ONE EFFECT ON PRE-SERVICE TEACHERS' SELF-EFFICACY SCORES LINKED TO CHANGES IN ANTI-COVID-19 MEASURES AS THE PANDEMIC PROGRESSED IN SCHOOLS IN THE NORTHWEST OF ENGLAND

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Abstract

Previous International Academy of Technology, Education and Development (IATED) conference proceedings papers [1] [2] [3] have reported the quantitative and qualitative findings from anonymous online surveys conducted by a Higher Education (HE), qualified teacher status (QTS) provider in the northwest of England. The surveys invited pre-service teachers qualifying to teach in England during the Covid-19 pandemic to volunteer demographic data, ascribe self-efficacy scores to pedagogy, behaviour management and student engagement teaching skills [1] and submit open responses to expand upon the reasons for their scorings [2]. The importance of Bandura's [4] framework of major self-efficacy influencing factors and utility of Korthagen's [5] onion model for reflection in theorising explanations for the findings have also been discussed [3].

Further statistical analysis of the self-efficacy scores was conducted to investigate the relationship between the different experiences of anti-Covid-19 measures and the respondents' self-efficacy scores for individual teaching skills. In-school training was curtailed for respondents from the 2019-2020 initial teacher education (ITE) programmes during the last phase, whilst the 2020-2021 respondents experienced more unpredictable local closures and absences and a range of changed procedures due to anti-Covid-19 measures [1] [2] [3]. Chi squared analysis using contingency tables [6] compared the numbers of respondents from the two groups that returned self-efficacy scores 10, 9, 8, 7 and 6 and below, higher scores indicating more confidence.

Where differences were significant, the second group ascribed more higher scores and less lower scores than expected. This was assumed to be linked, at least in part, to the different experiences of anti-Covid-measures and their impact on the respondents' ITE programmes. The chi squared calculations for individual skill statements were related to qualitative differences between the self-efficacy skill statements. Although all the statements describe skills which can be improved through professional knowledge, experience, and practice, some rely more on context and underlying teacher attributes [5] than others. Bandura's [4] and Korthagen's [5] perspectives were useful when applying theory to findings.

Keywords: pre-service teachers, self-efficacy, Covid-19, England, chi squared, contingency tables, mixed study, onion model, Bandura.

1 INTRODUCTION

At its height the Covid-19 pandemic had a profound impact on initial teacher education (ITE) programmes at a higher education [HE] qualified teacher status (QTS) provider working in partnership with schools in the northwest of England [1] [2] [3]. For the 2019-20 cohort of pre-service teachers, school experience placements terminated at a crucial phase of training and ITE programmes moved online [1] [2] [3]. The 2020-21 cohort experienced more localised and unpredictable effects due to anti-Covid-19 measures that skewed rather than curtailed their school experience [1] [2] [3]. Both cohorts were invited to participate in anonymous online surveys tracking the self-efficacy of respondents in twenty-four teaching skills grouped into three categories: pedagogy, behaviour management and student engagement. They were also invited to explain their scoring in open response items and share demographic information including the impact of anti-Covid-19 measures on their ITE programmes. The aim was to identify target areas for remedial support and the quantitative and qualitative findings have been reported in previous International Academy of Technology, Education and Development (IATED) conference proceedings papers [1] [2] [3]. The importance of Bandura's [4] self-efficacy conceptual framework for explaining the findings was also explored [3].

Bandura [4] considered mastery, persuasion and vicarious experiences, together with the factors governing an individual's affective state, as the major influences on the development and maintenance of self-efficacy. Fig. 1 illustrates the ITE programme structure in place at the HE QTS provider before the pandemic. Fig.2 maps the ITE programme structure to a process model for professional learning and its assessment [7] [8] [9] (Fig. 2). Normally, pre-service teachers would spend the majority of their ITE programme time in school practicing their teaching and interacting with mentors and more expert colleagues. This provided opportunities for mastery and persuasion experiences through routine observations of teaching and feedback sessions. Vicarious experience was also gained through observing more experienced teachers and engaging with literature and research. Mentors and coaches encouraged the pre-service teachers to take more responsibility for their classes' learning to develop independence and agency as teachers. However, they could progress through the phases of training (Fig. 1 and Fig. 2) at their own pace to preserve positive affective states.

