Maturity Model Analyses

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Contents

Notes on methodology

The analyses presented here were based on self-reports of maturity from institutions, the evaluation team's interviews and questionnaire data collated during the final year of the project (September 2005 to July 2006).

Preparation of the data sets

As with data from previous years, the analyses reported here were conducted using a merged data set collated using each institution's self-assessment and an assessment conducted by the evaluation team using a range of data collected throughout the fourth and final year of the project. A final data set was created for each institution by taking the average score of the institutions' and evaluation teams' assessment on each of the dimensions. It was not possible to collect a self-assessment from one of the secondary schools and so the assessment made by the quantitative evaluation team was used in place of a combined assessment. Similarly, data from the special school was not collected in 2006 due to this school being merged with schools that were not part of Test Bed during the summer of 2005. The scale of the models is linear from one to six, with six being the highest score available. Further analyses will be conducted on the maturity model data in due course, to include an assessment of performance on the models and the relation to performance on national tests. These will be conducted as soon as the performance data becomes available to us from the Department for Education and Skills.

Descriptive statistics

The overall mean score for each institution was calculated for the six maturity models and the following tables and graphs display a comparison of the means from all four years of the project, split by phase of education and by model. While this results in some duplication of data it also provides a full picture of the patterns within the data.

Between the first (02/03) and second (03/04) years of the project, first level analyses found a sharp rise in maturity across all sectors as the institutions began to embed the technology and engage with the emerging issues. The rise was concluded to be a reflection of the steep learning curve that these institutions had embarked on at the start of the project. Between the second (03/04) and third (04/05) year of the project, although a rise in maturity was found across the sectors and models, the rate of change was not as fast as that witnessed between the two first years. This raised the issue of whether or not a plateauing of maturity was emerging. In the fourth and final year (05/06) of the project the data suggests that the rate of change had indeed continued to slow. A levelling off of the rate of change was anticipated. Maintaining the momentum for change is less achievable as the integration of the systems becomes more complex and the plateauing of skills and integration of ICT is a reflection of the now steady increases in staff knowledge and expertise.

Model 1 – Technological Maturity

Data from the first year (02/03) of the project indicated that the FE sector was the most advanced sector in terms of their technology provision. This was interpreted as being a reflection of the ICT demands of further education provision and the level of ICT support that could be achieved in larger institutions. This finding was evident throughout the remaining three years of the project and the FE sector exhibits greater technological maturity than the other sectors in this, the final year of the project (05/06).

Throughout the project, the nursery and primary schools showed rapid technological development resulting in a narrowing of the technology gap between the sectors. By the end of the fourth year, all sectors registered a high level of technological maturity (see Table 1). The coalescence of the sectors in terms of technological maturity was anticipated given the high levels of investment and the near-ceiling performance of the institutions on this model is evidence of that investment.

As previously noted, the shift that has taken place over the lifetime of the project provides evidence of the rising resource levels that began in year one and which has now plateaued at the end of the project. Each of the sectors ended the project operating at the higher end of the Technological Maturity scale, around levels four and five. In real terms this indicates that the institutions had developed clear policies which focused on effective teaching and learning outcomes using ICT, rather than the technology *per se*, that management and curriculum systems are networked together allowing the sharing of resources and data and that all students and staff had regular access to central, portable or class-based ICT resources with a minimum ratio of 1:5.

Table 1: Displaying mean scores and standard deviations (SD) for Model 1 (Technological Maturity) split by phase of education and year

	Nursery	**Primary**	**Secondary**	**FE**	**Special**
Mean Score Yr 1 (2003)	2.07	2.73 (0.47)	2.83 (0.25)	3.42 (0.84)	3.36
Mean Score Yr 2 (2004)	3.57	3.78 (0.30)	3.5 (0.63)	4.00 (0.49)	3.57
Mean Score Yr 3 (2005)	3.86	4.29 (0.27)	4.17 (0.34)	4.38 (0.18)	4.14
Mean Score Yr 4 (2006)	4.29	4.52 (0.30)	4.19 (0.42)	4.69 (0.23)	unavailable

