

Reform at Scale: Teacher Development in Kazakhstan

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Abstract

This paper will add to the growing body of work that provides empirical evidence for the multidimensional nature of teacher education reform at scale. In this article we outline the rationale and theoretical underpinning for a Kazakhstan country-wide teacher education reform programme and draw on interim findings at the end of the first year of the extended programme. Although expanding the reform to multiple settings is a necessary condition for scale, it will not guarantee that the programme will achieve the key aim of changing learning and teaching practice in classrooms so that students' learning becomes the focus. We explain how we have tried to bring about conceptual changes and build capacity within schools so that there is a consequential change in classrooms which is sustained and over time.

Background

The Kazakhstan 2011 – 2020 education strategy set a target of developing 'the training system and professional development of the pedagogic staff of Kazakhstan'. In response to this target, in May 2011, the Government of the Republic of Kazakhstan set up the Centre of Excellence (CoE) programme under the auspices of the Autonomous Education Organisation (AEO) 'Nazarbayev Intellectual Schools' (NIS). The strategic plan included a target of training 120,000 teachers by 2016; that is, approximately 40% of the 307,000 comprehensive schools teachers of the Republic of Kazakhstan. In October 2011 the University of Cambridge became strategic partners in this educational reform process.

The main aim of the Teacher Education Reform programme is to develop the learning and expertise of teachers in the public school system, so that the young people of Kazakhstan will become global learners in the 21st century. A further aim is also to establish a network of professional development centres. These centres will provide leadership throughout the regions of Kazakhstan to aid the development process, so that it will be more likely to be sustained beyond the joint CoE – University of Cambridge (UoC) stages of training.

Educational Reform at Scale

To introduce external reform initiatives at scale is a complex endeavour. The process not only requires spreading reform to multiple teachers, schools and districts, but also involves sustaining change in a multilevel system characterized by multiple and shifting priorities (McLaughlin & Mitra, 2001). Educational research has tended to define scale in a one-dimensional way, rationalizing this as the expansion of numbers of schools reached. However, this is a rather narrow definition which does not take into account the simultaneous and complex nature of the challenges. A more helpful start is to conceptualize the problem of introducing reform at scale as a fundamentally multidimensional process.

Defining Scale as a Multidimensional Process

Previous research studies on scale tend to define this process as “scaling up” an external reform in quantitative terms, focusing on increasing the number of teachers, schools, or districts involved (Datnow, Hubbard & Mehan, 2002; Fullan, 2000; Hargreaves & Fink, 2000; Hubbard & Mehan, 1999; Legters, Balfanz, Jordan & Mc-Partland, 2002; McDermott, 2000). In a concise formulation of the predominant view, Stringfield and Datnow (1998, p. 271) define scaling up as “the deliberate expansion to many settings of an externally developed school restructuring design that previously has been used successfully in one or a small number of school settings”. Within this definition, scale involves *replication* of the reform in greater numbers of teachers and schools (Cooper, Slavin & Madden, 1997; Fuchs & Fuchs, 1998; Slavin & Madden, 1996; Taylor, Nelson & Adelman, 1999) or emphasize a process of *mutual adaptation* (Datnow *et al.* 2002; Hubbard & Mehan, 2002; Klein *et al.* 1995; Stringfield & Datnow, 1998) whereby schools are encouraged to adapt reform models to the needs of their local context. Another variation of this theme incorporates concerns for *geographic proximity*, defining scale in terms of an increase in the number of schools involved in a reform effort to achieve a critical mass in a bounded area such as a school district (Bodilly, 1998). The replication, mutual adaption and geographic proximity of reform at scale is largely assessed at an instrumental level and provides a straightforward but intuitive and easily measured parameter. However, this conceptualization of scale is narrow and does not take into account the nature of the change envisioned or enacted or the degree to which it is sustained, nor does it take into account the degree to which schools and teachers have the knowledge and capacity to continue to grow the reform over time. By focusing on numbers alone, traditional definitions of scale often neglect these and other qualitative measures that may be fundamental to demonstrate teachers’ capacity to engage with a reform effort in ways that make a difference for learning and teaching (Coburn, 2003).

In this article, we outline the rationale and theoretical underpinning for a Kazakhstan country-wide teacher education reform programme and draw on interim findings at the end of the first year of the extended programme. Although expanding the reform to multiple settings is a necessary condition for scale, it will not guarantee that the programme will achieve the key aim of changing learning and teaching practice in classrooms so that students’ learning becomes the focus. We explain how we have tried to bring about conceptual changes and build capacity within schools so that there is a

consequential change in classrooms which is sustained and over time.

