

Scrutiny Investigation into the Impact of New Building Developments for Schools on the Quality of Education

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Foreword by the Chair

The 21st Century Schools scheme has led to striking new school buildings in many areas in Gwynedd. As Band A of the scheme is coming to an end, it was timely to look at what has been achieved so far and to look at the lessons to be learnt for the future.

The recommendations have derived from the work of the investigation members whilst visiting a selection of new buildings, discussing with Headteachers, staff and pupils, and holding meetings with experts.

We acknowledge the hard work that is undertaken in the schools and the tireless efforts by the staff to provide the best for the pupils. I would like to thank the schools for their warm welcome when we visited them.

I would also like to thank my fellow members for their contributions, the Head of Education Department and its officers, the Housing and Property Department and GwE for their support to the work of the investigation.

Finally, I would like to thank Sion Owen for leading the investigation and to the team of Democratic Services officers for their support in producing this report.

Councillor Beth Lawton
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1. Introduction

- 1.1. In 2009, Welsh Government announced the 21st Century Schools Programme, with the aim of offering long-term capital investments in order to improve the learning environment and the outcomes of education. At the same time, in 2009 the Gwynedd Education Modernisation Strategy was published. Like a number of other Councils, Gwynedd Council was eager to take advantage of the opportunity to invest in education and modernise the provision of buildings and organisation.
- 1.2. The Council successfully gained grants from Band A of the 21st Century Schools Scheme; which led to significant investment of approximately £36 million in Gwynedd education, with £18 million in grant funding and £18 million from Council budgets. In addition, the Council has attracted further capital funding on the tail of Band A, funding that is used for the reorganisation of education in Bangor. This means that the total invested in education for children in Gwynedd has risen over £50 million.
- 1.3. By 2018, members of the Education and Economy Scrutiny Committee decided to investigate into whether there is a positive impact on the quality of education and pupils' experience deriving from the developments and expenditure on new buildings. At the meeting of the Scrutiny Committee on 20/9/18, a brief for the investigation was approved, which can be seen in **Appendix 1**.

2. Purpose of the Scrutiny Investigation

- 2.1. The main question to answer in the investigation was: 'What effect has new building development had on schools and the quality of pupil education, and are there lessons to be learnt for the future?'
- 2.2. In addition to this pivotal question, there was a series of other questions to be considered as an evidence base to answer the main question:
 - What are the features of a good education?
 - Are the educational results of the schools in question better/worse/stable after opening the new buildings?
 - How has the pupils' experience changed from the old building to the new building
 - How does the building affect education?
 - What were the success criteria of the developments and were these achieved?
 - What was the general condition of the buildings?
 - What changed from the old school to the new school?
 - How did the teaching staff, the governors and GwE find the building improved the quality of education?
 - Do the developments offer value for money?
 - Are there lessons to be learnt for the future?

3. Methodology

- 3.1. In order to respond to the brief and answer the basic question, 'What effect has new building development had on schools and the quality of pupil education, and are there lessons to be learnt for the future?', it was decided to use the following methodology:
- Research: understand the policy context, identify good practice from any other studies, research the best definition of the quality of education and how to measure it
 - Case Studies: visits to the sites agreed in order to gather qualitative data (the views of the Headteachers, pupils, governors) and quantitative data on measuring progress to see whether there is any impact on education results
 - Recommendations: Produce clear recommendations based on evidence to be submitted to the Cabinet Member
- 3.2. Research: It is important to understand the policy context as background to this work, and a short summary of the main findings is presented in part 4 of the report. In attempting to identify good practice in the field, it emerged early on that not much research has been carried out into the impact of school buildings on the quality of education. It is assumed that this is due to difficulty and complexity in being able to *prove the impact* of a building on the quality of education and pupil attainment. Members of the investigation considered the 'Clever Classrooms' research, a summary of which can be seen in part 5 and **Appendix 3**.
- 3.3. Additionally, members of the investigation considered a thematic report by Estyn, "An evaluation of performance in schools before and after moving into new buildings or significantly refurbished premises" - January 2007. The report noted, amongst its findings, that "better buildings contribute to one or more of the performance areas defined by us (Estyn)..." and "Old school buildings in a poor condition cannot satisfy the new teaching and learning needs." The report was considered, but as it had been published since 2007, there was a feeling that the information was slightly dated.
- 3.4. Additionally, coming to a standard and clear definition of the quality of education and how to measure it was challenging. This was an important factor in order to be able to answer the investigation's core question. Various responses and guidance were received, the details of which can be seen in part 6.
- 3.5. Case Studies: In accordance with the brief, the investigation members visited some schools. It is noted that each new school building development is unique. Case studies were carried out, which compared common themes that emerged from visiting the schools. Qualitative data was gathered by interviewing the Headteachers of the schools, as well as staff, pupils and governors. Their experiences of the new buildings were compared with the old buildings, where possible. A full record of the case study has been shared with the relevant services, and the main messages have been reported in parts 7 - 10.
- 3.6. At the meeting of the Education and Economy Scrutiny Committee on 20/9/18, the

