# 9th International Symposium

# of the

# Out-of-field Teaching Across Specialisations (OOFTAS) Collective

# 15-16 August 2022

# Virtual Symposium

OOF-TAS Collective <http://ooftas-collective.org/>

2022 Symposium <https://ooftas-collective.org/2022-symposium>

Welcome

Welcome to the 9th symposium for the OOF-TAS Collective. Due to the COVID-19 pandemic, we are holding a virtual symposium again.

The theme for the symposium is:

***International research and collaboration on the out-of-field teaching phenomenon***

### Online Symposium

This theme highlights the need for research and collaboration across sectors, and state and national borders to understand, theorise and develop solutions to the out-of-field teaching phenomenon. We welcome national and cross-national research and commentary on the policies, the people, and the effects associated with this phenomenon. Post-graduate students and early career researchers are welcome.

**An outcome of this meeting** will be to continue discussion about future collaborative research projects.

Virtual symposium

# Online access

Zoom will be used.

Recordings will be made of the presentations but not the discussions. The powerpoint presentations and/or the zoom recordings can be placed on the OOFTAS website after the presentation, as requested.

Zoom details are as follows:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | [Join Zoom Meeting](https://deakin.zoom.us/j/81721921659?pwd=dlY2cEhLV3UyMzE3cmRXOFk2VjcvZz09&from=addon) | | | One tap mobile: | Australia: [+61370182005,,81721921659#](tel:+61370182005,,81721921659) or [+61731853730,,81721921659#](tel:+61731853730,,81721921659) | | Meeting URL: | <https://deakin.zoom.us/j/81721921659?pwd=dlY2cEhLV3UyMzE3cmRXOFk2VjcvZz09&from=addon> | | Meeting ID: | 817 2192 1659 | | Passcode: | 82188799 | | **Join by Telephone** | | | For higher quality, dial a number based on your current location. | | | Dial: | Australia: +61 3 7018 2005 or +61 7 3185 3730 or +61 8 6119 3900 or +61 8 7150 1149 or +61 2 8015 6011 | | Meeting ID: | 817 2192 1659 | | [International numbers](https://deakin.zoom.us/u/kGxHMCTBt) | | |

# Presentation and session length

Presentation

15 minutes

Discussion

10 minutes

Break

5 minutes

# International Times

Table

Description automatically generated

<https://www.timeanddate.com/worldclock/meeting.html>

## Designated times:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *United States (Austin)* | *Dublin* | *Berlin* | *Israel* | *Melbourne\** |
| 0:00 | 6:00-7:00 | 7:00-8:00 | 8:00-9:00 | **15:00-1600** |
| 1:00-2:00 | 7:00-8:00 | 8:00-9:00 | 9:00:10:00 | **16:00-17:00** |
| 2:00-3:00 | 8:00-9:00 | 9:00:10:00 | 10:00-11:00 | **17:00-18:00** |
| 3:00-4:00 | 9:00:10:00 | 10:00-11:00 | 11:00-12:00 | **18:00-19:00** |
| 4:00-5:00 | 10:00-11:00 | 11:00-12:00 | 12:00-13:00 | **19:00-20:00** |
| 5:00-6:00 | 11:00-12:00 | 12:00-13:00 | 13:00-14:00 | **20:00-21:00** |

