

Evaluating the level of need for educational psychology services in England

A thesis submitted to the University of Manchester for the degree of Doctor of Educational and Child Psychology in the Faculty of Humanities.

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Timothy R Hooper

School of Environment, Education and Development.

Table of Contents

Abstract	5
Declaration Statement	6
Copyright Statement	6
Acknowledgements	7
Thesis introduction	8
Thesis outline	8
Research commission and the wider project	9
Researcher professional background	10
Positioning for data access	10
Research paradigm	10
References	13
Systematic literature review (Paper One)	14
Abstract	15
Introduction	16
The importance of workforce planning and challenges faced	16
Three types of WFP models	17
Rationale and aims of the current review	18
Method	20
Literature search strategy	20
Figure 1. PRISMA flowchart	21
Table 1 – Descriptive summary of each included paper	22
Research quality analysis	26
Review synthesis	26
Findings	26
Forward calculation models	26
OR models	27
Simulation models	29
Mixed synthesis	31
Table 2 – Components used across the nine WFP models.	32
Discussion	34
Evaluation of findings	34
Application of WFP models	35
Implications for EPS workforce planning	38
Limitations of this review	39
References	39
Empirical research (Paper Two)	43

<i>“What does ‘good’ look like?”: An investigation of primary and secondary school staff views on the level of need for educational psychology services</i>	43
<i>Abstract</i>	44
<i>Introduction</i>	45
Demand for and delivery of educational psychology services	45
EP workforce planning	46
Applications from workforce planning tools in healthcare	47
Aims of the current research	48
<i>Method</i>	49
Study design	49
Table 1 – Summary of data collection and working group meetings	50
Participant site and participant recruitment	50
Data gathering methods	51
Data analysis	53
Ethics	54
<i>Findings</i>	55
Index settings: Descriptive statistics, historical EP sessions purchased and forecasted EP sessions	55
Table 2 - Descriptive statistics: key demographics for the four index schools	56
Table 3 – EP sessions needed based on forecasting template returns from index schools and WG evaluation of EP time required	57
School staff rationale for how they would use forecasted EP sessions	57
Working group analysis of index schools’ forecasted commissioned work: Calculating corresponding EP time costs	58
Workforce planning modelling across the EPS	58
Table 5 – EP sessions for current and projected delivery to all schools in the LA, extrapolated from the four index schools	59
Evaluation of the workforce planning modelling	59
Table 6 – Projected EP sessions for six identified schools compared with WG estimates	59
<i>Discussion</i>	60
Implications for practice and policy	62
Future research	63
Limitations	64
<i>References</i>	65
<i>The dissemination of evidence to professional practice (Paper Three)</i>	71
Origin and principles of ‘evidence based practice’ and application to EP practice	72
The concept of ‘practice based evidence’ and application to EP practice	74
Figure 1 – the cycle of rigorous and relevant research in relation to EBP and PBE	75
EBP and PBE related to research on the EP workforce	77

Effective dissemination of research, knowledge transfer and measuring impact	78
Dissemination: Theoretical underpinnings, effective strategies and conceptual frameworks	79
Measuring impact	80
Knowledge transfer and exchange; strategies to support implementation	81
Table 2 - KT methods that demonstrate a statistically significant impact (from LaRocca et al., 2012)	82
Research implications of Paper One and Paper Two	83
Implications at the research site	84
Implications at the organisational level	85
Implications at the professional level	86
Strategy and action plan for promoting and evaluating dissemination of findings from papers one and two	87
Table 3 - Action plan for dissemination of research based on Harmsworth et al. (2000)	87
References	91
Appendices	93
Section A - journal submission guidelines relevant to T1 and T2	93
A i) T1 submission guidelines for the Journal of Health Services Research & Policy	93
A ii) T2 submission guidelines for the journal: Educational Psychology in Practice	95
Section B - documentation relating to ethical approval	97
B i) Notice of ethical approval for T2	97
B ii) Participant information sheets for T2	98
B iii) Participant consent form for T2	106
B iv) Emails sent during recruitment stage	107
Section C - instrumentation	110
C i) Critical appraisal of workforce planning research	110
C ii) Focus group interview schedules	111
C iii) Forecasting template for commissioned work	113
Section D - materials showing detail of data analysis processes.	114
D i) Coding frameworks	114
D ii) coding audit tools	115
D iii) Sample from coding framework used for identifying details of commissioned work	116
D iv) Summary of qualitative data taken from index setting FG/ interviews used by WG to allocate EP time required	119

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Abstract

Background: The Association of Educational Psychologists (AEP) commissioned this project to research how much educational psychology service (EPS) may be needed in an English local authority (LA) context, with the objective to obtain a clear view of workforce shortages and future training requirements.

Method: In Paper One, a systematic literature review (SLR), following PRISMA guidelines, analyses nine workforce planning models (WPMs) used in healthcare internationally and provides key, applicable findings for the educational psychologist (EP) workforce in England. The empirical investigation in Paper Two employs mixed methods, focusing on EPS delivery to schools in one LA; gathering the views of senior staff using focus groups and interviews within two primary and two secondary schools, establishing how much EP time they would commission if they had no funding restrictions. Descriptive statistics for these four schools are provided together with data from the LA EPS database; notional SEN budget per pupil is used to indicate the level of need in each school across the LA. Combining these sources of data and extrapolating the findings from the four schools, a model is created predicting how much EP time other schools across the LA might commission.

Findings: The SLR provides a synthesis of key components, functionality and application of WPMs from a variety of healthcare professions, including regional and national examples. The empirical study reveals that all four schools would commission more EP time with sufficient funding; some detail of commissioning is provided. Across all primary and secondary schools in the LA, the model estimates a more than fourfold increase in commissioned time compared to current levels. Dissemination strategies include reporting findings back to The AEP executive committee and seeking to publish the research in an established journal; a detailed strategic plan is provided in Paper Three.

Implications: The SLR reveals key considerations when undertaking workforce planning for application to the educational psychology workforce in England. Estimates from the model suggest the LA EPS would need to double their staffing to accommodate potential EP service demands from schools who may require increased SEN funding to enable increased commissioning of EP time. This research provides the first step towards creating a national workforce planning tool for EPSs, the DfE and the AEP.

Key words: educational psychology service; commissioning; workforce planning; level of need; supply and demand.

Declaration Statement

No portion of the work referred to in this thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

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Another integral part of the project has been the steering group and I would like to thank them for their careful direction and collaboration. In particular, huge thanks goes to my supervisor, Kevin Woods, who has been a consistent, dependable and sagacious fount of knowledge and guidance; his support has been immeasurable, there is no way I could have done this without him!

Thesis introduction

According to the Department for Education report on the educational psychologist (EP) workforce (2019a), there is a greater demand for practitioners than services are able to supply. This appears a simple problem to address at first glance. However, no formula exists to assess and calculate the staffing required either within one local authority (LA) or nationally and there are a number of complexities involved. This a challenging endeavour since there is substantial diversity within and between LAs and individual settings requiring EP support, a great variety in the structure and organisation of service delivery nationwide, and no reference point as to what constitutes an adequate level of service or to what extent services are meeting growing demand. Amongst the many reasons for advocating for improved planning of the future EP workforce in England, most important is the need to identify the number of training places required to address workforce shortages. Even with the recent government-funded 26% increase in training capacity from 2020 (DfE, 2019b), the effects of which will filter through from September 2023, it remains unclear whether workforce supply will meet national demand. In addition, it is crucial that there is not oversupply of practitioners, when issues of retirement, part-time working and EPs moving into non-LA practice are considered, it is clear a well-defined picture of the whole system of demand and supply is needed. Whilst no EP workforce planning (WFP) tool currently exists to provide this overview, many other professions employ sophisticated models to monitor, plan and deploy staffing (Safarishahrbijari, 2018). Healthcare delivery is made up of several professions and service providers, internationally there are a variety of WFP tools in operation; within the nursing profession alone there are many examples in use (Jackson et al., 2015; Flynn, Kellagher & Simpson, 2010).

Thesis outline

The aim of Paper One, a systematic literature review, is to identify key components and functionality of WFP models used in healthcare and describe how these models have been applied. This fits within the overall aim of this thesis, to evaluate the level of need for EP services in England. Of the many commissioners of EP services, primary and secondary schools are predominant (DfE, 2019a) and it was decided they would be the starting point for investigation. Paper Two focuses on EP service supply and demand factors when working

with these types of schools within a single LA, researching the perspective of commissioners as to their perceived level of need for EP services, with advice from a working group of EPs providing consultation as to the time-costs related to commissioned work. Data collected from four schools is extrapolated to give a conservative estimation of need for EP services across all primary and secondary schools within the LA. Paper Three provides an understanding of evidence-based practice and effective dissemination strategies, highlighting key concepts of effective knowledge transfer and how to evaluate the chosen dissemination strategy for this research.

The aim of the thesis is to provide the first step towards creating a national planning tool estimating the EP workforce required to deliver a 'good' level of EP service; this, in turn, can be utilised to inform the number of trainee EPs (TEPs) required each year. Paper One provides key considerations for EP WFP; Paper Two gives an estimation of future need for EP services in primary and secondary schools within a LA. Direction for future research as to the remaining areas of EP work that require assessment towards a comprehensive understanding of need for EP services in England is also provided.

Research commission and the wider project

In 2021, The Association of Educational Psychologists (AEP) commissioned The University of Manchester to research how much EP service may be needed in English LA contexts, with the objective to obtain a clear view of workforce shortages and future training requirements nationally. A steering group was formed including members of the AEP national executive committee to provide direction to the project. At present there are three other TEPs working on the project, who are aiming to research the EP service needs of specialist education settings, pre-school providers, and non-school commissioners. This research team has continued to grow under the stewardship of the steering group and directorate of the Doctorate in Child and Educational Psychology programme at Manchester University. It is anticipated that once investigatory research has been completed, a national picture of the need for EP services and the associated workforce requirement will be established, meeting the AEP's original commission.

Researcher professional background

The researcher is a TEP with experience working in a variety of education settings supporting children with special educational needs and disabilities (SEND), providing anecdotal evidence of often severely limited access to EP services and the widespread limited understanding of the services EPs offer. The researcher has worked in both primary and secondary schools as a support worker, teaching assistant and a trained secondary teacher. The researcher has also worked within four different EP services in England as an assistant EP and a TEP, seeing first-hand the pressures experienced in the face of often overwhelming need and the impact of understaffed services.

Positioning for data access

The LA recruited for this research is in the North of England, where the researcher was on practice placement for years 2 and 3 of training. The working group of EPs was recruited from within the EPS where the researcher was on placement, this allowed easy access to communication and data management systems as required. The four participating schools were recruited from within the LA, schools that had previously engaged with EP services and were either within a “high need” or “low need” bracket as assigned by their notional SEN budget per pupil. A pool of schools was contacted by their link EP to explain the research opportunity. The target number of four participating schools was achieved: two primary schools (one high need, one low need) and two secondary schools (one high need, one low need). The recruited schools were not previously known to the researcher and contact was established through the school SENDCo; each school was visited twice by the researcher to carry out data collection.

Research paradigm

Whilst it could be argued that an attempt to create a model that quantitatively represents reality, suggesting reality is accurately measurable, sits within a positivist paradigm, a critical realist perspective is more appropriate for this research, allowing for the fact that how we theorise and attempt to measure reality is not equivalent to what exists, models are only an estimation of the real world (Edwards et al., 2014). Critical realism has often been thought of as the middle ground, a compromise between positivism and constructivism (Lauzier-

Jobin, Brunson, & Olson, 2022). Realism ontology which suggests the world exists separate from individual personal interpretations is combined with the ontology of constructivism, which suggests there is no objective reality, only individual constructs of and personalised knowledge of the world dependent on experience (Maxwell, 2012). However, Lauzier-Jobin et al. (2022) argue against this compromise position and show that critical realism is distinctive. In terms of ontology, critical realism acknowledges that reality exists, mostly independent of human consciousness of it, and proposes three levels of reality: the empirical, that which is experienced; the actual, entities and events; and the real, the product of “causal mechanisms” (Lauzier-Jobin et al., 2022). In essence these three levels are based on the fact that human ability to know reality is “...complexified by our imperfect access to events that occur and to the mechanisms that generate them.” (Lauzier-Jobin et al., 2022, p6). Epistemology follows, in that whilst reality mostly exists separate from our awareness of it, our knowledge of it is indirect, filtered through language systems, our nervous system and brain, social and cultural interpretation which makes our knowledge of reality “incomplete (epistemic humility) but incrementally perfectible (judgemental rationality).” (Lauzier-Jobin et al., 2022, p6) and theorising is the intermediary that allows us to check, refine and perfect our concept of reality.

Bhaskar, who first defined critical realism, originally aimed to create a philosophy of change, transforming society through knowledge of the constructions that underpin it; he suggested the world could only be transformed with a sufficient interpretation of these structures (Shotter, 1990). He proposed that social entities have observable effects and are structured in such a way as to ensure survival but also giving them “unique causal properties”, for example, a university is formed from material and social entities “whose structural relationships endow the university with the power to recruit staff, raise finance, conduct research, teach students and award degrees.” (Sorrell, 2018). The elements that make up these entities also have structure and power to act in specific ways. From a critical realist perspective, the power and properties of entities produce tendencies to act in certain ways that are reliant on “contextual factors and influences” (Sorrell, 2018). Therefore, from this epistemological position, the current research investigates concepts that constitute reality, entities that have tendencies to act in particular ways contingent on context. Furthermore, action research is seen as an appropriate method within this epistemology to “effect change

in social situations” through cycles of inquiry and implementation of change (Houston, 2010).

The RADIO action research approach that is used in this research has been suggested to be positivist and experimental (Timmins, Bham, McFadyen & Ward, 2006), however, adaptations in applying the model will necessarily interpret and estimate social entities with some indirect access to incomplete knowledge, relying on approximation. Social constructions that form the basis of interactions between the people involved and understanding of how both education settings and the EPS interpret their roles, is an important aspect of the research. The research has produced estimations which are incomplete versions of reality, however, through a collaborative process these have been refined and perfected, showing critical realism to be the research paradigm which has been applied throughout.

One final aspect of the research paradigm to be considered is axiology, the role that the values of the researcher has on the research (Ponterotto, 2005). In many ways this aspect can be seen in the purpose of the research and the methodology chosen; aiming to address the shortage of EPs through understanding the need for EP services from the perspective of service-users both approaches the problem through a bottom-up rather than top-down lens and aims to provide equality of access to schools and transform the “status quo” (Ponterotto, 2005). This borrows from Bhaskar the intention to transform society through understanding underpinning constructions; whilst the reality is clear that there is a shortage of EPs nationally, identifying detailed needs and influencing change is the purpose of this research. As an EP the researcher’s values are aligned to this, providing equality of access and reducing the power imbalance between services and service users.

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Systematic literature review (Paper One)

**'Functionality and application of workforce planning models in healthcare: A
systematic literature review'**

Prepared in accordance with author guidelines for submission to the *Journal of Health
Services Research & Policy* (Appendix Ai)

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Abstract

Aim: To identify key components and functionality of workforce planning (WFP) models used in healthcare and describe how models have been applied.

Rationale: The UK's Association of Educational Psychologists has commissioned The University of Manchester to research how much educational psychology service may be needed in an English local authority, with the aim of accurately addressing apparent workforce shortages. It is the authors' intention to extract key findings to consider applicability to the educational psychologist workforce in England, where no WFP model currently exists.

Method: Using the PRISMA approach to systematic literature review, papers were selected from four databases/ platforms (ASSIA, Ovid, Web of Science and EBSCO), searched during July and August 2021 using the term "workforce planning model". 103 papers were screened, 15 full-text papers were assessed for eligibility and nine studies are included in the review.

Findings: WFP models are grouped into three types: forward calculation; operational research; and simulation. Key components are listed from across all nine models; functionality and application is described for each of the three model types, followed by a synthesis of all nine WFP models. Applications are at both regional and national levels, with all models estimating the discordance between supply and demand across varied time horizons for a variety of singular and multiple healthcare professions.

Implications: When considering WFP, key considerations include: Choosing a method to quantify supply; full-time equivalence and part-time working; efficient and essential aspects of skill mix; productivity, work efficiency and work intensity; the possibility for testing alternative scenarios; necessity to predict future need and identifying fluctuating demand; possibility to incorporate feedback loops.

Limitations: 1. A complex, broad-ranging and interdisciplinary field increases likelihood of search term/ research omission. 2. Interrogation of choice and analysis of data sources within WFP models was limited.

Key words: Workforce planning; prediction; forecasting; modelling; healthcare; educational psychology; projection; simulation; operational research; human resources.

Introduction

The importance of workforce planning and challenges faced

Workforce planning (WFP) in healthcare is crucial to maintaining access to care to address the needs of the population; also, to maintain quality standards and the safety of patients, staff morale and retention, and efficient use of healthcare budgets (O'Malley et al., 2020). Healthcare WFP is not comparable to workforce sectors governed by the sale of goods or labour related to consumer demand. Rather than being shaped by the influence of what people are willing to pay, the healthcare workforce is formed in relation to the needs of the population, this can be known as 'needs-based' WFP. With the large numbers of staff involved in a healthcare system, for example, The NHS is the largest employer in England (Birch et al., 2020), sophisticated WFP models have been developed including: simple calculations based on current service use with population projections; tools that calculate options for policy decisions; and multifaceted models incorporating numerous complex and interacting variables. WFP models have a wide range of functionality, purpose and application with a variety of key components.

Historically these models have been focused on demand or supply, or a combination known as "stock and flow", a simple form of calculating capacity based on current staffing and anticipating variations in demand based on forecasting demographic changes (O'Malley et al., 2020). Utilization of what is already provided is far from representative of what may be required in the future; historical service delivery doesn't represent population need, but rather reflects socio-economic and cultural influences, whereas population need is calculable based on objective, clinical data (Brailsford & De Silva, 2015). Sophisticated models that account for changing population need are most desirable, but are extremely difficult to configure, not least because the data required for functionality are often unavailable (Ahern et al., 2019). This means that projections and estimations, of variable/questionable reliability, are required. However, overly simplistic models are similarly unreliable and risk fluctuations between surplus and shortage (Van Greuning et al., 2012). Furthermore, many significant variables are difficult to define, for example, productivity

depends on work intensity, organisation of work, and diverse contributions from allied professionals (Bloom et al., 2012). Since many synchronised, interacting dynamics shape future workforce need, it is not possible to simply extrapolate from the existing provision and this means there will likely be more than one possible scenario to consider (Bloom et al., 2012).

Three types of WFP models

There is a variety of WFP models used in healthcare, some of which identify themselves as 'needs-based', albeit there is no definitive explanation of this desirable aspiration. Based on the research included in this review, there appear to be three distinctive types of healthcare WFP model identified.

First, there is operational research (OR) modelling, with two variations known as 'linear programming' and 'system dynamics'. They are essentially mathematical equations used to represent complex systems (Barbeito et al., 2017). OR models take estimates of future healthcare need and map all possible solutions, comparing outcomes in order to achieve balanced supply and demand at minimum cost. There are three core elements: "decision variables, an objective function and a set of constraints" (Lavieri et al., 2008, p.122). Using this method, solutions can be easily and quickly assessed while analysing the effect of changes to key decisions and constraints; for this reason the method is also scenario-based. System dynamics is the approach used by The Centre for Workforce Intelligence which is responsible in the UK for creating university places for medical/ dental students (Brailsford & De Silva, 2015).

The second type of WFP model in this review is the simulation model. Historically, WFP centred around standards such as the ratio of a given profession to the populous, which were combined with population demographic forecasts whilst presuming the rate of service use remained static. Many of these supply focused models are still used today (Laurence & Karnon, 2016). Simulation models are sometimes labelled as 'needs-based' since they extend beyond looking at supply issues to also considering the population need for services, including influences on demand (Laurence & Karnon, 2016). Different models account for a variety of factors such as geography, technology, economics, socio-political exigences, and

complexities such as rural-urban workforce distribution, or gender and age differences in working hours (Laurence & Karnon, 2016). They can incorporate dynamics such as changing incidence rates of disease; variable care needs; policy-informed service level plans; service delivery models and productivity; variation in the proportion or mix of professionals (O'Malley, et al., 2020). However, this requires sophisticated models based on population-need, requiring data which is often unavailable or not collected consistently (Gallagher et al., 2013). Some WFP models are more responsive to changes than others, for example, the more complex models do not account only for changing health needs but also how changing practice standards may affect services and service needs (O'Malley, et al., 2020).

The third type of WFP model is Forward Calculation, also known as the 'projection' model. This is a method for forecasting the balance of supply and demand, allowing identification of the most influential factors affecting equilibrium using sensitivity analysis (Stuckless et al., 2012). Examples of Forward Calculation in this review are from Canadian medical oncology services where they demonstrate key variables such as cancer incidence rates, individual workload and average age of retirement are amongst those with the greatest influence on balancing supply and demand (Stuckless et al., 2012; Yip et al., 2018).

Whilst this research has highlighted the distinctive features of three types of WFP models, in practice there are overlapping factors and possibilities for combining features from each. It was not the intention here to present an exhaustive account of all WFP models, rather an outline of key components and functionality across a broad taxonomy.

