access to education for students with special needs worldwide, bringing significant challenges for teachers. There is evidence that the reason teachers cannot meet the educational needs of students with special needs is because the lack of understanding and support for special education (The Secretary of State for Education and Employment of United Kingdom, 1997). The Excellence for all children: Meeting Special Educational Needs calls for general schools, special education schools and other providers of special education needs to provide high-quality training for trainee, new and serving teachers (The Secretary of State for Education and Employment of United Kingdom, 1997). China's Fourteenth Five-Year Plan of Action for the Promotion and Development of Special Education also calls for "organizing rotational training for principals and teachers of special education schools and general schools and inclusive education into the compulsory content of teachers continuing education in general schools" further to promote the development of inclusive education in China (Ministry of Education of the People's Republic of China, 2021). Although many countries provide policy guidance and support for the professional preparedness and development of general school teachers, research shows that the implementation level of teacher professional development policies is uneven (Fan, Zhang & Wang, 2021). Some general school teachers lack knowledge and skills for special education and understanding of the teaching strategies for students with special needs (Ravet, J., 2018).

Teachers' self-efficacy refers to the teacher's judgment and favorable faith that he can successfully teach in an educational environment (Xin, 1996). In this study, self-efficacy refers to the belief of general school teachers in their ability to teach successfully and meet the educational needs of all students, including those with special needs (Elisa et al., 2018). According to Bandura's (1997) Theory of Social Cognition, the self-efficacy of teachers may have a positive impact on their continued growth. It can even predict their

self-actualization. Understanding the self-efficacy of general school teachers will be one of the key elements to understand their inclusion literacy.

More professional development activities in teaching students with special needs, teaching in multicultural or multilingual settings, information communication technology (ICT) are desperately needed in TALIS 2018 report (OECD, 2020). With 22% of teachers reported that the most requested topic for professional development is teaching students with special needs. Boyd et al. investigated the certain aspects of instructors' professional preparedness which affect students' achievement (Boyd et al., 2008). The results demonstrated that teachers' preparedness has a significant role in students' academic success. What types of general school teachers' inclusive literacy preparedness in the world are there? What are the characteristics of different types of general school teachers? In order to support the high-quality development of special education in China, this study will use data from TALIS 2018 to investigate the state and features of inclusive literacy preparedness for foreign teachers of inclusive education through international comparison. It will also offer recommendations for improving general school teachers' inclusive education literacy in China.

2. Methods

2.1 Data Sources

This study used publicly available secondary data from Teaching and Learning International Survey (TALIS) 2018. Conducted by the Organization for Economic Co-operation and Development (OECD), TALIS 2018 randomly selects 200 schools in 47 countries (regions) using the probability proportional to size (PPS) sampling method. A representative sample of 20 teachers is randomly selected from each of these schools. A sample of Shanghai consisted of 198 junior high schools and 3976 teachers, which has high level of participation (schools, 100%; teachers, 99.5%). For this study, a sample of junior high school teachers from around the globe (BTGINTT3) was chosen, and those who selected the option "none" on the teacher's questionnaire regarding the characteristics of the students in the target class (TT3G35) were eliminated. This resulted in a sample of general junior high school teachers teaching students with special needs.

2.2 Variables and Measurements

Preparedness. The Preparedness is measured by an assessment includes "self-awareness of the following items," "Content of some or all subject(s) I teach" "Pedagogy of some or all subject(s) I teach" "general pedagogy" and so on (TT3G06A2~TT3G06L2). We eliminated the items "ability to bridge early childhood and primary school" and "promotion of play" based on the study's objectives and the characteristics of the junior high school teacher sample. A 4-point scale is used, ranging from "inadequate" to "very adequate".

Background variables. Some studies have shown that teachers' individual characteristics such as gender, age, education, and years of teaching have an impact on their professional preparedness (Gao & Xu, 2019; Zhou & Liu, 2022; Holzberger, Philipp & Kunter, 2013). To reveal the characteristics of teachers' inclusive literacy preparedness for inclusive educational literacy, gender (TT3G01), highest educational level (TT3G03), teaching age (TT3G11B), age (TCHAGEGR), pre-service education—"Whether or not a certain professional is included in teacher education and inclusive literacy preparedness content" (TT3G06A1~TT3G06J1), as shown in Table 1, and self-efficacy (T3SECLS, T3SEINS and T3SEENG) as the background variables of the study, "teaching experience" has been delineated four groups based on the quartiles of descriptive statistics in this study, which are 0~8 years, 9~17 years, 18~26 years, and higher than 26 years. This study will also compare the professional development participation (TT3G23A~TT3G23N) and needs (TT3G27A~TT3G27N) of the general school teachers to find ways to improve their inclusive literacy preparedness.