Graph 1: Displaying mean scores for Model 1 split by phase of education and year

Model 1: Technological Maturity
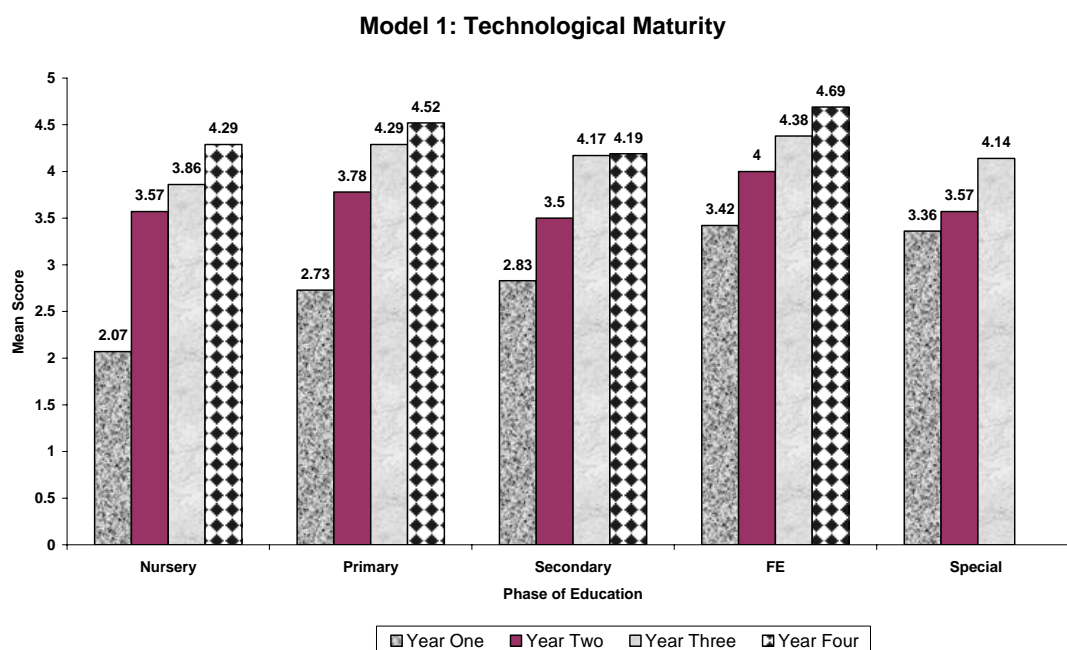

Model 2 – Curriculum Maturity
Overall, curriculum maturity scores were lower than technical maturity scores across the four years of the project. In the first year the FE colleges and the special school demonstrated the highest levels of maturity against the other sectors.

Data from year two indicated that the nursery had made the most progress on this model between year one and year two (see Table 2) and collectively the primaries, nursery and special school were leading the way in terms of curriculum maturity in year two.

In years three and four, mean scores across all the sectors were less varied than in the previous years and the sectors were scoring similarly. The institutions in years three and four continued to build on the trend noted in the second year of moving towards the embedding of ICT into the various curricula. Levels three and four on the model indicate institutions' focusing on effective learning outcomes rather than technology *per se*, having a collective agreement about the key uses and the embedding of ICT into the curriculum, and having a diverse range of working modes across the institution, which includes collaborative learning and learning at a distance.

Table 2: Displaying mean scores and standard deviations (SD) for Model 2 (Curriculum Maturity) split by phase of education and year

	Nursery	Primary	Secondary	FE	Special
Mean Score Yr 1 (2003)	1.43	2.18 (0.38)	2.28 (0.47)	2.48 (0.24)	2.83
Mean Score Yr 2 (2004)	3.07	3.03 (0.26)	2.81 (0.35)	2.90 (0.19)	3.07
Mean Score Yr 3 (2005)	3.25	3.81 (0.35)	3.49 (0.39)	3.58 (0.15)	4.05
Mean Score Yr 4 (2006)	3.84	3.94 (0.44)	3.52 (0.50)	3.58 (0.10)	unavailable

Graph 2: Displaying mean scores for Model 2 split by phase of education and year

Model 2: Curriculum Maturity
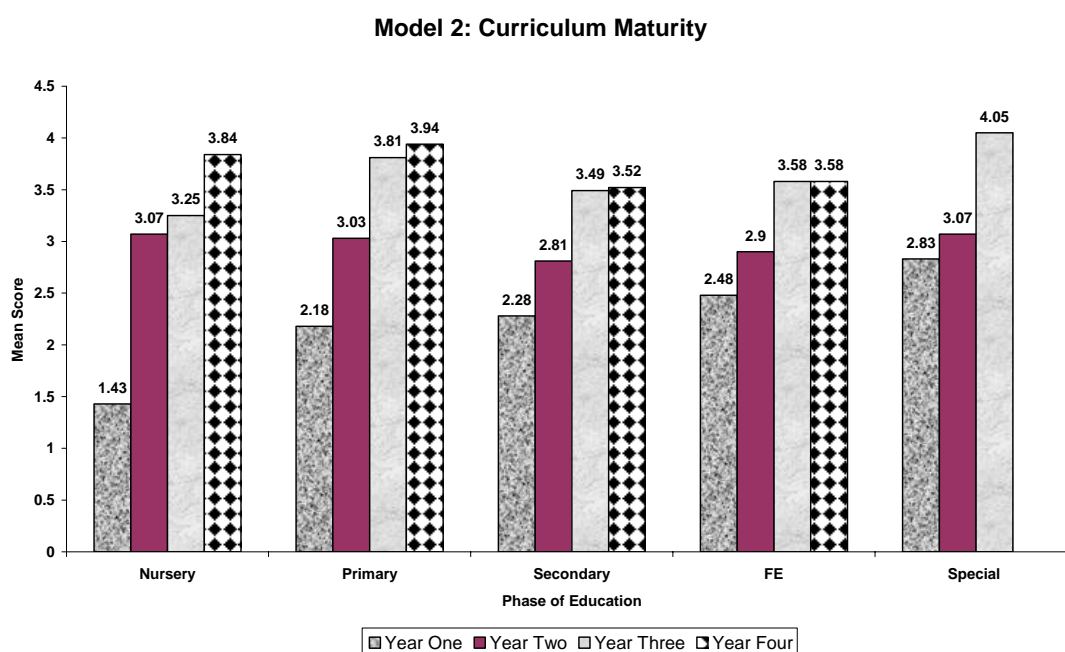
Model 3 – Leadership/Management Maturity
At the start of the project the three FE colleges and the special school were found to be operating at higher levels of maturity than the other sectors and this remained true for the FE colleges in the final year of the project. No data is available for the special school which ceased to exist as an individual entity at the end of the third year of the project. Mean scores for year two reflected the continuing but varied development of all the institutions in terms of leadership and management and at the time it was speculated that the disparities between the sectors were attributable to the management styles inherent in each sector.