Head of Education suggested that it may be useful for the investigation to look at the buildings of Penybryn, Tywyn as they were part of the reorganisation scheme that created Ysgol Craig y Deryn. The members of the investigation decided to visit Ysgol Treforthyr rather than Penybryn, Tywyn, in order to see an example of a school that needed a new building.

- 3.7. It was intended to gather quantitative data as well, and although data about individual schools is available through the Council's Education Department or through the StatsWales website, Welsh Government stated in summer 2019 that publishing the details of the performance of individual schools would not be permitted. This meant that it would not be possible to use the data of pupil progress in order to measure a building's impact. Whilst data such as budget per head and pupil numbers for the schools in question is useful to provide a picture of the success of the new buildings, it is not possible to use the attainment data to prove the impact of the building on the quality of education. However, the results of the Estyn inspections are noted in the case studies.
- 3.8. Recommendations: We are of the opinion that following the above methodology has led to gathering important information (acknowledging that a vast majority is qualitative data) which leads us to the conclusion that there are lessons to be learnt for the future. The work's recommendations are presented, based on the above methodology, in part 12.

4. Policy Context

- 4.1. 21st Century Schools. The Welsh Government introduced the 21st Century Schools scheme in 2009, confirming in its business case that there would be a change from a system where grants were allocated to Councils every year in order to be spent on school buildings, and move to a long term procedure that would facilitate a more strategic mindset.

"The main objectives of the programme is to:

- Reduce the number of school buildings that are in a poor condition
- Reduce the surplus capacity
- Reduce running costs to make the most of the available resources to target improvements in terms of learner outcomes
- Deal with specific demand for places in Welsh language provision and faith education"

- 4.2. The scheme commenced in 2014, and the Government funded 50% of the development, with the need for local authorities to seek 50% in match funding. In the meantime, Welsh Government allocated funding in order to support plans that were already in the pipeline.
- 4.3. Schools Organisation Code. When allocating grant funding, the Government sets strict conditions on what the grant can fund. Its aim is to create schools of a consistent

quality across the country and, in order to do so, the grant conditions set specific expectations and restrictions including the size of the schools, the amount of budget that is available per m², timetable requirements for construction, and environmental performance standards (BREEAM). It is considered that the guidelines and restrictions are quite strict. A full explanation of the requirements and the restrictions was given by the Head of Housing and Property Department (Senior Property Manager at the time). In addition, the requirements of Welsh Government have changed as time has gone by, e.g. requirements regarding ensuring community provision within the school's space. There were specific requirements to ensure a community provision (and specific funding to support this) for the earliest schemes, such as the Hendre and Craig y Deryn schools; however, this specific requirement and the funding to support it has since disappeared, such as for Ysgol Bro Llifon and Ysgol Glancegin.