Table 1. Inclusive education literacy measurement

	items	details
	TT3G06A1	Elements in form. educ. Content of some or all subject(s) I teach
	TT3G06B1	Elements in form. educ. Pedagogy of some or all subject(s) I teach
	TT3G06C1	Elements in form. educ. General pedagogy
Inclusive education literacy	TT3G06D1	Elements in form. educ. Classroom practice in some or all subject(s) I teach
	TT3G06E1	Elements in form. educ. Teaching in a mixed ability setting
	TT3G06F1	Elements in form. educ. Teaching in a multicultural or multilingual setting
	TT3G06G1	Elements in form. educ. Teaching cross-curricular skills
	TT3G06H1	Elements in form. educ. Use of ICT for teaching
	TT3G06I1	Elements in form. educ. Student behaviour and classroom management
	TT3G06J1	Elements in form. educ. Monitoring students development and learning

Data from: OECD, (2018). Organization for Economic Co-operation and Development (OECD) Teaching and Learning International Survey (TALIS) 2018 Teacher Questionnaire. https://www.oecd.org/education/school/TALIS-2018-MS-Teacher-Questionnaire-ENG.pdf

2.3 Data Analysis

To gain a deep understanding of different types of inclusive literacy preparedness of general school teachers in 46 countries (regions), SPSS 25.0 was utilized. It used the hierarchical cluster method first to cluster the countries. Then, the clustered countries were compared and analyzed descriptively to distill the international characteristics of general school teachers' inclusive literacy preparedness.

3. Results

3.1 Types of Inclusive Literacy Preparedness for Teachers in General Schools

A hierarchical cluster method was used to categorize the inclusive literacy preparedness of general school teachers in 46 countries (regions)[1]. The results showed that the 46 countries (regions) were classified into three clusters at the clustering level 10, and their inclusive literacy preparedness were classified into three different

[1] Russia was not included in this study due to lack of self-efficacy data.

types accordingly (Figure 1). The mean values of the inclusive literacy preparedness scores for the three types are shown in Figure 2.

Type 1: During the clustering process, South Africa and the United States were clustered together first, and then countries (regions) such as New Zealand were added to form a group of Pacific countries (regions) represented by Shanghai and Australia (Cluster 2), with a total of 20 countries. Compared with the other two clusters, the level of inclusive literacy preparedness in Cluster 2 is the highest among three clusters, named younger-highly inclusive literacy teachers.

Type 2: During the clustering process, Estonia, Latvia, and Argentina were first clustered together, and then the Netherlands and Austria were added to form a group of European countries represented by Finland and Italy (Cluster 1), with a total of 22 countries. Compared to the other two clusters, Cluster 1 scored in the middle of the range on the ten inclusive literacy preparedness components, named advanced age-medium inclusive literacy teachers.

Type 3: During the clustering process, the Czech Republic and Slovenia clustered together first,

followed by France and Spain (Cluster 3) for a total of 4 countries. Cluster 3 has the lowest level of inclusive literacy preparedness, named highly educated-low inclusive literacy teachers.
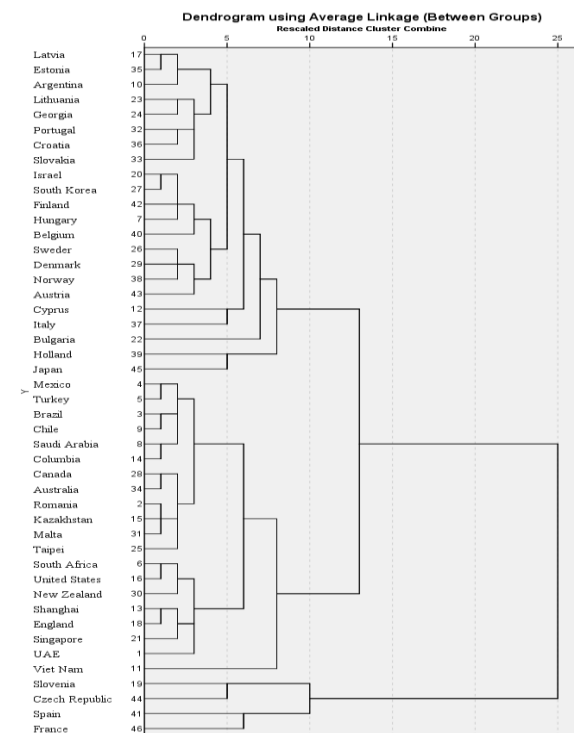
Figure 1. A Cluster Tree of 46 Countries in Preparedness
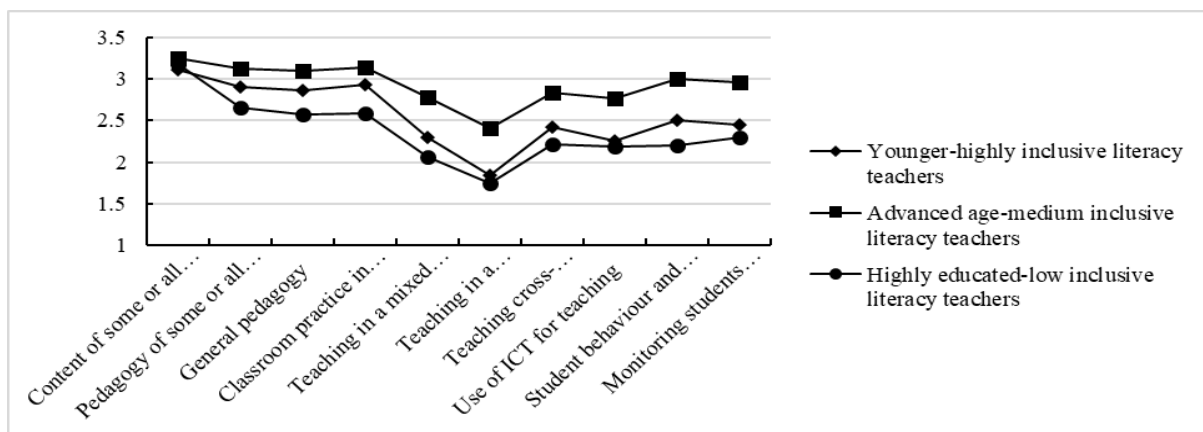
Figure 2. Types of Preparedness for Inclusive Education Teachers