Year	2019	2020				2021				
Month	September	December	January	April	July	September	December	January	April	July
ITE Programme	Start				End	Start				End
School Placements	4 days a week	5 days a week				4 days a week	5 days a week			
Phase of Training	Induction	Practice		Demonstrating competence		Induction	Practice		Demonstrating competence	
Covid-19 Measures			All schools closed, placements terminated			Social distancing, hygiene and other measures		All schools closed, placements interrupted	Social distancing, hygiene and other measures, absences, and localised closures	
Questionnaires distributed online				2019-20 Cohort End of Programme Survey		2020-21 Cohort Start of Programme Survey			2020-21 Cohort End of Programme Survey	

Figure 1 The timeline for the study, ITE programme structure and anti-Covid-measures affecting secondary schools in England [3].

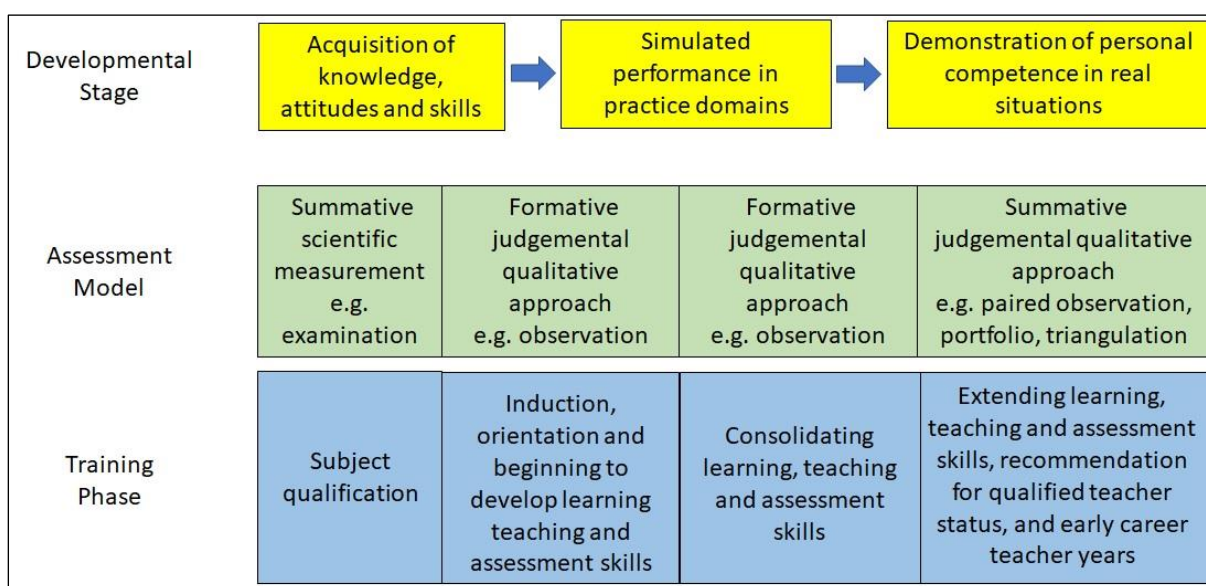| Developmental Stage	Acquisition of knowledge, attitudes and skills		Simulated performance in practice domains	Demonstration of personal competence in real situations	
Assessment Model	Summative scientific measurement e.g. examination	Formative judgemental qualitative approach e.g. observation	Formative judgemental qualitative approach e.g. observation	Summative judgemental qualitative approach e.g. paired observation, portfolio, triangulation	
Training Phase	Subject qualification	Induction, orientation and beginning to develop learning teaching and assessment skills	Consolidating learning, teaching and assessment skills	Extending learning, teaching and assessment skills, recommendation for qualified teacher status, and early career teacher years	

Figure 2 A professional learning and assessment model [7] applied to initial teacher education in England [8] and mapped to ITE programmes in the northwest of England [9].