Rationale and aims of the current review

A recent systematic review of workforce forecasting models (Safarishahrbijari, 2018) analysed workforce projection methodologies across all industries between 1980 and 2015, identifying several distinct approaches collated into three broad model types. Supply-based models which determine the number of staff available; demand-based models which predict the amount of service required in the future; and needs-based models which measure the sufficiency of staffing to meet service requirements. The review focused on the quality and quantity of publications, including 275 papers, they explicitly do not focus on the application

of models. When considering the different industries employing forecasting models, by far the most prolific use was in the area of healthcare.

Asamani, Christmals & Reitsma (2021) produced a systematic scoping review of needs-based health workforce planning methods, including 25 papers. They aimed to investigate the extent to which needs-based WFP modelling had been analytically applied in countries along with methodological considerations. However, as a result of their broad search, most of the included studies applied WFP models within specific disease areas or at a carefully defined subnational level, rather than at the level of a whole professional group; only two out of 25 included studies reported national planning, and three were multi-country application. The authors did not apply a date range limit to their review but found that 84% of papers were published after 2010, probably due to the innovation of the needs-based approach to WFP. As a result of this finding, the current review only included papers written after 2010 but broadened the scope to all types of WFP models.

The current study extends the scope from the analysis of only needs-based approaches to include variations of demand and supply-based models. Asamani, et al. (2021) examined WFP “methods” which produced a broad spectrum of results. However, with the aim of focusing the current review more specifically, our search included only profession-wide WFP models, avoiding methods which centre on a limited scope such as meeting the need for a specific disease.

As far as the author is aware, no previous systematic review exists appraising the functionality and application of WFP models in healthcare and, as indicated above, O’Malley et al. (2020) summarise the reasons that effective workforce planning is important. For these same reasons, it is important to address WFP in the field of educational psychology service (EPS) in England. In 2021, The Association of Educational Psychologists commissioned The University of Manchester to research how much EPS may be needed in an English local authority context, with the aim of addressing workforce shortages (DfE, 2019), in particular to inform how many new trainees are required each year, without producing a surplus. Ultimately, it is the author’s intention from this review to extract key components and functionality of WFP models in healthcare and consider their potential applicability to EPS delivery in England, where no model currently exists. Findings from this

review may then be used to inform the formulation of a prototype model for EPS WFP. Even though EPs often work in education settings they are regulated by The Health and Care Professions Council and it was decided that healthcare rather than education WFP was most applicable for the current review. In addition, as explained above, WFP models used in healthcare are well established with numerous examples.

This review identifies key elements across healthcare WFP models, such as timeframe, geographic scale, and data sources utilised. The review also identifies more complex characteristics of healthcare WFP models, such as utilisation of scenarios to allow comparison of altered variables or assumptions, validity checking of model workability or robustness of data, and output utility in terms of data and advice for policy makers.

The research question for this review is: What are the key components and functions of WFP models in healthcare, and how are these models applied?

Method

Literature search strategy

Based on the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) (Moher et al., 2009), papers were selected for review. Using this systematic approach, four databases/ platforms were searched during July and August 2021. These were: Applied Social Science Index and Abstract (ASSIA), Ovid (all databases), Web of Science and EBSCOhost Research Databases (all databases).

Several combinations of search terms were trialled in the scoping phase, for example, “workforce” AND “projection” OR “forecasting”. However, these efforts yielded too many returns across a wide spectrum of disciplines. A simpler approach, using the key search term “workforce planning model”, was adopted in order to focus the number and type of returns. To keep an up-to-date and relevant focus, the research publication date range was restricted to the last ten years (September 2011 to August 2021).

Inclusion criteria were established in order to ensure that the focus of studies was relevant to the research question. Firstly, only papers related to healthcare professions were

included. Secondly, only papers that presented, applied or evaluated a workforce planning model were included. Then, duplicate returns were removed.

The final sifting process required detailed analysis of the remaining 15 papers to establish their eligibility for inclusion. At this stage one item was excluded as it was a subsequent article by the authors of another of the included papers, reporting the same WPM. Another five papers were excluded because they did not apply a time horizon, or because there was no estimation of future need; in the most part they applied capacity modelling.

Figure 1. PRISMA flowchart

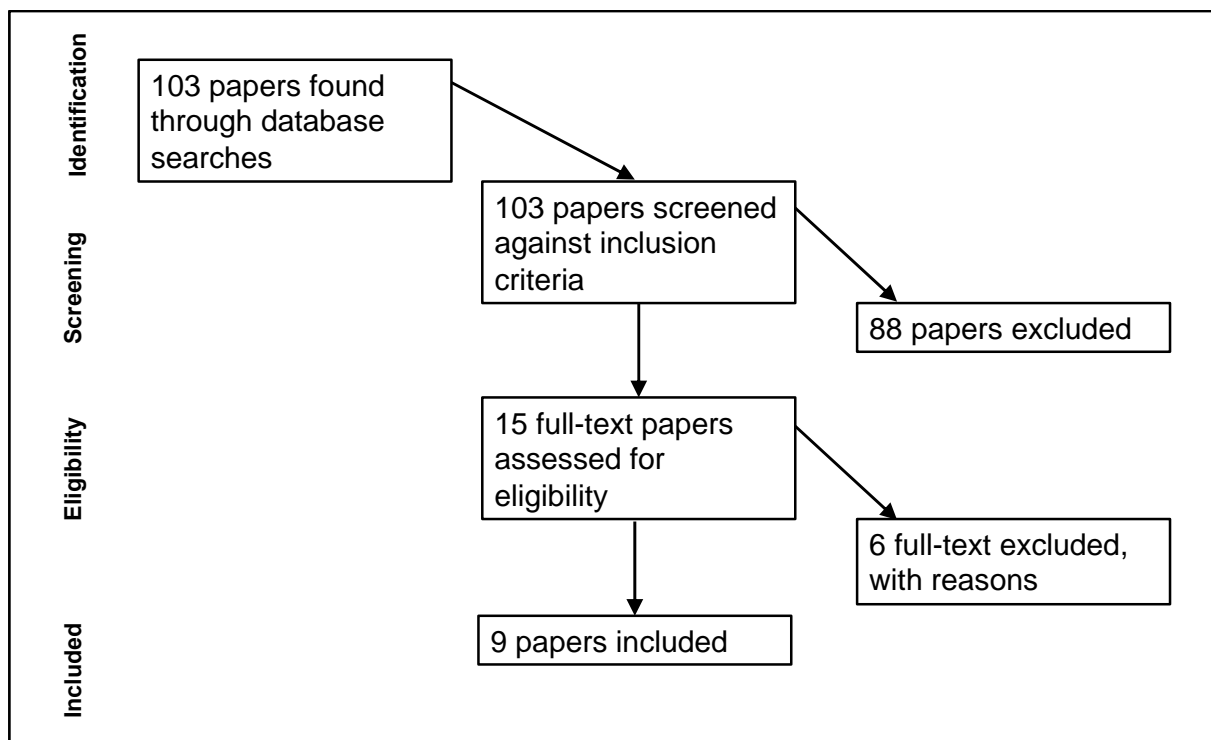


Table 1 – Descriptive summary of each included paper

Authors	Timeframe & profession	Scale	Aim	Model type	Data sources	Scenarios	Quality of source data/ Process validity evaluation	Output
1. Van Greuningen et al. (2012)	Retrospective 2002-2012 Healthcare Professionals Focus on GPs	National (Holland)	To explain the Dutch simulation model used since 2000 for healthcare WFP. With GPs as a case study, they evaluate the advised and realised inflow over 10 years and the extent to which balance of supply & demand was achieved.	Simulation model	<ul style="list-style-type: none"> Dutch medical registration Patient registration Survey of representative sample of health professionals Population projections Expert estimation made by groups of professionals, insurers & training institutions Empirical studies 	4 scenarios: 0. baseline 1. epidemiological & sociocultural developments 2. changes to working hours (FTE ratio) 3. developments in shift of activities between professional levels	<i>Relies on expert estimation.</i> <i>Comparison of advised with actual data allows direct evaluation of model.</i>	Estimates required & available capacity of GPs in Holland. Advised yearly inflow to GP training under 4 scenarios, aims to balance supply & demand.
2. Ahern et al. (2019)	Prospective 2017-2050 Dentists	National (Republic of Ireland)	To develop a needs-based WFP simulation tool and apply it to a hypothetical scenario using Irish data.	Needs-based simulation model	<ul style="list-style-type: none"> Publicly available data from Republic of Ireland Register of Dentists in Ireland Training details Irish undergraduate & graduate data Population demographics, health status & service use from the Irish Eurobarometer 330 Oral Health Survey dataset 	4 scenarios: 0. baseline 1. treatment time change 2. hours worked change 3. scenarios 1&2 combined	<i>Hypothetical application entails assumptions & estimations.</i> <i>Population projection to 2050</i>	The model simulated total provider requirements in workforce minutes each year between 2017 and 2050.
3. Stuckless et al. (2012)	Prospective 2010-2020 Oncologists	National (Canada)	To provide policy makers with sufficient information for effective WFP to meet health care needs of cancer patients; to inform training program capacity and recruitment strategy to avoid mismatch with opportunities available.	Forward calculation/ projection model <i>Utilization based</i>	<ul style="list-style-type: none"> Canadian Post-MD Education Registry Canadian Residency Matching Service CARO Manpower Survey National Physician Survey 2004 Canadian Cancer Statistics and the Canadian Cancer Registry 	Sensitivity analysis considers variation in several factors and reveals 5 most influential variables on balance of supply & demand.	<i>Face & construct validity confirmed.</i> <i>Historical data used to seed model; projected supply & demand validated by actual data.</i>	Under baseline assumptions, the model predicts a short-term surplus of trainees followed by a projected deficit in 2020. Sensitivity analyses showed that access to radiotherapy, individual workload & intensity, average age of retirement and resident training intake

								most influenced balance of supply and demand.
4. Bloom et al. (2012)	Prospective 2010-2020 Nurses & healthcare aids	Regional (Alberta in Canada)	Development of a WFP model to test scenarios: a variety of methods for addressing future service demand. Incorporating projections of supply and demand for all of the healthcare workforce disciplines. A transparent and visual tool to use with stakeholders.	OR model uses System Dynamics designed to test various scenarios addressing future service demand	<ul style="list-style-type: none"> December 2009 Alberta Health Services' ratio of funded positions Alberta Health Services 2009 payroll data Alberta Health Services vacancy mgt. system Number of graduates 2008/09 (Alberta Advanced Education & Technology, gov. department data) historical % of graduates retained within Alberta Estimates of population growth for age groups 	Large number of scenarios possible, stakeholders able to alter policy choices such as number of graduate places, and assumptions such as vacancy rate to see outcome. Discussion paper uses 6 main scenario alternatives	<i>"Almost every variable in the model involved some form of estimation or judgement."</i> (p.3)	A tool to be used with stakeholders to explore possibilities; demonstrating large number of options to meet needs in different ways; interacting effects, modelling which allows assessment of policy options. The discussion paper explores 6 scenarios looking at changing care services; FTE ratio; retirement impact; and skill mix.
5. Yip et al. (2018)	Prospective 2016-2026 Medical Oncologists	National (Canada)	To reveal adequate levels of cancer care staffing and assess whether present recruitment and training patterns will meet future need. Especially helpful for training course admissions.	A forward calculation model to forecast supply and demand	<ul style="list-style-type: none"> Canadian Institute for Health Information Canadian Medical Association databases (workforce, age distribution, departures) Post-MD Education Registry database Canadian Cancer Statistics database (incidence & prevalence) Alberta Cancer Registry data (new patients per MO & use of new systemic treatment) 	2 scenarios: a linear hiring rate and a demand-centred approach which shows the impact of hiring and training rates on workload over time.	<i>Face validity confirmed by The Royal College Medical Oncology Specialty Committee. Assumptions and estimations used in model.</i>	Medical oncologist (MO) workforce supply expected to grow from 541 staff in 2016 to 830 in 2026 (53.4%) based on the linear hiring rate. Scenarios detail new hires; departures; initial consultations; and new systemic therapy starts per MO per year; also the effect of reduced hiring rates.
6. Taghavi et al. (2021)	Prospective 2019-2038 Palliative Care Specialist Teams	Regional (Nova Scotia, Canada)	To develop a population-need WFP model for community-based palliative care specialist teams, providing a 20-year forecast for meeting the needs of terminally ill patients. To include the impact of	OR model uses linear programming	<ul style="list-style-type: none"> Canada population statistics (deaths) Population projections (software and method clearly stated) heterogeneous data from a range of other credible sources: (human resources departments; survey of specialist palliative care program nurses in 2018 in Nova Scotia; 	Compares all feasible strategies to find best balance of supply & demand at least cost	<i>Explicit use of data projection. Study claims proof of concept showing feasibility of their approach to WFP and the utility of their model, however, due to the phase of development they</i>	The model provides an estimate of 70.8 nurses, 23.6 physicians, and 11.9 social workers, a total of 106.3 staff required to meet palliative care needs in Nova Scotia in 2019.

			expansion of primary palliative care services.		metrics informed by national and provincial reports and practice.		<i>advise caution when applying the numbers generated.</i>	
7. Brailsford & De Silva (2015)	Prospective 2010-2025 Dentists	National (Sri Lanka)	To develop a stock-flow model with supply and demand components. Supply gives the total number of dental surgeon hours available annually; demand side gives population demand for care converted into hours. Aim to calculate shortfall to inform training and job role numbers/ planning.	System dynamics in its quantitative form; stock-flow modelling	<ul style="list-style-type: none"> Archival research at the Ministry of Health (Sri Lanka) Focus groups Postal questionnaire sent to all practicing dental surgeons in Sri Lanka, response rate 72% National register of dental surgeons Survey of dental students Historical employment data from 1991-95 WHO/Fédération Dentaire Internationale (FDI) model for estimating demand with low, moderate and high need-to-demand scenarios 	7 demand scenarios: <ol style="list-style-type: none"> low throughout moderate throughout high throughout increases steadily from low to moderate increases steadily from low to high increases steadily from moderate to high starts at moderate increases by 1% annually +Many other policy options were explored with the model.	<i>Historical data used to validate (1991-1995). Output fitted actual data. Face validity considered extremely high.</i>	Shows % of demand met under each of the seven demand scenarios, ranging from oversupply to undersupply. Scenario 7 shows undersupply until 2024 where supply and demand equalise. Based on model, government decided to fix intake of dentistry students and created 400 additional state vacancies in rural areas.
8. Harper et al. (2013)	Prospective 2013-2028 Dentists	National (England)	To investigate the cost effectiveness of various skill mix scenarios for dental teams aiming to meet future need/ demand of older people in England. WFP model utility evaluation.	Simulation model - three sub models: demand for dental treatment; workforce supply; optimisation of workforce skill mix.	<ul style="list-style-type: none"> The Adult Dental Health Survey undertaken every 10 years in England Government Actuary's Department population forecasts Dental Practice Board treatments database Heathrow treatment timings inquiry NHS Dental Activity and Workforce Report (2006) Report of the Primary Care Dental Workforce Review (2004) Primary Care Review for England and Wales (2004) General Dental Council (2005) 	5 scenarios of skill mix: <ol style="list-style-type: none"> baseline no skill mix, only dentists examinations by clinical dental technicians and hygienist/therapists clinical dental technicians expand their role to include partial dentures and repairs. maximum skill mix (combines 1, 3 & 4) 	<i>Utilising an iterative process, Monte Carlo sensitivity analysis indicates uncertainty in projected demand. Predictions may deviate by up to 22%; demand for treatment is sensitive to dental attendance.</i>	By 2028 the model predicts an increase in demand (in treatment hours) of over 80% with associated treatment costs rising by 250%. Scenarios provide evidence of cost savings through identifying the best skill-mix and staffing of the dental team, including members from a number of different dental professions. Especially through utilising significantly more hygienists/therapists

					<ul style="list-style-type: none"> • NHS Dentists' Average Remuneration (2006) & British Dental Association hourly pay rates (2005) 			and clinical dental technicians.
9. Laurence & Karnon (2016)	Retrospective 2003-2013 GP	Regional (South Australia)	To develop a WFP simulation model to plan the GP workforce in South Australia, accounting for population health need and demand; to estimate the future supply of GPs and need for their services; provide scenario analysis options to compare how different changes to policy affect supply and need in the future.	Deterministic simulation model	<ul style="list-style-type: none"> • Australian General Practice Training programme data • Australian Institute of Health and Welfare Medical Labour Force Surveys (demographic and employment characteristics) • Australian Government Department of Health GP workforce statistics • Rural Doctors Workforce Agency - International medical graduate recruits • Family Medicine Research Centre, University of Sydney (GP utilisation rates & GP activity) • Australian Institute of Health and Welfare Burden of Disease study (prevalence & incidence rates) • Australian Bureau of Statistics pop. projections • Medicare Australia GP attendances 	3 scenarios with three different levels of predicted future number of GP consultations needed, resulting in three different forecasts for FTE GPs required over the time period.	<i>Authors acknowledge that GP service use is not uniform across Australia but do not account for this. Model relies on data predictions and assumptions. Uses longitudinal study with small sample size and representativeness. Compared with observed data tendency to overestimate GP stock</i>	Estimates the number of FTE GPs required to provide services at 3 different demand scenarios, based on the needs of the population. Compares output with observed data. Scenario 2 closely fits actual data.

Research quality analysis

To assess the quality of the reported research (Gough, 2007), Woods' (2020) framework was adapted using a scoping review of WFP models in oral health (O'Malley et al., 2020) to fit the requirements of the current review (see Appendix Ci). Each paper was assessed using 16 criteria within four areas: general view of the research; appropriate use of data; components that make up the WFP model; output and interpretation. To support consistency of application of criteria, an initial process of independent rater evaluation was used. Two of the papers were scored independently by the author and a fellow researcher; 95% agreement was achieved, supporting the remaining seven papers being assessed independently by the author. Each criterion was assessed and a total score for each paper was given, these ranged from 14.5 to 19, from a maximum possible score of 21, representing a body of high quality research.

Review synthesis

Due to the variety of approaches to WFP being reviewed, Gough et al.'s (2012) approach for synthesis of mixed methods reviews was selected. Separate syntheses of each WFP method are followed by a mixed synthesis (Gough et al., 2012). In this review, each of the three types of WFP model will be considered, followed by a mixed synthesis of all nine models, addressing the research question concerning key components, functionality and application of the models.

Findings

For a detailed list of components used across the 9 models see Table 2 below; for descriptive summaries of the nine papers see Table 1 above.

Forward calculation models - the data for this section are taken from the two papers which employ this method: Stuckless et al. (2012) and Yip et al. (2018).

Key components & functionality

Stuckless et al. (2012) use workforce modelling equations for both future supply and demand calculation. For the demand side they calculate the *new patient referral rate* and

the *ratio of new patient consults seen per FTE available*. For the supply side they calculate *career initiation* and the number of staff leaving through *career termination or career change*. The resulting number of full-time equivalent (FTE) staff available is governed by the *workload intensity factor*. Sensitivity analysis is used to test a range of values for each parameter. It is then possible to see which of the parameters is most influential upon discordance between supply and demand. Yip et al. (2018) calculate future projected supply of medical oncologists and clinical demand. Unfortunately, they do not provide details of how the model functions.

Application

Stuckless et al. (2012) use their model and baseline parameters to project the discordance between supply and demand at each year over a 10-year timeframe. Their model predicts a surplus of graduates for the first 8 years which decreases to a deficit in years 9 and 10. They show the five factors which most influence the discordance between supply and demand.

Yip et al. (2018) use their model to project workforce supply and demand over a ten-year period based on current hiring trends. They predict the workforce will grow by 53.4%. They examine the proportion of Canadian and international graduates, showing the number of Canadian graduates required each year; they also analyse hiring rates by gender and age. They suggest the workload of oncologists will decrease based on projected cancer incidence rates. However, they provide alternatives showing the impact of 75% and 50% trainee numbers/ hiring rates on workload and service.

OR models - the data for this section are taken from the three papers which employ this method: Bloom et al. (2012); Taghavi et al. (2021); Brailsford & De Silva (2015)

Key components & functionality

Bloom et al. (2012) present two recursive equations with details of components and data sources. One unique component is *system shocks*, they define this as economic recovery and/or capital projects. The functionality of the model tests alternative scenarios for meeting future service demand by evaluating the impact of changing different variables, these are: Skill mix of care workforce; staff turnover rate for each profession and retirement

risks; Vacancy rate; Effect of economic recovery; Average FTE worked, including part-time to full-time ratio; Number of graduates produced and Proportion of graduates retained in region.

Taghavi et al. (2021) use linear programming and present a complex equation, detailing parameters and data sources. An interesting component of their model is the addition of five constraints, these are rules that must be included in projections. For example, 'ensure at least one full-time equivalent specialist palliative care nurse in each network'. Other constraints directed the ratio of professionals in each team and the provision of resources.

Brailsford & De Silva (2015) present a supply-side stock-flow model with stocks being numbers of available dental surgeons within several employment categories, and flows including: exits; training rates; movement between full and part-time working hours; transition between stocks. They convert the number of dentists into available service hours for ease of calculating capacity. The demand-side uses an internationally recognised model which accounts for economic development; disease experience and progression at different ages; and cultural attitudes to oral healthcare. It estimates the services needed per person, expressed in minutes, classified by aspect of oral healthcare and age cohort. They apply percentage conversion rates of need to demand, calculating the numbers who seek treatment. They apply seven alternative scenarios where demand fluctuates between a range of low, moderate and high. They then used the Heathrow Timings Enquiry, which gives time required for 21 different procedures, to convert demand into number of hours to match the supply-side model.