3.2 Characteristics of General School Teachers' Inclusive Literacy Preparedness in Different Types

3.2.1 Characteristics of Younger-Highly Inclusive Literacy Teachers

3.2.1.1 Teachers Are Young and Have a High Degree of Undergraduate Education

The descriptive statistics show that younger-highly inclusive literacy teachers had the highest percentage of teachers aged "<25"

and "25~29" (2.6%; 12.6%) and higher than that in OECD countries (1.9%; 9.6%). In terms of education, up to 70.3% reported a bachelor's degree and higher than that in OECD countries (53.1%). In "teaching age", the percentages of teachers with "0~8 years" and "9~17 years" were also the highest (31.7%; 34.0%) among the three types of teachers and higher than that in OECD countries (27.7%; 30.4%), which shows a high level of youthfulness and bachelor's degree in

general. Singapore reported that 2.7% of general school teachers less than 25 years old and 21.2% aged from 25 to 29 years old, which is higher than the countries (regions) in the same group, such as Brazil (1.7%; 8.2%), Chile (2.0%; 17.2%), and Turkey (1.6%; 18.8%). In "educational attainment", 75% of Singaporean general school teachers reported a bachelor's degree, which is lower than countries (regions) in the same group such as Brazil (90.7%), Kazakhstan (90.1%), and Saudi Arabia (94.8%). The higher bachelor's degree and the number of younger teachers also contribute to the high proportion of teachers with short teaching experience, with 47.8% of general school teachers in Singapore having teaching experience from 0 to 8 years, much higher than the OECD countries (27.7%).

It is related to the content of teacher education training or professional development in different countries. The universalization of teacher education has been the goal of teacher education development in Singapore, that is, to raise the academic qualifications of primary and secondary school teachers to the level of undergraduate qualifications and to improve the quality of the teacher literacy (Li, 2022). Thus, the universalization and undergraduate qualification of inclusive education in Singapore is inevitable. In addition, Singapore's Ministry of Education (MOE) recognizes some of the excellent and promising teacher when students are still in high school or even junior high school. This group is called MOE Teaching Scholars, and MOE provides them with scholarships and financial support to study in universities. However, they must commit to serving in the education sector for three to five years after graduation (Fan & Fang, 2017). The MOE Teaching Scholars program has injected new energy into the education sector. The three career paths offered by the MOE, Teacher Track, Leadership Track, and Senior Specialist Track, have enriched the career options for teachers and increases attractiveness, making it easier to retain outstanding young teachers (Wang, Bao & Liu, 2017). Other countries have also implemented policies to attract exceptional young educators and enhance the caliber of their teaching staff. The United Kingdom and Canadian governments require primary and secondary school teachers to have a minimum bachelor's degree and one year of professional training in education (Ye, 2005). China's Opinions on Comprehensively Strengthening the Construction of the Teaching Staff in the New Era, published in 2018, also put forward the requirement that "the academic qualifications of junior high school teachers should be raised to bachelor's degree."