Bandura thought that the accumulation of mastery experiences would be the most important influence on building self-efficacy, and these were curtailed or skewed for respondents during the pandemic [1] [2] [3]. Pre-service teachers' self-efficacy may have been supported by an increased provision of vicarious experiences [2] [3], but factors affecting individuals' positive affective states were probably more important in contributing to the high levels of confidence to teach expressed in the end of ITE programme surveys [2] [3]. Korthagen's onion model for reflection [5] suggests that teaching skills are expressed through the decisions made by teachers before, during and after lessons, and that these cannot be isolated from underlying teacher attributes such as values, attitudes, and motivations. Neither can they be isolated from the context for teaching and learning [5]. Both would contribute to pre-service teachers' affective states [4] and their self-efficacy during the changes in their ITE programmes due to anti-Coid-19 measures during 2019-20 and 2020-21. The statements in the online end of programme surveys referring to teaching skills

can be categorised according to the extent they refer to the skills or competencies that form the middle layers of Korthagen's onion model [5]. Some teacher competencies are underpinned by different aspects of professional subject knowledge and skill such as those described by Shulman's influential model [10]. These can be acquired and improved through direct and vicarious experience, and mentoring and coaching, and practice [4]. Korthagen's model [5] suggests that some skills or competencies rely more on a teacher's underlying attributes or a mixture of personal attributes and trainable skills. This could contribute to an individual's affective state [4] and the self-efficacy they might be willing to express in their ability to demonstrate teacher competencies in different contexts.

The data collected in the end of ITE programme surveys provided an opportunity to investigate differences between the self-efficacy of the two cohorts as the pandemic unfolded and the anti-Covid-19 measures enforced in schools changed. The mean end of programme self-efficacy scores for the three skills categories increased significantly [1]. One possible explanation for this was the effect of skewed school experiences on respondents, compared to having their placements terminated at the start of their final and crucial phase of training [1] [2]. In other words, opportunity for mastery, persuasion and vicarious experiences in altered contexts compared to curtailed opportunities for these [3]. Further statistical analysis was conducted to compare the numbers of respondents from the 2019-20 and 2020-21 cohorts returning different scores for individual survey items at the end of their ITE programmes. The aim of the current study is to identify any differences in the distribution of self-efficacy scores for individual survey items, and qualitative differences between the skill descriptors used in the surveys.

2   METHODOLOGY

This is a mixed methods study involving statistical analysis and qualitative consideration of the teaching skill descriptors used in online self-efficacy surveys.

The HE QTS provider followed British Education Research Association (BERA) ethical research guidelines [11] and categorised the study as posing minimum ethical risks. Questionnaires were launched online, and responses were anonymous. The participant information page explained the purpose of the research and that participation was voluntary. It also stated that by submitting a completed or partially completed questionnaire, participants had given informed implied consent for responses to be analysed and reported anonymously. However, participants could withdraw their responses from the study at any time.

The research question was: Can differences between the self-efficacy scores ascribed by the 2019-20 and 2020-21 respondents be associated with qualitative differences between the survey item statements describing teaching skills?

2.1   Data gathering

Five hundred pre-service teachers enrolled on 2019-20 Primary and Secondary Education ITE programmes at a HE QTS provider in the northwest of England were invited to participate in anonymous online surveys on completing their programme. The 2020-2021 cohort (also around five hundred) were invited to participate just after starting their PG ITE programme and once again on their successful completion of the course. The data for this current study was taken from the end of programme surveys. The respondents constitute a self-selecting, non-random, convenience sample [12].

Pre-validated teacher self-efficacy items [13][14] were utilised for the common structure of all questionnaires, with three sets of eight items covering Pedagogy, Behaviour Management and Engagement skills. For each item, participants read a statement regarding a teaching skill and rated their confidence in their capability in that area. Scores of 1-5 indicated lower, and 6-10 higher confidence levels. Other sections invited participants to share anonymous demographic information and details regarding how the respondent's training had been affected. There was an opportunity for participants to qualify or explain their scoring further using open response questions. Figure 1 summarises the timing of the surveys against the common ITE programme structure and the anti-Covid-19 measures in place at the time.

2.2   Data analysis

In addition to its use for comparing observed and expected counts predicted by models or random distributions, Chi squared analysis has long been used in conjunction with contingency tables as a test of association [6] [15].

For the 2019-20 (n=166) and 2020-21 (n=110) respondents, for each survey item, a 5 by 2 contingency table was constructed, and the number of respondents recorded that ascribed a score of 10, 9, 8, 7, or 6 and below. From the column, row and overall totals, expected counts were calculated. From the observed and calculated expected counts a Chi squared value was calculated for the table [6]. An effect size metric, Cramer's V [16], was also calculated. This was accomplished using spreadsheet cell calculations to construct an analysis template.