**\*Note that the program uses Melbourne times.**

Program

# Monday, August 15

|  |  |
| --- | --- |
| **14:30-14:50** | **Zooming in** |
| **14:50-15:00** | Welcome and introductions |
| 15:00-15:30 | Presentation 1: Linda Hobbs, Susan Caldis, Jared Carpendale, Lucinda McKnight, Coral Campbell & Seamus Delaney *A framework to inform out-of-field teacher expertise: disciplinary ways of knowing, doing and being* |
| 15:30-16:00 | Presentation 2: Jim Van Overschelde & Minda Lopez ***Teaching out-of-field versus Test-based Licensure: Comparing student outcomes*** |
| 16:00-16:30 | Presentation 3: Ming Ho & Ning Bo***Out-of-field teaching phenomenon in China: A national survey in the county-level areas*** |
| **16:30-17:00** | **BREAK** |
| 17:00-17:30 | Presentation 4: Karen Marangio & Elle Heyting *“I may as well be wallpaper”: Multiple In-Field/ Out-Of-Field identities for teachers introducing a new science subject in their school* |
| 17:30-18:00 | Presentation 5: Susan Caldis***Teaching geography beyond subject specialisation in the early-career years: A reflexive approach*** |
| 18:00-18:30 | Presentation 6: Carly Sawatzki & Jill Brown ***Where specialisations intersect: When teaching about finance, "Maybe we should be working together more?"*** |
| **18:30-19.00** | **BREAK** |
| 19:00-19:30 | Presentation 7: Stephen Quirke ***A Performative Lens on the Mathematics-Related Teacher Identities of Out-of-Field Mathematics Teacher-Learners*** |
| 19:30-20:00 | Presentation 8: Margaret Jakovac ***Hey, Miss, are you a real teacher? Australian online media representations of out-of-field teaching of STEM*** |
| 20:00-20:30 | Presentation 9: Teresa Beck ***Insights into the Life Stories of Teachers with an Alternative Approach – Challenges and Professional Biographical Resources*** |

# Tuesday, August 16

|  |  |
| --- | --- |
| **14:30-14.45** | Zooming in |
| 14:45-15:15 | Presentation 10: Harleen Singh *Noticing Scientific Practices in a physical science classroom video: How teaching out-of-field makes a difference* |
| 15.15-15:45 | Presentation 11: John Cripps Clark, Jared Carpendale, Victoria Millar, Merryn Dawborn-Gundlach, Rebecca Cooper***Looking from the inside out: The perception of in-field teachers of out-of-field teaching of Physics in Years 7-10 in Victorian schools*** |
| 15:45-16:15 | Presentation 12: Matt Bower & Coral Campbell ***Addressing the Crisis Undermining Technologies Education – Advancing the capabilities of Out-Of-Field Technologies Teachers through a proposed distributed mentorship model*** |
| **16:15-16:45** | **BREAK** |
| 16:45-17:05 (20 min) | Presentation 13: Russell Tytler, Jill Brown, Peta White, Linda Hobbs, Jo Raphael, Carly Sawatzki, John Cripps Clark, Seamus Delaney, Michael Fitzgerald, Amanda Peters *A design-based research approach to out-of-field teacher professional learning* |
| 17:05-17:25  (20 min) | Presentation 14: Linda Hobbs, Michael Fitzgerald, Peta White, Seamus Delaney, John Cripps Clark, Julianne Lynch, Jo Raphael, Russell Tytler, Carly Sawatzki***Meeting out-of-field teachers’ needs and expectations through re-specialisation courses*** |
| 17:25-18:45 (20 min) | Presentation 15: Carly Sawatzki, Linda Hobbs, Seamus Delaney, Russell Tytler, Jill Brown, John Cripps Clark***Out-of-field teachers crossing boundaries between school and university while gaining a qualification to teach mathematics or science*** |
| 17:45-18:15 | ***Discussion for Presentations 13-15*** |
| **18:15-18:30** | **BREAK** |
| 18:30-19.00 | Presentation 16: Stephen Quirke***An examination of the development of out-of-field mathematics teachers’ professional self-understanding*** |
| 19:00-19:30 | Presentation 17: Raphaela Porsch & Eva Wilden***What motivates English teachers to participate in professional development courses? An empirical investigation of motivational orientations of primary school teachers who differ in their subject-specific qualifications*** |
| 19:30-20:00 | Presentation 18: Niamh O'Meara & Olivia Fitzmaurice***Out-of-field teachers’ content knowledge in the area of fractions: A cause for concern?*** |
| **20:00-21:00** | **SYNTHESIS** |

