

An investigation into the Pedagogical Trajectories of PGCE Trainees Using Espoused 'Beliefs'

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Abstract

Postgraduate trainee teachers undergo profound 'shifts' in their pedagogical understanding and practices through the year that they are taught at a UK Higher Education Institution. This study 'investigated, in a paired pre-post design, the espoused pedagogical beliefs of three cohorts of PGCE trainees, at two time points – at the onset and toward the end of their studies in a teacher education department in a major HEI in the UK, with corroborative results from a fourth cohort and from a wider set of institutions. Using an adaptation of the 'practices' scale of Swan (2006), trainees' pedagogical beliefs were charted and described on a continuum running from transmissionist to child-centred through answering 25 items, and shifts from pre-course to post course were investigated on two fronts – individually and for each item. Two general principles are represented in the data: trainees seem to either make rather more radical shifts towards child-centeredness (75/117 trainees [64.1%] at an average shift of +0.28) or more slight shifts towards a more teacher centred orientation (37/117 trainees [31.6%] at an average shift of -0.18. The average shift was +0.14 per trainee (from 3.35 to 3.49) - a significant trend towards a greater learner-centrism across the longitudinal study.

I am currently studying the pedagogical beliefs of pre- and post-course postgraduate student teachers on the postgraduate Certificate of Education course (which qualification enables them to teach in the UK); charting shifts in these beliefs (Clarke and Hollingsworth, 2002) to try and understand the key levers for change (Smith, 2012). The beliefs under analysis are communicated through responses to questionnaires given on the day the trainees first arrive at University and again on the final day of the course. The questionnaires consist of 25 statements on English primary teaching practices in which the participants had to express a 'belief' (scored 1 to 5). Analysis of each trainee's cumulative responses places them on a continuum similar to that constructed by Pampaka *et al.*, following the 'practices scale' of Swan (2006). This continuum runs from teacher-centred to child-centred, based on the central concept of the "very common distinction" (Pampaka *et al.*, 2008 p3) between didactic teaching models (which they call "teacher-centric") which can be seen as transmissionist, or instructionist (Harel and Papert, 1991; cf. Schuh, 2004), and the "learning-centric" model where the focus is on students creating their own learning through the facilitation of the teacher rather than being directly taught (Smith, 2013). The aim is to chart the espoused beliefs of the trainees over the course of the year: whether the trainees leave with the same, similar or altered beliefs from those they arrived with.

A key problem with the issue of measuring teachers' beliefs is discriminating and differentiating between genuine beliefs and stated beliefs. Teachers – especially at the pre service stage – may erroneously assert that they hold certain beliefs because they think the researchers may want to hear these, or because they are in current vogue, or even pedagogies that they believe they are practising when they are not (Vacc and Bright, 1999; Wilson and Cooney, 2002). Espoused beliefs should not therefore be considered as predictors of genuine classroom practice. They are not necessarily deliberately disingenuous, but may be considered as representative of intentions rather than actions (Feiman-Nemser *et al.*, 1987; Fosnot, 1989). These intentions may not suit a reality which bears little or no resemblance to the envisioned situation and experiences for which the original intentions were created (Cooney, 1985; Karaagac and Threlfall, 2004, both in Liljedahl, 2008). However, measurement of these espoused beliefs is, itself, an indicator and predicator of trainee practices and pedagogical understandings, allowing the research to shed light on to the developmental trajectories of trainees through the course of their PGCE courses.

The research has been devised to approach the twin questions of what, if any, shifts in pedagogical belief are made by PGCE trainees through the year they study, and what the root causes of any changes in belief may be. To the first end, a scale has been created which consists of twenty-five questions (“items”) answerable on a Likert scale of frequency. The use of Likert scales has some key points to recommend it (Gilbert, 2008), not least that it builds in degrees of sensitivity and differentiation whilst still operating quantitatively – e.g. it generates numerical data which can be plotted. It also has a unidimensionality in that it only measures one thing at a time (Oppenheim, 1992). Not least, it allows for polytomous answers to be given, allowing the creation of a continuum. There are valid concerns raised in Gilbert (2008): firstly, that there can be no assumption of equal intervals between the possible answers, e.g. the step interval between ‘agree’ and ‘strongly agree’ is not necessarily the same as that between ‘no opinion’ and ‘agree’ leading to some dis coherence between individual respondents’ understanding as to which of the given answers their response more closely aligns to. This argument is perhaps best expressed by Richardson (2014), who claims that closed-ended questions make assumptions about the respondents and assume all rationales are the same, ignoring the fact that that one person’s perception may be different to another.