5 by 2 contingency tables have 4 degrees of freedom calculated by multiplying the number of columns in the table minus one by the number of rows minus one. The degrees of freedom are used to look up the probability levels of random distributions giving the Chi squared value obtained if the Null Hypothesis (H^0) is accepted that there was no difference between the observed and expected counts. The international accepted standard is that this can only be rejected if the probability that this conclusion is in error is 5%, or 0.05 or less. Accepting H^0 was taken to indicate that differences between observed and expected counts across the cohorts were likely to be random events, whilst rejecting it demonstrated a non-random difference. Consulting the contingency table and expected counts allowed the direction of the difference to be described. [6] [15]

Standard formulae were used for Chi squared [6] and Cramer's V [16]. Fig. 3 shows one worked example. The expected value for the 2019-20 score of 10 cell would be calculated as follows: The probability of scoring 10 across both columns was 17/276, and the probability being a 2019-20 respondent was 166/276. The overall probability of scoring a 10 and belonging to the 2019-20 respondents is 17/276 x 166/276. Multiplying this by 276 calculates the expected number of 2019-20 respondents scoring themselves 10. Rounded to a whole number (17/276 x 166/276) x 276 = 10. The observed number is less than expected. This process is repeated for all the observed counts using the appropriate row and column totals and overall total to calculate the expected numbers.

The Chi squared calculation provides an objective method for deciding if the differences between observed and expected counts are large enough for there to be a low probability that they are random fluctuations. In Fig. 3 the Chi squared value for the table is so large that there is less than 0.1% chance of error if we treat this as a non-random set of differences. It is at least worth considering reasons for there being fewer higher and more lower self-efficacy scores in the 2019-20 respondents than expected.

Ped 1	Observed	(O)			Expected	(E)	O-E=D	D^2	D^2/E		Probability		
Score	2019-20	2020-21	Total										
10	5	12	17		10	7	-5	27.29684	2.669712096		0.05	0.01	0.001
9	18	26	44		26	18	-8	71.63537	2.706922552	CV 4df	9.49	13.28	18.47
8	50	31	81		49	32	1	1.645085	0.033767922				
7	49	26	75		45	30	4	15.14225	0.335683604				
6-	44	15	59		35	24	9	72.49659	2.04299142				
Total	166	110	276				5	27.29684	4.028838255				
							8	71.63537	4.084992215				
							-1	1.645085	0.050958864				
							-4	15.14225	0.506577075				
							-9	72.49659	3.08305978	Significance level			
						Total	0	376	19.54	0.1pc			
							Cramers'V		0.3	medium			

Figure 3 Spreadsheet example: Chi squared and Cramer's V calculation for survey item Pedagogy 1.

3 RESULTS

3.1 The self-efficacy scores

Table 1 indicates the Chi squared values for the individual skill statements' 5 by 2 contingency tables. These compared the observed and expected numbers of respondents returning self-efficacy scores of 10, 9, 8, 7, or 6 and below for the 2019-20 and 2020-21 cohorts on ITE programmes at a HE QTS provider in the northwest of England. The probability of error for statements demonstrating significant differences between the observed and expected distributions of self-efficacy scores across the two groups and the effect sizes are also shown. All skill statements with significant differences indicated fewer higher self-efficacy scores than expected for 2019-20 ITE programme respondents and a greater number of lower self-efficacy scores. Conversely, for these skill statements the 2020-21 respondents returned a greater number of higher self-efficacy scores and fewer lower scores. For the results in Table

1 the effect sizes indicate the degree of separation between the observed and expected counts for the two groups of respondents regardless of the probability that the differences are random distributions.

Table 1 Chi squared (χ2) analysis of the distribution of self-efficacy scores for the 2019-20 and 2020-21 end of initial teacher education programmes surveys at a qualified teacher status provider in the northwest of England.