Coburn (2003) defines reform at scale as comprising of four interrelated dimensions: *spread*, *depth*, *sustainability* and *shift in reform ownership*. In the next sections we explain how we have devised a development programme which addresses Coburn's four dimensions of scale. In addition, we draw on emerging evidence after one year of the CoE programme based on data collected from the concurrent monitoring and evaluation processes.

The Centre of Excellence Programme: Reform at Scale

Bringing About and Sustaining Changes to Practice

Recent international studies of educational change management point to four key school-based strategies that are common to education systems where successful change has taken place (Levin, 2012), such as setting clear simple goals and promoting a 'can do' approach, while building capacity to help sustain the development. The fourth condition is linked to the public perception of teachers and teaching as profession. To raise the status of teaching the Kazakhstan Ministry has agreed to increase the salary of teachers who successfully complete the training programme.

i) Clear simple goals

Successful programmes focus on a few really important and ambitious goals. The mission of the CoE programme is driven by the universal desire within the country to improve the learning of pupils in Kazakhstan so that the young people can become global citizens equipped with 21st century skills and knowledge.

ii) Create positive cultures which support innovation

Secondly, team leaders are the key players who promote positive, collegial and convivial cultures. It is also the leaders' role to support teachers to take risks and encourage Kazakhstani specific innovation. The CoE programme aims to develop a climate for learning and discussion about how to manage and organise change so that this becomes sustained and embedded.

iii) Ways of thinking, ways of working, and tools for working

To bring about change and to help to train teachers in this widest sense the Cambridge professional development programme has introduced Kazakhstani trainers to new ways of thinking, new ways of working, and to tools to bring about change (see Table One, p. 4).

iv) Core Ideas

At the core of the change process is the belief that it will be what teachers do in classrooms that will have the most profound effect on pupils' learning. To achieve this will require teachers to explore the basic principles of leading learning in their own classrooms through small scale development work

and in engaging in small-scale project work focused largely on improving school-based practice. This approach is underpinned by four central tenets, with *How children learn* at the centre. The other three areas include: *What to teach*; *How to structure sequences of learning* and *How to assess if you have been successful*.

The full details of the programme are published in a series of written handbooks that are supplemented by extensive on-line, written and video support materials. The blended learning programme is structured into three discrete stages involving reflection and collaboration:

KEY DRIVERS	LEADING LEARNING IN CLASSROOMS	LEADING LEARNING OF TEACHERS IN A SCHOOL	LEADING LEARNING IN SCHOOLS AND NETWORKS
	Level Three (Core)	Level Two (Intermediate)	Level One (Advanced)
WAYS OF THINKING	Knowing about learning Critical thinking Identifying attitudes and dispositions of ALL learners Learning how to learn	Collaborative and collegial group work	Networking Development Planning
WAYS OF WORKING	Assessment for Learning Dialogic teaching Reflecting on practice	Coaching and mentoring Evaluating impact Lesson Study Action Research	School leadership Extended networks Researching practice
TOOLS FOR WORKING	Digital Technology Peer and self assessment Medium term plans	Coaching and mentor plans Action plans	School development plans Research designs and data gathering methods

Table One: Centre of Excellence Key Drivers

Spreading the reform programme through cascading training

Cambridge trainers work directly with Kazakhstani trainers in Astana and then these trainers travel to the regions to work directly with Kazakhstani teachers. The exponential multiplication of learning and development is intended to speed up the implementation process and maximise the reach of the key drivers.

To minimise the potential pitfalls of this approach the Astana based CoE development team and the UoC team from the Faculty of Education worked closely together during November and December 2011 to pre-plan the programme. The CoE team managed the logistics of bringing 286 trainers from all over Kazakhstan to Astana in January 2012 and enabling these already busy teachers to commit fully to the three month long training. At the same time the Cambridge team put the course together by preparing the tools, aids and approaches to be used for the three level programme. Written materials

were developed and shared via a project wiki page so that these could be translated into Russian and Kazakh prior to starting the training. To reduce the possibility of 'diluting' the new ideas, Cambridge trainers worked directly with 286 Kazakhstani trainers in Astana. Then the trainers were assessed and accredited before they were permitted to undertake training with other teachers.

The FoE team negotiated clear outcomes and criteria with the CoE team at the onset of the programme, defining the knowledge, skills and behaviour expected as a result of the training. This was made widely available to everyone involved in paper form and as electronic copies on the programme portal hosted at <http://www.cpm.kz>.