Abstracts

# Presentation 1

A framework to inform out-of-field teacher expertise: disciplinary ways of knowing, doing and being

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Coral Campbell, Deakin University, coral.campbell@deakin.edu.au  
Seamus Delaney, Deakin University, seamus.delaney@deakin.edu.au

Keywords: Out-of-field, Science, English, Geography, Mathematics, signature pedagogies, teacher knowledge

Learning to teach a subject out-of-field places subject-specific demands on teachers that can challenge their knowledge, practice and identity. As teacher educators/researchers from science, geography, English and mathematics education, we used a collaborative and interdisciplinary research methodology to invite dialogue between disciplinary experts. We use the notions of ‘discipline’ and Shulman’s ‘signature pedagogies’ to interrogate the distinctiveness of a subject and explore what out-of-field teachers need to know (thinking), do (performing) and be (acting and identity). We have generated a draft framework of subject specific expertise that invites dialogue on the relationships between broader disciplinary/subject-related ideas of knowing, doing and being, including: teacher identity; knowledge (curriculum and content); process (how knowledge is generated); connections (between disciplinary knowledge and between the individual and the world); and pedagogical imperatives (that drive teacher practice). These sit within the broader context of education and the disciplines, which are contested and constantly changing, influenced by social, cultural and political forces.

# Presentation 2

Teaching out-of-field versus Test-based Licensure: Comparing student outcomes

Jim Van Overschelde, Texas State University, jv23@txstate.edu   
Minda Lopez, Texas State University, Bo

Keywords: value-added modeling, teaching out-of-field, teaching licensure

The negative impacts on student learning of teaching out-of-field compared in-field have recently been demonstrated in secondary Maths (Van Overschelde, 2022) and secondary English (Van Overschelde & Lopez, 2022) when the assessments are directly linked to the curricula. Some governments permit teachers to obtain additional teaching licenses for new subject areas after completing an initial teacher preparation program. This mechanism of test-based licensure has a potential for reducing the out-of-field teaching rates. The question is, are these teachers as effective as teachers prepared to teach the subject through a teacher preparation program? This study explores differences in student outcomes across millions of students in secondary maths courses by comparing teachers with different types of teaching licenses. We found that students learned significantly more when taught by teachers who hold a test-based license compared to students taught by a teacher teaching out-of-field and unlicensed instructors. Students taught by teachers prepared through a teacher preparation program learned the most of any teacher group examined. The policy implications of these findings are discussed.

# Presentation 3

Out-of-field teaching phenomenon in China: A national survey in the county-level areas

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Ning Bo, Shanghai Normal University, ningbo@tec-unesco.org.cn

Keywords: out of field teaching; county-level areas; survey

The teaching workforce in the county-level primary schools accounts for 80% of all full-time teachers across China. The study measures the prevalence and distribution of out of field teaching in county-level primary schools, which is based on a national survey from 18 provinces and 35 counties in China. Participation rates were 83.5% of the total number of primary teachers (N = 43,441). Results show a widespread practice of out-of-field teaching in all subjects and the problem was even worse in the subjects, such as art, music, and physical exercises. In addition, rural schools have much fewer in-field teachers compared with county schools. The findings address the hidden shortage of qualified teacher in Chinese county-level primary schools and call for actions to ease the problem.