Teaching skill category	Item	Chi squared analysis and effect sizes (n=276)			
		$\chi 2$	df	p^a	Cramer's v^b
Pedagogy	1	19.54	4	0.001	0.3
	2	9.5	4	0.05	0.2
	3	15.46	4	0.01	0.2
	4	16.2	4	0.01	0.2
	5	10.72	4	0.05	0.2
	6	19.09	4	0.01	0.3
	7	13.74	4	0.01	0.2
	8	24.84	4	0.001	0.3
Behaviour management	1	1.65	4	ns	0.01
	2	7.63	4	ns	0.01
	3	13.68	4	0.01	0.2
	4	12.98	4	0.05	0.2
	5	9.35	4	ns	0.2
	6	9.83	4	0.05	0.2
	7	6.57	4	ns	0.2
	8	3.7	4	ns	0.1
Student engagement	1	9.25	4	ns	0.2
	2	11.17	4	0.05	0.2
	3	13.25	4	0.05	0.2
	4	18.46	4	0.01	0.3
	5	9.6	4	0.05	0.2
	6	12.18	4	0.05	0.2
	7	12.56	4	0.05	0.2
	8	8.34	4	ns	0.2

[a] For all significant χ2 values the observed counts for higher self-efficacy scores were greater than the expected counts calculated using a contingency table for the 2020-21 respondents and fewer than expected for the 2019-2020 respondents.
[b] Effect sizes: 0.1<0.3 = small, 0.3<0.5 = medium, 0.5-1 = large

Table 1 indicates differences between the responses for the three skill statement categories. The eight pedagogical skills survey items all demonstrated significant differences between the respondents from 2019-20 and 2020-21 with small or medium effect sizes. Three behaviour management skills statements demonstrated significant differences with small effect sizes, with the remaining five survey items a mixture of negligible and small effect sizes that are more likely to be random effects. Most of the engagement items exhibited significant differences, with all the statements returning small or medium effect sizes.

Although respondents returned self-efficacy scores [1] suggesting generally high levels of confidence in their teaching skills at the end of their programmes, there are clear differences between the distribution of their scores for the different teaching skills categories and individual skill statements (Table 1). The different experiences of anti-Covid-19 measures of the two groups of respondents have been reported elsewhere in some detail [1] [2]. However, in summary, the 2020-21 respondents ascribing significantly greater number of higher self-efficacy scores experienced skewed training ITE opportunities rather than the curtailed opportunities of the 2019-20 respondents.

3.2 The self-efficacy skill statements

Characteristics of the survey skill statements are indicated in Tables 1 and 2. Table 1 identifies the skill statements that significantly more than expected 2020-21 respondents ascribed higher self-efficacy scores. Table 1 also records an effect size metric regardless of the probability of error if that difference is considered non-random. Table 2 shows the survey statements in full and interprets their effect size metrics [16] as negligible, small, or medium differences in the numbers ascribing higher self-efficacy scores between the end of ITE programme survey respondents. Table 2 also lists some key attributes of teachers that can be associated with the skill statements and their successful demonstration.

Table 2 The self-efficacy survey item statements, their effect sizes and the teacher attributes needed for their successful demonstration.

Teaching skill category	Item	Statement	2020-21 increased confidence	Teacher attributes required
Pedagogy	1	To what extent can you use a variety of assessment strategies?	medium	pedagogical knowledge, practice
	2	To what extent can you provide an alternative explanation or example when students are confused?	small	subject knowledge, practice
	3	To what extent can you craft good questions for your students?	small	subject knowledge, practice
	4	How well can you implement alternative strategies in your classroom?	small	pedagocical knowledge, practice
	5	How well can you respond to difficult questions from your students?	small	subject knowledge, curriculum knowledge, practice
	6	How much can you do to adjust your lessons to the proper level for individual students?	medium	pedagogical knowledge, practice
	7	To what extent can you gauge student comprehension of what you have taught?	small	subject knowledge, curriculum knowledge, practice
	8	How well can you provide appropriate challenges for very capable students?	medium	pedagogical knowledge, practice
Behaviour management	1	How much can you do to control disruptive behaviour in the classroom?	not measurable	underlying values, consistency, professional behaviour
	2	How much can you do to get children to follow classroom rules?	not measurable	underlying values, consistency, patience, clarity
	3	How much can you do to calm a student who is disruptive or noisy?	small	underlying values, consistency, professional, calm personality
	4	How well can you establish a classroom management system with each group of students?	small	school knowledge, consistency, patience, clarity
	5	How well can you keep a few problem students from ruining an entire lesson?	small	school knowledge, professional behaviour
	6	How well can you respond to defiant students?	small	unserlying values, professional behaviour, school knowledge
	7	To what extent can you make your expectation clear about student behaviour?	small	school knowledge, consistency, clarity
	8	How well can you establish routines to keep activities running smoothly?	small	school knowledge, consistency, clarity
Student engagement	1	How much can you do to get students to believe they can do well in schoolwork?	small	underlying values, professional behaviour
	2	How much can you do to help your students' value learning?	small	underlying values, professional behaviour
	3	How much can you do to motivate students who show low interest in schoolwork?	small	underlying values, professional behaviour
	4	How much can you assist families in helping their children do well in school?	medium	underlying values, professional behaviour, opportunity for experience
	5	How much can you do to improve the understanding of a student who is failing or falling behind?	small	pedagogical knowledge, underlying values, professional behaviour
	6	How much can you do to help your students think critically?	small	pedagogical knowledge, critcality
	7	How much can you do to foster student creativity?	small	pedagogical knowledge, creativity
	8	How much can you do to get through to the most difficult students?	small	underlying values, professional behaviour