In year three there was rapid progress for two out of the five sectors with the FE and primary sectors recording scores around level four of the model. Of particular note was that all three institutions in the FE sector were registering such scores. The remaining sectors also progressed albeit less rapidly. Between the third and fourth (final) year of the project the greatest gains in maturity on this model had been made by the nursery school. Starting from a weak base, the nursery school made the most progress out of the four sectors for which we have complete data sets.

The clustering of scores in the final year around levels three and four of the scale illustrates the use of a clearer and more focused vision of the use of ICT across the institutions and is suggestive of a change in the way the institutions are governed and managed with the introduction of new MIS and improvements in the way data is collected, recorded and handled. The increase in maturity over the course of the four years to date is also an indication of a change in the way in which ICT is co-ordinated across the institutions, for example, more proactive rather than reactive management of initiatives involving the use of ICT and also having access to an integrated ICT-based assessment and recording system that is available to staff at least in the institution, if not externally.

Table 3: Displaying mean scores and standard deviations (SD) for Model 3 (Leadership/Management Maturity) split by phase of education and year

	Nursery	Primary	Secondary	FE	Special
Mean Score Yr 1 (2003)	1.83	2.61 (0.48)	2.68 (0.25)	3.08 (0.65)	3.33
Mean Score Yr 2 (2004)	2.67	3.49 (0.38)	3.27 (0.54)	3.57 (0.22)	3.39
Mean Score Yr 3 (2005)	3.22	4.21 (0.46)	3.78 (0.69)	4.17 (0.11)	3.56
Mean Score Yr 4 (2006)	3.78	4.32 (0.44)	3.94 (0.67)	4.41 (0.13)	unavailable

Graph 3: Displaying mean scores for Model 3 split by phase of education and year

Model 3: Leadership/Management Maturity
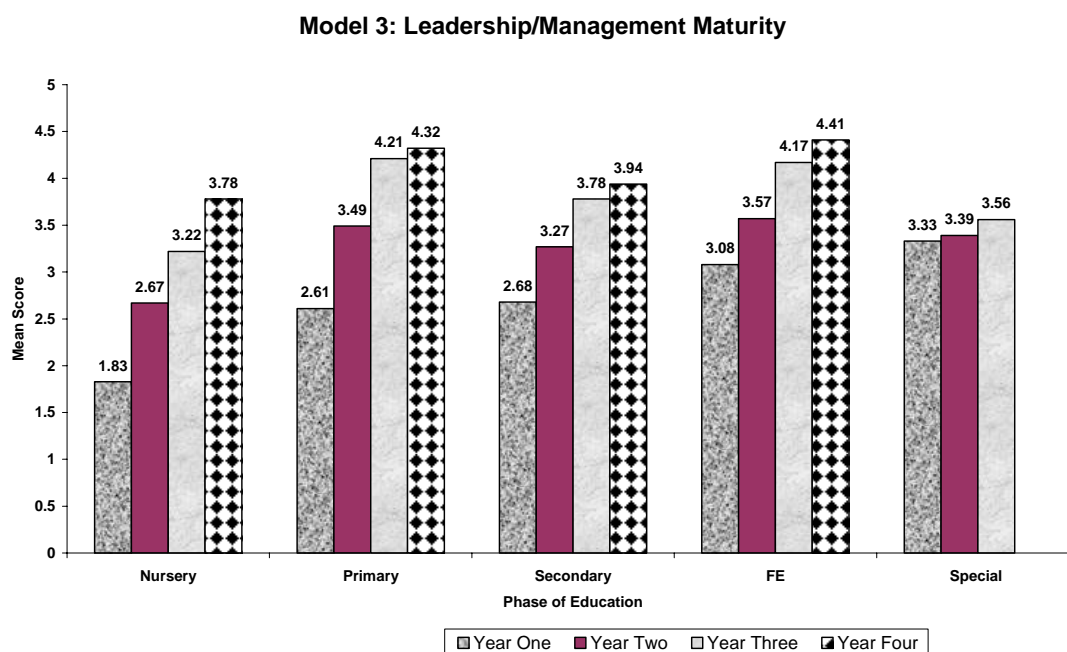

Model 4 – Workforce Maturity

In the first year of the project the special school demonstrated the highest levels of workforce maturity (see Table 4) followed by the FE institutions, whilst the primary and secondary sectors showed moderate levels of maturity. Analysis of mean scores from the second year, however, revealed that all sectors had increased workforce maturity levels and all were operating at or above the mid point of the scale by this time. At this point in time in the nursery school, which had previously lagged behind the other sectors, had made rapid progress and reached similar levels of maturity to the majority of the other sectors.