# Presentation 4

“I may as well be wallpaper”: Multiple In-Field/ Out-Of-Field identities for teachers introducing a new science subject in their school

Karen Marangio, Monash University, Karen.Marangio@monash.edu  
Ellen Heyting, Monash University, Ellen.Heyting1@monash.edu

Keywords: out-of-field teaching, psychology curriculum, psychology teachers, science departments, subject identity, teacher identity

This paper explores teachers’ perceptions of enacting a new science subject, psychology, at the senior secondary level in Queensland, Australia, as part of major curriculum reform. Seven teachers (4 IF, 3 OOF) participated in online meetings, one per term, during the inaugural two year period. Three teachers (2 IF, 1 OOF) had experience teaching psychology, four (2 IF & 2 OOF) had experience teaching science, and one (OOF) teaching mathematics. Data were thematically analysed using Hobbs (2013) Boundary Between Field (BBF) Model of OOF Teaching. A binary classification did not capture the complexity of teacher identities these participants experienced, instead, participants moved along multiple teaching IF/OOF continuums as they gained experience and self-awareness. From the onset, all participants were dedicated to teaching psychology, and most felt-like IF psychology teachers. As time progressed, however, feeling-like IF science and mathematics teachers differed. A defining feature was the presence of a culture of support within their school and, more specifically, their science department. This support enabled these teachers to cross the boundaries of psychology, science and mathematics teachers with confidence and agency. Implications for the support required by teachers introducing a new subject are discussed and directions for future research are suggested.

# Presentation 5

Teaching geography beyond subject specialisation in the early-career years: A reflexive approach

Susan Caldis, Macquiarie University, susan.caldis@mq.edu.au

Keywords: Teaching geography beyond subject specialisation in the early-career years: A reflexive approach

Empirical understanding about out-of-field teaching in geography is limited in an Australian secondary education context. However, a recent study showed that a sustained and explicit theory-practice reflection process helped early-career geography teachers manage their experience of teaching out-of-field as they transitioned into the profession. Such a process also enabled a university lecturer to navigate the redesign and focus of a methodology unit in an initial teacher education program. This presentation focuses on out-of-field teaching in geography; it is a project in its early stages. By conceptualising the project around boundary-crossing, reflection and pedagogy, the research aims to develop understanding about how those transitioning into the profession as secondary teachers in New South Wales interpret, respond to and act upon the requirement to teach geography as a subject beyond their specialisation. Data will be generated through a qualitative methodology with a recurring question and ongoing theory-practice reflection activities. Reflexivity theory and professional standards will be used to analyse data. It is hoped that research findings can be used to inform strategy and opportunities within initial teacher education programs and in-service teacher professional learning to support those who will be teaching geography out-of-field.

# Presentation 6

Where specialisations intersect: When teaching about finance, "Maybe we should be working together more?"

Carly Sawatzki, Deakin University, [coral.campbell@deakin.edu.au](mailto:coral.campbell@deakin.edu.au)  
Jill Brown, Deakin University, jill.brown@deakin.edu.au

Keywords: financial capability, financial education, curriculum, economics, mathematics, numeracy

As part of the *Economics + Maths = Financial Capability* project, Dr Carly Sawatzki & Dr Jill Brown drew on Shulman’s (1986) seminal thinking about teachers’ professional knowledge to design a course for secondary teachers. The underpinning assumption was that strengthening teachers’ interdisciplinary knowledge of curriculum, content and concepts, as well as their awareness of emerging financial contexts, would enhance their readiness to develop young people’s financial capability. The teachers Carly & Jill worked with identified as being a “maths person” (or not) as a way of signaling the extent to which they felt in or out-of-field to teach through real world financial tasks with an implicit numeracy demand. An important aspect of the course design was the idea to connect teachers of humanities and mathematics, since they bring distinct but complementary perspectives and knowledge to financial education. In this presentation, Carly and Jill will present snapshots of data collected from education professionals, teachers and students which highlight their reaction to the idea.**Presentation 7**

A Performative Lens on the Mathematics-Related Teacher Identities of Out-of-Field Mathematics Teacher-Learners

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Keywords: Teacher Identity, Professional Development, Mathematics Teacher Certification

There are teachers in secondary schools in Ireland teaching mathematics out-of-field (OOF). To address the issue of OOF mathematics teaching in Ireland, the government introduced a two-year programme, the Professional Diploma in Mathematics for Teaching (PDMT), to provide OOF teachers with mathematics teaching certification.

