



Challenges in the Professional Development of Teachers Teaching Out-of-field in Chinese Elementary Schools under the Background of “Structural Teacher Shortage”

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Abstract. In recent years, there have been numerous cases of out-of-field teaching in China due to the problem of “structural teacher shortage” in many primary schools, which poses challenges to the professional development of such teachers. This study aims to investigate the specific difficulties encountered in the professional development of teachers in this category. After conducting a case study in a primary school in Chongqing, China, the author found that the professional development challenges for teachers instructing out-of-field teaching are diverse and contingent upon individual emotions, mindsets, and personalities. Three main scenarios emerged: Firstly, some teachers, possessing open personalities and maintaining a positive emotional and mental outlook, handle the situation competently without facing significant professional development hurdles. Secondly, certain teachers struggle due to the extensive interdisciplinary nature of the subjects or their relatively conservative personalities, leading to a negative and resistant attitude toward this arrangement, and thus they are unable to cope with the teaching responsibilities, encountering substantial professional development challenges. Thirdly, some teachers approach this arrangement with moderate resistance and optimism, managing to fulfill interdisciplinary teaching duties adequately, and their professional development issues are not solely attributed to out-of-field teaching but rather reflect broader challenges within the subject itself.

Keywords: Structural Teacher Shortage (STS), Out-of-Field (OOF), Out-of-Field Teaching (OOF), Professional Development (PD), Challenges.

1 Introduction

During the 1980s and 1990s, and for a significant period thereafter, Chinese basic education was predominantly centered around cultural subjects such as Chinese and mathematics. Consequently, many primary schools across the country allocated their limited teaching resources to these disciplines. In recent years, however, the educational authorities in China have increasingly emphasized the importance of fostering comprehensive abilities in primary school students through a holistic approach known as “Balanced development” as many other nations. This shift has led to multiple rounds of

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curriculum reforms highlighting the significance of subjects beyond the traditional core, including physical education, science, art, and music, etc., resulting in an increased allocation of teaching hours to these disciplines. As a consequence of these reforms, there has been a redundancy of teachers in certain subjects, while others face a shortage, creating a situation known as “structural teacher shortage”. Additionally, in China, though teachers in public schools do not hold civil servant status, the management model for teachers closely resembles that of national civil servants, so they have a similar status as “tenured faculty” and cannot be dismissed by educational authorities or schools unless they voluntarily resign or violate significant rules before retirement. As a result, this “only in, not out” dynamic further exacerbates the issue of the “structural teacher shortage”.

To address these challenges, educational authorities and schools have implemented corresponding measures by assigning teachers from certain subjects to teach disciplines outside their expertise, leading to the phenomenon called “out-of-field teaching”. However, in terms of teachers’ training, the national approach to cultivating primary school teachers has transitioned from the “generalist teacher” training model of the 1980s and 1990s to a more specialized model where teachers receive education primarily related to their chosen specialization during the normal education phase, with limited exposure to other subjects. Consequently, some teachers may find themselves ill-equipped to handle the teaching responsibilities in other subjects.

In light of these circumstances, this study addresses the central question: under the backdrop of “structural teacher shortage” in primary schools, where teachers are compelled to teach subjects outside their expertise, do they encounter difficulties and other challenges in adapting? This paper, based on interviews with such teachers at J Primary School in Chongqing, conducts an analysis and discussion to raise awareness among society, educational authorities, and schools as well as to draw attention to the teaching realities and professional development concerns of these teachers, providing recommendations and support to help them navigate and clarify the direction of their professional development.

2 Literature Review

The practice of out-of-field teaching is an international concern which includes countries such as Australia, Philippines and US [1][2][3][4][5]. Through a review and analysis of international literature, the author identified existing discussions on the challenges such teachers faced in certain subjects [6][7]. Additionally, some literature focuses more on the issues of whether such teachers are professionally competent enough and able to solve problems, etc., during the process of teaching new subjects [8][9].