Other concerns raised by Gilbert include the fact that there is much evidence to support responses being left-side biased; there is no way to ensure that responders reply honestly; the extremes are often shunned (e.g. given 0-5, the vast majority of answers lie within 1-4); and there is the tendency to cluster answers in a similar area. In answering my questions, trainee responses are expressed numerically, giving me interval data (Fife-Schaw, 2000). In order to combat the problems of clustering and left-hand bias (Gilbert, 2008), some of the questions have been switched around so that e.g. “most of the time” becomes the negative response rather than the positive. This involves recoding these questions in the analysis in order to ensure coherence between each response. To answer the question of perception, as expressed by Richardson, I would counter that, although drawing conclusions at certain times about participants within cohorts that may not have the same assumptions and rationales, the overarching aim of my research is to compare the same individual participants’ responses longitudinally against each other and I believe it to be reasonable to assume that their individual rationales and their understanding of, and reactions to, the survey questions remain consistent between the two time periods of data collection.

Pampaka *et al.* (2008) argue for the use of a smaller Likert scale of four, or even three, points to alleviate the previously raised problems of clustering and avoidance of the extremes but academic advice would lean towards being a scale between five and eleven points with seven perhaps being the optimum (Cohen *et al.*, 2011). Nevertheless I feel that five is a useful number for the scale I have adopted with a more manageable scale of steps that respondents can understand without linguistic nuances between, for example, “often” and “regularly”. This also helps further counter the previously raised criticism of respondent perception. Once the trainees have completed their surveys, a twofold analysis is completed: of each respondent (generating a ‘person score’ for each) and each question (generating an ‘item score’ for each). These are the twin foci of the statistical analyses that follow.

Person Scores

To generate the person scores for each individual, the average of all their responses is taken, and this score is then allocated to them (this is in contrast to Swan, who uses a final summative score between 25 and 125. Either way, the same results are arrived at). This score is then plotted on a continuum, with a higher average score denoting the espousal of a more learner-centric approach and a lower score showing an understanding that teaching should be more transmissionist. This is calculated for the September data and again for the July data. Firstly these are calculated based in all the responses to the questionnaire in order to provide cohort-wide information and averages. Once this basic data is compiled, where there are responses for individuals (identified only by numeric signifiers) at both time points these responses are then compared in order to chart any shifts in espoused beliefs. The analysis below takes account of the raw data of all respondents from the three cohorts of 2011-12, 2012-13, and 2013-14 at the two time points, as well as the September data from the 2014-15 iteration, and Figure 1 (over) shows the shifts in belief of trainees plotted from September to July on the continuum shown in the double-headed arrow alongside. The first two iterations, and the recently-begun fourth, have focused solely on my own HEI. It began as a pilot study involving my own caseload of trainees then – as the earliest results showed potential for a more in-depth study – I widened it out to the whole cohort the following year, remaining in-house for ease of access to participants. Table 1 shows the numbers of completed responses in September and in July by cohort, as well as the numbers of individuals that can be tracked across the longitudinal study:

Table 1

Iteration:	Number of completed questionnaire at the first timepoint (September)	Number of completed questionnaire at the second timepoint (July)	Number of tracked participants on whom the pedagogical shift data is based
2010-11(pilot)	12*	9*	6*
2011-12	73	54	36
2012-13	62	64	34
2013-14	160	88	47
2014-15	33	33	0
TOTALS	328	239	117

*Unused data in full study after minor changes made to questionnaire.

Table 1: number of completed questionnaires in each iteration

The third iteration of this research saw a widened participation in this measurement of beliefs at two time points to a wider set of five geographically-dispersed HEIs. The initial response rate was excellent with 193 valid and complete surveys returned. These have been added to the overall September data to give as accurate picture as possible of the initial thoughts of pre-PGCE ITE trainees across the UK. Unfortunately, and despite repeated request emails, due to the contingencies and exigencies of ITE training pressures and deadlines etc. there was a very poor response rate from these other HEIs at the later time point: only 11 completed surveys were received, all from a single HEI. At my own HEI, where I could pursue responses both in a final lecture and by email prompt, there were 86 completed responses, of which 47 could be mapped and tracked back to the September scores for comparison. The final iteration used in this study only has use for aggregate September and July data, as there were no instances of comparative responses, partly because many trainees neglected or refused to give their ID numbers. The low response rate of 31 can be seen as due to the timing of the final survey: following a change in governmental policy (that PGCE trainees were to move from 90 days in school to 120 during their PGCE year), there was little opportunity for trainees to participate in a final survey, as they only had one session at University following the end of their final school placements, and once trainees have left it is very difficult to get responses.

Figure 1 (over) shows the matched data from all 117 instances where both the September and July data were available for the same trainee. Two general principles are represented: trainees seem to either make rather more radical shifts towards child-centredness (75/117 trainees [64.1%] at an average shift of +0.28) or more slight shifts towards a more teacher centred orientation (37/117 trainees [31.6%] at an average shift of -0.18).

The average shift was +0.13 per trainee (from 3.33 to 3.46) - a statistically significant trend towards a greater learner-centrism across the longitudinal study. On a basic visual level, although there is some evidence of regression to the mean, it is clear to see the upward trend from September to July as the majority of positions are higher.

Figure 1: matched comparative scores



Figure 1: Charting shifts in espoused pedagogical beliefs: graph of all person shifts on the continuum

A simple tabulation of all the results from all the cohorts combined is given in table 2:

Table 2

Timepoint	Number of responses	Average score
September	328	3.33
July	239	3.46

Table 2: All received responses and average score.