The rate of change from year two was echoed in year three with a clustering of scores around levels three and four, indicating an increasingly ICT mature workforce. Scores in year three (04/05) and four (05/06) of the project across all sectors represent the increasing skills base of staff in ICT, with evidence of improved training and staff development. The majority of staff within the Test Bed institutions are now classed as ICT competent and new approaches to teaching and learning are being piloted, evaluated and, where suitable, embedded in institutional practices. Improvements in technical support are also captured in the changes in year three with all institutions now receiving both reactive and proactive technical support. This is symptomatic of the increase in resources (evidenced in Maturity Model one: Technological Maturity) which stimulated a demand for technical support. The development of the roles of support staff is also in evidence, with an increase in autonomy and clearly defined roles for these staff members increasingly apparent.

Table 4: Displaying mean scores and standard deviations (SD) for Model 4 (Workforce Maturity) split by phase of education and year

	Nursery	Primary	Secondary	FE	Special
Mean Score Yr 1 (2003)	1.8	2.59 (0.37)	2.78 (0.40)	3.05 (0.40)	3.56
Mean Score Yr 2 (2004)	3.5	3.78 (0.31)	3.65 (0.63)	3.63 (0.45)	4.00
Mean Score Yr 3 (2005)	3.8	4.31 (0.28)	4.12 (0.37)	4.15 (0.26)	4.6
Mean Score Yr 4 (2006)	4.40	4.39 (0.35)	4.19 (0.45)	4.2 (0.26)	unavailable

Graph 4: Displaying mean scores for Model 4 split by phase of education and year

Model 4: Workforce Maturity
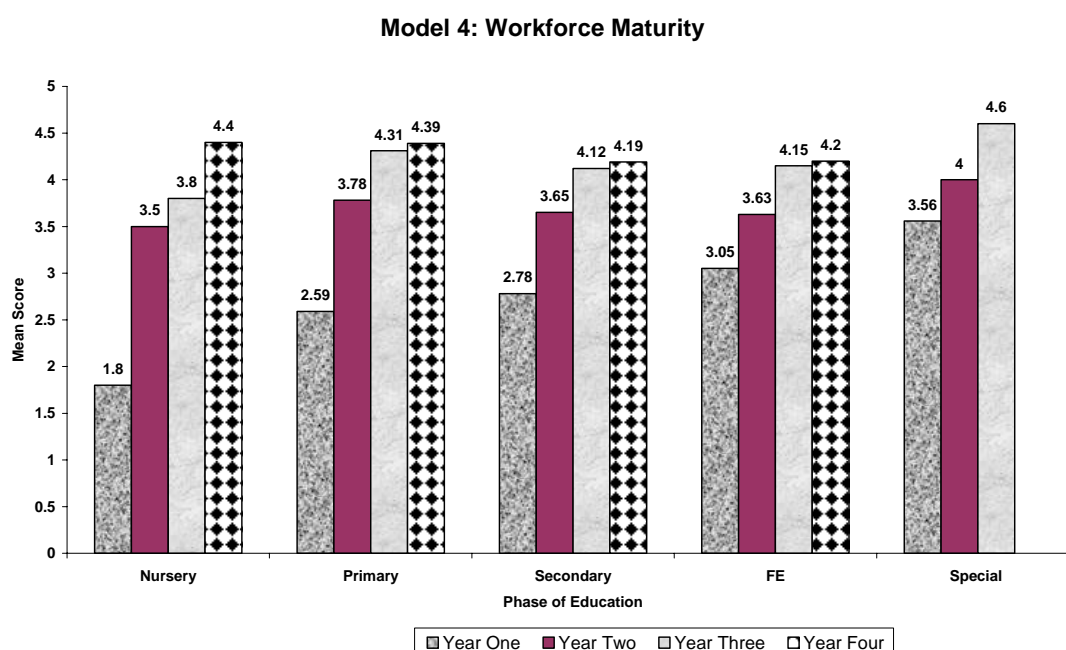
Model 5 – Linkage Maturity 1: Intra/inter-institutional
Intra/inter-institutional maturity was one of the least well developed areas at the inception of the project, although the special school had established such linkages (see Table and Graph 5).

In year one, the primary and secondary sectors demonstrated the greatest range of scores on this model with standard deviations of 0.50 and 0.57 respectively. One of the explanations advocated for the generally low rates of maturity in this area in year one was that at the start of the project planning for linkage was still in its infancy and development across the institutions was inconsistent, with greater emphases being placed on procurement and other issues. Given the themes of the project, it was anticipated that we would find a

much greater shift in developmental progression in this area as the project progressed, and this is certainly reflected in the scores from year two and three.

In the second year all sectors were performing at or above a mean score of three. The dramatic improvement of the nursery is indicative of their realisation of the value of such linkage. Once they had established the vision, implementing that vision has not proved to be a barrier.

Collectively, institutions across the sectors recorded scores of three or above in years three and four. Whilst this is indicative of considerable progress from the outset of the project, it represents a slowing down of progress in this area. In real terms, the positioning of the institutions at levels three and four on the scale is representative of the tangible achievements that many institutions have made in increasing links within and between themselves. It also suggests that staff now have easier access to information and data, that there have been increases in the use of electronic methods of communicating with LEAs/LSC, and in the formal sharing of best practice and expertise within and between Test Bed clusters. Finally, it is indicative of a shift in the institutional ethos, whereby an institution considers all students, teachers and other staff members to be learners – that is, a commitment to lifelong learning and recognising the existence of skills at all levels of the institution.