In China, the phenomenon of “OOFT” has persisted for a considerable period, and there are many studies on it in many Chinese academic literatures. However, through reading the existing literature, the author found that their discussions predominantly revolved around the causes and classifications of teachers instructing OOFT. These works analyzed and discussed the PD challenges these teachers faced from both internal and external perspectives, proposing corresponding strategies for PD. Scholars such as

Fan Zhang pointed out that teachers instructing OOFT are those whose pre-service education at university cannot directly support the knowledge required for the subjects they are assigned to teach, and becoming such teachers is either due to assignment or personal willingness [10][11]. In terms of research focus, domestic research is more concerned about teachers in rural areas and about the construction of teacher workforce, ect. Reviewing the research methods, empirical studies are commonly employed, presenting “OOFT” as a prevalent phenomenon in primary and secondary schools, as seen in studies by Lina Zhang, and Baowei Hao [12][13].

Existing studies mostly describe “OOFT” and “teachers instructing OOFT” as phenomena supporting viewpoints on teacher workforce construction and structure. However, research on the deeper developmental challenges such teachers faced is lacking. Moreover, there is limited societal attention and shallow research, mainly focusing on the numerical inadequacy of teachers in this category.

Based on the summary of existing literature, this study defines “Teachers instructing OOFT” as a category of educators who, within the context of “STS”, are assigned by the school to teach subjects inconsistent with their professional training received during pre-service education. In that such teachers are not familiar with the subject they are teaching, they can even have no idea how to teach it if there is a large span of specialization between different subjects. Therefore, in order to smoothly fulfill teaching responsibilities, they need to invest a considerable amount of time in adaptation and adjustment, which can significantly impact their professional growth and development.

Therefore, this study aims to understand the educational practices of such teachers through interviews, identifying the challenges they face in their professional development and providing recommendations and assistance for their growth.

3 Methodology

3.1 Research Method

This study employs a qualitative case study approach, selecting J Primary School in Chongqing, China, as the research site. This choice is motivated by the presence of numerous teachers at the school engaged in OOFT. The author conducted offline semi-structured interviews with teachers who are representative of this situation, designing interview outlines based on the research questions and corresponding objectives.

The interviews primarily covered two aspects: firstly, the background of teachers instructing OOFT is investigated, focusing on their professional backgrounds, reasons for the transition, and teaching experiences. Secondly, an inquiry is conducted into the challenges faced by teachers instructing OOFT after their transition, including the duration of the transition, current developments, and the professional development issues they encounter.

3.2 Selection of Research Subjects

Teachers instructing OOF are those teaching subjects not aligned with their own academic background and expertise, which implies that their teaching process is inherently

a challenging one involving simultaneous learning and teaching. Therefore, during the sample selection process, factors such as educational stage, interdisciplinary scope, teacher tenure, and transition situations were thoroughly considered to ensure the diversity of interview subjects. Ultimately, five teachers were selected as the focal points for in-depth interviews and analytical research. Their specific details are outlined in Table 1 below:

Table 1. Analysis of Interviewee Information

Interviewee	Teacher Yang	Teacher Fang	Teacher Jiao	Teacher Dai	Teacher Zhang
Gender	Female	Female	Male	Female	Male
Years of Teaching	17 years	11 years	10 years	8 years	29 years
Reasons for “OOFT”	Substitute for a full-time science teacher on maternity leave		Shortage of science teachers, thus taught science for several years	School lacked a science teacher	School lacked a generalist teacher, so taught various subjects based on school needs
“OOFT” Experience	Currently teaches 16 music classes and 2 science classes per week	Currently teaches 14 music classes and 4 science classes per week	Previously taught Chinese for 4 years, then science for 5 years, and briefly physical education. Now back to teaching Chinese	Previously taught art for 6.5 years, then science for 1.5 years, currently exclusively teaching science	With rich teaching experience in subjects like Chinese, mathematics, science, and physical education

Based on the responses of these five interviewees, the study utilizes thematic analysis to reflect, analyze, and research the challenges concerning teachers instructing OOFT and provides answers to these issues.

4 Research Findings

This study conducted interviews with five teachers, and after analyzing and organizing the interview results, several key findings emerged:

4.1 “Self-Perceived Competence” of Teachers Instructing OOFT Determines Their Emotions, Mindsets, and Teaching Competence