Application

Bloom et al. (2012) create a model to be used in consultations with stakeholders, illustrating the need for change and showing that future need can be met in a variety of ways; the tool works over a ten-year timeframe. Different scenarios give different required university/college intakes.

Taghavi et al. (2021) use their model to illustrate that palliative care teams in Nova Scotia are operating with a shortage of workers, a 64% staff increase is needed, they detail

numbers required in each profession. They show the increasing demand over a 20-year period with an additional 13% increase in staffing required, again with specifics. They provide two detailed projections, with and without palliative care expansion.

Brailsford & De Silva (2015) create a model to analyse a 15-year time horizon with two main decision points: annual recruitment rate for new university students, and creation of new state-funded clinical posts. The additional aim was to assess whether the workforce could meet current and future population demands for dental care. Selecting the demand scenario where moderate demand increases by 1% each year, they demonstrate a shortage of dentists for the first 14 years but supply meets demand in 2024. Their model was used to create additional jobs, cap the number of students being trained and create posts in rural areas.

Simulation models - the data for this section are taken from the four papers which employ this method: Van Greuningen et al. (2012); Ahern et al. (2019); Harper et al. (2013); and Laurence & Karnon (2016)

Components & functionality

Van Greuningen et al. (2012) detail 25 components in their WFP model and explain four sequential steps. There are several simulations involved. In step 1 they calculate the baseline in terms of available and required supply. In step 2 they determine influential developments between the baseline year and the target year. Step 3 calculates the future situation in the target year, drawing on the previous steps. Step 4 calculates the gap between the required and available supply in the target year. They extend the model by adding three scenarios: including the influence of epidemiological and sociocultural developments; adding the change in working hours per FTE; including developments in vertical substitution – the shift of activities between professional levels.

Ahern et al. (2019) use a 'provider supply' simulation and a 'provider requirement' simulation. The model calculates an estimation of the number of FTE practitioners required to meet the need of the adult population in four age cohorts: 15–44 years, 45–64 years, 65–74 years and 75 years and above. They include the number of visits and a time component

related to each of the three types of service. They also simulate four alternative scenarios: baseline; treatment time changed; hours worked changed; and both treatment time and hours worked changed.

Harper et al. (2013) develop a complex model with three parts: demand, supply and optimisation. Total demand for treatment is given in cost and time, workforce supply includes competencies and skill mix. They incorporate an OR linear programme to find the most cost-effective skill mix to meet population need. They have five different skill mix scenarios. They include three age bands: 65-74 years; 75-84 years; and 85-99 years.

Laurence & Karnon (2016) create a model which incorporates two simulations: supply; and workforce and services needed. There is then a third simulation using the supply and need sub models adding work rates and productivity to calculate the workforce gap (total GP workforce compared with required GPs). They use observed data to demonstrate the accuracy of their model over a ten-year period. They provide four alternative scenarios by varying the predicted number of GP consultations.

Application

Van Greuningen et al. (2012) describe a model which can estimate the gap between supply and demand for different healthcare professionals at different target years. In this paper they focus on estimating the required & available capacity of GPs in Holland, allowing them to calculate the required yearly inflow to GP training, presenting four alternative scenarios.

Ahern et al. (2019) simulate the total provider requirements in minutes for 2017 and each year to 2050, giving the number of FTE dentists needed each year, presenting four different scenarios.

Harper et al. (2013) forecast workforce shortages or surpluses giving both the required workforce and the optimal skill mix to meet demand. They also suggest that demand will increase by 80% between 2005-2028 and treatment costs by 250%. They break this down into the three age ranges.

Laurence & Karnon (2016) provide a comparison of the predicted number of FTE GPs required under three scenarios and the estimated number of GP consultations for each scenario. They compare these predictions to actual data as validation of the model.

Mixed synthesis

All nine models calculate future supply and demand; however, they employ a variety of methods using numerous components requiring various data sources; they apply the models for different purposes. This section will provide an overview of all nine WFP models regarding calculations of supply and demand and how models are applied.

Supply is generally seen as FTE professionals but can also be presented as available service hours; some models are sensitive to the proportion and movement between full-time and part-time staff. Most of the models include a component of career initiation or new hires, this usually incorporates graduation rates both those retained within a nation or region and those in-migrating. Models also include an element of staff leaving the workforce, through retirement, death, movement away and transition within. One crucial aspect to WFP is identified by many studies - the dynamic of workload intensity, also known as efficiency or productivity. Work rates obviously impact treatment time and available supply.

All models include elements of estimation regarding demand. Demand is often used interchangeably with need, but they are not the same thing. Demand is the number of people with need who seek treatment. This can be seen as referral rate, care hours required, new patient consultations or services needed per person. Demand can be indicated by disease incidence rates though for most health services this is a clinical assessment. However, only one of the models uses current service demand to project forwards (a utilisation approach), the others recognise fluctuations dependent on changing need, demographics, methods and technology, amongst other factors. As a result, many of the models include various scenarios to allow for demand alternatives. This can be aimed at optimisation of skill mix, but in a simpler form this involves varying working hours or treatment time; the most complex scenario requires inclusion of epidemiological and sociocultural developments.

Whilst application is varied, all the models aim to predict or measure discordance between supply and demand. This may be the gap at identified target years or fluctuations in shortage and surplus across a timeframe. Five of the models operate a ten-year time horizon, two use 15 years, one 20 years, and another 33 years. The models allow authorities to plan for staffing needs, job creation, optimise efficiency through skill mix and predict how many graduates to train. Some of the models are used as tools regarding policymaking; there are various ways to meet demand, model projections or simulations can assist these decisions.

Table 2 – Components used across the nine WFP models.

Category	Component/ parameter
Demand factors	new patient referral rate
	ratio of new patient consults seen per FTE available
	Disease incidence rate
	New patient consultations
	care hours required by disease decline trajectory
	projected number of deaths by disease trajectory
	services needed per person
	percentage conversion rates of need to demand (number who seek treatment)
	Unmet demand for care
	Epidemiological developments
	Sociocultural developments
	Technical developments regarding the profession
	Developments regarding efficiency
	Developments regarding horizontal and vertical substitution
	Health status/ health need
	Service (level/frequency/type) /treatments/ aspect of healthcare
	edendate rates (with or without dentures)
	Health Service participation and attendance
	level of service utilisation
	Supply factors
retirement	
career change/departure/ ending employment	
New hires	
Total workforce/ employee headcount/ available professionals/ total stock/ existing workforce/ Total FTE	
proportion of unfilled positions	
Average Full Time Equivalency	
Amount of FTE per professional	
full-time or part-time proportion and movement between	
Additional casual requirement	
cost of salaries and benefits	

	resources available for direct patient care
	expansion of primary care capacity
	deaths
	career initiation/ Graduation rate/ newly trained
	Training rate for entrants and specialisms
	Number in training/ number of trainees
	Required number of professionals in training
	Private practice (established or not)
	transition between stocks
	Required supply/ workforce
	outflow
	International migration
	Labour market return/ in-migration
	Difference between available and required supply
	Change of working hours per FTE
	competencies
	skill mix
	Work rate/ productivity/ workload intensity
Other	Sensitivity analysis
	System shocks
Demographics	Age distribution
	Population growth rate
	Population projections
	Population
	patient registration
	Gender
	Age
Scenarios	staff turnover rate for each profession and retirement risks
	Vacancy rate
	Effect of economic recovery
	Average FTE worked, including part-time to full-time ratio
	Number of graduates produced and number of assistants trained
	Proportion of graduates retained in Alberta
	ensure at least one full-time equivalent specialist palliative care nurse in each network
	Required ratio of professionals in each team
	Required resources
	Variations of low, moderate and high demand over time
	influence of epidemiological and sociocultural developments
	change in working hours per FTE
	developments in vertical substitution
	treatment time changed
	hours worked changed
	both treatment time and hours worked changed

Discussion

Evaluation of findings

Using systematically selected literature, this review has provided a compilation of the components used in healthcare WFP models, three general approaches to functionality and an understanding of how they are applied internationally. Considering functionality, all models calculate the available supply of practitioners in similar ways, which is essentially an accountancy task (Asamani, Christmals & Reitsma, 2021); it is the calculation of need, demand, efficiency and the output of models that seems to vary widely. The forward calculation model used by Stuckless et al. (2012) includes a workload intensity factor which dictates available supply, whereas the System Dynamics model employed by Bloom et al. (2012) and the simulation model created by Harper et al. (2013), which also uses OR for this function, focus on discovering the most efficient skill mix to meet demand. This is perhaps the main strength of OR models in finding cost-efficiency (Levy, 2007). These inclusions of efficiency are often neglected in WFP models in healthcare, especially regarding productivity and efficient service delivery (Birch et al., 2020).

There have been a number of criticisms of WFP models which are predominantly configured around changing population size. Even those including age and gender do not adjust to the variance within age and gender groups and are undifferentiated; in this way, aims to meet the need of the population are not achieved (Birch et al., 2020). A further criticism is that the healthcare workforce is often considered without implications on services of funding and vice versa, for example using common, extant service delivery models without regard for developments in evidence-based, best practice (Birch et al., 2020). When considering future workforce requirement it is almost impossible to account for developing digitalisation and the increase of smart technology. Some have labelled this the 4th industrial revolution, and predict profound effects on work, notably in the field of human resources. Where smart electronics are able to *“to sense, communicate, interact, and integrate seamlessly with each other, with humans, and with the environment”* (Strohmeier, 2016; Bissola & Imperatori, 2018, p.52). The impact on organisations could be substantial, considering the potential for integrating data from different sources, performance analysis and informed decision-making. (Kapoor & Kabra, 2014; Bissola & Imperatori, 2018).

Whilst this review has been structured around three types of model, it is also conceivable that grouping the models by discipline/ profession would have allowed for better comparison of the approaches. Similarly, in their scoping review, Asamani et al. (2021) separate models into micro and macro simulation approaches, where the former is concerned with '*best-practice clinical guidelines and patient-level attributes.*' (Asamani et al., 2021, p.1337), whilst the latter focuses on broader population and demographic health data. Of 25 papers in their review, 76% adopted the macrosimulation approach, which is unsurprising since WFP models operate with macro level objectives, albeit many omit potentially crucial micro-level data (Asamani et al., 2021).

As can be seen in Table 2, there is a diversity of terminologies used in WFP where different terms can be used to mean the same or different components, making it difficult to compare and review WFP models. For example, Ahern et al. (2019) use the phrase "needs-based" without clearly defining it, implying that it refers to services required based on the health status of the population. Tomblin Murphy et al. (2012) give a clear definition of "needs-based": direct measurement of population health levels which lead to care necessity, and identification of the exact services being provided to meet those needs (cf. Asamani et al. 2021). In WFP research it is crucial that terms are clearly defined in order to understand how they are used. Only one paper within this review (Brailsford & De Silva, 2015) explicitly details how the researchers 'translate' need to demand, in terms of the percentage of service users with a specified level of need, who do then access services.

Application of WFP models

It may be expected that the size of the healthcare system and model scale (national or regional), would dictate the complexity of the approach required, and indeed within this review regional models appear simpler to configure as they require fewer variables, analysing a smaller population. WFP that requires multiple professions compared with focusing on a single profession seem more complex since there is an interaction effect; for example, some models account for horizontal and vertical substitution, whereby activities or responsibilities move between professionals. An example of this interaction can be seen in recent developments in the role of paramedics, who are now trained to manage a

number of urgent case presentations at the scene, producing a potential knock-on effect of reducing the workload of other primary care staff (Eaton et al., 2019). In these sorts of contexts, a model which has a dimension to assess skill mix is superior to those without. However, some argue that where integration has been applied in this way, it is overly simplistic, as substitutions between health professionals is often more complicated than imagined (Birch et al., 2020). Where efficiency regarding staffing isn't the goal of WFP in healthcare, higher quality of service supersedes optimisation, albeit likely that such service requirements can be included in efficiency calculations.

The minimum term that WFP models seem to operate is a 10-year time horizon, although one of the models within this review extends to 33 years (cf. also Asamani et al., 2021). For many professions with a lengthy requirement of training, this minimum ensures time to alter university and college recruitment or funding, and to anticipate continued demand/supply discordance. Graduate training rate is one of the reasons WFP models are so important - knowing how many students to train without creating a surplus. Understanding staffing requirement also ensures workload balance for staff, enhancing wellbeing and retention.

In the case of public health, if the identified need is much higher than demand, education may be required to lead the public to access services, for example, targeting men to seek help for prostate problems. However, this then requires a larger workforce. A significant criticism of demand-based models is that where health workers are in limited supply it has been shown to reduce demand; conversely, over-supply of workers can encourage higher rates of service use, a phenomenon known as 'supplier-induced demand' (Birch et al., 2013; Asamani et al., 2021). This is one reason why using demand-based planning is considered to be limited; Asamani et al. (2021) note that the World Health Organisation (WHO) *'profoundly urged countries to make a paradigm shift in health workforce planning towards the use of population health needs as the basis for health workforce planning'* (p.1327).

In terms of calculating population need, several models in this review rely on incidence rates and disease trajectories, others include demographic projections to predict new patient referrals (e.g. Van Greuningen et al., 2012; Bloom et al., 2012). The most sophisticated

model used to calculate population need (Harper et al., 2013) accounts for sociocultural, economic and technological developments, although this is a secondary model and it is not clear how the researchers achieve this. Most often, the aim of WFP models is to identify the discordance between supply and demand, with two methods commonly used for evaluating the factors most impactful to this calculation: sensitivity analysis (e.g. the Monte Carlo simulation, Harper et al., 2013), or applying alternative scenarios. The former is a method for identifying the most influential parameters to the outcome, whereas the latter is a method of testing alternative solutions. The latter method is the most widely used, perhaps because of the utility of creating scenarios and potential outcomes providing direction for policymakers. The element of judgement and choice relating to variables included within a WFP model, leads us to the subject of data sources and how they are manipulated for application.

WFP models incorporate estimated, projected or hypothetical data and make assumptions in order to predict future workforce requirements. This is simply because the data isn't available or doesn't exist (O'Malley et al., 2020). Several of the models use population projections or apply hypothetical data. Most of them rely on estimated data, either based on current trends or assessments made by groups of experts. When the interpretation, implementation and impact of WFP models is so wide reaching, how do decision makers ensure reliability when there is so much uncertainty with the data involved? Again this is why many of the models incorporate scenarios, since there is always more than one way of meeting demand; it is also why OR models are often used to find the most efficient way of meeting demand. Usefully, however, two of the models within this review demonstrate the accuracy and reliability of complex WFP tools through retrospective application. They demonstrate the efficacy of their models by comparing the outputs to actual data, showing them to be very close to matching reality (Van Greuning et al., 2012; Laurence & Karnon, 2016). As we have seen, most WFP models necessarily rely upon estimated data, the implication of which is that their outputs too are approximations. Furthermore, it is hard to conceive how WFP models can reliably account for relatively unpredictable variables such as technology development, changes to practice or service delivery, and infrequent events such as the system shocks mentioned by Bloom et al. (2012).

Implications for EPS workforce planning

The research now returns to the original commission relating to this research – that is, investigating the shortage of EPs in England, minimising the potential for oversupply and calculation of the quantity of expensive training places needed for new trainees. Given the absence of WFP modelling in this field, almost all the findings of this review are relevant to some degree or other. However, there are seven key considerations:

- First, there needs to be an identified method of quantifying EPS supply, in terms of available practitioners and FTE or available service hours. This leads to another highly influential factor: skill mix. With the variety of roles within an EPS, what is the most efficient division of labour and to what extent are some roles essential for functional service?
- Second, the area of productivity, work efficiency and work intensity are crucial factors in determining required levels of service.
- Third, incorporating the possibility for testing alternative scenarios seems desirable. For example, what would be the impact of increased demand for statutory EPS work? What if innovation allows for more efficient consultation delivery (e.g. through recent developments of hybrid work using technology)? What would be the impact of increasing the number of trainee psychologists (interns) within a local authority EPS?
- Fourth, how feasible is it to produce simulations and projections into future time horizons? Given the various funding sources for EPSs - local authorities, schools, academy trusts, other agencies, third sector, parents - , the wide and changing range of potential services (cf. Fallon, Woods & Rooney, 2010), and the potential changes to the political landscape, this would be an extremely challenging endeavour in the field of practitioner educational psychology. However, identifying fluctuating demand is essential to inform recruitment over a seven-year minimum training route.
- Fifth, some WFP models incorporate feedback loops, which may be relevant for planning EPS service delivery. For example, does increasing EPS in a school over a short period reduce the need longer term?

- Sixth, with both an ageing workforce and a growing tendency towards part-time working (DfE, 2019), accurate prediction of staffing need must consider that if one FTE role is made up of two practitioners, a greater number of training places will be required.
- Finally, no matter how explicit the results of WFP exercises, stakeholders do not always act on direction for other political reasons (Brailsford & De Silva, 2015), whether evident or not at the time of embarking upon the WFP endeavour.

Limitations of this review

Two notable limitations apply. First, WFP is a complex and broad-ranging field, in which some specialist equivalent terminologies may have been overlooked, resulting in the omission of relevant research. Similarly, the review has involved research across several disciplines, increasing the likelihood of search term omission. Even with the careful use of search strategies involving Medical Subject Headings (MeSH) and snowballing keywords, it is possible that, since the researcher is from a small, sub-disciplinary field, ‘you don’t know what you don’t know’. Second, within the small research team, resources were necessarily limited; greater capacity would have allowed for more extensive interrogation of the choice and analysis of data sources used by included studies.

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Empirical research (Paper Two)

“What does ‘good’ look like?”: An investigation of primary and secondary school staff views on the level of need for educational psychology services

Prepared in accordance with author guidelines for submission to *Educational Psychology in Practice* (Appendix Aii)

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Abstract

Aim: To estimate educational psychologist (EP) service levels required to deliver a 'good' level of EP service within primary and secondary schools in one local authority (LA) in England.

Rationale: The 2019 DfE report on the EP workforce in England shows there is a greater demand for EP practitioners than services are able to supply. However, there is no current understanding of the level of demand for EP services, nor the required workforce to meet projected needs.

Method: Using a mixed method design, within a chosen LA four index schools were recruited. Key staff within each school evaluated the perceived level of need for traded EP services within their schools and a working group of EPs assessed the time-cost to supply these services. By extrapolation of the data gathered from these schools, a model predicted the level of need for EP services across all primary and secondary schools in the LA.

Findings: All four schools would commission significantly more EP time than they do currently, if they had sufficient funding; details of the desired work is reported. High need schools would increase commissioning more than low need schools. Overall, the model predicts that primary and secondary schools across the LA would commission a fourfold increase in traded EP time.

Implications: Under the assumption that other EP service levels remained constant, the model shows that meeting the projected need for increased school-traded services would equate to a requirement to more than double the LA EP workforce. If there were sufficient EPs to meet the demand indicated in this research, it is possible that schools would need increased funding to enable purchasing.

Limitations: The research did not seek to engage critically with school commissioners of EP services. Having only two data points in a large sample of primary schools (>100) may be assumed to weaken the predictive power of the model used. The participating EP service in this research is a 'fully-traded' service; modelling adaptations may be needed to replicate findings to non-traded services.

Key words: educational psychology service; primary and secondary schools; level of need

Introduction

Demand for and delivery of educational psychology services

Educational psychologists (EPs) perform a critical role identifying and responding to special educational needs and disability (SEND), contributing to statutory Education, Health and Care (EHC) assessments, and upskilling other professionals (DfE, 2019a). They are reportedly in greater demand than services are able to supply (DfE, 2019a). Woods (2016) identifies how, since 1978, successive government legislation relating to special educational needs (SEN) has resulted in increased demand for EP work. Reforms from the 2014 Children and Families Act have been identified as increasing demand for EP services (DfE, 2019a). Following this, government focus on improving the mental health of children and young people may have increased demand (DoH/ DfE, 2017; DfE, 2019a), further highlighted by the role of EPs in providing support following significant national critical incidents (DfE, 2017; Salford EPS, 2017); also, more recently, recovery work responding to the impact of Covid-19, especially helping to address negative effects for vulnerable learners (Szulewicz, 2021). Demand for statutory work, a core responsibility of EPs, continues to rise. Initial requests for education, health and care (EHC) needs assessments have increased by 23% since 2020, the number of new EHC plans has increased each year since 2014, and by 10% in the past two years (ONSa, 2022). Against this background of increasing demand for EP services, the 2019 DfE report on EP workforce found that: 68% of Principal EPs reported ongoing difficulty recruiting for vacant posts; 93% said they were experiencing more demand for EP services than could currently be met; 78% of EPs reported their workload was increasing and they did not have enough time to get everything done in their job (DfE, 2019). The problem, then, appears to be one of availability of supply, rather than underutilisation of an available workforce.