In order to further statistically corroborate the veracity of these claims, a detailed analysis using the SPSS programme was carried out. Having first created histograms of the raw, unmatched September and July data, showing the population distribution curves (Figure 2, over), a paired *t*-test was performed to ascertain whether there was a change in espoused pedagogic belief between the first and second surveys even when direct comparisons were not possible as not all the participants could be tracked between the two time points. The paired *t*-test is appropriate for data in which the two samples are paired in some way (Elliott & Woodward, 2007). This data meets that need as it consists of before and after measurements on a single group of subjects. The key assumption for the paired *t*-test to be valid with small sample sizes is that the difference scores are normally distributed and that the observed differences represent a random sample from the population of differences (Bryman, 2012).

Figure 2

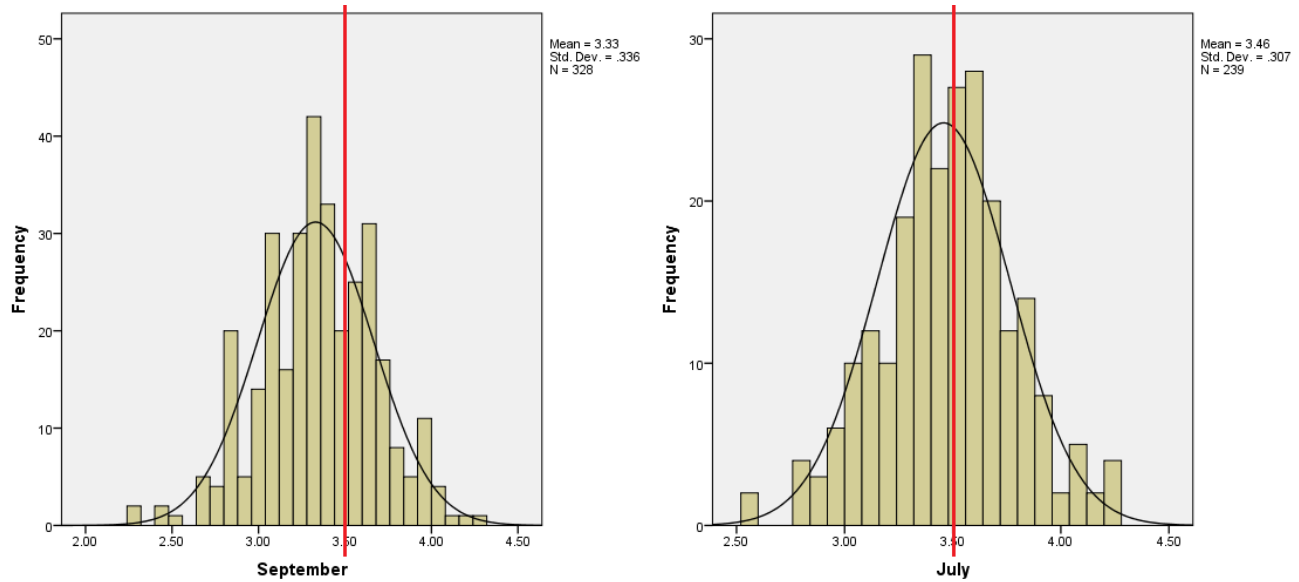


Figure 2: population distribution curves for all trainees’ September (left) and July (right) data

It is easy to see, with the overlaid lines, that there are greater numbers of trainees scoring above the 3.5 line in July, compared with September. The mean is also higher: 3.46 as compared with 3.33. The paired samples statistics from the directly comparable results, where the same trainees’ results from September *and* July can be ascertained and ‘matched’ (Dunlap *et al.*, 1996), are shown below in Figure 3:

Figure 3

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Sept	3.3549	117	.34539	.03193
	Jul	3.4928	117	.30718	.02840

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Sept & Jul	117	.587	.000

Paired Samples Test

		Paired Differences				T	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
Pair 1	Sept Jul	-.13795	.29840	.02759	-.19259	-.08331	-5.000	116	.000

Figure 3: Paired sample statistics, September/July data.

This provides clear evidence that the overall change is positive. The mean shift ($M = 0.138$, $SD = 0.298$, $N = 117$) was significantly larger than 0, $t = 5.000$, one-tailed $p < 0.00001$ (significant at $p < 0.05$), providing evidence that there is a clear shift in trainees’ espoused pedagogic approaches to teaching from the didactic to the learner-centric: that trainees’ pedagogic understanding and – by inference – practice has shifted from a more transmissionist approach to a more constructivist one. There is only one chance in 100,000 of falsely rejecting the null hypothesis (inferring there is a relationship in the population where none exists).

This leads me to be very confident that there is a relationship between being on the trainee course and making a shift on the created continuum (or certainly as espoused) among all trainees. A Pearson product-moment correlation coefficient was computed on SPSS to assess the relationship between the September score and that from July. There was a positive correlation between the two variables, $r = 0.587$, $n = 117$, $p = 0.000$. A scatter plot summarizes the results (see Figure 4, below). Overall, there was a positive correlation between the two time points.