Reform at Depth

If education reform is 'at scale' then deep and consequential changes will take place in classroom practice. Deep changes go beyond simply tinkering with procedures and structures, and usually involve altering teachers' beliefs about the norms and pedagogical practices of the classroom. This is because teaching is complex and requires developing the 'capacity to make appropriate judgements in rapidly changing, and often unique circumstances' (Beckett & Hager, 2002, p. 302). The key lever for development was to develop classroom-based practice so that teachers have the capacity to make suitable deliberative judgements about appropriate classroom interactions (Wilson & Demetriou, 2007) so that this would bring about enhanced pupil learning.

Teacher beliefs are very powerful in forming attitudes, which subsequently inform decision making and ultimately classroom actions. Therefore, the teaching repertoire of any individual teacher is an amalgam of beliefs, knowledge and assumptions. Together these elements make up the person's unique 'teaching schemata'. Pajares (1992) claims that teachers' beliefs are more influential than their knowledge in determining teaching behaviours: 'Beliefs about learning will affect everything they do in the classroom. Indeed, deep-rooted beliefs about how [subjects] are taught will pervade their classroom actions more than a particular methodology or course book'. However, these deeply held commitments may also restrict a teacher's receptiveness to new ideas. The premise of the CoE programme is that if 'traditional' transmission style teachers are to be able to help pupils to become critical reflective thinkers then teachers too will also need to become reflective critical thinkers themselves and open their minds to new ideas.

A Multi-layered Blended Learning Approach to achieve Depth

The reform programme introduced new ideas at three levels within schools, starting at the classroom level and working through middle leadership to senior teachers. At each level the programme involved three stages comprising of Stage 1 – a face-to-face series of workshops with theoretical input – followed by an extended practice based period (Stage 2) culminating in a further face-to-face period of reflection (Stage 3); see Figure One (p. 6).

Stage 1: The first face-to-face training focuses on learning about the key ideas and how to embed these into classroom or school-based practice.

Stage 2: The school-based stage consolidates and implements these ideas through carrying out new methods in the practice. At Level Three the focus is on classroom practice. Teachers introduce new approaches into their own classrooms. This includes teaching sequences of lessons and also carrying out school-based tasks issued during the first face-to-face training. The changes made by the teachers in their classrooms are evaluated by the teachers themselves during the school-based process. At Level 2 teachers bring about change through coaching and mentoring other teachers in Level Three approaches in their own schools. At Level One, advanced level teachers lead changes in the whole school through the school development planning process. Furthermore, during the school-based stages teachers are supported through an online asynchronous forum.

Stage 3: The final face-to-face stage focuses on self and peer reflection about the changes made and will self and peer evaluate the evidence gathered to measure the effects of the changes on children's learning and the developing understanding of the teachers. Trainers assist teachers in the preparation of their portfolio by providing formative feedback for the final summative assessment in the final week of this stage.

The accompanying trainers' and teachers' handbooks set out the theoretical research underpinning the programme but these handbooks will only form a small part of the overall programme.