This study employs mathematics-related teacher identity to investigate the learning of five teacher-learners as they undertook the PDMT. Participants’ narratives, gathered at three time-points, were analysed using sociolinguistics tools and thematic analysis to provide insights on the teacher-learners’ first-person mathematics-related (1st PM-R) teacher identity. Video- and audio-recorded mathematics lessons were analysed using systematic functional linguistics to situate one participant’s discourse on a continuum from univocal to dialogic teaching, providing insights on his third person mathematics-related (3rd PM-R) teacher identity.

The findings demonstrate that the teacher-learners’ 1st PM-R teacher identities are shaped by their experience learning mathematics, colleagues, school management, curriculum, assessments and professional development courses. The analysis of the participant’s 3rd PM-R teacher identity indicated that the PDMT had a minimal impact on his practice; there were some instances of dialogic teaching following the PDMT.

This research brings into focus the influence of mathematics teacher certification criteria on mathematics teacher education programme development and teacher identity.

# Presentation 8

Hey, Miss, are you a real teacher? Australian online media representations of out-of-field teaching of STEM

Margaret Jakovac, Deakin University, [mjakovac@deakin.edu.au](mailto:mjakovac@deakin.edu.au)

Keywords: media representations, out-of-field teaching, teaching quality, STEM

Out-of-field teaching is ‘education’s dirty little secret’, ‘systemic’, yet a complex phenomenon that lacks international agreement on its definition. So, what does the mass media as a ‘powerful influence’ on public discourse offer regarding conceptualisations of this phenomenon? As a hybrid journalist-teacher, I explored a small purposive sample of Australian online media representations of out-of-field teaching in the five years to December 2021. Through a media lens, including Media Representation Theory, the project harnessed a scoping review and Reflexive Thematic Analysis to problematise this education issue as: indicative of the teacher shortage; contributing to teacher overwork; and negatively impacting student learning outcomes through shortcomings in teaching quality and teacher quality. The findings suggest media representations perpetuate an oversimplification of a continuing complex phenomenon. The problematisation also revealed silenced voices of students, parents, success stories about out-of-field STEM teaching, and school leaders’ role in workforce allocation. The implications exacerbate distrust in teachers, erode professionalism, blame shifting them for inadequately preparing students for a STEM future workforce, essential for Australia’s future economic prosperity. This research fills a research gap in the intersection of media representations and out-of-field teaching, drawing on cross-disciplinary theories. Further work could unpack social media representations using data journalism/netnography.

# Presentation 9

Insights into the Life Stories of Teachers with an Alternative Approach – Challenges and Professional Biographical Resources

Teresa Beck, TU Chemnitz, [teresa.beck@zlb.tu-chemnitz.de](mailto:teresa.beck@zlb.tu-chemnitz.de)

Keywords: lateral entry, alternative approach, professionalization, biographical resources, Sociology of Praxeological Knowledge

For some years now, the demand for teachers has risen sharply. As a result, meeting the demand via lateral entry (*Seiteneinstieg*) became unavoidable in most of the Federal States in Germany, especially in the Free State of Saxony. The changing teaching force is accompanied by numerous unanswered questions that research is focusing on. On a micro-sociological and praxeological level, my dissertation attempts to answer the question of how the lateral entrants experienced their entry into the profession in this 'special role', which crises they cope with in their everyday practice and which professional biographical repertoire they fall back on to cope.

In my presentation, I would therefore like to explore the question: What challenges do lateral entrants experience in their career entry and everyday life, and what professional-biographical repertoires do they draw on?

Using the Sociology of Praxeological Knowledge, I would like to outline reconstructions of what these experiences and challenges are and what collective orientations become clear about what they have experienced. Based on narrative-biographical interviews I present first excerpts of my typology and want to give an insight into the life stories of people who have taken alternative paths to the teaching profession.