All the pedagogy survey items demonstrated significantly greater numbers of 2020-21 respondents ascribing higher self-efficacy scores with small or medium effect size metrics (Tables 1 and 2). The pedagogy statements describe skills that can be more quickly improved by developing aspects of professional teacher knowledge and with practice accompanied by effective mentoring and coaching (Table 2).

The behaviour management and engagement categories contained skill statements for which there was no significant difference between the observed and expected numbers of respondents ascribing the higher self-efficacy scores (Table 1). These demonstrated negligible or small effect sizes (Tables 1 and 2). The skill statements with significant differences demonstrated small or medium effect sizes. The statements were variable in the combinations of teacher attributes associated with them, with underlying personal attributes and values more likely to contribute to confidence in many areas. However, it should be noted that some statements described skills for which the pre-service teachers would normally adopt more responsibility later in their ITE programmes (Fig. 2), and for these the curtailment of teaching experience placements (Fig. 1) might be expected to have a direct impact on self-efficacy scores rather than the nature of the skill described. Some of these were identified in open responses to the survey self-efficacy items [2].

4   DISCUSSION

The survey participants constituted a non-random convenience sample [12] of pre-service teachers who qualified to teach in England during the Covid-19 pandemic in 2020 and 2021. They were from ITE programmes at a HE QTS provider in partnership with schools in the northwest of England. As such, no extrapolation to a larger population of pre-service teachers is intended. The survey sample can be

cautiously considered large enough to be representative of the pre-service teachers attending the HE QTS provider at the time [16].

The current paper investigates the relationship between teaching skills statements and differences in the number of survey respondents ascribing higher self-efficacy scores to them. The statements that returned no significant differences in the distribution of ascribed scores between the 2019-20 and 2020-21 respondents can be interpreted as indicating no difference in confidence levels between the groups for the skills described at the end of their ITE programmes. The statements returning significant differences could indicate greater confidence in respondents from the 2020-21 pre-service teachers who did not experience curtailment of their school placements. Table 2 lists skill descriptors and explores qualitative differences between them by relating them to associated teacher attributes required for their successful demonstration.

The respondents' articulation of the impact of anti-Covid-19 measures on their teacher training and ITE programmes have been described and discussed previously in some detail [1] [2] [3]. However, using Bandura's conceptual framework [4] the impact on respondents qualifying in 2020 can be summarised as a curtailment of opportunities for mastery, persuasion and some vicarious experiences gained by observation of more expert others when school placements were terminated at the start of the first national lockdown (Fig. 1). Those qualifying in 2021 reported skewed experiences as schools responded to anti-Covid-19 measures short of lockdown and unpredictable local absences, and shorter full or partial school closures [1] [2] [3]. They expressed significantly higher mean levels of confidence in their teaching capabilities than the previous cohort and more opportunities for in-person classroom teaching [1] [2] [3]. Tables 1 and 2 indicate that significantly more than expected respondents qualifying in 2021 ascribed higher self-efficacy scores for most of the skill statements with measurable effect sizes for almost all. One plausible contributory explanation is that the increased confidence levels are related to the difference between curtailed and skewed school placement experiences.