3.2.1.2 Emphasizing Pre-Service Education

Younger-highly inclusive literacy teachers reported higher levels of participation in the ten pre-service education components than the remaining two types. Many countries have pre-service education programs to support less-experienced teachers who face significant challenges in inclusive education settings and prepare them for teaching. Cultivating competent teachers and providing "scaffolding" for their continuous professional development are two goals of pre-service education (He, 2020). In 2009, the National Institute of Education (NIE) of Singapore proposed A Teacher Education Model for the 21st century (TE21), which proposed six reform suggestions. For example, there are "advocated for the implementation of the new V3SK model (Values, Skills & Knowledge)", "Enabling the Graduate Teacher Competences Framework (GTCF)", and so on (Wang, Bao & Liu, 2017). From building teachers' values to cultivating teaching skills, the NIE of Singapore has given directions and goals for teacher training, laying the foundation for constructing a high-quality teaching staff. In recent years, China has issued documents such as the Opinions on the Implementation of the Outstanding Teacher Training Program 2.0, which emphasize the improvement of the comprehensive quality, specialization, and innovation ability of teacher trainees. The training of normal university students focuses on establishing a strong disciplinary foundation, with the cultivation of excellent practical abilities as the ultimate goal, characterized by qualities such as art, information, and psychology (Zhang, Xiong & Lin, 2019). Canada has set up a rigorous selection process for teacher trainees. Applicants can only enter teacher training colleges to receive pre-service education if they have excellent results in cultural courses, pass the motivation to teach and the interview assessment. And the aim of teacher training is to combine theory, practice and research (Chen, 2017). From the strict threshold of pre-service teacher education to the rational curriculum and teaching practice, Canada has laid the foundation for teachers' continuous professional development through a

three-pronged approach of teacher qualification, theory, and practice.

Although the content of pre-service education includes most of the knowledge and skills that teachers need to teach, "Teaching in a multicultural or multilingual setting" is rarely included as a component of teacher education or training. On average, only 40.6% of teachers in OECD countries have received education or training on teaching skills in multicultural or multilingual contexts. 57% of younger-highly inclusive literacy teachers indicated that they have received relevant training, much higher than Type 2 (29.7%) and Type 3 (20.4%). Specifically, Singapore (73.3%), New Zealand (77.9%), South Africa (78.7%), the United Arab Emirates (77.3%), and the United States of America (75.4%) had a higher percentage of teachers who had received relevant training, which demonstrates that under the globalization of societies, it is typical for countries (regions) where English is the dominant language and there are multiple official languages or multicultural traditions in a globalized society to include "teaching in multicultural or multilingual contexts" as part of their teacher education or training (OECD, 2019).

3.2.1.3 Imbalance Between Supply and Demand for Professional Development Activities

A comparison of teachers' participation in and demand for the various professional development themes can reflect the supply and demand of professional development content for teachers (Wang, Liu & Chang, 2022). In demand for professional activities, the top three themes are inclusive education (24.8%), ICT skills for teaching (18.8%), and teaching and learning in a multicultural context (18.7%). It is suggested that younger-highly inclusive literacy teachers are more concerned with the educational needs of students with special needs, focus on equity in education, and have higher learning needs for educational technology and teaching in multiculturalism. The top three themes for younger-highly inclusive literacy teachers with more than moderate needs were inclusive education (61.2%), ICT skills for teaching (55.1%), and cross-curricular teaching skills (52.5%), which corresponded to participation rates of 52.2%, 69.2%, and 64.7%, respectively. In Figure 3, except "inclusive education," "teaching in multiculturalism," and "communicating with

people from different cultures or countries" are in demand with less than moderate or above participation, i.e., demand exceeded supply, the rest of the professional development activities showed an oversupply.