Table 5: Displaying mean scores and standard deviations (SD) for Model 5 (Linkage Maturity 1) split by phase of education and year

	Nursery	Primary	Secondary	FE	Special
Mean Score Yr 1 (2003)	1.33	2.16 (0.50)	2.03 (0.57)	2.56 (0.37)	3.08
Mean Score Yr 2 (2004)	3.00	3.13 (0.40)	2.95 (0.18)	3.31 (0.51)	3.25
Mean Score Yr 3 (2005)	3.33	3.91 (0.46)	3.83 (0.32)	3.83 (0.52)	2.83
Mean Score Yr 4 (2006)	3.33	4.03 (0.45)	3.88 (0.51)	3.88 (0.42)	unavailable

Graph 5: Displaying mean scores for Model 5 split by phase of education and year

Model 5: Inter/Intre Institution Linkage
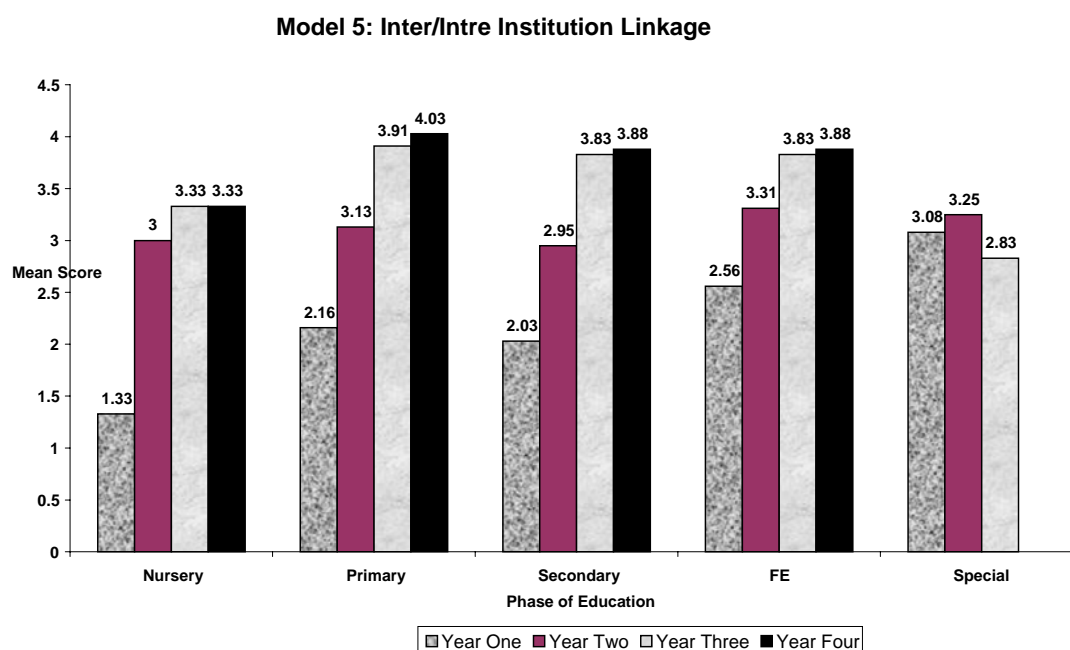
*Model 6 – Linkage Maturity 2: External Communication*
As had been anticipated with the External Linkage model, developing links with the home and the community proved one of the most challenging aspects of the project and in year one (Table and Graph 6) levels of maturity were low, with the FE colleges showing the most activity in this area. It is unsurprising that the FE sector still leads here given that linking with the community is a core aspect of their business.

As a whole the descriptive data indicates that development in this area is still ongoing, and that the biggest leaps in progress were made in the early stages of the project. This development tended to be in the form of push technologies, that is, a one-way flow of information from institution to learner or parent or potential employer. There has been little notable change between the third and fourth years of the project. The development of two-way information flows has not materialised in most institutions. The development of such communication places technological demands on the institution, and indeed the recipient environment such as the home, but it also requires institutions to rethink their relationships with learners and the home. However, it is encouraging to find that most institutions are working towards having websites that can at the very least be used to advertise the activities within the institution, that parental and community access to resources within the institutions is growing and that whilst the use of electronic communication between the home and school/college is still in the emergent phase, we do have some institutions who are actively encouraging this form of communication.

Table 6: Displaying mean scores and standard deviations (SD) for Model 6 (External Linkage) split by phase of education and year

	Nursery	Primary	Secondary	FE	Special
Mean Score Yr 1 (2003)	1.28	1.74 (0.40)	2.02 (0.69)	2.59 (0.25)	1.11
Mean Score Yr 2 (2004)	2.78	2.52 (0.54)	2.76 (0.80)	3.31 (0.28)	2.61
Mean Score Yr 3 (2005)	2.83	3.08 (0.58)	3.46 (0.33)	3.89 (0.10)	3.67
Mean Score Yr 4 (2006)	3.17	3.36 (0.55)	3.48 (0.69)	3.89 (0.51)	unavailable