However, before comparing skill statements returning significant increases and non-significant differences in expressed confidence, it should be noted that curtailment had a direct impact on self-efficacy scores due to its timing in 2020 (Fig.1 and Fig. 2). These were identified and articulated in open responses in the 2019-2020 end of programme survey and reflected by significantly lower mean self-efficacy scores for some individual skill statements [1] [2]. Certain skills, such as those involving assessment and differentiated teaching, could only be practiced, and demonstrated fully once pre-service teachers took full responsibility for classes' learning over an extended period, usually during the last phases of training and to demonstrate their competence (Fig. 2). Terminating school placements before or at the beginning of this phase would be expected to depress self-efficacy scores for these skills for the 2019-20 respondents (Fig. 1).

The 2019-20 end of ITE programme survey open responses [2] emphasized the negative impact of ending school placements at such a crucial phase of training. Respondents specifically referred to lost opportunities to develop a variety of assessment and teaching strategies in the classroom, summative assessments, and the use of assessment and other data to inform planning, particularly for differentiated teaching and learning [2]. The analysis in Tables 1 and 2 indicates that the Pedagogy skills statements associated with these areas (Pedagogy 1, 6 and 8) returned medium effect size metrics and small probabilities of error if the differences are assumed to be non-random. The skill statement engagement 4, regarding ability to help families assist learners, was also cited in open responses [2] and has a medium effect size metric. All other statements returned either negligible or small effect sizes. From this it is reasonable to suggest that a range of factors contributed to the effect sizes and that the larger effect sizes have more factors contributing and/or some factors contributing more. It is also reasonable to identify as a major contributary factor to the medium effect size metrics, the direct effect of curtailed compared to skewed school placements on confidence to demonstrate these skills. This does not preclude the influence of other factors on the medium effect sizes, nor the direct impact of curtailment contributing to differences in confidence expressed for skill statements with lower effect sizes.

The 2020-21 respondents expressed more confidence in their ability to deliver pedagogical skills than the 2029-20 respondents. Table 2 indicates that the skill statements in this category are the ones that can be mentored and coached and improved by observation of more experienced colleagues. Shulman's [10] influential model of teacher subject knowledge distinguishes between subject matter content knowledge (SMCK), pedagogical content knowledge (PCK) and Curriculum Knowledge (CK). Confidence in the areas described by the pedagogy survey items is related to undergraduate degree content and classification and the further acquisition of learning, teaching and assessment knowledge and skills during the respondents' ITE programmes. This is achieved by teaching practice, mentoring and coaching in school, and through engagement with educational literature and research through QTS

provider training days (Fig. 2). This combination of strategies are intended to provide the mastery, persuasion and vicarious experiences [4] necessary to build and maintain self-efficacy. A plausible explanation for the greater than expected numbers of 2020-21 respondents ascribing higher self-efficacy scores for pedagogical skill statements is that they had more opportunities for such experiences than the 2019-20 respondents, albeit skewed and inconsistent with other pre-service teachers.

Similarly, behaviour management 3, 4 and 6 and engagement 3 to 7 were skill statements that demonstrated significantly higher confidence levels in 2020-21 respondents. To some extent the behaviour management skill statements in this group relate to school knowledge of policy and procedures and their consistent application and all would benefit from mastery, persuasion and observation experiences [4]. The 2019-20 respondents had been able to practice in person behaviour management skills prior to lockdown (Fig. 1) but may not have had many opportunities to see or experience dealing with disaffected or disruptive individual learners who do not cope well with typical classroom routines and norms. The engagement skill statements in the group also had some associated teacher attributes that could be affected when school placements were terminated in 2020. Some required good PCK or opportunity for experience and practice that were curtailed due to the anti-Covid-19 measures (Fig. 1).