The self-perceived competence of teachers instructing OOFT influences their emotions, mindsets, teaching competence, and professional development momentum. For

example, Teacher Yang, originally a music teacher, feels inadequately equipped with the necessary knowledge and skills for science teaching. Consequently, she cannot accept this assignment, leading to a negative emotional response and strong resistance to teaching the subject. Her behavior manifests as avoidance or intentional underperformance and she has even repeatedly communicated her inability to handle science teaching to school leadership, requesting them not to assign her science classes any more, stating that teaching it would be misleading students. However, Teacher Fang's "self-perceived competence" is generally moderate, so she adopts a mindset of acceptance, believing that the task of "OOFT" is not entirely impossible. In terms of behavior, she chooses to seek guidance from other specialized science teachers on how to teach science effectively. In addition, she diligently prepares for classes, encourages students to actively engage in scientific experiments during lessons, and strives to enhance students' practical and hands-on abilities in science. For both of these two teachers, they are currently making efforts to adapt and endure the challenges, and they just hope to complete the teaching of the new subjects smoothly. However, their motivation for professional development is notably insufficient.

In contrast, Teacher Jiao possesses a strong "self-perceived competence" and even has a role identity for teaching a new subject (science). His positive attitude stems from the belief that he is fully competent in the new subject. Unlike teachers Yang and Fang, his focus is not on the cognitive abilities required to teach the new subject but on considering issues from the perspective of professional science teachers instructing outside their major: How can science classes be taught effectively? How can students be engaged in science classes? How can overall teaching effectiveness in the science subject be enhanced? In his actions, Teacher Jiao makes a concerted effort to teach science well, emphasizing the cultivation of students' overall scientific literacy. Consequently, he demonstrates a high level of professional development momentum.

4.2 The Magnitude of the Interdisciplinary Span in "OOFT" Significantly Influences the "Self-Perceived Competence" of Such Teachers

In other words, if the subject span is small, the teaching process becomes easier, and teachers are more receptive to such assignments. As mentioned by Teacher Fang, she suggests that the school's administration should consider assigning subjects with smaller spans when scheduling classes. For instance, as a music teacher, if she is assigned subjects like fine arts or music appreciation with a smaller discipline span, she would readily accept such an arrangement. Conversely, if the subject span is substantial, teaching becomes challenging, and teachers may even develop extreme aversion. For example, assigning a music teacher to teach science or Chinese and mathematics classes presents significant difficulties, as they lack the necessary expertise in these subjects, making effective teaching challenging. Teacher Fang, now transitioning from music to science, perceives the difficulty of the new subject. She also recalls an incident when, early in her career, the school principal assigned her to teach Chinese, which she found extremely challenging. After expressing her difficulties to the school leadership, they suggested she observe and learn experienced Chinese language teachers and replicate their lessons. Despite following this advice, she still found the task challenging

and felt incompetent, and as a result, a few weeks later, the leadership had no choice but to relieve her of the Chinese teaching duties and assign her to teach only music. In this role, she felt much more at ease, and her “self-perceived competence” returned. Similarly, Teacher Yang, being a music teacher assigned to teach science, experiences a significant subject span, leading to strong resistance and even extreme aversion to teaching the new subject.

4.3 OOFT may not always lead to negative outcomes

The Development Challenges that Teachers Instructing OOFT Faced Are Not Necessarily Caused by the Change of Subjects. Before conducting interviews, the author anticipated that teachers instructing OOFT would encounter numerous difficulties in their professional development. Comparing these teachers with those who have formal training in education, an unequal competition was expected, leading to significant differences in their performance in the educational process. However, during the interviews, the findings did not entirely align with the initial assumptions. When these teachers were asked whether this arrangement caused their current challenges, the situations broadly fell into two categories:

The first category of teachers aligns with our initial assumptions. For example, both Teacher Yang and Teacher Fang acknowledged that the OOFT system and school arrangements placed them in situations where they felt insufficient in terms of professional knowledge and ability in the new subject. Consequently, their overall emotions and mindsets toward this arrangement were characterized by resistance, negativity, and a lack of confidence. Their “self-perceived competence” was severely lacking, but this is not because their objective abilities were inadequate.

However, the second category of teachers exhibited significant differences from our expectations. For instance, upon analyzing Teacher Jiao’s responses, it was evident that he did not experience emotional, attitudinal, or other non-cognitive obstacles. He did not perceive any inadequacy in his professional knowledge or abilities. Fundamentally, the challenges he faced were not a direct result of the OOFT system but rather general and common problems associated with the subjects he was assigned to teach in the context of the “STS”.