At the same time as demand for EP services increased, government funding to local authorities (LAs) fell by an estimated 38% between 2010 and 2014 (Meegan et al., 2014). Financing became increasingly devolved to schools in many areas, providing either opportunities for adaptation and growth, or reduced services (Gibbs & Papps, 2017). Some LAs endeavoured to identify the 'statutory minimum' of EP service they required, often underestimating the need for preventive and consultative work with schools, and capacity

to respond to critical incidents, leading to increases in EHC assessments and sometimes to emergency funding of EP services (Fallon, 2018). More recently, UK local government have been faced with the aftermath of Covid-19 and a cost-of-living crisis which have worsened already stretched financial resilience (Ahrens & Ferry, 2020). LAs aiming to maintain services with less money are forced to reduce expenditure; when evaluating the essential contribution of EPs, understanding the level of need expressed by service commissioners is crucial to avoid compounding the impacts of an already understaffed workforce. Of the wide range of settings that require EP services, the largest commissioner in the UK is primary and secondary schools (DfE, 2019a).

EP workforce planning

Following the findings from the 2019 DfE EP workforce report, UK government's Department for Education (DfE) contracting for the initial professional training of educational psychologists (ITEP) from 2020 increased by 26%, and efforts have been made to improve retention of newly qualified EPs within the LA educational psychology service (EPS) workforce (DfE, 2019b). Whilst this will provide a boost in numbers entering the profession from 2023, there is not a clear picture of how many newly qualified EPs are required each year to meet national demand, not least because there is no current method of measuring demand. Additionally, when issues of retirement, part-time working and employment outside an LA are accounted for, increasing trainee numbers may not equate to a larger LA EP workforce.

A "needs-based" approach necessitates understanding of the needs requiring EP intervention, together with definition of the services provided to meet those needs (Asamani et al. 2021). Since there is substantial diversity within and between LAs and individual settings requiring EP support, a great variety in the structure and organisation of service delivery nationwide, and no reference point as to what constitutes an adequate level of service or to what extent services are meeting growing demand, any endeavour to quantify EP shortages is challenging.

One basic method of measuring the supply and availability of EPs can be seen in international comparisons of EP:school population ratios. These indicate large differences

between countries: for example, English regions report ratios of between 1:2,700 and 1:5,600¹ whilst ratios in the US are commonly around 1:1,500 and are sometimes state-mandated (DfE, 2019a; Jimerson, Oakland, & Farrell, 2007, 2016; Van Voorhis, 2020). Where ratios provide broad insight to supply of practitioners, measurement giving more functional and specific detail is required to allow LAs to plan their workforce, and to inform decisions about ITEP, ensuring there is not oversupply of practitioners for the work available.

Applications from workforce planning tools in healthcare

Since no workforce planning tools exist for EP service delivery, we may benefit from looking to other professions for guidance. A recent review of workforce planning models in healthcare identified key principles applicable to EP workforce planning (Hooper & Woods, *under review*). The review highlights the importance of clearly defining how EP supply is quantified, in terms of available practitioners, full time equivalent (FTE) staff, or using available service hours; this can be complicated where multiple part-time staff often make up one FTE. Also, consideration of skill mix is essential to establish the required balance of skill levels for service efficiency. The review highlights productivity, work efficiency and work intensity as crucial factors in determining available supply.

Jackson et al. (2015) report that, by comparison, tools for managing the nursing workforce in the UK are complex and costly; for example, 'Cassandra' was developed using 50 million hours of activity analysed over 9 years. Whilst model developers agreed that each nursing action has eight dimensions to consider, they also highlighted complexities resulting from excessive workloads impacting quality of work, staff morale and retention (Jackson et al., 2015). The nursing workforce is not directly comparable to EPs, though some principles may be transferable to EP workforce planning, such as the challenge of defining multi-faceted actions and quality of work relative to workload.

Research focusing on nursing and midwifery in Scotland, shows the importance of identifying standardised, timed activities and benchmarking the workforce against key variables such as mortality rates (Flynn, Kellagher & Simpson, 2010). Fallon, Woods, and

¹ These figures may include a range of within-region variation and do not, in any case, encompass the EP client age ranges 0-5 or 20-25 years.

Rooney (2010, p. 4) define areas of EP work as “...consultation, assessment, intervention, research and training, at organisational, group or individual level”, which could act as a relevant starting point; however, it may be complicated to standardise the time taken for these work areas due to variation of services in what is delivered, to whom and how. Yet it should be possible to sample directly how school commissioners currently use EP time and to ascertain what EP services they might commission in the future, in the context of what they understand to be possible. In turn, extrapolation from such sampling could be modelled using variables such as number of EHC plans, number of children on the SEN register within a school, and/ or a school’s level of deprivation.

Aims of the current research

In 2021, The Association of Educational Psychologists (AEP) commissioned the host university to research how much EP service may be needed in English LA contexts, with the objective to obtain a clear view of workforce shortages and future training requirements. The aim of the current research is to provide the first step towards creating a national planning tool estimating the EP workforce required to deliver a ‘good’ level of EP service; this, in turn, can be utilised to inform the number of trainee EPs required each year. In order to focus upon the design of an appropriate methodology, and to work within the resource constraints of trainee EP research time allocation, it was decided that investigation at this first stage would incorporate both EP service supply and demand factors within a single LA, with a particular focus upon primary and secondary schools, since these sectors are the predominant service commissioners. The project research questions were:

1. How can a sample of primary and secondary schools be identified to represent the wider schools community (‘index’ schools)?
2. For each index school, what EP work is currently commissioned and what work might be commissioned if funding was not a constraint?
3. Considering the requirements of each index school (demand), what would be the EP time cost to meet those needs (supply)?
4. How can a prototype workforce planning tool for EP service delivery to primary and secondary schools across the identified LA be developed and evaluated?

Method

Study design

This research uses mixed methods, analysing both statistical and qualitative data; this involves an investigatory, collaborative action research design through a broad application of the RADIO model (Timmins et al., 2003; Timmins et al., 2006). Collaboration is with the educational psychology service (EPS) within a large LA, focussing upon all primary/secondary schools that access the EPS' services. Four 'index' schools were chosen to represent all schools (see below). The EPS database was accessed to record the number of EP service sessions each school had purchased in previous years including details of how that time was used (one EP session is equivalent to three hours work). The 12 phases of the RADIO model were adapted to five stages for the current research: Stage 1 involves research commissioning, clarification of need, investigating dimensions of the problem, and application for ethical approval; Stage 2 involves identifying stakeholders, agreeing the focus and framework for data collection; Stage 3 is the data collection phase; Stage 4 involves analysing data and determining service allocation for each index school; and in Stage 5 a workforce model is created and evaluated (see Table 1).

Table 1 – Summary of data collection and working group meetings

Stage of research	Data collection for each index school	Working group (WG) actions
Stage 2		First WG meeting to refine research questions, identify index schools and agree data collection methods
Stage 3	<ol style="list-style-type: none"> 1. Profile of EP time usage for current and previous year 2. FG 1 (or interview) discuss previous usage and potential future use 3. School internal liaison and completion of template 4. Forecasting template returned and discussed in FG 2 (or interview) 	
Stage 4		Second WG meeting to scrutinise EP time allocation for commissioned work using collected data and specialist knowledge
Stage 5		Third WG meeting to evaluate the model

Participant site and participant recruitment

An EPS was recruited by approaching the principal EP and confirming their commitment to support the research over a two-year period. The EPS is based in the north of England and serves a predominantly urban population, with approximately 180 primary and 60 secondary schools. The DfE commissioned providers of ITEP programmes in England to create an index of need ensuring that LAs with the greatest need have trainees on placement, using this tool, from a group of 153 LA areas, the chosen LA in this research falls within the top 15 highest in need² (NOREMIDSW, 2023). Within the participating EPS two main grade, one senior, and the principal EP were recruited to form a working group.

Purposive, convenience sampling was used to recruit two primary and two secondary schools. All schools in the LA were ranked based on ‘notional SEN budget per pupil’; this is

² This measurement tool incorporates data from IDACI; 0-25 population; new EHC needs assessments and established EHC plans made within the last year.

identified monies taken from their designated schools grant which must be used for securing SEN provision and accounts for level of deprivation (Education and Skills Funding Agency, 2022). Potential schools were identified by the working group from the top of the list (high need) and bottom of the list (low need); schools were selected that were known by the group to have previously used EP time, were familiar with implementing EP services and that were likely to fully engage in the research. School SEND coordinators (SENDCos) were then approached via their school link EP who presented the research opportunity; if there was interest at this stage, the researcher emailed the SENDCo with a brief introduction and a research participant information sheet. Two primary schools (one high need, one low need) labelled 'LNPS' and 'HNPS' throughout this report and two secondary schools (one high need, one low need), labelled 'LNSS' and 'HNSS' throughout this report were successfully recruited. At the time of recruitment, approximately 40% of primary and secondary schools in the LA did not purchase any EP services and a conservative assumption was made within the wider project brief that this would continue to be the case.

Data gathering methods

a) Focus groups and interviews

In primary and secondary schools, the SENDCo has oversight of operationalising the school SEN policy and coordinating provision for children with SEN (DfE/DoH, 2015); therefore, they are very well positioned to understand school requirements regarding EP service. Further to this, Gillies (2018) suggests that sound judgement in educational leadership requires appreciating a number of perspectives, discussing alternative approaches and collaborative decision-making. Against this background, two focus group (FG) meetings were arranged at each of the four index schools, each to include the SENDCo, a member of the senior leadership team (SLT) and a class teacher (see Appendix Cii for FG schedules sent to participants in advance of the FG meeting). The first FG meeting in each school aimed to discuss previous EP service usage and possible areas for commissioning EP time; the second FG meeting discussed potential future use of EP services as set out in the school's co-constructed forecasting template (see Appendix Ciii). In two index schools, FG meetings were not possible, and so they were substituted by an interview with the SENDCo, following the same FG schedule. For consistency, there were two school participation conditions: the

SENDCo (or SEN lead) fully participated throughout; and time was prioritised in between meetings for the SENDCo to discuss the needs of the school with the SLT and collaboratively complete a forecasting template for commissioning EP time. All FGs were audio recorded and each index school provided to the researcher their forecasting template (see Table 1 for details of data collection strategy).

b) Working group meetings

There were three, two-hour meetings of the working group, each of which was audio-recorded. In meeting 1, potential index schools were identified, research questions were refined, and data collection methods were established. Directed content analysis (Hsieh & Shannon, 2005) of index school FG and interview data was presented to the WG in meeting 2; the forecasting templates for each index school, including rationale for the forecast provided through the analysed data, were evaluated by the WG to specify the EP time cost required to deliver the forecasted work.

In meeting 3, the preliminary outputs from a prototype workforce planning model were evaluated. Having shared with the group at meeting 2 the forecasting templates provided by index schools, three WG members identified two non-index schools each for comparison to the model's estimation of need. Each member selected one primary and one secondary school that they knew well, and then analysed the school's needs using a forecasting template in the same way as had been undertaken within the four index schools (WG members had no knowledge of the model's prediction for their chosen schools at this stage). From this, each member provided an estimate of EP time needed and a brief rationale for their assessment. This estimate was then compared with the model's prediction and the group identified possible reasons for any discrepancies.

c) Creating a workforce planning model

By extrapolation of the data gathered from the index schools, a model was created to predict how much EP time other schools within the LA might commission, identifying comparable level based upon the school's notional SEN budget per pupil and number of pupils on roll. The following gives a description of how this was created.

Conservatively, all schools that did not buy EP time in the year 2021/22 were removed from the overall service delivery estimation; this was decided as a means of balanced extrapolation using the current situation as the baseline and maintaining the equilibrium of services requested by schools as is, rather than presuming expansion into non-purchasing schools. Separate modelling was undertaken for the primary and secondary schools sectors. Then, the number of EP sessions needed at each non-index school was derived by producing a session requirement per pupil for each school, based upon index school estimates, and then multiplying this by the number of pupils at the non-index school. The sessions per pupil requirement between the two known data points was derived by using a sliding scale from one known data point to the other, using the notional SEND as the ratio. For schools outside the bookends of the two known data points taken from the two index settings, a simple calculation relative to notional SEND of the adjacent school was used to define sessions per pupil requirement. It was then possible to calculate a summation of projected EP service need across the primary and secondary school sectors respectively. Finally, a calculation of total forecasted EP sessions across all schools in the LA was made by adding primary and secondary school estimates together.

The EPS organises service delivery broadly into three main areas: 'Statutory work', which involves the completion of EHC needs assessments; 'school traded', which is EP time purchased by schools; and 'non-school traded', which is EP time bought by non-school organisations such as The Clinical Commissioning Group and Youth Justice Service. The model's forecasted estimates necessitated increasing non-front-facing EP time (e.g. time for Continuing Professional Development (CPD), supervision, team meetings, leave) to meet expanded service requirements and a conservative assumption of static levels of non-school traded and statutory demand levels (as at 2021/22).

Data analysis

Descriptive quantitative analysis and summary using spreadsheet tables was used to give an overview of each index school, to include key demographics, number of EP sessions purchased in 2021/22 and EP sessions required to deliver the work identified in index school's forecasting templates.

Qualitative content analysis (QCA) was used to analyse transcripts of audio recordings. This is a process of examining text which is flexible dependent on the theory, area of interest and problem being studied (Hsieh & Shannon, 2005). Many qualitative methods can derive meaning from narrative data, however, the specific aims of our analysis were to identify exact descriptions of work commissions from index schools and present findings of an evaluation by the WG. QCA was chosen as it is useful for analysing manifest rather than latent meaning (Graneheim & Lundman, 2003). The specific approach used was directed QCA, which takes a deductive approach, building on existing understanding and extending conceptual frameworks using predetermined categories (Hsieh & Shannon, 2005). Two simple coding frameworks were created and used for analysis (see Appendix Di); both frameworks were checked between the researcher and research supervisor for fitness-of-purpose. The first framework was a simple adaptation of the forecasting template and was used to analyse transcript data from each of the four follow-up FG meetings (or interviews). The second framework was used to analyse transcript data from the third WG meeting when members evaluated the model.

One potential drawback to QCA is that researchers may have a bias towards finding particular data, which may be addressed through auditing (Hsieh & Shannon, 2005). Before analysing the full data set, extracts of transcript data were analysed by a second doctoral educational psychology researcher, independent of this project, who used the same coding frameworks. Analyses were cross-checked with the first researcher's coding and where ambiguity was identified, the two researchers discussed and clarified. Member-checking was also employed, whereby school staff and working group members were shown narrative summaries of their data, with selected quotations to check for accuracy, asking for any omissions, inaccuracies or misinterpretations to be highlighted before finalising. Participants were satisfied with the summaries and did not ask for any changes to be made.

Ethics

Ethical approval was granted by the host university's Research Ethics Committee (see Appendix Bi). The project was evaluated as low risk since participants were non-vulnerable adults who provided informed consent and there was no activity involved that could cause risk of physical harm, psychological stress or adverse effects. All data collected was fully

anonymised before presentation. All participants were provided with information sheets (see Appendix Bii) and completed individual consent forms (see Appendix Biii). Ethical practice/ research guidance from The Health and Care Professions Council (HCPC, 2016), the host university (2014) and The BPS (2014) were followed throughout. An identified potential risk was the possibility of a WG member being linked to an index school providing a negative or less favourable forecasting estimate. This risk was mitigated by anonymising forecast data before presentation to the WG.

Findings

Index settings: Descriptive statistics, historical EP sessions purchased and forecasted EP sessions

Table 2 below shows descriptive data for each of the four index schools, it can be seen that the key statistic differentiating the schools is the percentage of pupils receiving free school meals, whereby the low need schools have a significantly lower percentage compared to the high need schools; this follows the distinctive figures for notional SEN budget per pupil which was the statistic used to identify high and low need schools. Other statistics that might be considered in relation to level of need, such as % of pupils on SEN support or % with EHCPs are less closely matched with high/ low need categorisations as higher percentages might be expected in high need schools and lower percentages in low need schools. However, low numbers on SEN support could be indicative of unresponsive SEN systems in school; similarly purchasing large quantities of EP time may reduce the need for EHCPs. The HNPS shows an elevated number of pupils on SEN support and a very high proportion of pupils speaking English as an additional language. This school also has substantially more teaching assistants than the others.

Table 2 - Descriptive statistics: key demographics for the four index schools

Index School	Type of school	Notional SEN budget per pupil 2021/22	Pupils on roll	EHCP %	SEN support %	EAL %	FSM %	FTE Teacher	Pupil to teacher ratio	FTE TAs	Previous EP sessions purchased	
											2020/21	2021/22
LNPS	Academy	446	433	3.93	10.39	20.3	16.6	20.4	21.1	14.7	4	16
HNPS	Maintained	894	671	1.49	21.16	63	50.75	35.9	17.9	35.7	76	76
LNSS	Academy	646	1663	2.41	18.8	15.6	15.4	91.3	18.2	17.4	19	19
HNSS	Academy	1042	1008	3.08	15.87	21.9	49.3	46	15.9	13.8	0	39

Nb. Population data from 2021/22; workforce data from 2018/19 (DfE, 2022)

Table 3 below shows the number of EP sessions requested by each index school based on staff completion of the forecasting template. It can be seen that forecasts made by all four schools indicate they would like to access more EP time than they had currently purchased. The two high need schools show a larger percentage increase in forecasted EP sessions than the low need schools, with both requesting over 100 sessions more than they had currently purchased. The HNSS forecasted a substantially larger increase than the other three; Table 2 shows that this school has the largest notional SEN budget per pupil.

Table 3 – EP sessions needed based on forecasting template returns from index schools and WG evaluation of EP time required

Index School	EP sessions requested based on forecasting template*							Increase in number of EP sessions from 2021/22	% Increase from 2021/22
	Total	Consultation	Assessment	Training	Intervention	Research	Other		
LNPS	28	11	6	2	5	4	0	12	75
HNPS	192	49	49	10	78	0	6	116	153
LNSS	45	15	10	5	10	2	3	26	137
HNSS	186	50	50	8	78	0	0	147	377

** These numbers are a combination of the sessions requested by school staff who gave detailed reasoning for requests, with additional sessions identified by the WG to ensure sufficient time to meet identified needs*

School staff rationale for how they would use forecasted EP sessions

Forecasting template returns from all four schools indicate they would like to commission more consultation and assessment work than they do currently; three out of the four schools gave a clear view as to the number of individual cases they would like EPs to work on. Rather than basing estimates on the number of cases, staff at HNPS allocated the amount of time they could potentially use for this work: one day per week across the year. School staff identified a variety of purposes other than individual casework for using consultation with an EP, for example, providing drop-in sessions for parents or finding the most suitable interventions for specified needs.

Very little commissioning for research was envisaged; three of the four index school staff commented that this was because there were designated staff in school who already did this type of work. All four school forecasting templates allocated time for training, ranging from one ‘all-staff’ training session to several across the year, or a mixture of ‘all-staff’ and small group training. There were two areas of EP work, highlighted by all four school forecasting templates, where staff would like to allocate EP time, but under normal circumstances they are unable to due to competing priorities and insufficient time. These

were staff training and implementing interventions. Table 3 shows that both high need school forecasting templates indicated 78 sessions for implementing interventions which equates to one day per week across the year during termtime. School staff envisaged EP time in this area being used to both identify and deliver suitable interventions; they explained they would want the EP to regularly deliver interventions as well as to train their staff in interventions delivery. See Appendix Div for a summary of qualitative data taken from FG/ interviews with index setting staff explaining their rationale for forecasts.

Working group analysis of index schools' forecasted commissioned work: Calculating corresponding EP time costs

Deciding how much total EP time the forecasted work required involved careful deliberation with the WG and resulted in a pragmatic approach for predicting time allocation. Consideration was given to the exact nature of work identified and additional time was given in some areas where requirements had been overlooked, such as, planning, preparation and writing reports. For example, the group differentiated between drop-in or brief consultations requiring no written report, where 0.5 sessions were allocated, and more complex cases involving consultation, assessment and written reports where between 2 and 4 sessions were allocated. Similarly, for interventions that were short or familiar and involved only training/ coaching staff, between 2 and 5 sessions were allocated; those requiring delivery, modelling or more bespoke production, between 5 and 10 sessions were allocated. Exact session numbers depended on the details provided by school staff.

Workforce planning modelling across the EPS

Table 5 below shows data taken from the EPS database for 2021/22 and projected data based on the findings from the four index schools. It can be seen that there is a projected more than fourfold increase in commissioned EP time compared to 2021/22 levels in the area of traded work with schools. It can be seen that maintaining the same level of delivery for statutory and non-school traded work (since these areas have not yet been researched and it is conservatively presumed there is no change to demand) whilst increasing demand for school traded work in line with the index school forecasts, including corresponding 'non-front facing' time, requires slightly more than double the current service staff levels.

Table 5 – EP sessions for current and projected delivery to all schools in the LA, extrapolated from the four index schools

Year	School traded	Non-school traded	Statutory	Non-front-facing time*	Total sessions	Total staff required**
Current year (2021/22)	2366	2366	3154	5368	13254	31
Projected year	10700	2366	3154	11041	27261	63

*CPD, management time, supervision, team meetings, leave, travel, etc

** This includes a mixture of assistants, main grades, trainees, specialist seniors, seniors and principle EPs

Evaluation of the workforce planning modelling

Table 6 below shows a comparison of the WG’s assessment of need in six non-index schools (in terms of forecasted EP sessions), without prior knowledge of the model’s predictions for those six settings but with knowledge of the forecasts for index schools. These estimates were then compared with those predicted by the model. There followed a discussion as to reasons for any disparity.