- 4.4. In 2009, the 'Excellent Primary Education for the Children of Gwynedd' Strategy was adopted, noting the following main objectives:
- "Offer the best possible experiences and opportunities to the children of the County by ensuring **classes of an appropriate size** and **high quality school leadership** in our schools;
 - Aim to **promote and strengthen the Welsh language** - as an educational and social medium - by presenting new proposals for primary education within the County;
 - Respond to the needs and opportunities in the existing primary education system by **being pro-active and creative**, and jointly working with others towards a **long term plan** that will be sustainable and practical;
 - Make the **best possible use of the resources available** - human, technical, financial - so that the children get the greatest benefit from the county's expenditure on education;
 - **Create a first-class learning environment for children and teachers of the County** by improving facilities and buildings
 - Develop our schools to be **establishments that are the focus for community activities.**"
- 4.5. It can be seen that the Council's strategy responds to and incorporates the requirements of the 21st Century Schools Strategy and the Schools Organisation Code.
- 4.6 In the decade since adopting the Strategy, there have been changes in the education policy field. The greatest change by far is a new curriculum presented to educators for observations during 2019, which was developed following the Donaldson review in 2015. Although it is a document that is in the consultative stages as a legislation, schools are being encouraged to change their teaching methods in order to comply with the significant changes that will be proposed in the new curriculum. Although this is not directly relevant to the work of the investigation, it is fair to note that the new requirements should be considered with any future developments.

5. Good Practice

- 5.1. When considering good practice, members of the investigation looked for studies that had been undertaken on the impact of school buildings on the quality of education and educational outcomes. Given all the developments with school buildings, it was astonishing that so few quality studies and research had been undertaken in the field. Although some research has been carried out on the impacts of some specific aspects of buildings on the quality of education, only one study was found to have attempted to assess the impact of each aspect on buildings together, namely *Clever Classrooms*, Salford University, 2015¹.
- 5.2. Although there are restrictions to this research (e.g. sample size and the range of subjects assessed), very important messages have derived from the work. A full summary of the 'Clever Classrooms' report can be found in **Appendix 3**, however the main recommendations that should be considered when designing new school buildings include the need to consider the following factors:
- Naturalness - light, air quality, temperature and noise levels
 - Individuality - the building's flexibility, and ownership by the users
 - Stimulation - an appropriate level of complexity along with an appropriate level of colour
- 5.3. Members of the investigation were of the opinion that very important messages derived from this research, factors to be considered for any design or new building. Following a discussion with the Head of Housing and Property Department, we are glad to understand that these factors receive attention in any development, and we encourage the continuation of this. Furthermore, we understand that Government Grant Regulations also offer such recommendations, and the latest recommendations receive consideration for any new development.
- 5.4. It is also noted that considerations for teachers have been included in this research, and guidance should be given to teachers on how to implement the recommendations of the *Clever Classrooms* report.

6 Quality of Education

- 6.1. As already noted, it emerged that there is no standard definition of what is meant by "good quality education" and how it can be measured. A number of enquiries were made, and various responses were received, although there were common elements to them all.
- 6.2. The Education Department is addressing this work through a Ffordd Gwynedd review. The department had asked many children what mattered to them in terms of their education, and the following points were noted:

1. [*Clever Classrooms: Summary report of the HEAD Project \(Holistic Evidence and Design\)*](#) by Peter Barrett, Yufan Zhang, Fay Davies and Lucinda Barrett, Salford University, Manchester, February 2015

- That the school was a safe place
- Good lessons
- An opportunity to study every subject through the medium of Welsh
- There was much emphasis on core academic subjects, but that the focus on life skills had disappeared.
- Being happy

6.3 Estyn referred to their report 'Improving Teaching' which was published in June 2018.

The report states that good teaching and learning:

- Maintains a consistent focus on the overall purposes of the curriculum
- Challenges all learners by encouraging them to recognise the importance of sustained effort in meeting expectations that are high but achievable for them
- Means employing a blend of approaches including direct teaching
- Means employing a blend of approaches including those that promote problem-solving, creative and critical thinking skills
- Sets tasks and selects resources that build on previous knowledge and experience and engage interest
- Creates authentic contexts for learning
- Means applying assessment for learning principles
- Ranges within and across Areas of Learning and Experience
- Regularly reinforces Cross-curriculum Responsibilities, including literacy, numeracy and digital competence, and provides opportunities to practice them
- Encourages children and young people to take increasing responsibility for their own learning
- Supports social and emotional development and positive relationships
- Encourages collaboration

6.4 Members of the investigation had a conversation with an officer from GwE to discuss the quality of education and the impact of school buildings on the quality of education. In response to the question about the impact of school buildings on the quality of education, it was noted that school buildings did have an impact, but it was likely that this was through improved efficiency and expediency.