The author has deeply reflected on the reasons for the emergence of this phenomenon: at primary school level, the knowledge that students learn is relatively shallow and simple, so objectively speaking, the professional competence challenge posed to teachers by the arrangement of OOF is not particularly large, and the size of this challenge depends mainly on the strength of the teacher's “self-perceived competence”.

“OOFT” in New Subjects Does Not Only Bring Problems but Also Benefits Some Teachers. In other words, some teachers instructing OOFT unexpectedly gain many benefits from teaching in new subjects. For instance, Teacher Dai who has an open personality is willing to learn many new things, and maintains an optimistic and positive mindset. During the interview, she expressed a genuine interest in scientific knowledge despite her background in the humanities, and learning scientific knowledge broadens her knowledge base, enhances her overall qualities, and enables her to teach

her own child. Additionally, she prefers the organization of teaching work in science classes.

5 Conclusions

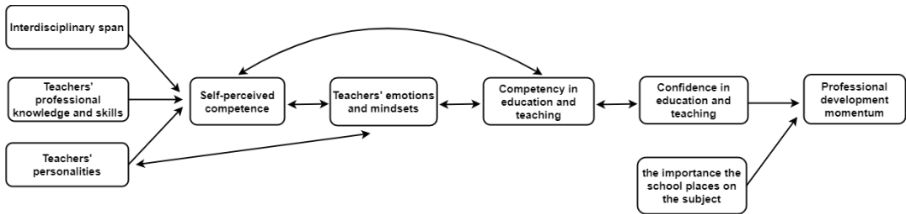


Fig. 1. Factors influencing teachers' professional development

Through interview research and analysis, the logical relationships presented in Figure 1 are summarized. It is evident that, in the primary school stage, the arrangement of "OOFT" is not as unreasonable and challenging as initially perceived. The difficulties brought about by this arrangement vary among teachers, with the dividing line lying in their individual emotions, mindsets, and personalities towards this arrangement. Broadly, these teachers can be categorized into three types:

(1) Some teachers can successfully handle "OOFT" work without encountering professional development challenges or issues. These teachers have open personalities and believe that the interdisciplinary teaching required in the primary school stage does not demand high levels of professional knowledge and skills. Therefore, they possess a strong "self-perceived competence," maintaining positive attitudes and emotions towards teaching in the new subject. In addition, their confidence in educational teaching is high, resulting in better educational teaching competence and stronger momentum for professional development.

(2) Some teachers cannot handle "OOFT" work effectively, facing significant professional development challenges, and this can be attributed to two main reasons: Firstly, some teachers have faced with an excessively large interdisciplinary span, lacking the corresponding professional knowledge and skills. Secondly, some teachers subjectively resist this arrangement, demonstrating a negative attitude towards new subject teaching. This significantly impacts their "self-perceived competence," subsequently affecting their confidence in educational teaching. As a result, these teachers may simply choose to avoid or perfunctorily cope with their work in terms of their behavior. For teachers facing such challenges, the following suggestions are recommended:

Firstly, pay attention to teachers' subjective willingness for teaching reassignment. If teachers exhibit a highly negative and resistant attitude, forcing them to teach a new subject is not advisable. Otherwise, this may lead to various problems that external knowledge and skill training cannot resolve. In such cases, schools should consider addressing and overcoming their non-cognitive issues, such as their overall mindset, emotions, and self-confidence.

Secondly, school leaders should try to arrange teachers to teach subjects that are similar or related because it is easier for teachers and enhances their “self-perceived competence.” Additionally, providing relevant training and guidance in professional knowledge and skills can help these teachers establish confidence in new subject teaching, facilitating their adaptation to related educational and teaching tasks.

(3) Some teachers are neither overly optimistic nor resistant to the “OOFT” arrangement. Through the analysis of dissatisfactions among this group, it becomes evident that their issues do not result from this arrangement but rather stem from general problems the new subject itself faced. In this situation, there is no need to overly worry about them or provide additional support, instead, what needs to be done is to address the general problems the subject faced. By resolving the common issues in the subject, the difficulties these teachers faced, as well as all teachers in this subject, will naturally be alleviated. For instance, some subjects, compared to others, may receive less attention from the education department and schools. Therefore, teachers in these subjects may have relatively fewer opportunities for professional development. However, this is not directly related to the focus of this study; rather, it pertains to issues concerning educational development and policies.