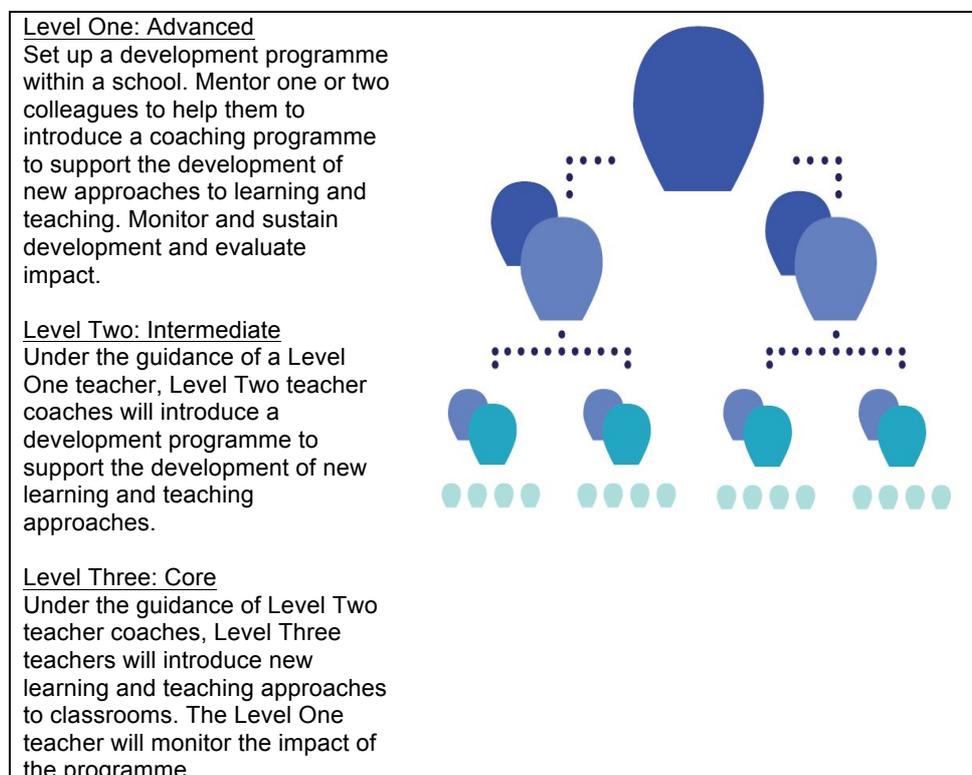


Figure One: Leading Learning at three levels

To extend the reform at depth the programme introduced three levels. At the basic third level teachers lead learning within their own classrooms; at the intermediate second level teachers coach and mentor other teachers within their school; and at the advanced first level the focus is on whole school leadership of learning and teaching.

An increased emphasis on depth as a key element of scale requires extensive and innovative ways of monitoring and evaluating the implementation of the programme using other methods in addition to survey methods.

Spillane and Jennings (1997) demonstrated that it is possible to come to very different conclusions about the degree of implementation of reform practice depending on whether the focus is on activity structures and materials used rather than what they call “below-the-surface’ differences in pedagogy” (p. 453). Therefore, measuring deep and consequential change in classroom practice requires explicit attention to beliefs, norms, and pedagogical principles.

Capturing depth will require in-depth interviewing and classroom observation, refocused on such indicators as the nature of strategic planning and teaching tasks, discourse patterns in the classroom, and teachers’ conceptions of knowledge and learning. Other methods less often used in studies of scale, such as the systematic collection of student work and changing attitudes, as well as the use of teacher reflective logs, will also be collected.

Shift in Reform Ownership

To try to increase the likelihood of being successful and ultimately becoming a Kazakhstani owned reform the new programme was co-planned with contributions from both Cambridge and Kazakhstan based team members. The joint planning team recognised that bringing about change in teacher education would not simply be a case of direct ‘policy borrowing’. Furthermore, the materials were adapted to fit the specific Kazakhstani context whilst also being grounded in rigorous research evidence and practical teacher education experience. In addition, the planning team took into consideration that teachers are often slow to develop their practices because these are often embedded in organisational structures that are resistant to new ideas. One reason often cited for this conservatism is that teacher education has a relatively weak knowledge base compared with, for example, the health professions (Spillane *et al.* 2002). To try to overcome potential conservatism the development team consulted evidence from a range of international educational reform programmes, particularly where large scale innovative projects had been shown to be successful in bringing about change (Levin, 2012)

Language barriers

The first cycle of the training programme showed that getting the language right is very difficult but that time and effort to carry out good interpretation of ideas is a crucial stage to the success of the programme. To try to overcome some of the conceptual misunderstanding diagrams and metaphors were used extensively to support the written text.

By August 2012, the Kazakhstan-based team has made significant progress in setting up systems to ensure more accurate translation of complex concepts. All documents are now translated into Russian and then checked for accuracy before being subsequently translated into Kazakh.

Sustainability and Capacity Building

There is also now strong evidence about the conditions required for teachers' professional growth. Findings from a UK wide study of the state of CPD nationwide (Pedder *et al.* 2009), which built on a larger study carried out in the US (Desimone, 2009) recorded six features which increased teachers' capacity to extend professional learning and also, more importantly, resulted in enhanced students' learning (see Figure Two, p. 9). In essence the findings showed that the conditions necessary for teacher learning to be transformative are that development of practice must be context specific and embedded in a real classroom. Furthermore, development ought to involve a reflective stage where teachers think deeply about what they are doing and why. The development activity must also be sustained over an extended period of time, and include some form of collaborative inquiry-based practice supported by more knowledgeable critical friend.

Sustain development through support and encouragement

The process of change requires hard work, determination and resilience on the part of everybody involved. Part of the role of the CoE Cambridge and Kazakhstani trainers is to motivate teachers by adopting a positive approach through encouragement and praise, and, more importantly, by helping to build teachers' beliefs that they are good at what they do whilst also holding them to account for pupils' learning and attainment. To this end the focus of the CoE programme is centred on making classroom learning and teaching better for all learners in each classroom. This is achieved through building on context specific evidence from all staff, parents and students in each school.

It is intended that the goals are realised through establishing a strong, positive and optimistic belief that all pupils learning can develop that will be achieved through collaborative team work with experts and novices working together to produce short and long term plans for schools and classrooms.