Figure 4

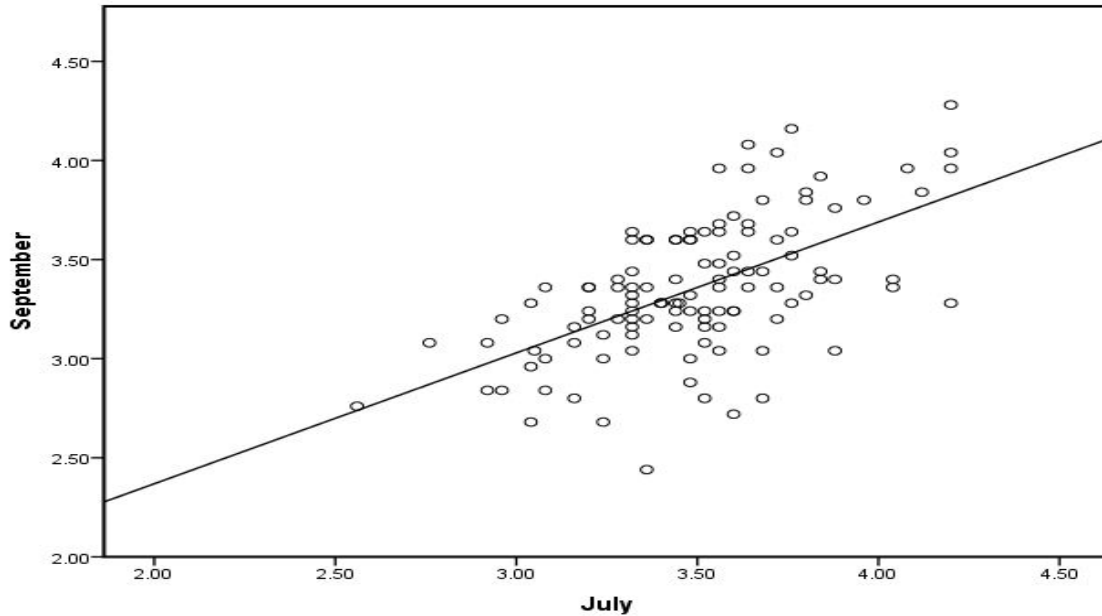


Figure 4: Paired data scatter plot with overlaid Pearson's R.

All of this is in line both with my original hypothesis, that trainees would make more positive moves toward learner-centric practices, and with the expressed preference of myself and the culture within which I work, which espouses learner-centrist, socio-constructive practices as an expressed goal. "As a lecturer in Primary Initial Teacher Education at a Higher Education Institution (HEI), my aim is for my trainees to leave with a clear understanding of the power of learning rather than teaching, and the pedagogical strategies to facilitate the learning of children rather strategies to 'merely' teach them" (Smith, 2013, pp1-2). For a fuller justification of this practice of enculturation through interaction with human role-models (Bandura, 1969), see Smith (2014). Mason (2002) raises the problem of the generation of data using methods and principles that could be seen to express my own epistemological standpoint, but the trainees answered authentically with no input from me, and the data received is 'true' and valid for analysis 'as is'.

However, Nevill et al. (2001) discuss the use of a nonparametric Median sign test, allowing for greater reliability of results compared to a paired t -test. The latter assumes that data is distributed equally (as noted above). In this case, when used for the test and re-test data, a median sign test assumes non-homogeneity of variance and can therefore be depended on for a greater statistical reliability (Nevill et al., 2001 p273). The results show the same trend: a slight positive shift towards a more learner-centric position on the curriculum, with a high degree of statistical significance (asymptotic significance, 2-tailed, of .000) – figure 5 (over):

Figure 5

Frequencies		N
July - Sept	Negative Differences ^a	37
	Positive Differences ^b	75
	Ties ^c	5
	Total	117

a. July < Sept

b. July > Sept

c. July = Sept

Test Statistics^a

	July - Sept
Z	-3.496
Asymp. Sig. (2-tailed)	.000

a. Sign Test

Figure 5: non-parametric median sign test results, September/July data

As to the face validity of the measurement itself, I have elsewhere described, with justification from academic sources, its construction and validity (Smith, 2012b). The diagrams (Figures 1 and 6) have many aspects and need explaining but once understood, it is easy to discern in Figure 1 the curve of distribution of the teachers along the teacher-centric $\leftarrow \rightarrow$ learner-centric continuum that has been created for the September data, for the July data, and the pattern of shifts, described with upward movements for the positive shifts (e.g. to a more learner-centric espousal) and downward trajectories for the negative shifts to a more transmissions pedagogic espousal of beliefs. Similarly for Figure 6, the distribution of each item can be clearly seen, and patterns identified.

I have some confidence moving forward in the ability of this test to accurately measure teachers' pedagogic beliefs. My initial conclusion is that completing an ITE course at my Higher Education Institution (HEI) is more likely to result in trainees espousing a more learner-centric pedagogic approach. This instrument makes it possible to measure teachers on a continuum of teacher- to learner-centrism with a high level of accuracy, although further validation through calibration against different and wider populations of teachers would be preferable before generalisation to the wider population can be made with any validity.