The reasons are related to national policy regulations. The content of teachers' professional development activities inevitably responds to the national policy environment and educational reforms, and changes in subject content brought about by educational reforms are also reflected in the content of teachers' professional development activities (Ávalos, 2011). With the development of education reform, teachers in Shanghai's inclusive education reported a participation rate of over 95% in the subject knowledge and competence component. In addition, national regulations and requirements for the professional development of primary and secondary school teachers may also affect the participation rate in teachers' professional activities. As reported by the OECD, countries such as Australia, the UK, Turkey, and Kazakhstan have incorporated teacher professional development into their policy regimes, making participation in professional development activities mandatory for teachers to maintain employment. In contrast, Chile, South Korea, and Mexico have made participation in professional development activities a requirement for teachers to be promoted and receive salary increases (OECD, 2019). As a result, teachers in all these countries report high participation rates in professional development activities. It is important to note that while most countries reported high participation rates in professional development activities, their corresponding demand rates were much smaller than the participation rates. It suggests that the content setting and scale of professional development activities have not yet matched the needs of the main teachers and that the effectiveness of professional development has yet to be considered, with a certain degree of wasted resources. In addition, providing teachers with too many professional development activities that do not match their needs will only increase extra burden on them, waste their time, and result in low-level duplication of teachers' professional development (Wang, Liu & Chang, 2022).
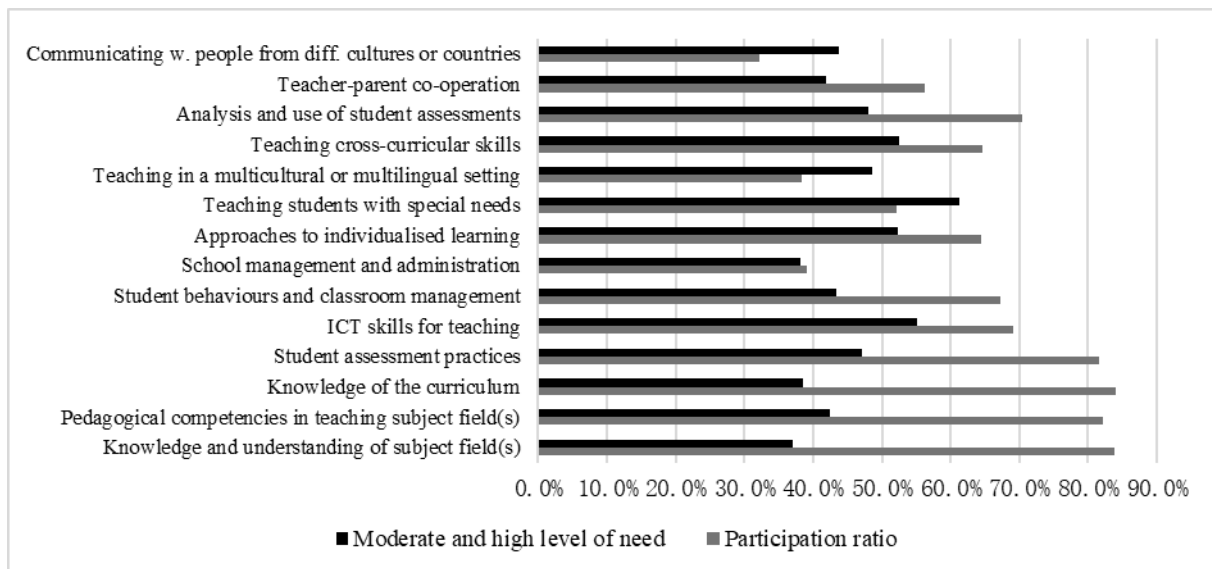
Figure 3. Inclusive Education Teachers' Demands and Preparedness in Professional Development Content

3.2.2 Characteristics of Advanced Age-Medium Inclusive Literacy Teachers

3.2.2.1 Aging of Teachers

The proportion of teachers older than 60 years in this group is 10.1%, and "50~59 years of age" is as high as 27.8%, which means that there is an aging of the teaching staff. Specifically, among the countries in the advanced age-medium inclusive literacy teachers group, 33.1% of teachers in Estonia are 50~59 years old, and 22.0% are over 60; 36.6% of teachers in Bulgaria are 50~59 years old, and 15.6% are over 60 years old. It means that one-half of the general school teachers in Estonia and Bulgaria must be renewed in the next decade or so. In Sweden, there are 25.7% of teachers aged 50~59 and 10.2% over 60, which means that in the next approximately ten years, Sweden will need to renew one-third of its general school teachers. Many OECD countries, like Japan, Sweden, and Italy, have taken measures to extend the retirement age in response to the social problems and pressure on public finances brought about by an aging population. As of 2014, the average level of statutory retirement age in OECD countries is 64.62 for men and 63.88 for women, 70% of member countries have realized the exact age of retirement for men and women, and in the future, the retirement age is even expected to reach 67 years old by 2050 (Tu, 2017). The extension of the retirement age has implications for the continuing professional development of teachers. Senior teachers have a

specific age base and often have advantages over younger teachers regarding knowledge, skills, experience, and exposure (Huang, 2019). At the same time, their physical fitness and learning ability deteriorate with age, resulting in weaker adaptability to the times (Wu & Zhang, 2021), which in turn leads to a lack of inclusive literacy preparedness, failing to meet the diversified learning needs of students with special needs, and affecting the quality of teaching.

3.2.2.2 Pre-Service Education is Incomprehensive

Advanced age-medium inclusive literacy teachers had moderate levels of participation in pre-service education. More than 90% of teachers participated in content knowledge, teaching competencies, teaching practices, and general pedagogy in some or all subjects during pre-service education. In contrast, participation in the remaining six pre-service education components was low, with the lowest participation rate of 29.7% in the "teaching in multicultural or multilingual settings." The importance of pre-service teacher education is emphasized in the Estonian Teachers' Standards adapted in 2013, which require teachers to have the ability to create learning environments, support learning and development, reflection, professional self-development, and mentoring, but do not list the specific subject matter of pre-service teacher education (Yu & Liu, 2022). This may result in varying levels of pre-service education between schools and less

comprehensive preparedness of teachers due to school leaders' biased understanding of the policy. The researchers state that the Estonian teacher standards have substantially impacted pre-service teacher education. However, their intended use level has yet to be achieved in schools' pre-planned goals (Pedaste et al., 2019). Specifically, Estonian teachers of inclusive education have a low participation in "teaching in conditions of different student abilities" (52.5%), "teaching in multicultural or multilingual settings" (28.6%), and "use of ICT" (56.6%). With the deepening development of inclusive education and the increasing frequency of global economic and cultural exchanges, schools and relevant education departments can only develop more reasonable pre-service education programs by grasping the times' requirements and understanding the reality's needs. Teachers, too, can only meet the diverse learning needs of their students and master the educational technologies if they continue to participate in professional development and upgrade their abilities.