# Presentation 10

Noticing scientific practices in a physical science classroom video: How teaching out-of-field makes a difference

Harleen Singh, Medaille University, harrleen@gmail.com

Keywords: out-of-field teaching, Physical science, Science and engineering practices, noticing, video

This study explores in-field and out-of-field secondary science teachers’ knowledge of the science and engineering practices (SEPs), and other practices important to science instruction. The framing of this study lies in teacher noticing, which is the process through which teachers manage the ongoing information in the form of sensory data they encounter during instruction. The participants of this study are 29 science teachers from six states in the United States. Data was collected in the form of video-based interviews. Each teacher watched a ten-minute video clip of a middle grades physical science teacher, teaching photovoltaics. Within this video, students used different SEPs. Teachers were asked to let the interviewer know when they saw something important to science teaching. Structural coding was used to code the interviews. Coding included both labeling and indexing of data. Analysis of the data reveals a difference in noticing the SEPs and other science practices based on teachers’ preparation and experiences with teaching physics/physical science. Teachers who taught physical science in-field and watched the physical science video had the maximum instances of noticing SEPs. On the other hand, teachers with neither education background nor experience teaching physics/physical science in-filed or out-of-field did not notice any SEPs.

# Presentation 11

Looking from the inside out: The perception of in-field teachers of out-of-field teaching of Physics in Years 7-10 in Victorian schools

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International and national studies have identified that there are fewer teacher graduates qualified to teach physics, resulting in teachers needing to teach outside their field of expertise. Teachers in these out-of-field positions experience anxiety and low self-efficacy, resulting in didactic teaching strongly informed by assessments. Unfortunately, this may result in learning experiences for Years 7-10 students that can turn them off physics. Research is needed to investigate ways to retain students in post-compulsory physics in secondary schools. This collaborative study sought views from in-field physics teachers about their self-perceived role for supporting physics education in Years 7-10. Out-of-field science teachers were asked about their confidence to teach physics concepts and the support they required. This presentation shares preliminary findings, which indicate physics teachers see the main barrier to post-compulsory physics participation as Year 7-10 teacher quality and that their role is to support curriculum design and their colleague’s knowledge development. The confidence of science teacher participants for teaching physics varied. These teachers required support from in-field physics teachers for ways to manage and teach content. These preliminary findings signal that development of mechanisms to support out-of-field physics teachers could enhance their knowledge to offer Years 7-10 students engaging learning experiences.

# Presentation 12

Addressing the crisis undermining Technologies Education – Advancing the capabilities of out-of-field technologies teachers through a proposed distributed mentorship model

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Keywords: Technologies, out-of-field teachers, online, mentorship

This presentation outlines key challenges faced by Out-Of-Field Technologies Teachers (OOFTTs) and how they can be addressed. Technologies is a critical teaching area that has been identified as crucial for national prosperity and success. Yet schools struggle to find Technologies teachers because of the high workload associated with technologies teaching and the competitive demand from industry for technological capabilities. Technologies teachers often experience burn-out, because their area is more rapidly changing than any other, involves the management of equipment as a part of their load, and often involves solving general technology problems in schools. This leads to an unvirtuous cycle, where untrained teachers teach Technologies, learners receive a suboptimal experience, students opt out of studying Technologies, and there is a shortfall of Technologies experts in the workforce (including Technologies teachers). A model of distributed mentorship and professional learning is proposed to address this problem, involving OOFTTs teaching their classes with the assistance of expert teachers through online technologies, and concurrently undertaking university studies to provide OOFTTs with the conceptual underpinnings and professional learning they need to qualify as Technologies teachers. Directions for future research and development are suggested, including a validation of the distributed mentorship model, a scoping study to better understand the key issues in the Technologies teaching area, and government, industry and higher education institutions all working together in order to address the crisis in Technologies education.