Ethnographic data was entered into Excel and SPSS and used to create charts for age, gender and ethnicity of respondents. However, these charts were less statistically reliable as they work with such small numbers of matched respondents: males, for example, show an average shift of +0.05 but represent only 23 out of the 117 matched responses (19.7%). Trainees in the age range 22-29 made an average shift of +0.16; those in the age range 30-39 shifted an average of +0.07; and those in the age range 40+ made an average shift of +0.04, but the latter two scores are based on the averages of 20 and 6 respondents respectively, and cannot be generalised from with any validity. Inasmuch as they can be interpreted, it shows an increasing reluctance to move towards a more learner-centric position in teaching English the older a trainee on the PGCE course is. Further iterations of the study, and on a larger scale, would be necessary before any generalisations could be made.

Statistical analysis of the generated data has nevertheless allowed insight into the pattern of behaviour of trainees on the teacher training course at the single HEI, somewhat corroborated by responses from a wider participant group: a general pattern of movement from a more teacher-centric to a more learner-centric espousal of pedagogical beliefs. The next step will be to gain an understanding of the key levers for this change, but this qualitative element to my research is without the scope of this paper. I now go on to describe the results of the item scores.

Item Scores

For the item data, the score given to each question by each respondent is collected and the average calculated, which allows the questions to be ranked and those which are more closely aligned with the teacher-centric or learner-centric approaches identified.

As with the person scores, each cohort's data can be analysed individually or as an amalgamation, patterns at the beginning and end of the courses identified, and cohorts or survey times compared. Table 3 (below) gives the questions and average responses, Figure 6 (over) shows the overall September and July data for both cohorts, and Figure 7 (further below) shows the comparative places on the continuum between the overall September responses and those from July. This allows me firstly to see which areas are initially perceived as lending themselves to teacher-centric pedagogical strategies, which are thought of as more child-centred, and what shifts in perception occur across the longitudinal study, and secondly to pinpoint specific areas of Primary English teaching that become understood differently across the time period.

Table 3

Q	Belief Statement	Sept average	July average	Diff Sept-Jul
Q1	I believe learners should start with easy questions and work up to harder questions.	2.10	2.75	0.64
Q2	I believe I should tell learners which questions to tackle.	2.99	3.31	0.33
Q3	I believe I should teach the whole group all at once.	2.77	2.96	0.19
Q4	I believe I should know exactly what each lesson will contain.	1.60	1.70	0.10
Q5	I believe learners learn through doing repeated exercises.	2.57	3.03	0.46
Q6	I believe I should try to cover <i>everything</i> in a topic.	3.02	3.46	0.44
Q7	I believe I should avoid learners making mistakes by explaining things to them carefully first.	2.19	2.43	0.23
Q8	I believe learners should mostly work on their own, consulting a neighbour from time to time.	3.63	3.42	-0.21
Q9	I believe I should teach each topic from the beginning, assuming they know nothing.	3.32	3.61	0.29
Q10	I believe I need to teach each element of a topic independently.	3.76	3.78	0.03
Q11	I believe learners should use only the methods which I teach them.	4.19	4.03	-0.15
Q12	I believe I should draw links between topics and move back and forth between several topics.	3.36	3.46	0.10
Q13	I believe I should follow the textbook, or worksheets, closely.	3.59	4.20	0.61
Q14	I believe I should only go through one method for doing each type of question.	4.41	4.40	-0.01
Q15	I believe I should encourage learners to make mistakes and discuss mistakes.	3.85	3.92	0.07
Q16	I believe learners should be allowed to work collaboratively in pairs or small groups.	3.78	4.06	0.28
Q17	I believe learners should learn through discussing <i>their</i> ideas.	4.22	4.28	0.06
Q18	I believe I should jump between topics as the need arises.	3.01	3.33	0.33
Q19	I believe I should find out which parts learners already understand and don't teach those parts.	2.59	2.58	-0.01
Q20	I believe I should teach each learner differently according to their individual needs.	4.00	4.27	0.27
Q21	I believe learners should compare different methods for doing questions.	4.19	4.04	-0.15
Q22	Even though I'll plan my lessons thoroughly, I believe I'll be constantly surprised by the ideas that come up during my lessons.	4.58	4.44	-0.14
Q23	I believe I should encourage learners to work more slowly.	2.49	2.50	0.01
Q24	I believe learners themselves should choose which questions they are to tackle.	2.59	2.80	0.21
Q25	I believe learners should be allowed to invent their own methods.	2.91	3.00	0.09