In summary, the key functions of the CoE programme are to sustain the will of teachers through providing them with the skill to learn how to learn so that they understood how to bring about change. When the key players have the necessary skill and knowledge of how to build capacity within the school system then improvements are more likely to be pervasive and sustained. The CoE programme started as a Cambridge programme but has now rapidly become a Kazakhstani CoE programme.

Emerging evidence of reform at scale

Train the trainers

The first training of trainers took place in January 2012 at the Centre of Excellence in Astana and involved 281 trainers. An online survey was used in order to gather baseline information about the trainers. This was translated into Russian and Kazakh and 252 of the 281 trainers responded to the survey (90% response). The base line data shows that there were 164 Russian speaking and 88 Kazakh speaking trainers. Of these 111 were teachers in NIS and other schools and 141 were from Regional and Republican Training Institutes. Although many were not working in schools at the time of the training the majority of the trainers were highly experienced teachers. Indeed, over 30% of the Russian-speaking trainers and 30% of the Kazakh speakers had over twenty-five years of teaching experience.

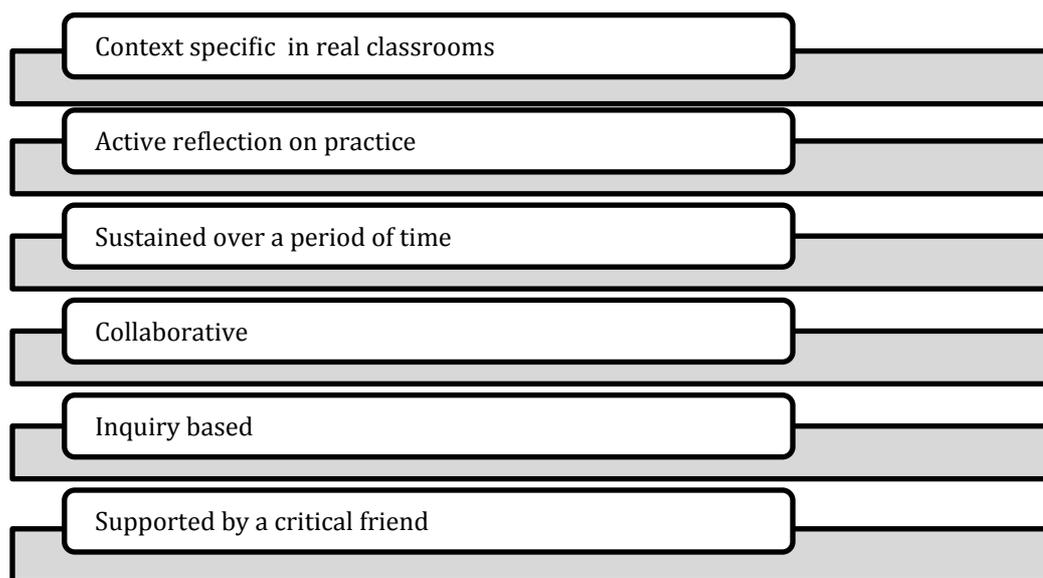


Figure Two: Conditions necessary for transformation of teachers' practice

The training of trainers followed the format of the training for teachers i.e. a first face-to-face period, a school-based period, and a final face-to-face period. During the first period Cambridge trainers used materials from the teachers' programme to model the training process and facilitated discussion about how ideas and approaches might be adapted within the Kazakhstani context. Trainers were required to trial ideas in schools during the school-based period; the final face-to-face period involved them in reflection on, and discussion of, their school experience. On completion of this programme trainers received a certificate of attendance from CoE but were not given accreditation as trainers until they

had completed a rigorous assessment process which involved evaluation of both understanding and application of the programme.

The process of assessment of trainers was jointly developed by Cambridge International Examinations (CIE) and members of the CoE team in consultation with UoC Faculty of Education programme developers. At the start of the January training programme, two members of the CoE team who had been involved in developing the assessment process moved from CoE to head up a new parallel organisation, charged with responsibility for assessment of trainers and teachers and with monitoring Quality Assurance (QA). This organisation was integrated into the Centre for Pedagogical Measurement (CPM). Although it is a separate organisation, it is significant that the head of the CPM was a key member of the Kazakhstani team involved in developing the training programme from the outset and so fully understands the aims and shares the values and visions of the CoE programme.

During the first period of training trainers, 29 of the 286 trainers were identified and selected by CPM to become assessors in the QA team. Assessors attended all CoE training and also were provided with supplementary training by the CIE team and by CPM. In April 2012 assessors were re-designated as 'Experts'.