6 Discussion

Most existing literature focuses on the “cognitive” aspects of whether teachers instructing OOFT can competently handle new subjects in their teaching process. However, through interview research, it is discovered that, in the primary school stage, the crucial problems these teachers faced are not rooted in their “cognitive” aspects, i.e., whether they are equipped with sufficient knowledge and skills in the new subject, but the most critical issues originate from their “non-cognitive” aspects, including their personal characteristics, mindsets, and subjective acceptance of the new subject emotionally.

Certainly, this study has limitations, such as being a case study conducted in a specific primary school in Chongqing, China, with a relatively limited sample size. Additionally, the generalizability of the study’s conclusions is somewhat limited and may not be applicable to all schools.

References

1. John Kenny, Linda Hobbs & Robert Whannell (2019): Designing professional development for teachers teaching out-of-field, *Professional Development in Education*, DOI: 10.1080/19415257.2019.1613257.
2. Rebuscas, E. (2022). Experiences of science teachers teaching non-science subjects: A phenomenology study. *International Journal on Studies in Education (IJonSE)*, 4(2), 130-140. <https://doi.org/10.46328/ijonse.73>.
3. Jessica B. Napier, Julie A. Luft & Harleen Singh (2020) In the Classrooms of Newly Hired Secondary Science Teachers: The Consequences of Teaching In-field or Out-of-field, *Journal of Science Teacher Education*, 31:7, 802-820, DOI: 10.1080/1046560X.2020.1800195.

4. Shah L, Jannuzzo C, Hassan T, Gadidov B, Ray HE, Rushton GT (2019) Diagnosing the current state of out-of-field teaching in high school science and mathematics. *PLoS ONE* 14(9): e0223186. <https://doi.org/10.1371/journal.pone.0223186>.
5. Julie A. Luft, Deborah Hanuscin, Linda Hobbs & Günter Törner (2020) Out-of-Field Teaching in Science: An Overlooked Problem, *Journal of Science Teacher Education*, 31:7, 719-724, DOI: 10.1080/1046560X.2020.1814052.
6. John Kenny, Linda Hobbs & Robert Whannell (2020) Designing professional development for teachers teaching out-of-field, *Professional Development in Education*, 46:3, 500-515, DOI: 10.1080/19415257.2019.1613257.
7. Bajar, J. T. F., Bajar, M. A. F., & Alarcon, E. P. (2021). SCHOOL LEARNING ACTION CELL AS A REMEDY TO OUT-OF-FIELD TEACHING: A CASE IN ONE RURAL SCHOOL IN SOUTHERN PHILIPPINES. *International Journal of Educational Management and Innovation*, 2(3), 249–260. <https://doi.org/10.12928/ijemi.v2i3.3667>.
8. Owusu, M., & Mensah, E. (2022). Out-of- Field Teaching: The Bane of Christian Religious Education in Senior High Schools. *Asian Journal of Humanities and Social Studies*, 10(4). <https://doi.org/10.24203/ajhss.v10i4.7032>.
9. Ivan E. Arendain, Marilou Y. Limpot (2022). PHENOMENOLOGICAL APPROACH OF OUT-OF-FIELD TEACHING: CHALLENGES AND OPPORTUNITIES. *EPRA International Journal of Multidisciplinary Research (IJMR) - Peer Reviewed Journal*. 8(1). DOI: <https://doi.org/10.36713/epra9379>.
10. Zhang, F. (2021). A Study on the Professional Development Challenges and Strategies of “Teaching Outside Major” Teachers [Doctoral dissertation, Shandong Normal University]. DOI: 10.27280/d.cnki.gsdnu.2021.001068.
11. Zhao, C. (2013). A Narrative Study on the Professional Identity of “Teaching Outside Major” Teachers in Rural Junior High Schools [Doctoral dissertation, Northeast Normal University]. 2013. DOI: CNKI: CDMD:2.1013.362381.
12. Zhang, L. (2010). An Investigation into the Structure of Science Teacher Teams in Primary and Secondary Schools in Beijing under the Context of the New Curriculum. *Teacher Education Research*, 2010(1): 5. DOI: CNKI: SUN:GDSZ.0.2010-01-012.
13. Hao, B. (2014). Current Situation, Issues, and Reflection on the New Teacher Team in Junior High Schools in Beijing. *Educational Science Research*, 2014(10): 6. DOI: 10.3969/j.issn.1009-718X.2014.10.011.

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