Table 3: all questions and the September and July average responses

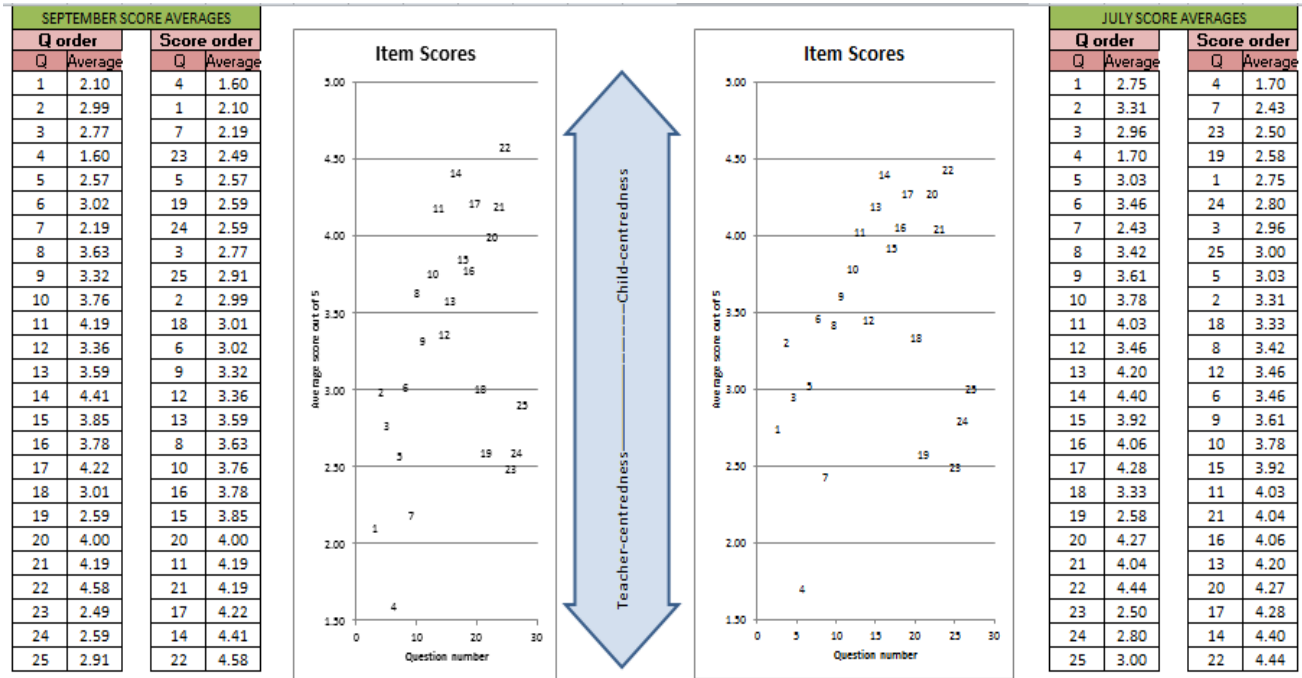


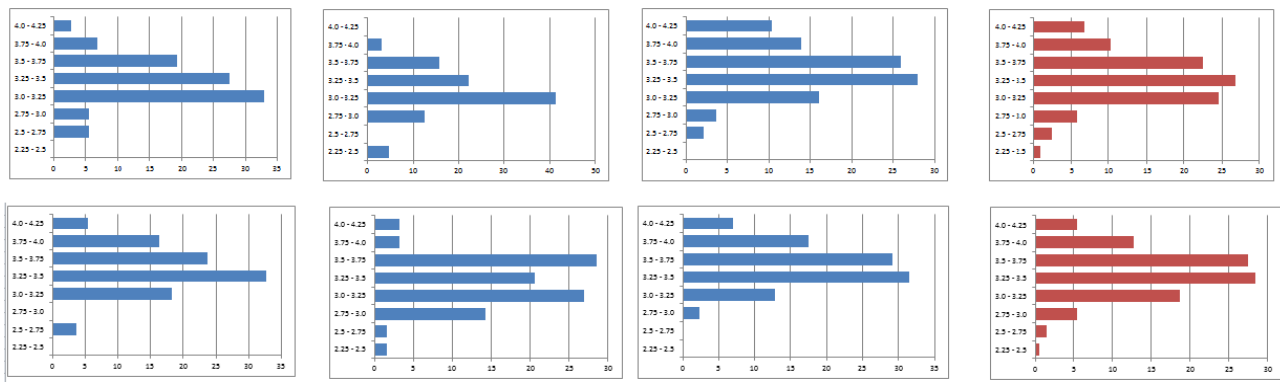
Figure 6: All cohorts – item scores, September and July

Q	Septemb	July	Difference
1	2.10	2.75	0.64
2	2.99	3.31	0.33
3	2.77	2.96	0.19
4	1.60	1.70	0.10
5	2.57	3.03	0.46
6	3.02	3.46	0.44
7	2.19	2.43	0.23
8	3.63	3.42	-0.21
9	3.32	3.61	0.29
10	3.76	3.78	0.03
11	4.19	4.03	-0.15
12	3.36	3.46	0.10
13	3.59	4.20	0.61
14	4.41	4.40	-0.01
15	3.85	3.92	0.07
16	3.78	4.06	0.28
17	4.22	4.28	0.06
18	3.01	3.33	0.33
19	2.59	2.58	-0.01
20	4.00	4.27	0.27
21	4.19	4.04	-0.15
22	4.58	4.44	-0.14
23	2.49	2.50	0.01
24	2.59	2.80	0.21
25	2.91	3.00	0.09



Figure 7: Item shifts from September to July – all cohorts

Alongside this basic data, records are kept of the numbers and percentages of trainees who fall into the various logit steps along the continuum, allowing further insight into cohort, timeframe and overall patterns (Figures 8 and 9, below).