Following the completion of the assessment process, 233 people were successfully accredited as CoE trainers. A team of external examiners from the UK monitored the final assessment procedures and found the process to be rigorous and fit for purpose. In order to gain accreditation to carry out CoE training of teachers at Levels Two and One, trainers also completed the Cambridge-led train the trainers courses at the appropriate level. Of the Level Three trainers 165 went on to complete Level Two training in August and September 2012, and 133 completed the advanced Level One training between October and December 2012. Some additional people joined the Level Two train the trainers course and were assessed using the same processes as those who had also completed the Level Three course.

Train the teachers

Teacher training took place between April and June 2012 in ten locations throughout Kazakhstan. At these centres 3,292 Level Three teachers were trained in the first cohort with 3,038 completing the assessment and accreditation process. In the second cohort between October and December 2012, 4,292 teachers were trained in 23 locations including thirteen Republican Institutes.

By December 2012, 370 trainers have been accredited by CIE and these trainers have successfully trained the above 7,584 classroom-based teachers at Level Three. A further 300 Level Two teachers have been accredited in January 2013.

i. Monitoring the efficiency of the cascade model

Success of a cascade model of teacher professional development depends on the integrity of the programme being sustained at each step. Specifically, it is important that the programme presented by trainers to teachers is consistent with that modelled and jointly constructed in relation to the Kazakhstani context during the train the trainers courses. There is an expectation within the programme that trainers will adapt and import materials to suit the needs of their teachers. However, there are key ideas and approaches that are central to the programme which are not open to significant change. In order to support trainers in delivering the programme to teachers with integrity and to monitor the efficacy of the cascade model, a programme of mentoring has been instigated.

In June 2012, a pilot team of four Cambridge trainers worked alongside trainers working with teachers at Level Three in Astana, Semey, Pavlodar and Taldykorgan. Reports were produced which suggested that the 'dilution effect', as new ideas were cascaded from Stage One to Stage Two through trainers working with classroom teachers, was not a serious problem. Two extracts from reports from Cambridge mentors provide an insight into the train the teachers in action:

"In all, I listened to thirty one practice presentations and these were followed by peer discussion and comments by the trainer and myself where relevant. The presentations covered all of the seven topics, although critical thinking was the most popular, and it was obvious that the training of the teachers had given them a very good knowledge of all seven. All teachers were very enthusiastic about how they had integrated the topics into their lessons, and many mentioned the improvements in children's work, behaviour and enjoyment of lessons when using the new approaches. Some teachers mentioned an improvement in their own feelings about teaching, following the success of their pupils. Peer review following the presentations was well organised and generally positive, with advice given where relevant. Full use was made of slides to accompany the presentations. It was obvious that the trainers had done a very good job in covering all the materials in the face to face sessions, and that the teachers were delighted with the results they had obtained when using the new approaches in school. I made it clear to all the groups how delighted I personally was with the progress made".

There was, however, some anxiety on the part of the trainers about the time required to make a difference to teachers' practice:

"The anxiety came through how they were going to manage to look at so much work in the time and about the presentations. I listened to a number of the presentations and built into the programme was the opportunity to listen to the whole group; and I was at a meeting with the officials and suggested they couldn't possibly listen to all 31, so I suggested they split the groups because there was more than one trainer to a group and the assessment team agreed to that, although I know that did not always happen".

ii) Trainers' evaluation by consulting pupils

The next section includes extracts from one report collected at the start of Level Two training from a trainer who had earlier completed the Level Three teacher training. The extracts provide anecdotal but encouraging feedback from students in a class which had been taught by a teacher taking part in Level Three training in a village school in the Almaty region:

'The experimental lessons in the program proposed by the University of Cambridge went to school No. 28 of the village Besagash Talgar district of Almaty region. The students liked the new format. They say that Kazakhstan's education system limits their freedom. Teachers believe that discipline is more important than all the same students as the main factor of success.'

'Azattyk radio reporters visited the village Besagash to meet with students of school No. 28, which attended the experimental lessons. Student of 10th class Asel Adilgazy said that usually the teacher asks questions, and the student answers standing: "If the student is shy, often he/she cannot answer the teacher's questions, and just keep quiet...automatically the students in the class are divided into two groups – those who 'learn' and those who 'do not study'".