3.2.2.3 The Need for Professional Development in ICT Teaching is Most Pressing

Advanced age-medium inclusive literacy teachers had the highest need for ICT teaching at 62.9%. 72.1%, 70.7%, and 66.1% of teachers in Georgia, Norway, and Portugal reported a medium or higher level of need on ICT teaching. China's Core Competencies for Student Development, published in 2016, lists character and critical competencies that students should possess, and having "information awareness" is one of the developmental requirements for students. Lack of mastery of ICT can hurt disadvantaged groups in terms of knowledge gap and impact on daily life (Soomro et al., 2020). In Shanghai, 72.6% of teachers reported a moderate or higher need on ICT teaching. Previous studies have found that teachers in Shanghai have a good understanding and preparedness for ICT teaching, while they are below the OECD average in application, and there needs to be more connection between theory and practice (Liang, 2020). Aging is one of the reasons for the urgent need for professional development activities in ICT teaching. Senior teachers need help adapting to the new technological needs due to their disadvantages in physical fitness and learning ability. They often need more professional development support.

3.2.3 Characteristics of Highly Educated-Low Inclusive Literacy Teachers

3.2.3.1 Teachers are Highly Educated

The percentage of highly educated-low inclusive literacy teachers with master's degrees and doctoral degrees was 76.2% and 3.5%, respectively, the highest of the three categories. Except for Spain, for which no data is publicly available, the countries in descending order of the percentage of teachers with a master's degree are the Czech Republic (91.4%), Slovenia (68.7%), and France (66.4%). In France, the reform of the master's degree in teacher education began as early as 2008, requiring a master's degree as the academic threshold for participation in teacher qualification exams. Moreover, in Spain, its education law also stipulates that the academic requirement for secondary school teachers is a five-year undergraduate degree (master's degree). Zakharov suggests that well-educated teachers accumulate mainly subject knowledge and research skills during their schooling, but less experience regarding teaching practice (Zakharov, Tsheko & Carnoy, 2016). On the other hand, teachers with lower qualifications enter the workplace after graduating from university. Compared with teachers with higher qualifications, those with lower qualifications come into contact with students earlier and accumulate more experience in teaching. As a result, teachers with higher degrees perceive less inclusive literacy preparedness in their teaching practice than those with lower degrees. At the same time, the higher the educational level of teachers also means that teachers have a higher level of knowledge reserve, which is conducive to the professionalization and high quality in education, and the building of high-quality teaching staff.

3.2.3.2 Low Level of Pre-Service Education

The rate of pre-service education participation of the highly educated-low inclusive literacy teachers is at the lowest level of the three typologies. For countries of the same group, Spain's Education Law of 2006 sets out the objectives for the professional development of teachers in pre-service education, ranging from subject matter knowledge, skills of evaluating students and the conduct of educational research. Spain also grants university education autonomy to develop pre-service education curricula according to the conditions and

characteristics of the respective schools (Huang & Pan, 2012). However, the Spanish data from TALIS 2018 show that, except "some or all of the content of subject knowledge," which has a participation rate of 90.8%, the rest of content has the lowest rate of the three types of pre-service education. This suggests that the pre-service education provided to teachers may not meet the policy requirements and that the teacher education curricula in schools may have yet to achieve the objectives of personnel cultivation expected by the policy. The educational autonomy of schools may bring uneven levels of teacher preparedness.

3.2.3.3 Imbalance Between Supply and Demand for Professional Development Activities

Among the professional contents above medium demand for teachers in the highly educated-low inclusive literacy teachers group, the top three subject contents are inclusive education (69.8%), ICT teaching (57.9%), and personalized learning styles (55.2%), with their rates of 43.3%, 57.7%, and 41.6% respectively. Except for professional subject content such as subject curriculum knowledge and competence and student assessment, for which participation is higher than demand, i.e., the supply surpasses the demand, the rest shows in limited availability. Specifically, teacher professional development activities in France are conducted concurrently with national education reforms or important academic priorities and do not capture the professional development needs of teachers (Régis Malet, 2020). Consequently, the professional development of general school teachers in France does not align with the current demand, even leading to a lack of inclusive literacy preparedness of teaching and practicing in inclusive settings.

4. Research Implications

This study argues that the different types of inclusive literacy preparedness of general schools teachers internationally are shaped primarily by the education they receive. Inclusive education teachers with more pre-service education, comprehensive and diversified course and continuous professional development opportunities, tend to be more professionally prepared in inclusive settings and better able to meet the diverse learning needs of their students. Relevant school staff should investigate and understand the professional development needs of in-service teachers as a

basis for offering continuous professional development courses to avoid an imbalance between supply and demand for professional development activities. In addition, the national education departments need to accelerate the integration of teacher education and realize the mutual complementarity and integration between pre-service education, induction training, and in-service training for teachers in order to improve the level of inclusive literacy preparedness and the quality of teaching and learning.