For skill statements behaviour management 1, 2, 7 and 8 and engagement 1 and 8, there was no significant difference in the confidence levels expressed as self-efficacy scores between the two groups of respondents (Table 1). Fig. 4 shows Korthagen's onion model [5], which suggests that teacher competencies lie between underlying teacher personal attributes and the external context for their teaching. The anti-Covid-19 measures adopted in England during the pandemic radically altered the normal context for learning, teaching and assessment in schools (Fig. 1) and constituted the changes to the system that made this study possible. The underlying personal attributes of the respondents depended on their personality, underlying values and motivations for teaching, their previous experiences, and their sense of professional identity as teachers. The skill statements in this category depend much on a teacher's values, motivation and professionalism for the manner and degree of perseverance that they exhibit to pursue their success. Korthagen [5] maintains that the main characteristic of a successful teacher is that they make decisions in and out of the classroom that promote learning. Descriptions of their teaching competencies should not be considered in isolation to context and underlying personal attributes [5]. Underlying personal teacher characteristics may have been a major contributor to the high overall levels of confidence expressed as self-efficacy scores in both surveys [1] [2] [3] for these skill statements.
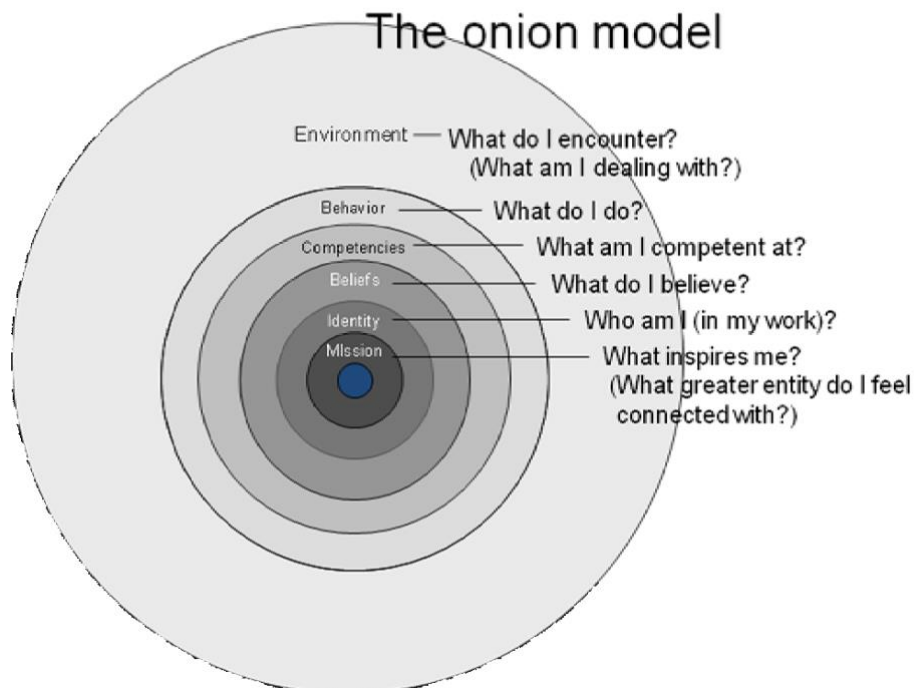

Figure 4 Korthagen's onion model for reflection [5]

5   CONCLUSIONS

Regarding the end of ITE programme self-efficacy survey respondents who attended a HE QTS provider in the northwest of England in 2019-20 and 2020-21:

The first year-group experienced curtailment of their school placements at a crucial phase of training and the second year-group experienced unpredictable and skewed disruption to their programme.

There was a significant increase in confidence between the two surveys expressed as self-efficacy scores, for many teaching skill statements in the categories: pedagogy, behaviour management and student engagement. This can be attributed, at least in part, to the experience of different ant-Covid-19-measures as the pandemic progressed.

There is evidence of the direct impact of terminating school placements on self-efficacy in skills to do with assessment and using assessment to inform planning and differentiation. These were expected to develop fully in school in the final phase of training, which did not take place for 2019-20 respondents but did in some format for 2020-21 respondents.

There is evidence that self-efficacy scores can also be related to qualitative differences in the skill statements when linked to teacher attributes.

Bandura's [4] self-efficacy influencing factors and Korthagen's model for reflection [5] were both useful in explaining the findings. Mastery, persuasion and vicarious experiences [4] may have been more important to the development of confidence in pedagogy skills and some behaviour management and engagement skills during the pandemic. Underlying personal teacher characteristics [5] and positive affective states [4] may be more important influences on some behaviour management and engagement skills.

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