6.5 It was also noted that the main factor that impacted on the quality of education in GwE's experience was leadership, and the Headteacher was key to this. He also noted that problems in schools most often derived from problems with the leadership.

6.6 The Headteachers of the schools visited were also asked what they considered to be good quality education. Their observations focused on leadership, staff, developing pupils to their full potential and measuring pupil progress (rather than measuring their attainment at the end of their time in primary school). Although no Headteachers specifically referred to the impact of buildings when considering the quality of education, it was noted that appropriate buildings facilitates the teaching, learning and day to day arrangements in schools.

Case Studies

7 Case Study: Ysgol yr Hendre

BACKGROUND

- 7.1 The first new building plan from the current generation was Ysgol yr Hendre.
- 7.2 Ysgol yr Hendre was opened in its current form in March 2012, with capacity for 450 pupils. The school's former buildings had been designed to hold 200 pupils, and at the time of closing the school, the pupil numbers was 377. The buildings had also reached the end of their lifespan, as they were small and had been modified many times as the needs of the school changed. The available areas to play were small and, as the pupil numbers of the school was over its capacity, space was limited.
- 7.3 The plan to provide new buildings for Ysgol yr Hendre was approved after attracting a grant from Welsh Government's Strategic Capital Investment Fund to develop a new school for the twenty first century in November 2009. In order to satisfy the grant conditions, the timetable was very challenging, where three years' work had to be completed within approximately 18 months.

QUALITATIVE EVIDENCE - STRENGTHS

- 7.4 See below a summary of the main strengths noted by the Headteacher, staff, children or governors during the visit.
- Overall, the buildings have been praised.
 - They are light buildings, with a sense of place and are well laid out.
 - A large and flexible space, where the use of the space can be adapted, e.g. use the wide corridors to hold activities (especially in the foundation phase). It was noted that meeting the requirements of the new curriculum would have been very difficult in the former buildings due to a lack of space.
 - Praise for the large hall - large enough to use as a whole school, physical exercise and the school's community events such as the Christmas show.
 - A suitable space to be able to implement the 'nurture' plan which cares for the children's emotional well-being, with the ability to adapt the space to respond to individual requirements and their emotional well-being (see further explanation in 7.5 below)
 - Year 6 pupils (who were also in the old building when they were in nursery year) noted that they were generally happy with the new space.
- 7.5 Nurture Programme - Ysgol yr Hendre is one of Gwynedd's pilot schools which implements the 'Nurture' Programme due to the social patterns in its catchment area. The plan means that the school is able to look after the emotional and mental well-being of the pupils as well as their academic development, and offer them various levels of support and intervention as the individual children require it. The design of

the school, that has a number of small rooms in addition to the classrooms, facilitates the implementation of the programme, by placing a number of convenient spaces across the school site in order for pupils to have the space that they need. An example was noted of a specific space being painted dark to provide a quiet and calm space for pupils to use if matters became too much for them. It is assumed that such consideration is suitable for schools in providing for children who have additional learning needs.

QUALITATIVE EVIDENCE - MATTERS REQUIRING ATTENTION

7.6 Similarly, see below a summary of the main matters requiring attention that were noted by the Headteacher, staff, children or governors during the visit.