Sept 11
July 12

Sept 12
July 13

Sept 13
July 14

Overall Sept averages
Overall July averages

Figure 8: Person scores in September and July (all completed cohorts) – percentage scores at each logit step

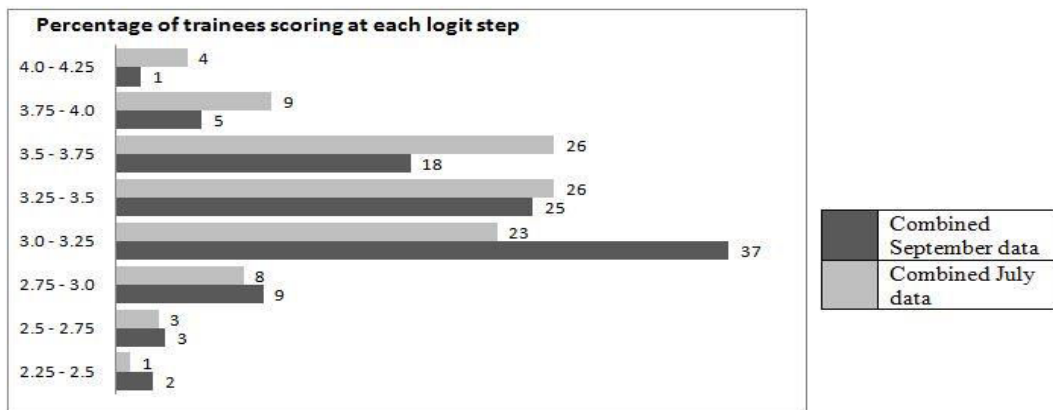


Figure 9: Percentage scores at each logit step: all cohorts combined

What this shows (see Figures 10 and 11, over, for more detail) is that, when combining the comparative data from both cohorts, the overall trend for the average answer to each question (Figure 9) was a slight positive change, representing an encouraging change *in general* (Figure 10) towards a less didactic approach to teaching. Figure 8, in particular, shows a lower number of trainees at each of the lower logit steps, and a concomitant rise in trainees scoring themselves at each of the higher steps in July.

Q:	1	2	3	4	5	6	7	8	9	10	11	12	13
Sept	2.10	2.99	2.77	1.60	2.57	3.02	2.19	3.63	3.32	3.76	4.19	3.36	3.59
July	2.75	3.31	2.96	1.70	3.03	3.46	2.43	3.42	3.61	3.78	4.03	3.46	4.20
Diff:	0.64	0.33	0.19	0.10	0.46	0.44	0.23	-0.21	0.29	0.03	-0.15	0.10	0.61
Q:	14	15	16	17	18	19	20	21	22	23	24	25	
Sept	4.41	3.85	3.78	4.22	3.01	2.59	4.00	4.19	4.58	2.49	2.59	2.91	
July	4.40	3.92	4.06	4.28	3.33	2.58	4.27	4.04	4.44	2.50	2.80	3.00	
Diff:	-0.01	0.07	0.28	0.06	0.33	-0.01	0.27	-0.15	-0.14	0.01	0.21	0.09	

Figure 10: Changes in the item scores from September to July

Figure 10 shows that 19 out of 25 item scores moved in a positive direction, with 11 shifting significantly (see Figure 11); the trainee responses thus indicating a move towards a more learner-centric teaching orientation. A binomial test was run, on this data, and the probability of getting 19 out of 25 going in the same direction, assuming equal probability of a negative and positive shift, is 0.005, i.e. this could not have happened by chance, and can be assumed to be due to the mechanisms described below.

In order to further investigate these shifts, univariate analyses of variance were run on the bases of gender and age. There were no significant trends in either age or gender having a bearing on the shifts made, so the next step in my research is to work with individuals and groups to identify patterns of influence on their developing understanding and practice.

Figure 10 also describes that 19 of the 25 questions resulted in a positive shift, and only six were negative when averaged across the 117 respondents. Of these six, four were downshifts from extremely high starting positions, and all remain above 4.0, i.e. in the top eight most positive responses and, to some extent, can be explained by a regression to the mean. Of the two remaining, Q19 only regressed by 0.01, and the final one, Q8, "I believe learners should mostly work on their own, consulting a neighbour from time to time", made the most dramatic downshift, losing four places in a regression of -0.21. All of the responses in July are based on a year's exposure to centre-based theory and authentic school-based practice and the exigencies and contingencies of the realities of working with children have clearly led the average trainee to expect children to work independently more often than they first espoused in September. This is a key question that I intend to follow up in the final qualitative dialogic sessions I run with trainees.