'There is no connection between the teacher and the student. [Students are] Afraid to share with the teacher their personal problems. Because we are afraid that the teacher cannot understand and even scream. In just one month of lessons the teacher was our friend. Free way of communication in the classroom can happen to conquer fear – says Erkezhan Kametaeva.

ii) External moderation by a UK team of examiners

Two external Moderators attended the examination process in March and April 2012, and in December 2012. The examiners' role is to confirm the extent to which assessment of the Level Three and two programmes have been carried out according to the processes outlined in the Assessment Handbook and to ensure that the judgments are consistent and fair. Finally, examiners are asked to identify any issues or concern and to make recommendations for improvements to the assessment process and the continuing development of the programme.

Examiners scrutinised a sample of completed portfolios translated into English and were also able to review hard copies of completed teacher and trainer portfolios with the authors. They observed ten teacher presentations, where trainers provided formative and summative feedback to the teachers they were training. They also observed trainers being provided with formative and summative feedback from experts. Furthermore, examiners participated in extensive discussions with teachers, trainers and experts about the assessment process and observed a review of the evidence by experts of candidates deemed to be 'Borderline' in the examination.

The reports provided evidence of teachers actively engaging with ideas from the programme and demonstrating that they have met the success criteria set out by showing that they had:

- gained knowledge and understanding of the key ideas presented in the programme;
- are applying these ideas within their own practice;
- are reflecting on the implementation of new practices and considering implications for further development.

Examiners wrote in the final report (External Examiners Report, 2012) that: *“We saw clear evidence of ways in which teachers’ practice and their perception of learners is changing. For example, when using collaborative group work and involving pupils in learning activities, teachers reported being surprised by the achievements of children previously judged as ‘slower learners’”.*

As one teacher said: *“If you change the strategy, a great deal can be achieved.”*

Another commented: *“The development of the learner depends on active engagement.”*

“The evidence presented by several teachers showed that the children who made the greatest gains were those previously judged as ‘cognitively weak’. To challenge deeply held assumptions in this way is a significant achievement of the programme”.

“Congratulations are due to all those who have been involved. Across the whole programme, more than 7,000 teachers have successfully completed Levels Three and Two in a remarkably short time”.

Early Evidence of Capacity Building

There are some early signs of capacity building within the system.

i) Kazakhstani Expert assessor team

There is now a team of expert assessors who have completed all three Levels of CoE training and who have also undertaken additional assessment training carried out by CIE. This team now oversees the assessment process under the guidance of a support team lead by an original member of the CoE planning team.

ii) Growth in the numbers of CoE offices with expert Directors supported by international trainers

There are now 17 centres of excellence throughout Kazakhstan supported by a fully trained team of teachers and lecturers. These centres are located in Astana, Karaganda, Semey, Oskemen, Taldykorgan, Almaty, Shymkent, Aktau, Atyrau, Aktobe, Pavlodar, Kokshetau, Taraz, Kyzylorda, Kostanai, Petropavlovsk and Uralsk. (see Figure Three, p. 14). The Directors of the centres have completed all three Levels of CoE training and carried out teacher training within their regions. Each

centre now has a recently recruited English speaking international trainer working in their team. The Centres of Excellence will act as hubs for networks of teachers within the regions.



Figure Three: Location of the Training Centres 2012

iii) Kazakhstani Expert trainer team

A team of expert trainers who have attended all three Levels of the CoE programme have been appointed to work as co-trainers with the Cambridge team in the second cycle of Level Three train the trainers programme in January 2013.

iv) Kazakhstani Expert ‘ambassador’ team

Although there is not an official team of ‘ambassadors’, there are a number of extremely competent, articulate trainers who occupy senior positions within the Kazakhstani education system who have completed all three Levels of CoE training and have also either trained or assessed teachers. Indeed, at the December 2012 *Teacher Professional Development: traditions and changes* international conference several CoE trainers presented papers related to their work with the CoE programme.

Action research reports and reflective accounts

The action research projects carried out by trainers during the school-based/on-line period have been very influential in deepening trainers’ understanding of the process of learning and teaching through structuring the systematic collection of classroom-based data about implementing change. The programme’s seven themes were integrated into trainers’ school-based training and teachers’ classroom practice though more strategic medium term planning. This planning process helped trainers and teachers to structure the integration of all the ideas from the programme into classroom practice rather than as isolated discrete teaching strategies. The collection of data about the positive effects of the programme on pupils’ learning and motivation served to reinforce trainers’ and teachers’

determination to continue with the training programme. Whilst the research findings were presented to peers in the second face-to-face seminars, these useful reports are largely inaccessible to Cambridge trainers because they were usually written in either Russian or Kazakh.