Table 6 – Projected EP sessions for six identified schools compared with WG estimates

School	Model projection (EP sessions)	WG assessment (EP sessions)	Difference
Primary 1	31	40	WG estimate +9
Primary 2	67	59	Model projection +8
Primary 3	121	80	Model projection +41
Secondary 1	164	106	Model projection +58
Secondary 2	100	124	WG estimate +24
Secondary 3	152	88	Model projection +64

Based on notional SEN budget per pupil, primary schools 1 & 2 have relatively low need, the other 4 schools represent a high level of need. Estimates made for the two lower need primary schools were close to the model, however, when schools had a higher level of need, EPs tended to estimate significantly less EP time needed than would be predicted by the

model. The group provided reasoning for these differences. In summary, EPs had a specific understanding of school contexts and identified barriers to implementing very much larger quantities of EP time, such as ineffective senior leadership or restricted SEN teams; where they judged capacity to be restricted they underestimated the number of sessions compared to the model.

Where the WG over estimated EP time compared to the model, they identified three reasons: new leaders, SENDCos or teachers requiring extra support; schools ranked as 'inadequate' by OFSTED; and specialist knowledge of EPs making the estimation able to identify greater potential for applying EP time. Based on the evaluation of the WG, it is possible that a school-based estimation of need may slightly overestimate realisable supply to meet that need.

Discussion

The four research questions will now be addressed individually. First, index settings were identified by ranking all schools in the LA by level of need, apportioned by their notional SEN budget per pupil. Two high need and two low need schools were recruited; these were used as a sample to represent all primary and secondary schools in the LA. Second, by collating data held by the LA EPS it was possible to summarise previous EP sessions purchased by the four index schools. Key members of school staff from each index setting used a forecasting template to collaboratively estimate how many EP sessions they might commission without funding restrictions, also providing details of the requested work. Third, an established WG of EPs from the LA appraised the detailed requests made by school staff and determined the amount of EP time necessary to deliver identified services, giving a final figure for each index setting. Fourth, these figures were extrapolated across all primary and secondary schools in the LA, creating a statistical model (not including 40% of schools who did not buy any time from the EPS at the time of sampling). Projected EP time requirement for individual schools as calculated by this model, were evaluated by comparing predictions with independent estimates made by the WG of EPs.

A method for measuring schools' future need for EP services was devised involving consultation with SENDCos and senior leaders using focus groups, interviews and a

forecasting template. Applying this approach in two index primary schools and two index secondary schools revealed that all schools would commission more EP time if they had sufficient funding; schools with a high notional SEN budget would increase commissioned time far more than schools with a low budget. Whilst all four schools projected that they would commission more consultation and assessment work than they do currently, schools' projections to commission substantial amounts of EP time for training and implementing interventions was striking in that they do not currently allocate any resources to these types of EP services due to competing priorities. These findings demonstrate that schools may require increased SEN funding to commission the EP time they need.

By extrapolation of the data gathered from the index schools, a model was created to predict how much EP time other schools within the LA might commission, establishing comparability with reference to settings' notional SEN budget per pupil and number of pupils on roll. Projected outputs from the model estimate a more than fourfold increase in commissioned EP time in the area of traded work with schools compared to current levels. In turn, this would require the EPS to more than double its current EP staffing levels to accommodate projected demand across all of the primary and secondary schools within the LA. However, this only accounts for traded service time; statutory work and non-school traded service delivery were not evaluated and were conservatively assumed to remain at current levels of demand. Overall, findings from this research confirm reports of shortages in EP services nationally (DfE, 2019a), and the model presented here offers a first step towards quantification of the resource deficit. This pioneering and innovative research has directly gathered and quantitatively evaluated data related to service user demand for psychology services, an identified need within educational psychology workforce planning in England (Hooper & Woods, *under review*).

There has been rapid growth in the EP profession in England over the past 50 years. In 1965 it was recommended that there should be a ratio of 1:23,000 EPs to children (William, 1971), whereas the DfE report (2019a) reports ratios of between 1:2,700 and 1:5,600³.

³ These figures may include a range of within-region variation and do not, in any case, encompass the EP client age range 0-5 or 20-25 years.

Although there have been increases to the number of EPs being trained to meet increasing demand (DfE, 2019b), EP: population ratios do not provide any rational understanding of demand or need for EP services. This research has for the first time started to answer the question ‘what does a good level of EP service look like?’ and provides data to suggest that even with the recent government-funded 26% increase in training capacity from 2020 (DfE, 2019b), the effects of which will filter through to service delivery sites from September 2023, there may still be insufficient workforce supply to meet national demand.

Furthermore, increasing numbers in training does not directly equate to a larger LA EP workforce, when issues of retirement, part-time working and EPs moving into non-LA practice are considered; to accurately measure the required workforce, a clear picture of the whole system of demand and supply is needed (Hooper & Woods, *under review*).

Given the complexity of WFP and the innovation required in a field where there is no existing precedent, it was necessary to take a pragmatic approach to both providing a first step towards a national understanding of the demand for EP services and demonstrating an initial method for calculating need across schools in a LA. The findings of this research are indicative not definitive and will contribute to a wider project; as outlined below, further research is necessary to fulfil the original commission, eventually giving a national estimate of demand for EP services and creating a national WFP model. When research findings are combined and extended to form a national picture there are three factors to take into account. First, this research has estimated perceived need for EP services, whilst this has been used as a proxy for demand, the actual national demand for EP services will need to consider to what extent need is converted into demand. Second, consideration will be needed in relation to different models of service delivery; supply of EP services differ widely between English LAs. Third, the seven key considerations identified in Paper One will need to be incorporated into a national WFP model.

Implications for practice and policy

This research has developed and demonstrated a framework for gathering data on the need for EP service levels that could be replicated and scaled up to provide an understanding of demand across all areas of EP work nationwide. Specifically, a method has been demonstrated that could be applied to measure the needs of service users in primary and

secondary schools within any LA. However, if there were sufficient EP practitioners to meet higher levels of need indicated in this research, it is possible that schools or LAs would need increased, 'ring-fenced' funding to enable purchasing. The main implication for policy at government level is that our estimates suggest a need for approximately twice the current staffing of EP service in England (although further evaluation of demand and consideration of skills mix is needed – see below). At a local level, our framework and model has the potential to be used by EP service leaders to gather data when making the case for local service expansion.

Future research

The focus of this research was EP service delivery to primary and secondary schools. In respect of our initial, broader question about sufficiency of EP services across the children's services sector, there remain other significant areas of EP work for investigation regarding required EP workforce, including replication and extension of the current findings to confirm a reliably representative national picture. The current research has investigated EP traded work with schools which does not include statutory work commissioned separately by the LA, for which increased national demand is reported (ONSa, 2022). Other areas of EP work include pre-school, post-school, special schools, and non-school traded work (e.g. LA commissioned projects, multi-agency and interdisciplinary work); for example, The House of Commons Education Committee (2022) recently recommended that all prisoners be assessed for learning needs, which will likely involve EPs working closely with The Ministry of Justice. There should also be some consideration of the views of service users such as children and families who do not currently directly commission EP work.

When estimating the EP workforce required to meet identified demand, a more comprehensive model than the simple prototype created in this research will better inform local recruitment and annual training requirements; for example, Hooper & Woods (*under review*) found that most workforce planning tools used in healthcare project service needs over a 10-year period and present alternatives to furnish a more comprehensive workforce planning model. In the case of educational psychology this might include: feedback loops where early intervention and preventive work reduces future need (e.g. for statutory work); calculation of differences between rural and urban populations; workload intensity and

efficiency measures that are known to affect productivity (cf. Jackson et al., 2015); consideration of full-time versus part-time staff and numbers leaving the profession through retirement or career changes/ breaks; considerations of service structure efficiency regarding skills mix, including the use of trainee/ assistant/ locum EPs, and of potential system 'shocks', such as rapid increases in demand for EHC needs assessments.

Limitations

In the present research, there are five limitations to consider. First, the research did not seek to engage critically with school commissioners of EP services and chose to report their independent prospective estimation of service need. Some barriers to utilising EP time were identified by the EPS WG but there was no moderation to school staff forecasts, for example, with respect to potential difficulties organising, applying or enabling commissioned work. Critical insight could be sought from EPs who know the school, with comparison of EPs' perspectives on projected need with school staff's assessments providing a counterbalance; however, on the question of 'need' per se, it seems more appropriate to trust the judgement of SENCos and senior leaders who know the SEN needs of the school first hand. These staff are experienced in commissioning and allocating EP time and whilst EPs deliver services they do not have this experience and are often only in schools for brief periods. From this perspective, it may have been more useful to evaluate the model using estimates from non-index school staff focus groups.

Second, many schools in the participating LA do not currently buy 'traded' time from an EPS. Understanding the reasoning and reluctance to commission EP work would provide further information to provide a comprehensive view of relevant school needs. Third, having only two data points in a large sample of primary schools (>100) weakened the predictive power of the model used. A third index school, taken as a mid-point between the HNPS and the LNPS, would, theoretically, provide greater predictive accuracy of extrapolations from the index schools to the non-index schools. Secondary schools were fewer in number and so having two data points is less problematic for assumed predictive accuracy, though more index settings would be preferable. One possible alteration to our process would be to amalgamate primary and secondary schools into one data set, thus providing additional data points for greater accuracy. However, looking at the differences in percentage increase

in EP sessions between secondary and primary schools and the differences in needs between KS1/2 and KS3/4 learners, it seems appropriate to maintain separate modelling for the primary and secondary schools sectors.

Fourth, variability in school structures are not accounted for across the primary and secondary sectors, for example, 'through schools' (KS1 to KS4) may require different levels of service with reduced concerns around transition work at the end of KS2. Fifth, the participating EPS in this research is a 'fully-traded' service; modelling adaptations may be needed to replicate findings to non-traded EPSs where, for example, LA statutory work may be incorporated with other services to schools.

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The dissemination of evidence to professional practice (Paper Three)

Word count: 5, 276

Origin and principles of 'evidence based practice' and application to EP practice

To understand what is meant by evidence-based practice (EBP) we must return to where it originated, within the field of medicine in the 1960s. The founders of evidence-based medicine (EBM) are widely regarded to be David Sackett, a clinical epidemiologist who established the use of clinical trials to inform individual treatment decisions; and Gordon Guyatt, a professor in Clinical Epidemiology and Biostatistics, who devised innovative methodology, training and communication tools foundational to the approach (Watts, 2015). By 1990, after hundreds of clinical trials providing evidence for such things as the efficacy of aspirin for averting heart disease, the pair had drastically transformed medical practice from reliance on often ineffective conventional methods, to procedure and protocols for finding effective medical interventions demonstrated through strong evidence of efficacy (Watts, 2015). Many at the time were beginning to question the value of the medical profession because so much conventional practice was being revealed as ineffective and labelled as “*quackery*” (Sackett, Ellis, Mulligan & Rowe, 1995, p.407).

To show the impact of the EBM revolution, researchers investigated the procedures used to treat 109 patients within a given month in a hospital in Oxford, finding that 82% of treatments were evidence-based (Sackett et al., 1995). The standard they operated to ensure evidence was reliable involved randomised-control trials (RCTs) (Sackett et al., 1995). These forms of clinical trial must include “*randomization, manualised treatment, a control condition and specific inclusion and exclusion criteria*”; RCTs allow medical professionals to make reliable judgements about which treatments are effective in relation to specific presenting problems (Barkham & Mellor-Clark, 2003, p.320). Results from RCTs fit within the following hierarchy of evidence, although it should be noted that not all research questions are suited to this method, for example, in some cases qualitative investigation is necessary to gain insight to people’s opinions (Frederickson, 2002, p.97):

1. Several systematic reviews of randomised controlled trials
2. Systematic review of randomised controlled trials
3. Randomised controlled trials
4. Quasi-experimental trials
5. Case control and cohort studies

6. Expert consensus opinion
7. Individual opinion

Based on these foundations from medical science, principles of EBP in educational psychology are concerned with procedures of establishing reliable evidence supporting the efficacy of treatment/ intervention through the systematic evaluation of interventions and outcomes, providing accountability for services with benefits to both clients and practitioners (Dunsmuir, Brown, Iyadurai & Monsen, 2009). In the field of educational psychology, Frederickson (2002) explains that RCTs are often not possible or ethical in practice, especially since one of the central tenets of EBP, that intervention is informed by evidence, cannot be reliably applied due to the rigorous clinical requirements of RCTs which are not replicable in real life contexts. Similarly, academic research findings may not be directly relevant to specific cases and context (Reason & Woods, 2002). It is therefore necessary to employ alternative methods which allow application with replicability, one such suggested method is the use of Target Monitoring and Evaluation (TME) (Dunsmuir et al., 2009).

TME is based on Goal Attainment Scaling which sets measurable goals with specified levels of outcome for each that can be reviewed over a period of time providing an achieved level of attainment (Smith and Cardillo, 1994). This method has been shown to have difficulties with implementation regarding definition, time requirement and subjective judgement; TME was developed to address these weaknesses (Dunsmuir et al., 2009). The main differences are that TME provides a clearer method of establishing baseline and greater sensitivity for measuring progress; regardless which approach is employed, they have been shown to be an effective method of measuring and evaluating pupil's progress regarding educational psychology intervention (Dunsmuir et al., 2009). These are especially useful and applicable tools where educational psychologists (EPs) operate a consultation model of intervention, using social influence to indirectly affect and monitor outcomes for children and young people (CYP) (Erchul & Raven, 1997).

Reason and Woods (2002) outline three challenges to consider for psychologists seeking an EBP approach: facing complex and dynamic problems posing difficulties for conceptualisation involving wide-ranging evidence; availability and reliability of information

requiring professional judgement and integration of diverse sources; evidence required to explore specified hypotheses may be constrained due to time, an unclear relationship between dependent and independent variables and over-generalisation. With all these complications, following the established process of assess-plan-do-review whilst attending to personal knowledge/ experience, an integration of practitioner and academic research and consideration of social influences provides a possible route for EBP in the complex scenarios EPs often work (Reason & Woods, 2002).

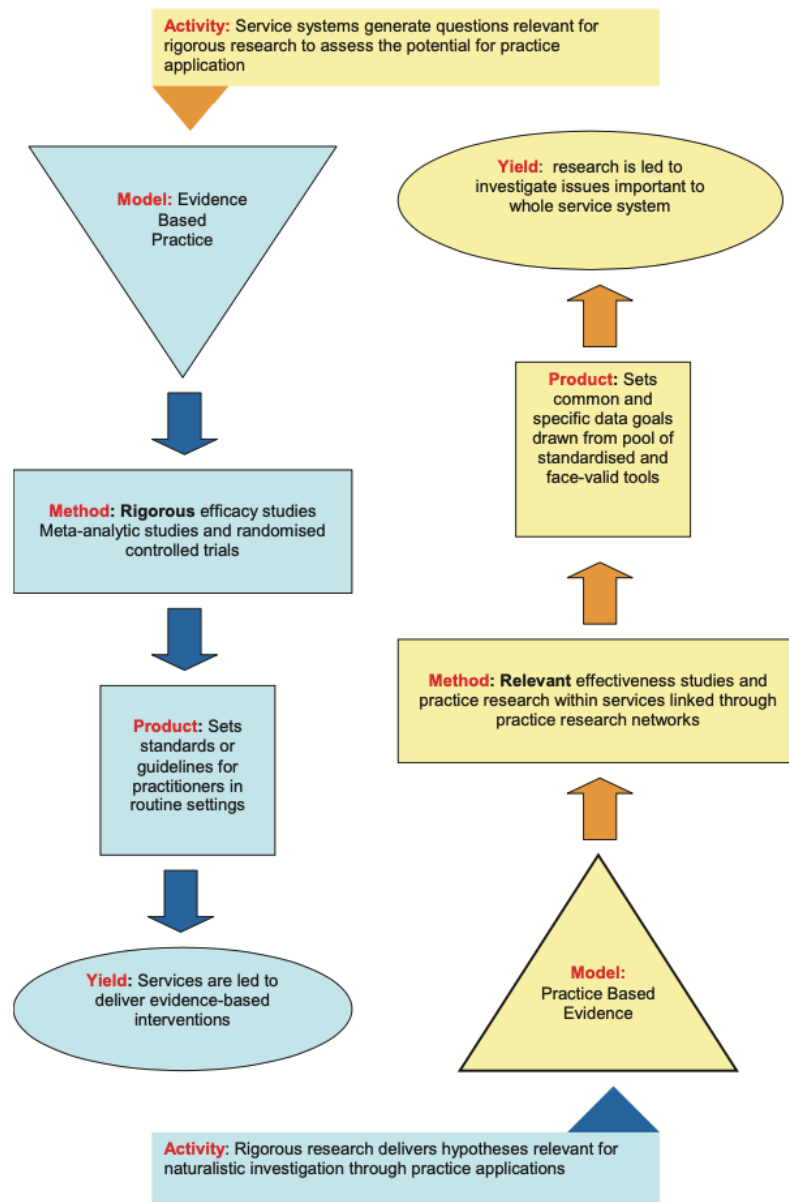
The concept of 'practice based evidence' and application to EP practice

Since EPs *'frequently work in domains where there is no one set of universally accepted and uncontested research findings... the efficacy of innovative interventions, developed through work with individual cases, was subsequently investigated through quasi-experimental designs in applied settings'* (Miller & Frederickson, 2002, p.106); this type of evidence is below RCTs in the hierarchy mentioned above. Whilst eventually, quasi-experimental evidence may lead to larger scale systematic evaluation equivalent to that generated by RCTs, a large portion of evidence used by EPs as the basis for decision-making does not fit this stringent criterion. If the evidence used is less robust, what prevents EPs operating their own form of "quackery"? There are many reasons that the clinical paradigm is not replicable in reality and an alternative paradigm has developed, known as 'practice-based evidence' (PBE); there are tensions between this and EBP but the alternative approach provides rigour for evaluating quality of interventions in a different way, although they are not necessarily incompatible (Barkham & Mellor-Clark, 2003).

Barkham & Mellor-Clark (2003) conceptualise the difference between the EBP and PBE paradigms clearly, stating that EBP relies upon efficacy studies involving RCTs, maintaining internal validity, whereas PBE relies upon effectiveness studies involving service delivery in specified settings including individual differences within that setting, maintaining external validity. For PBE to be considered as robust as efficacy research a much larger sample size is required and for this reason different networks of clinicians often collaborate to provide large datasets (Barkham & Mellor-Clark, 2003). With the evident differences between these paradigms it would be easy to deduce that they are in competition when in actuality they complement each other; it is often presumed that evidence moves linearly from efficacy to

effectiveness, but it is perhaps more useful to see the relationship as complementary and cyclical (Barkham & Mellor-Clark, 2003). This has been illustrated using psychological therapies as an example in figure 1.

Figure 1 – the cycle of rigorous and relevant research in relation to EBP and PBE (taken from Barkham & Mellor-Clark, 2003, p.324)



A further approach that enhances the utility of PBE in applied psychology is Problem Based Methodologies (PBM) which seek to make theories of action explicit in order to evaluate practice (Kennedy & Monsen, 2016). How practitioners integrate research evidence with their own practice and apply it with service users is largely missing from EBP, in fact within

this paradigm practitioners are expected to “*practise according to research conducted at a different time in a different cultural context with different clients.*” (Kennedy & Monsen, 2016, p.12). Furthermore, practitioners are largely unaware of the dissonance between their chosen methodology and their application of it meaning they are unable to correct mistakes; whereas PBM support practitioners to identify dissonance and improve their practice (Kennedy & Monsen, 2016).

Exploring the extent to which EPs see themselves as realists or pragmatists, Burnham (2013) found that respondents most often aimed to be relevant rather than rigorous. This meant they would create bespoke interventions, combining theory with practical resources regardless of theoretical or disciplinary boundaries; they were concerned with the nature of their work and making a positive difference, “*but it was uncomfortable to admit how improvised and situational much of it was.*” (Burnham, 2013, p.26). Although this was a small scale study and only represents the views of seven EPs, in many ways this type of pragmatism is the reason that proponents of EBP are often sceptical of PBE; but this may be a misconception depending on the extent to which psychological science is seen as a realist, positivist undertaking. Rather than concentrating on accurately replicating clinical procedure, the EP as a scientist-practitioner is more focussed on working scientifically in terms of strategy (Shapiro, 2002), PBE is perhaps more applicable in this regard, but that depends on how EBP is defined.

The American Psychological Association (APA, 2006) define EBP as “*the integration of the best available research with clinical expertise in the context of patient characteristics, culture and preferences*”, with this more flexible definition EBP can be interpreted to fit with a person-centred approach. This is more in line with the SEND code of practice (DfE/ DoH, 2014) and suggests that the psychologist should start with the individual and apply the best evidence for achieving better outcomes for CYP. Fallon, Woods & Rooney (2010) advocate for a similar approach, whereby EPs should use professional judgement and expertise to decide whether evidence is applicable for individuals. From this perspective both EBP and PBE are highly applicable to the EP role as a scientist-practitioner and complement each other; where evidence demonstrates the efficacy of specified psychological intervention,

PBE provides the effectiveness as related to context and preference allowing for a person-centred approach to EBP.