In pre-service education, the national education departments should widely offer general courses on inclusive education in teacher training programs and continue to improve and upgrade them during implementation. Teacher training programs that have already offered general education courses on inclusive education should also continue to improve the quality of their courses to increase the knowledge of teachers. At the same time, more courses on skills and practical exercises related to inclusive education should be organized, and appropriate problematic situations should be created for teachers of inclusive education, or they should be placed directly in real problematic situations so that the knowledge they have learned can be practically applied to real life and solve real problems. In addition, the relevant education departments should also improve the assessment mechanisms and standards for knowledge and skills corresponding to the general education courses on inclusive education so that each normal university student can effectively master the knowledge and skills related to inclusive education.

Several limitations in this study should be considered. First, this study classified the inclusive literacy preparedness of OECD countries (regions) into three types by hierarchical cluster method. It summarized the characteristics of each type, but the inclusive literacy preparedness of general school teachers in each country is heterogeneous, and an in-depth exploration of specific countries (regions) is needed to understand the inclusive literacy preparedness of specific countries (regions). Second, the TALIS 2018 questionnaire uses a self-reported format to collect data on teachers' perceived inclusive literacy preparedness, which is susceptible to individual subjective thought, the tendency of society's

public opinion toward teachers, and the country's macro-environment, which responds to societal expectations (van de Vijver & He, 2014). This has a detrimental effect on reflecting the actual state of inclusive literacy preparedness of general school teachers and further introduces some bias to the accuracy of the findings of this study. Furthermore, although this study compares the level of inclusive literacy preparedness of general school teachers globally, it needs to explore further the factors that may influence it. Finally, there are many factors influencing the level of inclusive literacy preparedness, and multiple indicators should be used to assess them. The PISA database can be linked to assess the quality of teachers in conjunction with students' academic performance and to further analyze the characteristics of general school teachers' inclusive literacy preparedness. It can also explore the potential mechanisms affecting students by their characteristics of inclusive literacy preparedness.

Fund Project

References

Boyd, D.J., Grossman, P., Lankford, H., Loeb, S., & Wyckoff, J.H. (2008). Teacher Preparedness and Student Achievement. *Educational Evaluation and Policy Analysis, 31,* 416-440.

Chen, Y. C. (2017). Comparison of Preservice Teacher Education Between Finland and Canada. *Journal of Heilongjiang University of Technology (Comprehensive Edition), 17*(12), 4-8. DOI: 10.16792/j.cnki.1672-6758.2017.12.002.

Elisa, M., Kuok, A. C. H., Correia, A. M., Chris, F., & Vitor, T. (2018). Perceived efficacy of teachers in Macao and their alacrity to engage with inclusive education. *International Journal of Inclusive Education,* 1-16.

Fan, W. J., Zhang, W. X. & Wang, Y. (2021). A Study on the Elements of Policy Implementation and Its Counter Measures in Preservice Teachers' Inclusive Literacy Training. *Chinese Journal of Special Education,* (12), 16-20.

Fan, W. Y. & Fang, Z. Y. (2017). What makes Singapore's high standard teachers? *Shanghai Education,* (08), 30-33.

Gao, Y. & Xu, J. J. (2019). Narrow the Professional Gap for Beginning Teacher-Based on the Data Results and Implications of TALIS 2018 Survey. *Primary & Secondary Schooling Abroad,* (12), 61-68+10.

General Office of the State Council. (2022, January 25). Notice on Forwarding the "Fourteenth Five-Year Plan" Action Plan for the Development and Promotion of Special Education by the Ministry of Education and other departments [GuoChangfa (2021) No. 60]. http://www.moe.gov.cn/jyb_xxgk/moe_1777/moe_1778/202201/t20220125_596312.html.

He, J. L. (2020). Research on the Goal and Curriculum of Teacher Education Integration Under the Background of Educational Modernization. *Journal of Shaanxi Normal University (Philosophy and Social Sciences Edition), 49*(03), 149-160. DOI: 10.15983/j.cnki.sxss.2020.0544.

Holzberger, D., A. Philipp and M. Kunter. (2013). "How teachers' self-efficacy is related to instructional quality: A longitudinal analysis". *Journal of Educational Psychology, 105/3,* pp. 774-786, http://dx.doi.org/10.1037/a0032198.

Huang, J. X. (2019). The characteristics and enlightenment of the age structure of American and Japanese university teachers. *Education Modernization, 6*(09), 58-61. DOI:10.16541/j.cnki.2095-8420.2019.09.017.

Huang, Z. C. & Pan, J. P. (2012). The Characteristics of Teacher Education Standards in Spain. *Journal of Schooling Studies, 9*(02), 11-17.