Discussion

Introducing innovation and development of practice does not have a direct linear outcome because there are many contributory mediating factors in place between the initial Cambridge training and ultimate pupils' outcomes. Consequently, it is not a straightforward process to monitor outcomes. However, an ongoing monitoring and evaluation programme is in place to determine the impact of the CoE programme as it is introduced and developed. The CoE evaluation process will look for evidence of deep changes taking place which illustrate how teachers' beliefs about the norms and pedagogical practices of the classroom have changed. Data will continue to be gathered beyond the Cambridge training stages to look for evidence of change and sustainability of the programme over time. The three types of evidence being collected are:

- **instrumental evidence:** participants feedback, evidence of influencing the development of practice or altering teachers' and pupils' behaviour;
- **conceptual change:** contributing to the understanding of the participants;
- **evidence of capacity building:** through technical and sustained personal skill development.

By early 2013 substantial data sets has been collected and this is summarised in Table Two (p. 16). The next sections will present an analysis of the interim findings of these data.

Challenges facing the process of Reform at Scale

Monitoring and Evaluation

Broadening the definition of scale in the way we have described earlier highlights inherent tensions for both monitoring and introducing the reform process. The broader conceptualization emphasizes dimensions of scale that are more challenging to measure because it is more challenging to measure conceptual change or enacted pedagogical principles than the presence or absence of activities or materials. It is more challenging to measure the spread of norms of interaction than the number of teachers or schools involved in such an initiative. It is also arguably more challenging to measure the shift in authority over and knowledge of reform than reform adoption and sustainability. Evaluation strategies that capture depth and shift in ownership, most often qualitative, will be more labour intensive and time consuming than survey and other quantitative methods better suited to capture breadth.

However, it is very important to solve these challenges to ensure that we develop research designs that capture what is important rather than only what is easily measurable. To that end, we will continue to analyze conceptual changes through the development of appropriate methodological approaches. We plan to explore creative and cost-effective ways to study schools that have been

engaged in reform initiatives for more than a few years.

Domain	Type of Evidence		
	Instrumental	Conceptual	Capacity Building
Teacher Values and Beliefs <ul style="list-style-type: none"> • Expectations and beliefs about what is good teaching • Feedback on the training process 	Participants' reactions i) CoE surveys ii) FoE baseline survey iii) Cambridge and Kazakhstani trainers interviews	Participants' Outcomes i) Trainers' Portfolios ii) Trainers' work iii) Trainers' reflections	Participants' Ideas Reflective accounts of practice
Norms of Social Interaction <ul style="list-style-type: none"> • Teacher – student roles • Nature of talk in classrooms • Culture of classroom • Collaboration in classrooms • Teachers' learning 	Participation in training sessions i) Group work outcomes ii) Photographs of trainers working	Participation in classrooms i) Video and reports, evidence of teachers working in schools from school-based stages ii) Integrated Professional Development follow up reports	Extending expertise i) Building teams of experts ii) Action Research reports iii) Building teams of co- trainers team to support the second cycle
Underlying Pedagogical Principles <ul style="list-style-type: none"> • how changes are enacted • how ideas are applied • increased student outcomes 	Change in practice i) Practice survey pre and post ii) Video evidence iii) Cambridge mentor support feedback	Change in values i) Success rates of trainers and teachers ii) External Examining reports iii) Trainers' and Teachers' Portfolios iv) Values survey pre-post.	Capacity to teach others i) Vignettes case studies ii) Trainers' conference presentations

Table Two: Monitoring and interim evaluating the change process

Embedding Reform

There are also tensions as the CoE navigates the tension between breadth and depth. The capacity building at multiple levels of the system that is necessary for depth and reform ownership will be expensive and resource-intensive (Slavin & Madden, 1999). That is, the more challenging a reform is to teachers' existing beliefs and practices, or the more aspects of classroom practice or levels of the system it engages, the more it may need well-elaborated materials and sustained, ongoing professional development to achieve depth.

We have tried to overcome some of the tension between depth and breadth through the careful design of the reform itself which we have explained in this paper.

Finally, there are also tensions between reform ownership and fidelity because the reform programme places a high priority on fidelity to particular activity structures. As knowledge and authority shifts from the University of Cambridge to the Centres of Excellence personnel and Kazakhstani schools, the decisions about what aspects of the reform to emphasize or adapt will no longer lie with the University

of Cambridge, the external reform organization. To minimise the 'dilution effect' we have tried to develop a deep understanding of *why* as well as *how* to bring about changes. With such knowledge, teachers and others will theoretically be able to make decisions about the reform in ways that remain faithful to the underlying philosophy and pedagogical principles, thus mitigating some of the tension between reform ownership and fidelity (McLaughlin & Mitra, 2001; Coburn, 2003).

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