EBP and PBE related to research on the EP workforce

The best available evidence that relates to understanding the EP workforce in England is provided by the DfE (2019a); this document maps the workforce, provides understanding of the drivers of EP shortages and mechanisms to address them. The research provides a broad national picture from the perspective of EP services, however, there is no available evidence as to the shortage of EPs as experienced by education settings. Paper Two seeks to address this gap by providing empirical evidence as to the level of need for EP services as expressed by senior school staff and estimation of the workforce required to meet those needs within a chosen LA. Paper One provides evidence gathered systematically from research into WFP models used in healthcare, highlighting the components and functionality required to create an effective WFP model. No such model exists for the EP workforce in England and seven key considerations are stipulated for application within this field.

Effective dissemination of research, knowledge transfer and measuring impact

“...delivering and receiving of a message... the engagement of an individual in a process... and the transfer of a process or product”. (Harmsworth, Turpin, Rees and Pell, 2000, p.3)

According to Harmsworth et al. (2000), when considering educational development projects, there are three types of dissemination. The first is awareness, so that prospective audiences are alerted to the aims and objectives of the research; second is understanding, whereby members of this audience become sufficiently interested to request a more comprehensive knowledge of the project and findings; and third is action, where stakeholders have been engaged in the previous two stages and are enabled to act upon practical outworking of the research. Dissemination for a project is likely to pass through each stage in turn and rather than it being an additional task tagged onto the end of research, it should be built into the project from the start (Harmsworth et al., 2000).

An effective dissemination strategy according to Harmsworth et al. (2000), moves through several stages. First comes the decision as to what to disseminate. Second is the identification of stakeholders, who are a group or an individual that can be impacted by or influential towards the outcomes of the research. Third is the decision as to when to disseminate. Fourth is deciding the most effective methods of dissemination that fit the target audience. Fifth is finding those who might help with dissemination. Sixth is preparation of a strategy and seventh is turning this into an action plan (see table 1 for an example of this). The final step, after estimating costs is to identify what will demonstrate that dissemination has been successful.

Table 1 – example of an action plan from Harmsworth et al. (2000)

Purpose	Target groups	Method	Vehicle	Timing	Responsibility of

Dissemination: Theoretical underpinnings, effective strategies and conceptual frameworks

Wilson, Petticrew, Calnan and Nazareth (2010) completed a systematic scoping review of conceptual frameworks used by researchers as guidance for dissemination. The majority of papers included in their study were based on three different theories. The first is persuasive communication which highlights five influential factors: the source; the message; channels of communication; characteristics of the audience; and the setting. The second is diffusion of innovations theory which sets out how and why innovations disperse socially within populations, the speed at which they spread and factors affecting this; they include a linear process of adopting innovations: knowledge; persuasion; decision; implementation; and confirmation. The final theory is social marketing which applies commercial advertising and promotion strategies, involving consumer-oriented research. Brownson, Eyler, Harris, Moore and Tabak (2018) add a fourth theory which applies political science suggesting three key elements work in unison: definition of the problem; possible policy solutions; and the role of politics and public opinion.

In addition to these potential theoretical underpinnings, there are established principles for effective dissemination practice. Perhaps most importantly, dissemination must be participatory and engaging to the receiver where they are involved in a form of evaluation of the research; passive approaches do not result in 'uptake' (Harmsworth et al., 2000; Brownson et al., 2018; Ross-Hellauer et al., 2020). Dissemination will vary depending on the audience. To the lay person it must be interesting, useful and provoke an emotional connection, whereas at an organisational level the approach should be associated with the culture, resources and skills of members (Brownson et al., 2018). Once the audience is identified there are a variety of methods for reaching them: News media; social media, including blogs and podcasts; policy briefs; one-to-one meetings; workshops and seminars (Brownson et al., 2018). In addition, dissemination should report 'failures' as well as successes as these provide important lessons (Hruschka et al., 2018), similarly, some topics are underreported in dissemination such as costs, sustainability and tool inadequacies (Neta et al., 2015).

Ross-Hellauer et al. (2020) report 10 rules for innovative dissemination resulting from new opportunities related to communication and digital possibilities, these are:

1. Get the basics right
2. Keep the right profile
3. Encourage participation
4. Open science for impact
5. Remix traditional outputs
6. Go live
7. Think visual
8. Respect diversity
9. Find the right tools
10. Evaluate, evaluate, evaluate

Many of these areas have already been covered, however, there are some key points to highlight. It is important to have a coordinated and unique profile online and offline, using websites, social media, researcher identifiers and 'branding' whilst avoiding explicit self-promotion; allow a natural profile to develop organically through effective communication that has impact. Open science is important, allowing others to access publications, data, tools, resources; this is "*rooted in principles of equitable participation and transparency, enabling others to collaborate...*" (Ross-Hellauer et al., 2020, p.5). Opportunities to use digital media to remix traditional outputs increase impact of communication, for example, creating 'nonspecialist summaries' or innovative visuals and videos. Being more visual is key, dissemination has largely focussed on the use of words, where possible use visuals to enhance, attract and interpret findings artistically. The authors list a variety of tools that can be used to aid dissemination from visualisation of data to crowdsourcing. The final point is crucial, evaluate dissemination activities rigorously to ensure they are effective. The goal of any dissemination activity is to achieve maximum impact, there are various ways of measuring this factor (Brownson et al., 2018).

Measuring impact

Impact can be measured over different timescales and methods vary dependent on setting. In an academic setting, short-term impacts might be citation rates or journal downloads; mid-term impacts could be establishing social media networks or getting national media recognition; long-term impacts might be contribution to systematic reviews or national policy decisions (Brownson et al., 2018). In a practice setting, short-term impacts might be awareness, knowledge and use of evidence-based practice; mid-term impacts could be evidence used for funding applications or practice guidelines; long-term impacts might be

increased uptake of evidence-based interventions and cessation of ineffective practice (Brownson et al., 2018). At a policy level, short-term impacts might be knowledge and awareness of evidence-based policy; mid-term impacts could be evidence used in developing policy proposals, whereas long-term impacts might be enactment and evaluation of evidence-based policy (Brownson et al., 2018). Within health literature, one area of impact in terms of long-term outcome is reportedly often missing: whether an intervention or policy is sustained over time. There is limited understanding as to how interventions evolve over time and 'dynamic sustainability' is emerging as a new area of study (Neta et al., 2015).

Knowledge transfer and exchange; strategies to support implementation

Knowledge transfer and exchange is a phrase that represents the bidirectional movement of information (knowledge) between those that use research and the researchers (Mitton et al., 2007). A systematic review of the effectiveness of 'knowledge translation' (KT) in health care provides a narrative synthesis of five different strategies, four of which involved RCTs. The strategies include peer education and development; workshops; communication channels involving print, CD-ROM and internet; supervised consultants providing technical help and training to staff; and internet-based service (LaRocca, Yost, Dobbins, Ciliska, & Butt, 2012). The five included studies evaluated different aspects of KT, table 2 shows all factors that were found to be statistically significant. The review suggests that using the internet to share knowledge; or numerous workshops alongside web-based information and newsletters achieves an impact of increased knowledge in participants. Interactive education sessions alongside national exposure to procedure improves adherence to practice guidelines; and targeted messages with access to an online registry improves evidence-based decision making in public health.

Table 2 - KT methods that demonstrate a statistically significant impact (from LaRocca et al., 2012)

Aspect of KT	Method	Impact
Change in knowledge	Substance abuse prevention materials delivered via pamphlet, CD-ROM or Internet	After 6 month follow up materials disseminated via CD-Rom and internet greater knowledge retention ($p < 0.05$) and preference of respondents for internet ($p < 0.05$)
	Evidence-based public health involving 11 Skill building workshops; web-based information service and 3 newsletters; control group had access to library services	Statistically significant difference between groups for concept knowledge ($p < 0.001$) and source knowledge ($p < 0.01$)
Change in practice	Evaluation of effectiveness of knowledge transfer on evidence-based decision making and the implementation of public health policies/ programs	health departments that received tailored and targeted messages plus access to an online registry improved significantly from baseline to follow-up ($p < 0.01$) compared to a group that only had access to online registry and a group that had online registry plus 1:1 knowledge broker. Improvements were greater within health departments with a high organisational research culture compared to low research culture
	Using time series analysis to evaluate professionals' adherence to national suicide prevention guideline	Educational session with didactic teaching, peer discussion and group work had no significant impact. However when combined with a national event where the guideline was introduced by the health care commission, there was a statistically significant impact on adherence ($p = 0.0001$)

An additional consideration when exploring implementation and KT is identification of facilitators and barriers to knowledge use. When evaluating the use of the “F-words” (function, family, fitness, fun, friends, and future) in practice, disability service providers demonstrated that they had both implemented and integrated the use of the words in practice. They identified several barriers to implementation: “fixing” mentality; insufficient funding and resources; and lack of uptake in higher education curriculum (Soper, Cross, Rosenbaum & Gorter, 2021). This research demonstrated that KT strategies should be adjusted to fit with local context. Service providers recommended the following strategies to support implementation of the “F-words”: local opinion leaders to influence colleagues; linkage and exchange with other service providers; educational outreach including training

and inclusion in the higher education curriculum; and distribution of educational materials (Soper et al., 2021).

Research implications of Paper One and Paper Two

Both papers are the result of research commissioned by the AEP, to investigate the apparent shortage of EPs in England, to identify what a “good” level of EPS looks like and the number of practitioners required to deliver it, minimising the potential for oversupply and calculation of the number of training places needed for new trainees.

Paper One is a systematic literature review of the functionality and application of workforce planning models in healthcare. WFP modelling does not currently exist in the EP field, making implications based on the findings of this review very important. Almost every aspect of the numerous components, functions and applications described in the review provide potential learning for LA decision makers and the AEP commissioner when planning the EP workforce. However, there are seven key considerations to be addressed when constructing a WFP model for the EP field:

1. Identify a method of quantifying EPS supply, in terms of available practitioners and FTE or available service hours, including consideration of skill mix. What is the most efficient division of labour and to what extent are some roles essential for functional service?
2. Productivity, work efficiency and work intensity are crucial factors in determining required levels of service and must be factored into the model.
3. Create an option for testing alternative scenarios to observe the potential impact on the balance of supply and demand. For example, what if innovation allows for more efficient consultation delivery (e.g. through recent developments of hybrid work using technology)? What would be the impact of increasing the number of trainee psychologists (interns) within a local authority EPS?
4. Ideally any WFP model would produce simulations and projections into future time horizons. Whilst this would be an extremely challenging endeavour in the field of practitioner educational psychology, identifying fluctuating demand is essential to inform recruitment over a seven-year minimum training route.

5. Some WFP models incorporate feedback loops, which may be relevant for planning EPS service delivery. For example, does increasing EPS in a school over a short period reduce the need longer term?
6. With both an ageing workforce and a growing tendency towards part-time working (DfE, 2019), accurate prediction of staffing need must consider that if one FTE role is made up of two practitioners, a greater number of training places will be required.
7. No matter how explicit the results of WFP exercises, stakeholders do not always act on direction for other political reasons (Brailsford & De Silva, 2015), whether evident or not at the time of embarking upon the WFP endeavour.

In Paper Two, a framework for gathering data on the need for EP services is developed and demonstrated which could be replicated and scaled up to provide an understanding of demand across all areas of EP work nationwide. Specifically, a method is demonstrated that could be applied to measure the needs of service users in primary and secondary schools within any LA. If there were sufficient EP practitioners to meet the higher levels of need indicated in this research, it is possible that schools or LAs would need increased, 'ring-fenced' funding to enable this. The main implication for policy at government level is that these estimates suggest a need for approximately twice the current staffing of EP service in England, although further evaluation of demand and consideration of skills mix is needed. At a local level, the developed framework and model has the potential to be used by EP service leaders to gather data when making the case for local service expansion.

Implications will now be presented at three levels: the research site, organisational level and professional level.

Implications at the research site

The research site involves three different aspects. First is the AEP commissioner of the work that provided representatives on the steering group for the project, however they will be included in the organisational level implications. Second, is the wider research group who will be continuing and expanding the project. Third, is the EPS and the four schools who participated in the research.

Paper One provides guidance and understanding of what is involved in WFP and the necessary considerations when compiling a model. The components, especially the seven listed above, will be crucial for the wider research team; once estimation of need has been completed across all areas of EP work, creation of a WFP model estimating the required national workforce in England and providing projections to inform decision makers will be the final goal of the research team.

The framework provided in Paper Two along with interview schedules and description of working group processes are being adapted and applied by the wider research team to undertake investigations of need for EP services in other areas such as specialist education settings and early years providers. Estimation of need within primary and secondary schools has provided the first step towards obtaining a national picture of quantifiable need for the EP workforce. As such, this has been a pioneering project which has given direction to subsequent research projects undertaken by the wider team.

The EPS that participated in the research have access to empirical data supporting the need for increased staffing levels, this implication is useful in two ways. First, to be used with LA decision makers as persuasive evidence for expanding the EPS and, second, as guidance as to which schools are most likely to require significantly more EP time. Using findings from Paper One, they will need to consider skill mix and productivity/ efficiency/ intensity factors in their response.

Finally, the participating schools were enabled to evaluate their use of and need for EP services, the implication of this work is that future commissioning of services are likely to be changed based on their reassessment of how they prioritise EP work.

Implications at the organisational level

From the outset, this research has been guided by a steering group including members of the AEP national executive committee. As the commissioners of the project they have been provided with regular updates. The findings from Paper Two that school staff identified need for EP time that equates to a fourfold increase compared to current levels, requiring a

near doubling of staffing levels, provides data for the AEP as the project's preliminary estimate of EP workforce requirements. This is useful data for discussions with the DfE as it suggests that recent training places increases (DfE, 2019b) will not be sufficient to meet need. If TEP places were to increase, there are geographical implications since expanding places within institutions already providing training may not be feasible. There are areas in England that find it harder to recruit EPs (DfE, 2019a) meaning that the establishment of new EP training programmes to strategically meet these needs would be preferable.

The implications of this research are that EPSs nationally may need to prepare for further increases in the number of TEPs who will require placement within their services. This will need careful planning regarding funding and support infrastructure. The implications of having a fully staffed service where currently most EPSs have unfilled vacancies (DfE, 2019a) means that EPSs will be able to plan work more strategically, potentially responding to needs more quickly and providing early intervention. As Paper One highlights, this is a possible feedback loop leading to reduced future need.

Implications at the professional level

As mentioned above, increased number of TEPs will require support infrastructures, especially EPs trained to mentor, develop and provide supervision for new recruits. Whilst representatives of the AEP are actively involved in this research project, wider AEP members will be unaware of this work and will require a channel of communication to raise awareness, potentially through a published journal article (Paper Two) and presentation at conferences.

Workload and the intensity of work are factors contributing to EPs not feeling able to manage and fully attend to the overwhelming demands of their jobs (DfE, 2019a). The implications of increased staffing and the capacity of EPSs to provide sufficient EPs to respond to the overwhelming need would improve job satisfaction, staff wellbeing and retention.

Strategy and action plan for promoting and evaluating dissemination of findings from papers one and two

Given the multitude of considerations discussed regarding dissemination, KT and measuring impact, a carefully planned strategy and action plan were devised to ensure best practice and effective dissemination of research findings. Table 3 shows the target groups, methods, timing and evaluation of this process.

Table 3 - Action plan for dissemination of research based on Harmsworth et al. (2000)

Purpose and type of dissemination	Target groups	Method	Timing	Form of KT	Success criteria and evaluation of impact
Awareness, understanding and action. Share research findings & methodology.	Wider research team (currently including three other TEPs).	Meeting with the research team to explain research process and share developed resources. Also offering availability through email and video call to answer queries. Summary of findings provided. Regular meetings of steering group to ensure adherence to wider research aims.	Between September 2022 and March 2023.	Knowledge of concept and source information. Adherence to procedure and adaptation to practice.	<ol style="list-style-type: none"> 1. Coordination of research approaches between 4 TEPs to ensure consistency. 2. Access and understanding for application of research materials. 3. Adaptations of research resources demonstrates action by TEPs. 4. Knowledge of findings demonstrated.

<p>Awareness, understanding and action.</p> <p>Share research findings, create WFP model.</p>	<p>Wider research team</p>	<p>Sharing of paper one, highlighting the 7 key considerations for WFP models.</p> <p>Action will be in the future when the other TEPs have completed their research.</p>	<p>April 2023</p> <p>July 2025</p>	<p>Knowledge of concept and source information.</p> <p>Application of knowledge to create model.</p>	<ol style="list-style-type: none"> 1. Research group demonstrate knowledge and understanding of WFP models and are able to explain the relevance of 7 key principles. 2. Formation of a functional WFP model.
<p>Awareness & understanding.</p> <p>Share research and highlight key findings.</p>	<p>Local EPS representatives (members of working group including PEP).</p>	<p>Sharing of paper one and two with working group inviting feedback.</p> <p>Individual discussions with working group members to highlight key findings and gain feedback.</p> <p>Meeting with PEP to explain findings and implications.</p>	<p>Between April and July 2023</p>	<p>Knowledge of concept and source information.</p>	<ol style="list-style-type: none"> 1. Feedback given by all 4 members of working group. 2. PEP understands key findings from paper two and is aware of key components of WFP model from paper one.

<p>Awareness & understanding. Present summary of research and key findings.</p>	<p>Local EPS all staff</p>	<p>Present summary of research and key findings during team meeting.</p>	<p>June/ July 2023</p>	<p>Knowledge of source information. Application of procedure.</p>	<ol style="list-style-type: none"> 1. EPS team members aware of potential increased demand from schools especially those with a high notional SEN budget per pupil. 2. Individuals understand the potential for educating commissioners about possibilities regarding time allocation. Especially that school staff said they would like more training and implementation of interventions if they had sufficient EP time.
<p>Awareness and understanding. Share research and highlight key findings.</p>	<p>Representatives of the AEP (steering group and national executive committee). Representatives of the DfE.</p>	<p>Regular summary of research and updates provided orally and in writing. Final summary of paper one and two provided to AEP executive committee and access to paper one and two upon request.</p>	<p>Between September 2022 and July 2023</p>	<p>Knowledge of source information.</p>	<ol style="list-style-type: none"> 1. Attendance and interaction during steering group meetings, taking opportunities to present findings. 2. Written summaries provided to AEP executive committee. 3. Sharing of paper one and two upon request.

		AEP representative to share findings with DfE representative.			
Awareness and understanding. Share research and highlight key findings.	Educational Psychologists and associated professionals.	Submission for publishing in a recognised EP journal. Presentation at conferences.	By July 2023 Ongoing	Knowledge of source information.	<ol style="list-style-type: none"> 1. Papers accepted for publishing. 2. Research presented at conference.

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Appendices

Section A - journal submission guidelines relevant to T1 and T2

A i) T1 submission guidelines for the Journal of Health Services Research & Policy

Aims & Scope

The Journal of Health Services Research & Policy publishes scientific research on health services, health systems and health care from a wide range of disciplines. The Journal also engages in, and responds to, current scientific, methodological and policy debates in health care that are relevant to many health systems. The Journal aims both to reflect current concerns and to contribute to setting health services, health systems and health care policy agendas internationally.

We welcome submissions reporting on research and/or policy analyses concerning low-, middle and high-income countries. In all cases, the international relevance of the submitted work should be clearly drawn out.

As we are a multidisciplinary journal with an international readership we specifically consider a number of criteria in deciding on publication:

- the importance and originality of the research/policy question;
- the appropriateness of the methods used and how well the research has been carried out;
- the strengths and weaknesses of work presented in the article, including the level of critical engagement with the existing evidence base and critical reflection on the findings and implications of the work;
- the extent to which the implications of the findings for policy or practice have been drawn out and have been justified;
- the writing, organisation and presentation of the work reported in the paper;
- the degree to which the paper would be understood by an international audience, which is not necessarily familiar with the health system in question.

Article Types

We consider the following types of submissions:

- Reviews

We consider systematic reviews of published research, which may include rapid evidence syntheses, scoping reviews, meta-ethnography, meta-narrative reviews and realist reviews.

Reviews can be up to 6000 words with up to 50 references.

Where review work exceeds the maximum number of 50 references, authors are encouraged to present additional material in an online supplement.

- Original research (N/A)
- Conceptual/methodological articles (N/A)
- Essays (N/A)

Note that all word counts exclude text in the abstract, references, tables and figures.

Please do not exceed the word limit.

Writing your paper

The SAGE Author Gateway has some general advice and on [how to get published](#), plus links to further resources.

When devising the paper please be aware that the text must be written in a way that cannot be construed as legally objectionable, infringing copyright, defamatory, obscene or likely to be actionable by law.

Reviews

Systematic reviews should be reported according to PRISMA guidelines or respective extension for scoping reviews. For realist reviews please follow the RAMESES publication standards. For reporting meta-ethnography please consider the eMERGe Reporting Guidance.

A ii) T2 submission guidelines for the journal: Educational Psychology in Practice

About the Journal

Educational Psychology in Practice is an international, peer-reviewed journal publishing high-quality, original research. Please see the journal's Aims & Scope for information about its focus and peer-review policy.

Please note that this journal only publishes manuscripts in English.

Educational Psychology in Practice accepts the following types of article: Research Article, Practice Article, Review Article.

Preparing Your Paper

- Structure

Your paper should be compiled in the following order: title page; abstract; keywords; main text introduction, materials and methods, results, discussion; acknowledgments; declaration of interest statement; references; appendices (as appropriate); table(s) with caption(s) (on individual pages); figures; figure captions (as a list).

- Word Limits

Please include a word count for your paper.