Kortering, L. J., McClannon, T. W., & Braziel, P. M. (2008). Universal Design for Learning: A Look at What Algebra and Biology Students With and Without High Incidence Conditions Are Saying. *Remedial and Special Education, 29*(6), 352-363. https://doi.org/10.1177/0741932507314020.

Li, S. B. (2022). Teacher Education in Singapore: Model Reform and Innovation. *Journal of South China Normal University (Social Science Edition),* (03), 88-98+206-207.

Liang, X. (2020). Influencing Factors and Promotion of Teachers' ICT Application: Evidences from Shanghai's TALlS 2018 Data.

Open Education Research, 26(01), 50-59. DOI: 10.13966/j.cnki.kfjyyj.2020.01.006.

OECD. (2018). Organisation for Economic Co-operation and Development (OECD)Teaching and Learning International Survey (TALIS) 2018 Teacher Questionnaire. https://www.oecd.org/education/school/TALIS-2018-MS-Teacher-Questionnaire-ENG.pdf.

OECD. (2019). TALIS 2018 Results (Volume I): Teachers and School Leaders as Lifelong Learners. TALIS. Paris: OECD Publishing. https://www.oecd-ilibrary.org/sites/1d0bc92a-en/1/2/4/index.html?itemId=/content/publication/1d0bc92a-en&_csp_=1418ec5a16ddb9919c5bc207486a271c&itemIGO=oecd&itemContentType=book.

OECD. (2020, March 18). TALIS 2018 Technical Report. https://www.oecd.org/education/talis/TALIS_2018_Technical_Report.pdf.

Pedaste, M., Leijen, Ä., Poom-Valickis, K., & Eisenschmidt, E. (2019). Teacher professional standards to support teacher quality and learning in Estonia. *European Journal of Education.*

Ravet, J. (2018). 'But how do I teach them?': Autism & Initial Teacher Education (ITE). *International Journal of Inclusive Education, 22*(7), 714-733. https://doi.org/10.1080/13603116.2017.1412505.

Régis Malet. (2020). From In-Service Education to Teachers' Continuous Professional Development. The French Case in the Light of International Comparisons. *Journal of Comparative Education*, (06). 3-14.

Soomro, K.A., Kale, U., Curtis, R. et al. (2020). Digital divide among higher education faculty. *Int J Educ Technol High Educ*, (21), 17. https://doi.org/10.1186/s41239-020-00191-5.

The Secretary of State for Education and Employment of United Kingdom. (1997, October). Excellence for all children Department for Education and Employment Meeting Special Educational Needs. http://www.educationengland.org.uk/documents/pdfs/1997-green-paper.pdf.

Tu, Q. X. (2017). Policy Study of OECD Countries Extending Mandatory Retirement Age. Central China Normal University.

van de Vijver, F. J. R., & He, J. (2014). *Report on social desirability, midpoint and extreme responding in TALIS 2013*. OECD Publishing. https://doi.org/10.1787/5jxswcfwt76h-en.

Wang, J. K., Liu, J. & Chang, J. S. (2022). Status and Problems of Professional Development of Teachers in the International Perspective and Its Enlightenment to China-Based on the Report and Data of TALIS 2018. *China Adult Education*, (07), 39-47.

Wang, S., Bao, H. Y., & Liu, Y. X. (2017). Strategies and Models of Primary and Secondary School Teachers Professional Development in Singapore. *International and Comparative Education, 39*(02), 87-92.

Wu, W. & Zhang, J. J. (2021). The Challenges and Responses of Higher Education in Countries with Aging Population in the Intelligent Age: Taking Japan as an Example. *University Education Science*, (02), 99-108.

Xin, T. (1996). Personal teaching efficacy: Its structure and determinants. *Chinese Journal of Applied Psychology,* (2), 7.

Ye, J. (2005). Cultivating High Quality Instructors in the Process of Improving the Primary School Teacher's Academic Credentials. East China Normal University.

Yu, S. & Liu, J. H. (2022). Value Evolution, Structure, and Features of Estonia Initial Teacher Education Curriculum Construction-Taking University of Tartu as an Example. *Journal of Hebei University (Philosophy and Social Science), 47*(04), 137-146.

Zakharov, A., Tsheko, G.N., & Carnoy, M. (2016). Do "better" teachers and classroom resources improve student achievement? A causal comparative approach in Kenya, South Africa, and Swaziland. *International Journal of Educational Development, 50*, 108-124.

Zhang, W. K., Xiong, J. W. & Lin, T. L. (2019). New Era and New Normal: Background, Ideas and Measures. *Higher Education Exploration*, (01), 32-36+110.

Zhou, N. & Liu X. (2022). Exploring the Profiles of Teachers' Instructional Quality and the Relationship with Self-efficacy and Job Satisfaction at middle Schools-insights from theTALIS2018 Shanghai. *Journal of Shanghai Educational Research*, (01), 55-59+88. DOI: 10.16194/j.cnki.31-1059/g4.2022.01.010.