# Presentation 13

A design-based research approach to out-of-field teacher professional learning

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Keywords: Out of field teaching, science teacher learning, mathematics teacher learning, design-based research, teacher professional growth

The Victorian DET has recognised high out-of-field (OOF) incidence as a major policy challenge, committing funds to a Secondary Mathematics and Science Initiative (SMSI) involving 300+ OOF mathematics and science teachers to date undertaking Graduate Certificates in Secondary Mathematics or Science. Funding includes course costs and support for schools for time release to attend intensive workshops. Deakin University researchers are using a design-based research methodology to create a course responsive to teachers’ contexts and needs.

The research explores a potentially powerful model of teacher learning and re-specialisation. At stake is the nature of the learning content and responsiveness to adult learning needs, accommodation of the challenge for teachers returning to tertiary study, and school support for reflective practice. The initiative includes a program of targeted support to teachers faced with ‘return to study’ challenges.

In the presentation we will describe the nature and rationale of the evolving course design that was responsive to teachers’ diverse learning needs across the first year of the project. In the presentation we will focus on: the shaping of the web-based delivery to account for teachers’ learning needs and expectations including challenges due to the COVID pandemic; and the operation and impact of the individualized ‘CIRCLS’ mentoring program.

# Presentation 14

Meeting out-of-field teachers’ needs and expectations through re-specialisation courses

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Carly Sawatzki, Deakin University, carly.sawatzki@deakin.edu.au

Keywords: Teaching out-of-field; Re-specialisation; Secondary Mathematics and Science; Teacher professional learning; Motivations, expectations and outcomes

A common response to the problems associated with out-of-field teaching is to upskill teachers through formal professional development programs or re-specialisation courses. Who engages with these opportunities and why, and what outcomes are there for teachers? This presentation explores why out-of-field teachers engaged with the graduate certificates offered through the state funded Secondary Mathematics and Science Initiative (SMSI).The analysis draws on survey and interview data (early in the initiative and after) to explore why the teachers were teaching out-of-field and how they believed the course would benefit them and/or their teaching. The teacher profile was varied in experience and reasons for teaching out-field, and there was a mixture of extrinsic and intrinsic motivations for undertaking the course. Science teachers wanted professional learning (PL) predominantly in subject related content and contexts, whilst the mathematics teachers wanted PL in a range of teaching related knowledge and practices. The range of outcomes identified by teachers included changes in improved teaching skills, more student-focused instruction, better lesson planning, confidence to influence others’ teaching, and improved conceptual understanding. Post-course data shows that expectations were mostly met, although the varied profile of teachers meant that different needs were or were not met by different aspects of the course.

# Presentation 15

Out-of-field teachers crossing boundaries between school and university while gaining a qualification to teach mathematics or science

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Keywords: teacher education; school context; scholarship of practice; relational work

As part of the Department of Education and Training Victoria’s Secondary Mathematics and Science Initiative, Deakin University has designed Graduate Certificate courses for those assigned to teach mathematics and science out-of-field. In this presentation, we will analyse survey data collected from the 2021 initial cohort at different points in their coursework learning. Setting aside the fact that the teachers completed the qualification wholly online amidst the challenges of COVID-19 lockdowns, we observe an experiential trajectory that points to the important role that the school context plays in creating the necessary conditions for out-of-field teachers’ professional growth. In particular, we found that school leaders and in-field school colleagues, together with curriculum enactment practices, facilitated and/or challenged experimentation with research-informed pedagogies and digital technology. From a design perspective, requiring teachers to experiment as part of their university assessments intended to generate a scholarship of practice amongst the participating teachers and their colleagues while gently influencing school-level change. While entrenched school practices, together with the limitations of teaching through the pandemic, had a mediating effect on this scholarship, our data shows that upskilling out-of-field teachers is not simply a matter of ‘fixing’ individuals, but requires enabling relationships and practices at the school level.