Graph 6: Displaying mean scores for Model 6 split by phase of education and year

Model 6: Linkage Maturity 2: External Communication
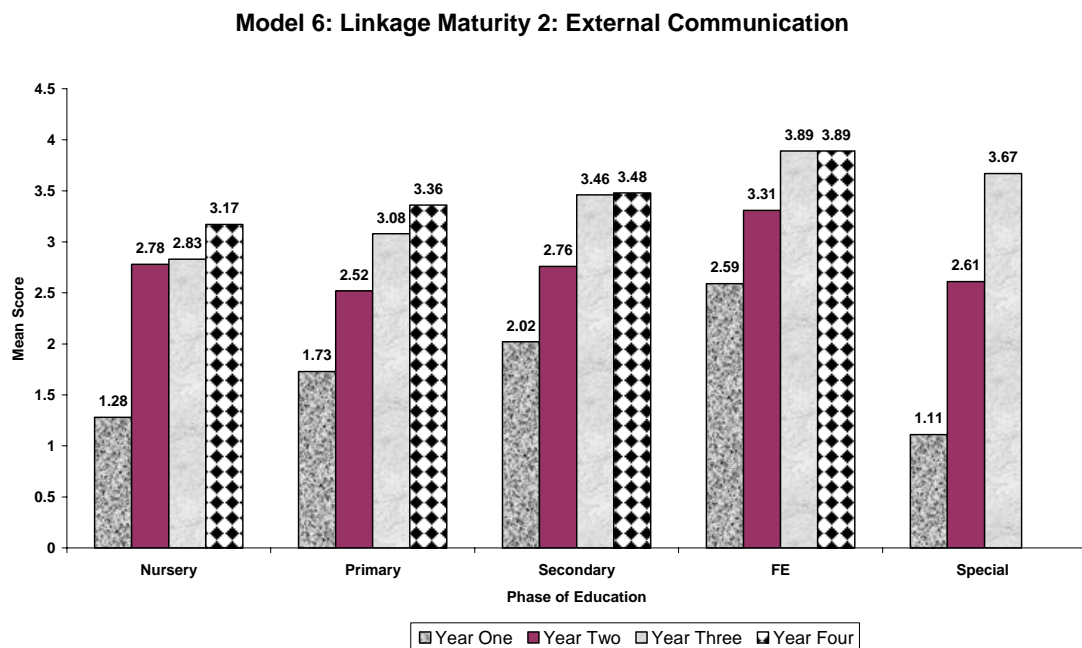
Measures of change

For each of the models the degree of change between the years was calculated. This measure of change was derived by subtracting the mean score for each model from the previous year from the subsequent year mean scores (for example, subtracting year one scores from year two scores). The following series of graphs display the change over time by phase and are presented for each model in turn.

Each of the graphs (7a to f) displays mean change for that model per sector (between year one and year two; year two and year three and year three and year four) expressed as a percentage of the two years. For example, for the first model, Technological Maturity, we can determine that most of the change that has occurred to date occurred between year one and year two of the project (approximately 83 per cent of change occurred during this time), and that the actual change measure scores were 1.5 and 0.29 respectively for data representing years one to two and years two to three.

One of the key findings from these graphs is that across all the models, with the exception of the leadership/management model, the nursery school made the most progress in the first two years. This contrasts sharply with the special school where the rate of development accelerated between the second and third years of the project. The low initial starting point of the nursery school, which was in keeping with the general philosophy of nursery provision, on many of the models might be one reason for the quite outstanding levels of change that the school went through in the first half of the project. However, involvement in the project and with the support of the cluster, the vision and ethos of the nursery school was scaffolded and the school was able to make rapid progress. In contrast, the special school had already been working to different pedagogical principles and their initial starting point was higher, making the higher level developments more achievable as the project progressed into the mid stages (years two and three). The primary, secondary and FE institutions appear to have responded to the demands of the project in a more measured and linear fashion, with change occurring more or less equally over the first three years.

With regard to rates of change between the final years of the project (years three (2005) and four (2006)), it is interesting to note that the nursery school demonstrated an accelerated rate of change for the Technological, Curriculum, Workforce and External Linkage maturity models in comparison to the rate of change evident between years two and three for this institution. For the remaining sectors, change appears to be more of a linear process evident over the course of the project, with a large proportion of change occurring between the first and second years, followed by smaller degrees of change between the second and third years and then between the third and fourth years for the Curriculum Maturity Model and the Internal and External Linkage Models.

For the Workforce Maturity Model, the nursery, primary and secondary schools made rapid progress between the first and second years, followed by a smaller degree of change between years three and four and then an accelerated rate of change in the final years of the project. Interestingly, the three FE colleges collectively demonstrated a more even profile of change over the first three years of the project, reaching a natural plateau on this model by the end of year three (as evidenced by the small rate of change scores calculated between years three and four).