A typical paper for this journal should be **no more than 6000 words**

- Style Guidelines

Please refer to these quick style guidelines when preparing your paper, rather than any published articles or a sample copy.

Please use British (-ize) spelling style consistently throughout your manuscript.

Please use single quotation marks, except where 'a quotation is "within" a quotation'.

Please note that long quotations should be indented without quotation marks.

Taylor & Francis Journals Standard Reference Style Guide: American Psychological Association, Seventh Edition (APA-7)

This reference guide details methods for citing and formatting reference entries in accordance with principles established by the Publication Manual of the American Psychological Association, Seventh Edition (2020). For more information about APA style, visit <https://apastyle.apa.org/> and <https://apastyle.apa.org/blog>

- **Formatting and Templates**

Papers may be submitted in Word format. Figures should be saved separately from the text. To assist you in preparing your paper, we provide formatting template(s).

Word templates are available for this journal. Please save the template to your hard drive, ready for use.

If you are not able to use the template via the links (or if you have any other template queries) please contact us here.

Section B - documentation relating to ethical approval

B i) Notice of ethical approval for T2



Environment, Education and Development School Panel PGR
School for Environment, Education and Development
Humanities Bridgeford Street 1.17
The University of Manchester
Manchester
M13 9PL
Email: PGR.ethics.seed@manchester.ac.uk

Ref: 2021-12759-20239

10/08/2021

Dear Mr Timothy Hooper, , Prof Kevin Woods

Study Title: Educational psychology service delivery to primary and secondary schools within a local authority: creating a model estimating required workforce for different levels of service

Environment, Education and Development School Panel PGR

I write to thank you for submitting the final version of your documents for your project to the Committee on 29/07/2021 11:31 . I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form and supporting documentation as submitted and approved by the Committee.

COVID-19 Important Note

Please ensure you read the information on the [Research Ethics website](#) in relation to data collection in the COVID environment as well as the [guidance issued by the University](#) in relation to face-to-face (in person) data collection both on and off campus.

[A word document version of this guidance is also available.](#)

Please see below for a table of the titles, version numbers and dates of all the final approved documents for your project:

Document Type	File Name	Date	Version
Consent Form	Participant Consent working group	27/07/2021	1
Consent Form	Participant Consent school staff	27/07/2021	1
Consent Form	Participant Consent parent:carer	27/07/2021	1
Participant Information Sheet	Participant Information Sheet working group	27/07/2021	1
Participant Information Sheet	Participant Information Sheet school staff	27/07/2021	1
Participant Information Sheet	Participant Information Sheet parent:carer	27/07/2021	1
Additional docs	Data Management Outline email from research data mgt service	27/07/2021	1
Data Management Plan	Data management plan	27/07/2021	1
Letters of Permission	Written correspondence to participants	29/07/2021	1
Additional docs	data collection tools	29/07/2021	1

This approval is effective for a period of five years and is on delegated authority of the University Research Ethics Committee (UREC) however please note that it is only valid for the specifications of the research project as outlined in the approved documentation set. If the project continues beyond the 5 year period or if you wish to propose any changes to the methodology or any other specifics within the project an application to seek an amendment must be submitted for review. Failure to do so could invalidate the insurance and constitute research misconduct.

You are reminded that, in accordance with University policy, any data carrying personal identifiers must be encrypted when not held on a secure university computer or kept securely as a hard copy in a location which is accessible only to those involved with the research.

For those undertaking research requiring a DBS Certificate: As you have now completed your ethical application if required a colleague at the University of Manchester will be in touch for you to undertake a DBS check. Please note that you do not have DBS approval until you have received a DBS Certificate completed by the University of Manchester, or you are an MA Teach First student who holds a DBS certificate for your current teaching role.

Reporting Requirements:

You are required to report to us the following:

1. [Amendments](#): Guidance on what constitutes an amendment
2. [Amendments](#): How to submit an amendment in the ERM system
3. [Ethics Breaches and adverse events](#)

4. [Data breaches](#)

We wish you every success with the research.

Yours sincerely,

Dr Kate Rowlands

Environment, Education and Development School Panel PGR

B ii) Participant information sheets for T2

- *Participant information sheet for EPS & working group*

Participant Information Sheet



Research Participant Information Sheet

Educational psychology service delivery to primary and secondary schools within a local authority: creating a model estimating required workforce for different levels of service

Participant Information Sheet (PIS)

You are being invited to take part in a research study aiming to explore the work of educational psychologists (EPs) in your local authority (LA) – how they currently work in primary and secondary schools and what might be possible in the future. It will form part of the researcher's Doctorate in Educational and Child Psychology. Before deciding whether to take part, it is important to understand why the research is being undertaken and what will be involved. Please read the following information carefully to help inform your decision, you may also discuss it with others if that would be helpful. Feel free to ask if there is anything unclear or if you would like additional information.

About the research

- **Who will conduct the research?**

Tim Hooper, Trainee Educational Psychologist, Doctorate in Child and Educational Psychology, School of Environment Education and Development, The University of Manchester.

- **Research purpose**

This research has been commissioned by The Association of Educational Psychologists (AEP), and the main aim is to create a workforce planning tool for educational psychology services (EPSs) to estimate required staffing levels. At this stage the project will investigate the organisation and delivery of EP work within several primary and secondary schools in ***(LA)**, discover service users experiences and attempt to differentiate levels of service delivery.

- **Will the outcomes of the research be published?**

The research will be reported within a student research project which forms part of assessment for the Doctorate in Child and Educational Psychology. Findings may be published in peer reviewed scientific journals or presented at research conferences.

It is hoped that the outcomes of the research will contribute to the formation of a workforce planning tool that will be shared with The AEP and national EPSs. Outcomes might be used in justification of the model.

- **Who has reviewed the research project?**

The project has been reviewed by The School of Environment Education and Development school-based Ethics Committee at the University of Manchester.

- **Who is funding the research project?**

The project is funded through the DfE ITEP

What would your involvement be?

- **What would you be asked to do if you were to participate?**

If you would like to participate in the research, you will be a member of a working group for the project and required to participate in the following:

- The meetings of the working group are detailed below, they follow the progression of the research project, dates will be confirmed at a later date:
 - part 1 - agreeing the focus of research and negotiating the framework for information gathering
 - part 2 - allocating EP services for settings and differentiating service levels
 - part 3 - evaluating the workforce planning model
- Part 1 – meetings of working group will be once in October, once in November and once in December 2021
- Part 2 – the working group will meet four times between July and August 2022
- Part 3 – meetings will be once in January, once in February and once in March 2023

It is anticipated there will be 10 working group meetings between October 2021 and March 2023. Each meeting will be approximately 3 hours long with breaks (refreshments will be provided). **Some of these meetings will be audio recorded to capture data from discussions (all data will be anonymised).**

You have the option to not take part in the working group and to cease taking part once the project has started if you choose to. You may also choose to decline participation in any activity or discussion of the working group without giving a reason and without detriment to yourself.

- **Will I be compensated for taking part?**

No compensation or remuneration will be given for participating in the research.

- **What happens if I do not want to participate or if I change my mind?**

It is up to you to decide whether to participate. If you decide to participate you will be given this information sheet to keep and will be asked to sign the consent form; you are still free to withdraw at any time without giving a reason and without detriment to yourself. This does not affect your data protection rights. If you decide not to participate you do not need to do anything else.

Consent to audio recording is essential to your participation in the study. You should always be comfortable with the recording process and you are free to stop recording at any time. The researcher will make it clear when the recording is taking place.

Data Protection and Confidentiality

- **What information will you collect about me?**

To participate in the research project, we will need to collect information that could identify you (“personal identifiable information”). This will be:

- Names and signatures on the consent forms.
- Voice audio recording obtained during working group discussions

- **What is the legal basis for collecting this information?**

We are collecting and storing this personal identifiable information in accordance with data protection law which protect your rights. These state that we must have a legal basis (specific reason) for collecting your data. For this study, the specific reason is that it is “a public interest task” and “a process necessary for research purposes”.

- **What are my rights in relation to the information you will collect about me?**

You have a number of rights under data protection law regarding your personal information. For example, you can request a copy of the information we hold about you, including audio recordings. If you would like to know more about your different rights or the way we use your personal information to ensure we follow the law, please consult our [Privacy Notice for Research](http://documents.manchester.ac.uk/display.aspx?DocID=37095).
<http://documents.manchester.ac.uk/display.aspx?DocID=37095>

- **Confidentiality and protection of personal identifiable information**

In accordance with data protection law, The University of Manchester is the Data Controller for this project. This means that we are responsible for making sure your personal information is kept secure, confidential and used only in the way you have been told it will be used. All researchers are trained with this in mind, and your data will be looked after in the following way:

- Only the study team at The University of Manchester will have access to your personal information, but they will anonymise it as soon as possible. Your consent form will be retained for 5 years in a secure locked cabinet.
- The data/findings may be used in future research studies.

Audio recordings

- Data will be transferred from the audio recording device to the University of Manchester secure P drive as soon as possible after the recording is made. It will then be deleted from the audio recording device.
- The recordings will be transcribed by a University of Manchester approved transcriber.

- Personal identifiable information (such as names) will be anonymised during the process of transcription with pseudonyms used where appropriate. The standard retention period for data once anonymised is 5 years.

Potential Disclosures

- If, during the study, you disclose information about misconduct/poor practice, we have a professional obligation to report this and will therefore need to inform your employer/professional body.
- Individuals from the University, the site where the research is taking place and regulatory authorities may need to review the study information for auditing and monitoring purposes or in the event of an incident.
- Please also note that individuals from The University of Manchester or regulatory authorities may need to look at the data collected for this study to make sure the project is being carried out as planned. This may involve looking at identifiable data. All individuals involved in auditing and monitoring the study will have a strict duty of confidentiality to you as a research participant.

Please also note that individuals from The University of Manchester or regulatory authorities may need to look at the data collected for this study to make sure the project is being carried out as planned. This may involve looking at identifiable data. All individuals involved in auditing and monitoring the study will have a strict duty of confidentiality to you as a research participant.

What if I have a complaint?

➤ **Contact details for complaints**

If you have a complaint that you wish to direct to members of the research team, please contact:

Professor Kevin Woods: kevin.a.woods@manchester.ac.uk

If you wish to make a formal complaint to someone independent of the research team or if you are not satisfied with the response you have gained from the researchers in the first instance, then please contact:

The Research Governance and Integrity Officer, Research Office, Christie Building, The University of Manchester, Oxford Road, Manchester, M13 9PL, by emailing: research.complaints@manchester.ac.uk or by telephoning 0161 275 2674.

If you wish to contact us about your data protection rights, please email dataprotection@manchester.ac.uk or write to The Information Governance Office, Christie Building, The University of Manchester, Oxford Road, M13 9PL at the University and we will guide you through the process of exercising your rights.

You also have a right to complain to the [Information Commissioner's Office about complaints relating to your personal identifiable information](#)

Tel 0303 123 1113 <https://ico.org.uk/make-a-complaint/>

Contact Details

If you have any queries about the study or if you are interested in taking part, please contact the researcher.

Tim Hooper: timothy.hooper@postgrad.manchester.ac.uk

- *Participant information sheet for school staff*

Participant Information Sheet



Research Participant Information Sheet

Educational psychology service delivery to primary and secondary schools within a local authority: creating a model estimating required workforce for different levels of service

Participant Information Sheet (PIS)

You are being invited to take part in a research study aiming to explore the work of educational psychologists (EPs) in your local authority (LA) – how they currently work in primary and secondary schools and what might be possible in the future. It will form part of the researcher’s Doctorate in Educational and Child Psychology. Before deciding whether to take part, it is important to understand why the research is being undertaken and what will be involved. Please read the following information carefully to help inform your decision, you may also discuss it with others if that would be helpful. Feel free to ask if there is anything unclear or if you would like additional information.

About the research

- **Who will conduct the research?**

Tim Hooper, Trainee Educational Psychologist, Doctorate in Child and Educational Psychology, School of Environment Education and Development, The University of Manchester.

- **Research purpose**

This research has been commissioned by The Association of Educational Psychologists (AEP), and the main aim is to create a workforce planning tool for educational psychology services (EPSs) to estimate required staffing levels. At this stage the project will investigate the organisation and delivery of EP work within several primary and secondary schools in *(LA), discover service users experiences and attempt to differentiate levels of service delivery.

- **Will the outcomes of the research be published?**

The research will be reported within a student research project which forms part of assessment for the Doctorate in Child and Educational Psychology. Findings may be published in peer reviewed scientific journals or presented at research conferences.

It is hoped that the outcomes of the research will contribute to the formation of a workforce planning tool that will be shared with The AEP and national EPSs. Outcomes might be used in justification of the model.

- **Who has reviewed the research project?**

The project has been reviewed by The School of Environment Education and Development school-based Ethics Committee at the University of Manchester.

- **Who is funding the research project?**

The project is funded through the DfE ITEP

What would your involvement be?

- **What would you be asked to do if you were to participate?**

If you would like to participate in the research, you will be taking part in a focus group where between 5 and 10 members of school staff discuss EP work in your school. The focus group will meet at a time and date to be decided between January and June 2022.

You have the option to not take part in the focus group and to cease taking part once the group discussion has started if you choose to. You may also choose to decline to answer any question or participate in any discussion during the focus group without giving a reason and without detriment to yourself.

The focus group will discuss experiences of EP work, preferences and desires for future EP work and how different levels of EP work might be defined. **The focus group will be audio recorded (data will be anonymised).**

- **Will I be compensated for taking part?**

No compensation or remuneration will be given for participating in the research.

- **What happens if I do not want to participate or if I change my mind?**

It is up to you to decide whether to participate. If you decide to participate you will be given this information sheet to keep and will be asked to sign the consent form; you are still free to withdraw at any time without giving a reason and without detriment to yourself. This does not affect your data protection rights. If you decide not to participate you do not need to do anything else.

Consent to audio recording is essential to your participation in the study. You should always be comfortable with the recording process and you are free to withdraw at any time. The researcher will make it clear when the recording is taking place.

Data Protection and Confidentiality

- **What information will you collect about me?**

To participate in the research project, we will need to collect information that could identify you (“personal identifiable information”). This will be:

- Names and signatures on the consent forms.
 - Voice audio recording obtained during working group discussions
- **What is the legal basis for collecting this information?**

We are collecting and storing this personal identifiable information in accordance with data protection law which protect your rights. These state that we must have a legal basis (specific reason) for collecting your data. For this study, the specific reason is that it is “a public interest task” and “a process necessary for research purposes”.

- **What are my rights in relation to the information you will collect about me?**

You have a number of rights under data protection law regarding your personal information. For example, you can request a copy of the information we hold about you, including audio recordings. If you would like to know more about your different rights or the way we use your personal information to ensure we follow the law, please consult our [Privacy Notice for Research](http://documents.manchester.ac.uk/display.aspx?DocID=37095).
<http://documents.manchester.ac.uk/display.aspx?DocID=37095>

- **Confidentiality and protection of personal identifiable information**

In accordance with data protection law, The University of Manchester is the Data Controller for this project. This means that we are responsible for making sure your personal information is kept secure, confidential and used only in the way you have been told it will be used. All researchers are trained with this in mind, and your data will be looked after in the following way:

- Only the study team at The University of Manchester will have access to your personal information, but they will anonymise it as soon as possible. Your consent form will be retained for 5 years in a secure locked cabinet.
- The data/findings may be used in future research studies.

Audio recordings

- Data will be transferred from the audio recording device to the University of Manchester secure P drive as soon as possible after the recording is made. It will then be deleted from the audio recording device.
- The recordings will be transcribed by a University of Manchester approved transcriber.
- Personal identifiable information (such as names) will be anonymised during the process of transcription with pseudonyms used where appropriate. The standard retention period for data once anonymised is 5 years.

Potential Disclosures

- If, during the study, you disclose information about misconduct/poor practice, we have a professional obligation to report this and will therefore need to inform your employer/professional body.
- Individuals from the University, the site where the research is taking place and regulatory authorities may need to review the study information for auditing and monitoring purposes or in the event of an incident.
- Please also note that individuals from The University of Manchester or regulatory authorities may need to look at the data collected for this study to make sure the project is being carried out as planned. This may involve looking at identifiable data. All individuals involved in auditing and monitoring the study will have a strict duty of confidentiality to you as a research participant.

Please also note that individuals from The University of Manchester or regulatory authorities may need to look at the data collected for this study to make sure the project is being carried out as planned. This may involve looking at identifiable data. All individuals involved in auditing and monitoring the study will have a strict duty of confidentiality to you as a research participant.

What if I have a complaint?

➤ Contact details for complaints

If you have a complaint that you wish to direct to members of the research team, please contact:

Professor Kevin Woods: kevin.a.woods@manchester.ac.uk

If you wish to make a formal complaint to someone independent of the research team or if you are not satisfied with the response you have gained from the researchers in the first instance, then please contact:

The Research Governance and Integrity Officer, Research Office, Christie Building, The University of Manchester, Oxford Road, Manchester, M13 9PL, by emailing: research.complaints@manchester.ac.uk or by telephoning 0161 275 2674.

If you wish to contact us about your data protection rights, please email dataprotection@manchester.ac.uk or write to The Information Governance Office, Christie Building, The University of Manchester, Oxford Road, M13 9PL at the University and we will guide you through the process of exercising your rights.

You also have a right to complain to the [Information Commissioner's Office about complaints relating to your personal identifiable information](#)

Tel 0303 123 1113 <https://ico.org.uk/make-a-complaint/>

Contact Details

If you have any queries about the study or if you are interested in taking part, please contact the researcher.

Tim Hooper: timothy.hooper@postgrad.manchester.ac.uk

B iii) Participant consent form for T2



Educational psychology service delivery to primary and secondary schools within a local authority: creating a model estimating required workforce for different levels of service

Consent Form

If you agree to participate please complete and sign the consent form below

	Activities	Initials
1	I confirm that I have read the attached information sheet for the above study and have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	
2	I understand that my participation in the study is voluntary and that I am free to withdraw at any time without giving a reason and without detriment to myself. I understand that it will not be possible to remove my data from the project once it has been anonymised and forms part of the data set. I agree to take part on this basis.	
3	I agree to the interview being audio recorded.	
4	I agree that any data collected may be published in anonymous form in academic books, reports or journals.	
5	I understand that data collected during the study may be looked at by individuals from The University of Manchester or regulatory authorities, where it is relevant to my taking part in this research. I give permission for these individuals to have access to my data.	
7	I agree that any anonymised data collected may be shared with researchers/researchers at other institutions.	
8	I agree that the researchers may retain my contact details in order to provide me with a summary of the findings for this study.	
9	I understand that there may be instances where during the course of the interview information is revealed which means that the researchers will be obliged to break confidentiality, and this has been explained in more detail in the information sheet.	
10	I agree that some of the data collected may be used in future research studies. The findings of these research studies may be published in anonymous form in academic books, reports or journals.	

requested from your EPS would be to allow three or four EPs to participate in a working group for the project (approximately 10 meetings between October 2021 and March 2023).

As I'm sure you will appreciate, this is a complex project and difficult to explain in an email. Would it be possible to discuss the research with you over the phone? There is absolutely no obligation to participate and I will understand if you decide not to. The project will be subject to ethical approval from The University of Manchester and will take the upmost care when interacting with service users and commissioners.

Thank you for your time and consideration.

Kind regards

Tim Hooper
Trainee Educational Psychologist

Doctorate in Educational and Child Psychology Programme
School of Environment, Education and Development
University of Manchester,
Oxford Road,
Manchester M13 9PL
timothy.hooper@postgrad.manchester.ac.uk

- Email to potential working group member from EPS

I'm emailing to follow up from my presentation at your team meeting about the research project I will be undertaking in ****LA**** over the next two years.

As I explained, this is an exciting project commissioned by The AEP that will contribute to a clearer picture of EP workforce requirements in the UK. I would be very grateful if you would consider participating in the working group which will help to shape and direct the research. I've attached a participant information sheet giving details of the research project and the requirements for participation.

Please feel free to contact me with any questions or concerns and let me know if you are interested in joining the working group. I should mention at this point that the group will be limited to six members (for functional reasons), if there are more people interested than this, a transparent method for selecting participants will be employed. There is no obligation to participate and no detrimental effects should you choose not to.

Thank you for your time and consideration.

Kind regards

Tim Hooper
Trainee Educational Psychologist

Doctorate in Educational and Child Psychology Programme
School of Environment, Education and Development
University of Manchester,
Oxford Road,

Manchester M13 9PL
timothy.hooper@postgrad.manchester.ac.uk

- Email to potential school and school staff

My name is Tim Hooper and I'm a trainee educational psychologist (EP) at The University of Manchester. For the next two years I will be undertaking a research project in ****LA**** exploring how schools access EP services, experiences of school staff/ service users, and consideration of levels of adequacy of service (in particular future potential requirements).

In discussion with ****LA**** EP service, your school was identified as a potential candidate to participate in the research. This would involve allowing me to carry out an audit of current EP services and to run three focus groups (one with staff, one with parents/ carers who have accessed EP services, and one with children/ young people who have accessed EP services). The project has received ethical clearance from the University of Manchester.

I have attached an information sheet giving details of the project and requirements for participation. There is absolutely no obligation to take part and no detrimental effects if you choose not to. However, if you have any questions or would like an informal discussion about the research please don't hesitate to get in touch.

Thank you for your time and consideration.