When investigating the item scores, again the data was fed into SPSS and a Wilcoxon signed ranks test was performed. The evidence of a significant shift for almost all item scores (figure 11, below) provides further clear corroboration that being on the PGCE course effects a change on the espoused pedagogical stance of trainees.

	Z	Asymp. Sig. (2-tailed)
J1 - S1	-3.139 ^b	.002
J2 - S2	-2.345 ^b	.019
J3 - S3	-.502 ^c	.616
J4 - S4	-1.745 ^b	.081
J5 - S5	-3.578 ^b	.000
J6 - S6	-4.339 ^b	.000
J7 - S7	-1.464 ^b	.143
J8 - S8	-2.758 ^c	.006
J9 - S9	-3.295 ^b	.001
J10 - S10	-.150 ^b	.881
J11 - S11	-2.333 ^c	.020
J12 - S12	-1.711 ^b	.087
J13 - S13	-4.173 ^b	.000
J14 - S14	-1.971 ^c	.049
J15 - S15	-1.386 ^b	.166
J16 - S16	-2.270 ^b	.023
J17 - S17	-.666 ^b	.505
J18 - S18	-2.094 ^b	.036
J19 - S19	-1.287 ^b	.198
J20 - S20	-1.786 ^b	.074
J21 - S21	-1.532 ^c	.126
J22 - S22	-1.421 ^c	.155
J23 - S23	-1.048 ^b	.295
J24 - S24	-.606 ^b	.545
J25 - S25	-.485 ^c	.628
a. Wilcoxon Signed Ranks Test; b. Based on negative ranks. c. Based on positive ranks.		

Figure 11: Wilcoxon signed ranks test: all item shifts, September – July

Difference	No. of responses	%age of responses
-4	3	0.10%
-3	34	1.17%
-2	136	4.68%
-1	568	19.54%
0	1229	42.28%
1	626	21.53%
2	228	7.84%
3	72	2.48%
4	11	0.38%

NO CHANGE: 42.3%
 POSITIVE RESPONSES: 32.2%
 NEGATIVE RESPONSES: 25.5%

Figure 12: Differences in response from September to July

There were 2907 possible changes in belief (117 students x 25 statements [one survey was missing eight responses, one missed seven and one missed four]) involved in this study. 1229 responses (42.3%) were zero representing no change in beliefs. Of those responses which represented a change in belief, 937 (32.2%) were positive changes representing a change towards a less didactic approach to teaching and 741 (25.5%) were negative changes representing a change towards a more didactic approach to teaching.

Adding this to the previously described average shift of +0.13 on the continuum between time points gives further evidence at a basic level that leads me to state that participation in this PGCE course, and hence exposure to a variety of teaching approaches, has changed the 'beliefs' of pre-ITE students concerning the way in which **they** think children should be taught. Overall, the beliefs of the participants appear to have changed away from more didactic teaching approaches during the duration of the PGCE course towards more learner-centric, experiential teaching approaches.

Conclusions and Next Steps

Parametric and non-parametric tests run on both the person and item data corroborate the findings and demonstrate a clear significance to this research. It has shown that working on a PGCE course for a year and being exposed to both centre-based tuition and classroom-based practical realities has caused significant shifts in trainees' understanding of pedagogical practice, as demonstrated by their responses to the same questions at the beginning and end of their course, with the average trainee making a positive shift towards a more learner-centric teaching orientation and responses to 25 item scores showing a concomitantly more constructivist set of beliefs in July than was reported in September, at the start of the courses.

The test itself has been demonstrated to be effective in measuring trainees' espoused beliefs and I am confident, moving forward, in its efficacy to accurately represent the currently-held views of participants on postgraduate Initial Teacher Education courses at two time points and in the use of the methods described above to accurately chart the shifts in pedagogical position of respondents in order to develop a greater understanding of the trajectories of cohorts and individuals along the transmissionist-facilitative continuum previously described, and to further investigate along both the item and the person lines of enquiry. There were no significant trends in either age or gender having a bearing on the shifts made, so another next step in my research is to work with individuals and groups to identify patterns of influence on their developing understanding and practice, for example whether the greater influence lies in the institutional teaching or the more apprenticeship model of trainees taking on the skill set and attitudes of their mentors in 'authentic' class-based situations.

I am confident in the statistical significance of the outlined results. My next step is to add a further, qualitative element to my research, and to widen the participation in order to collect data from a larger number of HEIs to further corroborate my findings. I am interested in the levers for change in the described pedagogical shifts, and around the respondents' changing personal epistemologies and espoused pedagogies.

Although I have identified trends in these changes through a quantitative reading of the data, I hope to discover these levers for change through observing and analysing the dialogues of a focus group of participants on the course who are undergoing these profound changes. Adapting Becker's (1970) metaphor, I believe that using both quantitative analysis of the statistical data and qualitative interpretation of the comments is additive in the sense in which the pieces of a mosaic are additive – the different elements come together to produce a composite picture: the findings of each are not just added together as corroborative evidence; but any element that makes a genuine contribution changes the emerging theory.

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