These graphs should be interpreted with caution. The lack of equivalence in sample size between the sectors means that the individual results for those institutions which are greater in number are 'hidden' within the collective findings for that sector. In the case of the nursery and the special school, in which they are both the single representative, findings may be inflated or skewed and this should be taken into account when interpreting the findings. Furthermore, given the very different natures of the educational sectors represented here, comparisons across sectors should be conducted with care.
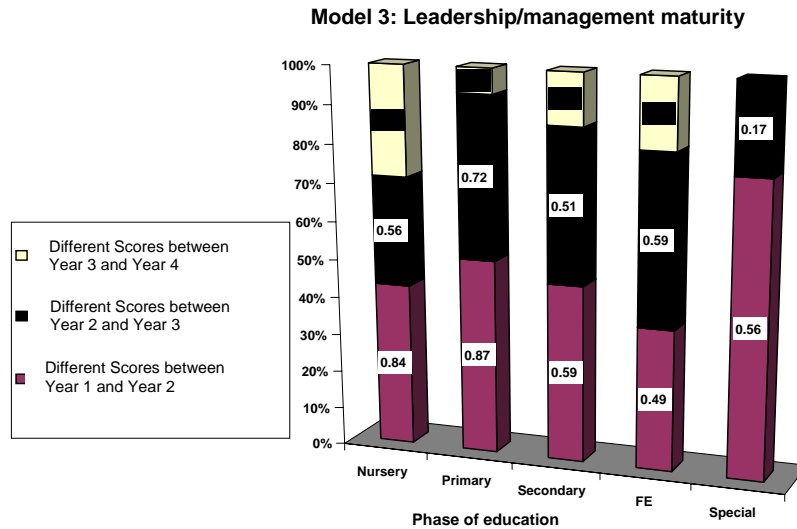
Graph 7a: Displaying the mean difference in maturity between years one and two, between years two and three and between years three and four for Model 1 (Technological Maturity)
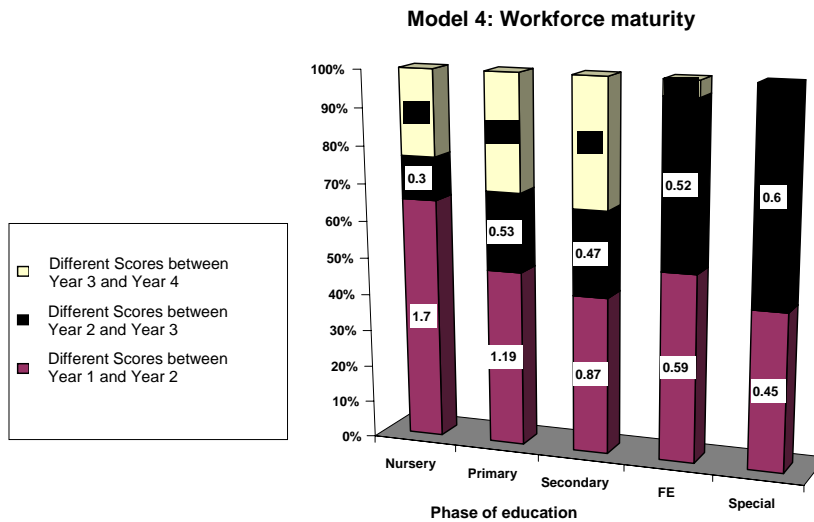
Model 1: Technological maturity
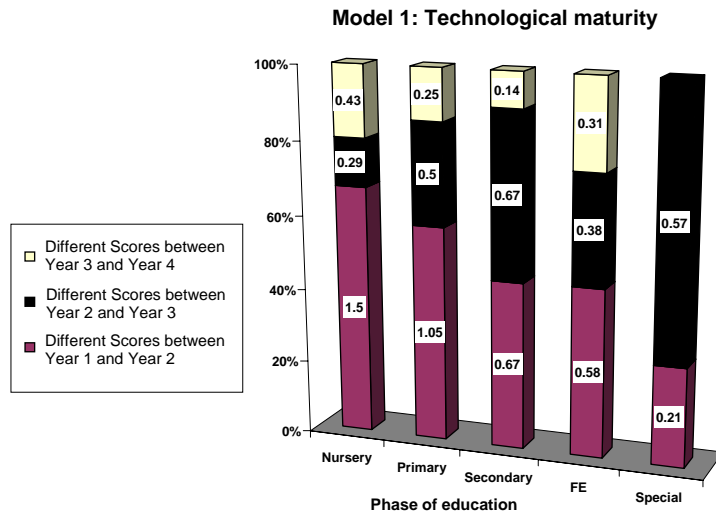
Graph 7b: Displaying the mean difference in maturity between years one and two, between years two and three and between years three and four for Model 2 (Curriculum Maturity)

Model 2: Curriculum maturity
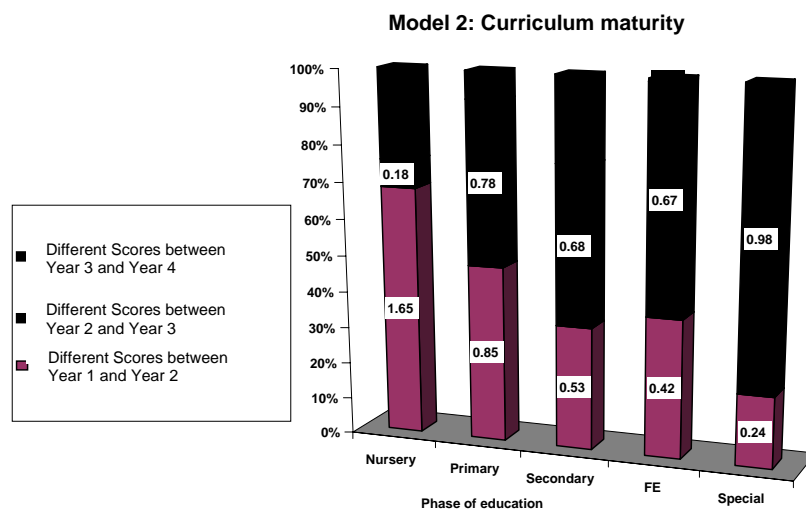
Graph 7c: Displaying the mean difference in maturity between years one and two, between years two and three and between years three and four for Model 3 (Leadership/Management Maturity)