Kind regards

Tim Hooper
Trainee Educational Psychologist

Doctorate in Educational and Child Psychology Programme
School of Environment, Education and Development
University of Manchester,
Oxford Road,
Manchester M13 9PL
timothy.hooper@postgrad.manchester.ac.uk

Section C - instrumentation

C i) Critical appraisal of workforce planning research

The following critical appraisal framework was created using information from a scoping review of workforce planning models (WPM) written by O'Malley, et al. (2020) in conjunction with the framework created by Woods (2020) for assessing quantitative research quality.

Author(s):

Title:

Journal Reference:

Criterion	Score	R	R	Agree	R	R	Agree	Comment
		1	2	%	1	2	%	
General								
Well defined aims, clear purpose of WPM	1 0							
Describes and uses previous research for guidance and direction	1 0							
Clear statement of the problem and potential solution; ecological validity (not overly theoretical or estimated)	1 0							
Data								
Multiple sources of data. <i>reliability/ validity carefully considered</i>	2 1 0							
Population subgroup data collected	1 0							
Robustness of data <i>Including justification for data manipulation (ie. Projection, estimation) based on actual data?</i>	2 1 0							

Elements of the WPM								
Timeframe identified	1 0							
Geographic considerations <i>e.g. regional or subgroup analyses</i>	1 0							
Demand measure (0= current utilization; 1=linked to population need; 2=built in productivity)	2 1 0							
Healthcare system appraisal <i>evidence based approaches</i>	1 0							
Analytic approach clear	1 0							
Output – estimated workforce numbers	1 0							
Multi-level analyses present (e.g. scenarios)	1 0							
Visual representation of model	1 0							
Output and interpretation								
Application of WPM to real life, presents implications for healthcare system and workforce	2 1 0							
Limitations of the research considered solutions suggested <i>e.g. critique of method; generalizability estimate</i>	2 1 0							
	Total score			Mean % agree			Mean % agree	
Total (max=21)								

C ii) Focus group interview schedules

Focus group 1

1.Introductions, Agenda/ timings, ground rules

Starter/ warm-up “Does your school receive enough EP time?”

2. Over the past 2 years your school has commissioned the following EP time (sessions), how do you decide how many sessions to purchase each year?

3. Overall EP work was used in the following areas (% consultation, assessment, training, research, interventions).

- a. How did you decide to use EP time in this way?
- b. What are your priorities for EP involvement?
- c. Are there any of these areas of EP work where you would consider commissioning more work? Why?

4. Bring to mind previous work with an EP. Think about your experience of their initial involvement; then how their work developed; and finally the impact of their work.

- a. What did you value about their involvement? What worked well?
- b. What did the work/ service involve? Is that what you expected?
- c. What was the impact of their work?
- d. If you could change anything about EP work what would that be?

5. Imagine that your experience of EP work over the past 3 years was at a silver level, what would a gold level of service look like? If there was no question of available funding, what additional EP services would you commission?

Before the next focus group I'm going to ask you to think about this last question and discuss it amongst yourselves. What are the needs in your school and how might you address these using EP support? To help you with this I have a template for you to complete (show each participant a copy at this point, make it clear they are to complete one version collaboratively). Discuss the template, arrange a date for FG2 and ask them to complete the template together by this date.

Focus group 2:

1. How far did you get with completing the template? How did you find the process? (If not yet complete, spend time doing this together).
2. How easy was it to make and agree these decisions?
3. How did you decide on the number of sessions? Explain each section (go through each of the 6 sections on the template) *Find out how the information provided and discussed during the first focus group and through the template itself helped/ didn't. Get as much detail of the commissioned work as possible*

C iii) Forecasting template for commissioned work

In the table below there are 6 areas of work you could commission from an educational psychologist (EP) in the academic year 2022/23. Decide how many sessions you would like (1 session is equivalent to 3 hours EP work). For the purpose of this research, funding is not a constraint; you can choose as many sessions as you think you need (try to be realistic).

Area of EP work	Examples	Number of sessions
Consultation	<ul style="list-style-type: none"> • During initial consultations concerns are identified and clarified; desired outcomes collaboratively developed. • There can also be feedback consultations, explaining the results of EP assessment work, often establishing an intervention plan; and review consultations to evaluate impact over time. • It may involve parents, teachers or other professionals. Once desired outcomes have been agreed, the EP will select the most appropriate next steps, based on their professional view. • May be about individuals, groups or whole school issues. 	
Assessment	<ul style="list-style-type: none"> • EPs offer a comprehensive range of psychological assessments to support children and young people with a range of needs. Assessments may be formal and standardised or qualitative. • Assessment can also be environmental or systemic, considering all aspects of the school environment, policies and systems. • An audit of SEND provision in school can be carried out, followed by a review 	
Intervention	<ul style="list-style-type: none"> • EPs offer a range of interventions and therapeutic approaches. Bespoke interventions can be developed and delivered on a needs led basis. • EPs can train school staff to deliver these, enabling continuity and upskilling • Other examples include staff supervision, coaching and Video Enhanced Reflective Practice (VERP), staff well-being sessions and collaborative problem solving. 	
Training	<ul style="list-style-type: none"> • A wide range of quality training courses on topics relating to psychology and learning. This includes inclusive learning, support for children with SEND, SEND processes and Emotional Well-being. • Courses are offered in both pre-recorded videos to be viewed at a time that suits you and live interactive e-learning sessions. • Courses can be tailored to individual needs and delivered in your setting. 	
Research	<ul style="list-style-type: none"> • Support to develop learning and behaviour across the whole school. This might include analysis and monitoring of existing provision, research into the impact of interventions or developing whole school learning strategies. 	

	<ul style="list-style-type: none"> • EPs can support you with your own school-based research, or help you identify appropriate evidence-based programmes to meet your needs. 	
Other	<ul style="list-style-type: none"> • Some areas of EP work are hard to predict, try to estimate how you might commission work in these 2 areas: <ul style="list-style-type: none"> ○ Statutory assessments: psychological advice as part of the statutory Education Health and Care assessment process. ○ Critical Incident Support: In the event of a critical incident or other traumatic event, providing assistance, advice and support. 	

Section D - materials showing detail of data analysis processes.

D i) Coding frameworks

1. Coding framework for identifying time and details of commissioned work

Researcher:		School: LNPS/ HNPS/ LNSS/ HNSS (circle)	
Area of EP work	Number of sessions	Rationale/ detail of commissioned work	Page & line
Consultation			
Assessment			
Intervention			
Training			
Research			
Other			

2. Coding framework for working group evaluation of model

Researcher:		Working group evaluation	
School for comparison to model	Number of sessions identified	Explanations offered for difference to model projection	Page & line

School 1			
School 2			
School 3			
School 4			
School 5			
School 6			

D ii) coding audit tools

1. Audit tool for focus group data

Where is the coding difference?		Resolution	
Coding reference	Page & line	Discussion – changes/ addition to analysis needed?	Resolved?
LNPS			
HNPS			
LNSS			
HNPS			

2. Audit tool for WG data

Where is the coding difference?		Resolution	
School for comparison to model	Page & line	Discussion – changes/ addition to analysis needed?	Resolved?
School 1			
School 2			

School 3			
School 4			
School 5			
School 6			

D iii) Sample from coding framework used for identifying details of commissioned work

Researcher: TH		School: <u>LNPS</u> / HNPS/ LNSS/ HNSS	
Area of EP work	Number of sessions	Rationale/ detail of commissioned work	Page & line
Consultation	16 sessions across both C&A	<ul style="list-style-type: none"> [P1] put consultation and assessment together... I don't know if it is together, but that's how I envision it.... [P2] 	2:14-16 5:28-29
Assessment		<ul style="list-style-type: none"> Putting these two together is probably best, because that's consultation and assessment with advice 'cos we very rarely do just a consultation without assessment or just assessment without a consultation [P1] observations over a couple of different sessions, maybe a morning and an afternoon, to get a clearer view of how the students are behaving in school... to get a full picture of what that student is actually like on a typical day. [P2] because one half an hour or even an hour in one single lesson's not always a full view of what they're actually like. They might be brilliant in a morning and then not as great after lunch, or the other way round, they might be asleep in the morning and come alive in the afternoon or whatever. So it would be good to get some more observation time in there, just to get their professional input. 'Cos obviously we're seeing day in, day out what the students could do, but it would be good to have a second pair of eyes [P1] Finding out is there something else that we could put in place to support them. The strategies I think are the most important thing, something that we can share with staff around school that comes from a professional person who knows [P2] if they've got a particular area of need, cognition learning or SEMH, whatever it is, if 	4:31-32 4:33-38 5:2-5 5:22-24

		<p>there's some assessments that could be done on a one to one basis with the student that can give us a little more insight than that'd be helpful</p> <ul style="list-style-type: none"> • [P1] consultation is talking to us and the child, and I would like perhaps that to involve the head of year as well a bit more often • [P2] I think it does take more than one visit to do this, and that's why there's more time in here 'cos visiting a child twice, you probably get an awful lot more out of them the second time, because they will open up. They will come with an open mind rather than, "Who is this stranger?" • [P1] you know, we probably go through two or three a term, so maybe up to ten in the year, and then that would be maybe two sessions per child. But that's not giving any time for a write-up, does it? • [P1] But in the course of a typical year, how many children would I be wanting our EP to come in and really do some productive, impactful work with? Probably about ten, twelve. ... I think at present it's probably more like six to eight. 	<p>5:30-32</p> <p>5:40-6:3</p> <p>6:18-20</p> <p>6:34-36</p> <p>6:40</p>
Intervention	5 total	<ul style="list-style-type: none"> • [P2] There's tons, isn't there? ...We won't know what they all are, I suppose • [P1] I do perceive that the EPs still have a finger in current research more than classroom teachers do. So, you know, it would be good to communicate those things that come out that do – and have shown to have impact. I mean, most teachers do look at things like the EEF, and go on Twitter and pick up things, but, you know, in reality do they all work. And, you know, using the EP to consult and bounce ideas off, "This is the issues, what's currently being used out there that makes a difference?" • [P2] we don't know what interventions are out there or what interventions might be suitable for particular students, but if an EP was to come in and, say, observe the nurture class, then they might pick up on areas of need that we might not necessarily have picked up on, and then those students could be targeted for intervention work. Like, I don't know, Student A's at the back and tapping his fingers or twiddling his thumbs or whatever. I might not know how to deal with that, but the EP might say, "Oh, this is a really good intervention that will work with that," and then work with that particular student on that. It's hard 	<p>8:34-38</p> <p>8:40-9:5</p> <p>9:7-14</p> <p>9:17-20</p>

		<p>to know, isn't it, if you don't know what's out there.</p> <ul style="list-style-type: none"> • [P1] I think schools are understanding dyslexia more nowadays. But in secondary school, my understanding is, and I'm certainly in that category, really don't understand or have strategies around speech and language development. It was never in our training, and don't know what works. • [P1] intervention modelling, how to do that over a period of time, maybe two or three sessions, would take – well, not necessarily two or three – three hour sessions. So three short sessions with a child, modelling it, would be more impactful, because then that colleague can go on and use it a number of times. • [P2] we had some work from EP about precision teaching, and she did come back and follow up, talked to the colleagues. So, you know, that model does exist, and I think it's more impactful for anybody – if you know you're going to have a visitor come back and ask you questions about it, you're going to do it. • [P2] It's good to have a check-in, isn't it, and know that it's working and you're still on the right tracks. • [P1] to implement 2 interventions over the year with some modelling and checking in afterwards. 	<p>10:5-8</p> <p>10:23-27</p> <p>10:34</p> <p>10:40</p>
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*P1 was a SENDCo (and on SLT) and P2 was a teacher

D iv) Summary of qualitative data taken from index setting FG/ interviews used by WG to allocate EP time required

LNPS

Data from interview/ FG	Notes to consider	Additional time required for EP service and why
<p>CONSULTATION & ADVICE [10 TOTAL]</p> <ul style="list-style-type: none"> • 2 sessions for consultation and review re: behaviour policy • 2 for the consultation [CYP need EHCP advice] • 2 sessions - Three children who are “building up”, three single hour consultations would be one session wouldn't it?... I always want a bit of writing up yeah, probably two [2 sessions] • I think our parents would benefit from a half termly drop ... six drop in sessions, two hours each [4 sessions] 	<p>Prep for drop-ins or follow-up?</p>	<p>+ 1 session – plan/ prep/ feedback from drop-ins</p>
<p>ASSESSMENT & ADVICE [6 TOTAL]</p> <ul style="list-style-type: none"> • Three children who – and each child I think for a thorough assessment, probably needs, and a report writing, and actually the EP would need to meet with parents of all of these children... So six for the assessment and advice 		
<p>TRAINING [2 TOTAL]</p> <ul style="list-style-type: none"> • One of those NQTs is getting a class who there are some children with attachment needs, and some additional needs in there, so some training for that member of staff would be really good. So probably looking at two sessions for that member of staff. 		
<p>INTERVENTIONS [3 TOTAL]</p> <ul style="list-style-type: none"> • [name]'s actually been in and done some observations, you know, it would be nice to continue that into year four to look at running some interventions with the children who struggle to manage their distractions, their impulsiveness, you know, that would be good. But you're probably looking at once a week for a half term, so might be looking at maybe six sessions, or you know, to push eight sessions, maybe an hour a session. [3 sessions] 	<p>Time for prep materials/ research</p>	<p>8x 1hr = 3 sessions + 2 sessions prep</p>

<p>RESEARCH [4TOTAL]</p> <ul style="list-style-type: none"> Next year we're going to do an overhaul of the behaviour system look at the current behaviour system, maybe get pupil voice, look at how it's working, look at evidence that we've got around the problems we have, and then look into helping us to develop a new system. [2 session consultation/review; 4 session research] 		
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LNSS

Data from interview/ FG	Notes to consider	Additional time required for EP service and why
<p>CONSULTATION & ASSESSMENT [16 TOTAL]</p> <ul style="list-style-type: none"> put consultation and assessment together... that's consultation and assessment with advice observations over a couple of different sessions is there something else that we could put in place to support them? The strategies I think are the most important thing assessments that could be done on a one to one basis with the student that can give us a little more insight then that'd be helpful I think it does take more than one visit to do this, and that's why there's more time in here 'cos visiting a child twice... that would be maybe two sessions per child. But that's not giving any time for a write-up, does it? But in the course of a typical year, how many children would I be wanting our EP to come in and really do some productive, impactful work with? Probably about ten, twelve. 	<p>16 sessions doesn't seem right for seeing 12 children and doesn't include write-up time</p>	<p>12 CYP, 2 sessions each = 24 sessions + 1 session consultation re: intervention & training needs 25 split over C&A</p>
<p>TRAINING [5 TOTAL]</p> <ul style="list-style-type: none"> Whole school for maybe an hour on a pertinent issue staff group session such as a faculty based training eg English faculty on language and questioning or the Heads of year on the impacts of attachment development or training the TA team on the importance of student adult secure relationships in a school setting. 		<p>3x sessions delivery, 2x prep</p>

<p>INTERVENTIONS [5 TOTAL]</p> <ul style="list-style-type: none"> • EP to consult and bounce ideas off, “This is the issues, what’s currently being used out there that makes a difference?” • EP was to come in and, say, observe the nurture class, then they might pick up on areas of need that we might not necessarily have picked up on • It’s hard to know, isn’t it, if you don’t know what’s out there. • intervention modelling, So three short sessions with a child, modelling it, would be more impactful, because then that colleague can go on and use it a number of times. • we had some work from EP about precision teaching, and she did come back and follow up, talked to the colleagues. • It’s good to have a check-in, isn’t it, and know that it’s working and you’re still on the right tracks. • I clarified they would want to implement 2 interventions over the year using the modelling and supervision approach. 	<p>+session to consultation?</p> <p>consultation modelling and finally supervision</p> <p>they hoped to establish 2 interventions with 5 sessions</p> <p>What about prep and training time?</p>	<p>5x face time; 5x prep time 10 total</p>
<p>RESEARCH [2 TOTAL]</p> <ul style="list-style-type: none"> • You know what I said before about school having a couple of staff which are very good at implementing research into teaching and learning? ...for those members of staff who have that whole school responsibility, to meet the EP and run past them – and get that joined up thinking • I don’t know how every school’s structured, but, you know, ours is that there is a dedicated deputy head and assistant head who do research and implement around teaching and learning 		
<p>OTHER [3 TOTAL]</p> <ul style="list-style-type: none"> • Unexpected occurrences are things that happen where you get a crisis moment, with a child or a situation, in a domestic or a school situation that you need an EP’s advice. Or the authority may be going to – not mediation but a tribunal, and you need an EP’s view on the situation before action can be taken. Sometimes these things happen very quickly. I mean, I’m thinking of one in particular ...we needed an EP to spend quite a bit of time with the child and unpick what the difficulties were 	<p>3 contingency sessions</p>	

HNPS

Data from interview/ FG	Notes to consider	Additional time required for EP service and why
<p>CONSULTATION & ADVICE [39 TOTAL]</p> <ul style="list-style-type: none"> • So the consultation and advice, and the assessment and advice, I put thirty-nine sessions for each, so that would kind of come out about seventy-eight sessions altogether. And that's because, predominantly, I think that's what we've used our EP time for this year. • A day a week in school C&A 	<p>1 day to do consult, assess, report & feedback. Enough?</p>	<p>2 sessions per child to do all of that not sufficient, 2.5 sessions average = 98</p> <p>98/2 = 49</p>
<p>ASSESSMENT & ADVICE [39 TOTAL]</p> <ul style="list-style-type: none"> • So then it would be [name] coming in, observing that child, meeting with teacher, meeting with parents, producing a report, which is pretty much a day's work, and then at some point feeding back to those parents and feeding back to us. 		<p>Planning/ prep time</p>
<p>TRAINING [5 TOTAL]</p> <ul style="list-style-type: none"> • full day training session would be really beneficial for all staff, so whether that was trauma informed and we got a full staff day training on trauma informed practice, or – a lot of the reports I've received recently have recommended zones of regulation, and again that's something we don't use in school yet • So we'd get a full training and then just get like extra bits for those different groups of people in school, like our mentors. So yeah, so it was a full day training, then I think three additional sessions with those different groups as well 	<p>Running 3 intervention groups weekly, prep and additional time for training/ supervision</p>	<p>39 sessions face time + 39 sessions prep = 78</p>
<p>INTERVENTIONS [39 TOTAL]</p> <ul style="list-style-type: none"> • So intervention is where, within our own provision, I think there's a significant gap, ... therapeutic interventions or around some element of their learning. • I've put weekly would be the ideal, and I've put roughly thirty-nine sessions, which will cover the whole school year • having a morning with our EP, where they might run three different intervention groups for different needs throughout the school • But also the model whereby the EP trains staff to then deliver the interventions • Detail of interventions on p5 FG2. 		

RESEARCH [0 TOTAL]		
OTHER [6 TOTAL] <ul style="list-style-type: none"> I put six, because I felt like it would probably be one per half term, where we have realised, "Right, I feel this child needs an EHCP now, I want to get an application done." And in terms of strengthening that application 		6 contingency (pre EHC)

HNSS

Data from interview/ FG	Notes to consider	Additional time required for EP service and why
CONSULTATION & ADVICE [80 TOTAL (hours)] <ul style="list-style-type: none"> In an ideal world, you'd have an educational psychologist one day a week, where, a, you can look at staff training problems, you can look at the ed psych to support with behaviour, if you've got a staff member that's struggling with behaviour... cognition and learning... emotional understanding, anxiety issues. In an ideal world, you'd have someone once a week for a whole day. Consult with teachers and sometimes pastoral staff... meeting with parents. Between thirty and forty students, we'd want to see...there's a lot of children that are sitting under the radar that have been missed, especially cognition and learning, I would say. 	A day a week = 78 sessions + write ups prob not far off 40 CYP 80 + 120 Guess work	asking for a day a week to see 40 CYP 40x2.5= 100
ASSESSMENT & ADVICE [120 TOTAL (hours)] <ul style="list-style-type: none"> you think about all the children that need some additional support through, you know, cognition and learning, never mind, you know, your ASC and your ADHD, your mental health needs... we've got a large number of children, especially in our school... half the school's pupil premium. I could do 120 [hours] So, if we said eighty hours of consultation and 120 hours of assessment or a day a week. 		
TRAINING [4 TOTAL] <ul style="list-style-type: none"> You'd only really be able to fit two in, wouldn't you, because of how it fits and everything else. You'd want two that are specific... So, two full days' training, two full days 	4 sessions face time	+ 4 prep time = 8 total

<p>INTERVENTIONS [39 TOTAL]</p> <ul style="list-style-type: none"> • I think you're talking about a session a week just on running interventions, so that would probably be thirty-nine sessions.... • Proper therapy – cognitive behaviour therapy • things like zones of regulation has been in a lot of reports recently and work on regulation strategies... we have a lot of need and some group work for staff to follow • You've got your adhd and ASC groups so managing behaviour and social skills • EPs know a lot about evidence and interventions that work ...reading and literacy needs for example • I clarified that they want 39 sessions face time – a mix of delivery and modelling/supervision 		39 face + 39 prep = 78 total
<p>RESEARCH [0 TOTAL]</p>		
<p>Other 10 sessions allocated for EHCAs</p>	<p>Not sure about the 10 sessions EHCP...</p>	<p>Decision to remove because EHCA is not taken from traded time</p>