# Presentation 16

An examination of the development of out-of-field mathematics teachers’ professional self-understanding

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Keywords: Commitment, job satisfaction, mathematics, professional self-understanding, self-efficacy

Research has demonstrated that teacher identity matters in mathematics education. This is of heightened concern when we consider those teaching mathematics out-of-field, a phenomenon prevalent at the post-primary level in the Irish context. A national program (PDMT) to upskill out-of-field teachers was established and current research is appraising graduates’ experiences. In this chapter we bring together out-of-field teachers’ knowledge and identities, using Kelchtermans’ (2009) concept of professional self-understanding, which is an essential part of a teacher’s personal interpretive framework and acts as a lens through which teachers view their job, give meaning to it and act in it. We report on aspects of an online, primarily quantitative, survey administered to graduates of the PDMT examining their professional self-understandings on completion of the program. The findings contribute to our understanding of important considerations relating to the development of professional learning programs for upskilling out-of-field mathematics teachers.

# Presentation 17

What motivates English teachers to participate in professional development courses? An empirical investigation of motivational orientations of primary school teachers who differ in their subject-specific qualifications

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Keywords: English as a foreign language, motivations, primary schools, professional development, teaching out-of-field

Studies on the participation of teachers in professional development (PD) courses have repeatedly shown that teachers differ in the number of attended courses and explained this by their motivational orientation (e.g. Richter et al., 2019). However, so far none of the studies considered the aspect of different subject-specific qualifications among primary foreign language teachers. In Germany, an extensive number of primary teachers teach English out-of-field (Porsch & Wilden, 2022). Thus, on the one hand we assume those teachers have a greater need for PD compared to in-field teachers (“compensation hypothesis”). On the other hand, teachers choose their subjects based on profound competencies and interests. According to this idea (Desimone et al., 2009), teachers with a subject-specific qualification would more frequently take part in PD (“interest hypothesis”). The current study focuses on primary EFL (English as a foreign language) teachers from Germany and their motives for taking part in PD. The study surveyed primary teachers (n = 844), who regularly teach EFL but differ in their formal qualifications. Three types of qualifications were identified, i.e. fully trained EFL teachers, teachers who had completed post-qualification courses and teachers who had been trained only in subjects other than English. The study explored potential differences in motives for taking part in PD courses explained by teachers who differ in their subject-specific training. The teachers most frequently stated to attend PD courses due to personal interest and to improve their teaching. A multifactorial analysis of variance points to the significance of taking part in PD depending on the teachers’ qualification: Personal interest and the desire for social contacts are more important for primary school teachers who have studied English than for out-of-field teachers. Implications for the design of further training for teachers with different specialist qualifications as well as research desiderata will form the conclusion of the presentation.

# Presentation 18

Out-of-field teachers’ content knowledge in the area of fractions: A cause for concern?

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Keywords: out-of-field, teacher knowledge, procedural understanding, fractions

In 2011 a study conducted by NíRiordáin and Hannigan found that the incidence of mathematics out-of-field teaching in Ireland was 48%. Furthermore, the data showed that the majority of these teachers are assigned to non-exam classes in the early years of secondary education. Literature shows that the transition from primary to secondary mathematics education is a critical milestone in a student’s journey which requires knowledgeable teachers to facilitate an effective transition. It also highlights that there exists a positive association between teachers’ subject knowledge and student achievement. Hence, the deployment of out-of-field teachers to students in early secondary education is, potentially, a precarious situation. This research seeks to establish the levels of mathematical content knowledge among a group of out-of-field mathematics teachers at the outset of an upskilling programme, in order to ascertain how prepared they are to teach mathematics and to determine the nature of any misconceptions they hold. Participants (n=75) were asked to provide answers to a series of questions (n=4) involving fraction operations (e.g.3/8×1/5). Analysis showed 12% were unable to provide an answer or demonstrated a misconception in the area of addition while the corresponding figures for subtraction, multiplication and division were 5.3%, 20% and 29.3%, respectively.