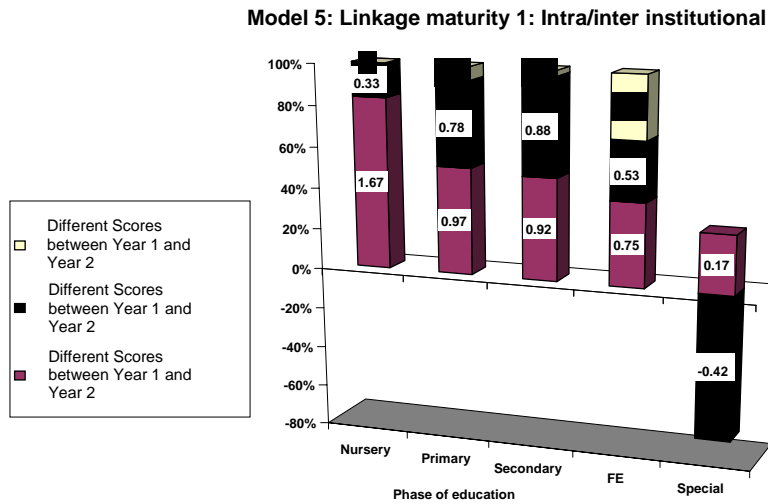**Model 3: Leadership/management maturity**

Graph 7d: Displaying the mean difference in maturity between years one and two, between years two and three and between years three and four for Model 4 (Workforce Maturity)

Model 4: Workforce maturity

Graph 7e: Displaying the mean difference in maturity between years one and two, between years two and three and between years three and four for Model 5 (Intra/inter-institution Linkage Maturity)

Model 5: Linkage maturity 1: Intra/inter institutional

Graph 7f: Displaying the mean difference in maturity between years one and two, between years two and three and between years three and four for Model 6 (External Linkage Maturity)

Model 6: Linkage maturity 2: External communication
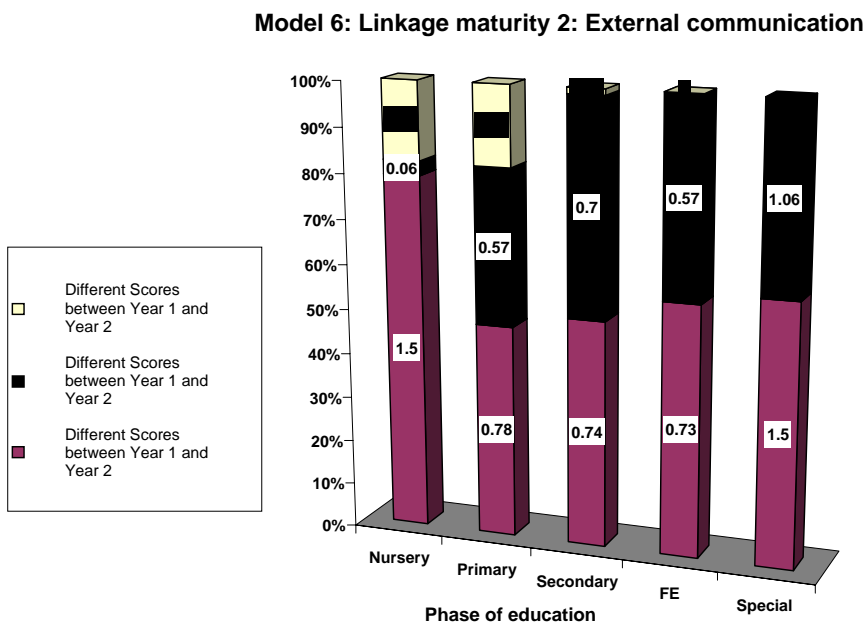
Summary

At the start of the Test Bed project, institutions in each of the sectors were, as might be expected, operating at the lower end of the six maturity models. In particular, performance on the two linkage models was found to be weak. During the first two years of the project a sharp rise in overall maturity was evident as the institutions received hardware and software and were starting to become embedded as modes of working were amended accordingly. Year three of the project found evidence of a slowing in the rate of change across the sectors, although progress was still being made on the each of the models. In the final year of the project (year four: 2005-2006), the evaluation found evidence of a small but steady increase across the six models. The limited progress made in year four confirmed predictions that progression on the models would slow from the third year as change became increasingly more difficult to implement.

The different sample sizes between the sectors make any comparison problematic. However, the progress of the nursery school was particularly marked. At the start of the project this school had a low starting point (in keeping with the nursery sector). By the final year, rapid progress had been made and the nursery finished the project operating at levels of maturity that were in keeping with institutions in the other sectors. The primary, secondary and FE institutions appear to have responded in a more measured and linear fashion, with change occurring more evenly over the first three years.

The two models that institutions as a whole performed better on were Model one (Technological Maturity) and Model four (Workforce Maturity) – the former because the institutions were being heavily subsidised and the latter because the institutions could see an immediate need to respond to the changing infrastructure. The two linkage models, Models five and six, were the models on which the institutions performed least well. This pattern was evident throughout the four years of the project. Institutional progress on the two linkage models inevitably involved a great deal of change in the institutions' *modus operandi* but without an immediate 'need' being identified. We had therefore predicted that performance on these models would lag behind the other four models.