- Although praising the fact that there is enough room available, it was noted that there was also a feeling of a wasted space in the school, e.g. corridors that were not flexible enough to be used other than as a corridor. Members of the investigation note that the long-term should be considered when planning, giving consideration to whether it would be possible to adapt wide corridors into storage space or for computer use. The Head of Housing and Property Department has confirmed that the corridors have been unavoidable on this site as it is on a slope, and that the only way of ensuring that the school is accessible to people with physical needs is to include long corridors on a gradual angle.
- Consideration should also be given to the location of the staff room. As the size of the school has increased, the need for a central location for the staff room was noted, so that it would be convenient for everyone and would enable a sense of one team and working together as one school.
- Some problems with the building work were also noted, mainly that the roof of the hall had been leaking and that the render outside the school had started to collapse in a few places. The Head of Housing and Property has confirmed that work is underway to rectify this and that the original builder is still taking responsibility for the shortcoming on their behalf. Members of the investigation note that consideration should be given to how this can be avoided in any future plans.
- It was noted that lessons had been learnt in context of the outside space, especially due to health and safety matters for the pupils and staff. We understand that the school's original desire was to have a play area surrounded by the building in order to facilitate keeping the children safe and under close supervision. As time went by, a conclusion was reached that this was not practical and that access was required to additional space. Further work has been completed in order to allow this to happen. However, members of the investigation note that the full picture should be considered at the beginning of any project in order to ensure that the best use is made of all resources, including the outside space, and carefully planning and funding this.
- The Ysgol yr Hendre development was one of the developments that had community space requirements (with capital to support the requirement). Members of the investigation note that they feel that there is room to develop the use of this space further.

ESTYN RESULTS

7.7 The results of Estyn's recent inspections are noted below.

AREA	January 2018
Standards	GOOD
Well-being and attitudes to learning	GOOD
Teaching and learning experiences	GOOD
Care, support and guidance	GOOD
Leadership and management	GOOD

Note that the results below (2013) are prior to moving to the new building.

AREA	February 2013
SUMMARY	
The School's current performance	Adequate
The school's improvement prospects	Unsatisfactory
KEY QUESTION	
How good are the outcomes?	Good
How good is the provision?	Adequate
How good are the leadership and management?	Unsatisfactory

8 Case Study: Ysgol Craig y Deryn

- 8.1 *It should be noted that Cllr Beth Lawton, Chair of the Investigation, had taken up her role as Chair of the Governing Body of Ysgol Craig y Deryn during the investigation's visit to the school.*

BACKGROUND

- 8.2 Ysgol Craig y Deryn was created by merging Ysgol Abergynolwyn, Ysgol Bryncrug, Ysgol Llwyngwriil and Ysgol Llanegryn as part of a wider scheme to reorganise education in the Tywyn area. An investment was also made to upgrade the buildings of Ysgol Penybryn, Tywyn as part of the same plan, and closing Ysgol Aberdyfi. Ysgol Craig y Deryn was opened in its current form in September 2013, with capacity for 105 children from reception to year 6.
- 8.3 The consultation period and determining the new school's location whilst reorganising was a very difficult time. Although it is not directly relevant to this investigation, it should be acknowledged that the process of merging schools is difficult, and temporarily affects the quality of education (especially in the final transitional year). Members of the investigation are of the opinion that there is scope to learn lessons from the experience, and to consider how to mitigate this impact with any future developments.

QUALITATIVE EVIDENCE - STRENGTHS

- 8.4 See below a summary of the main strengths noted by the Deputy Headteacher, staff, children or governors during the visit.
- The school is located on a very attractive site with outside space
 - The space is flexible and it has been possible to change the use of the space as time has passed and as requirements change and adapt (e.g. adapt the library and the IT room). This is an essential consideration in order to be able to adapt to new learning and development needs.
 - The design has meant that there is a separate space for some rooms, e.g. the music room. This has led to raising the pupils' confidence and independence.
 - The staff of the schools that were merging had an opportunity to collaborate and plan together for the new school.
 - The children questioned note that they were, overall, happy enough with the new school and everyone considered themselves as 'Craig y Deryn children'.

QUALITATIVE EVIDENCE - MATTERS REQUIRING ATTENTION

- 8.5 Similarly, see below a summary of the main matters requiring attention noted by the Deputy Headteacher, staff, children or governors during the visit.
- Unexpected planning matters brought challenges to the timetable, and there was a time where staff and governors were helping to prepare the school for its

opening, and another time where the school was open and the construction work was ongoing. Members of the investigation note that all the preparation work should be considered and timetabled (including time for things to go wrong) so that all preparations are completed before the site opens. We understand that very unusual circumstances led to this situation at Craig y Deryn, in light of months' delay in the work programme, as the planning decision had been deferred three times. As a result, this meant that there was not enough time left to complete the construction work. The Council had two choices - either to continue to attempt to open as much as possible of the building on time, or to defer the new school's opening date. It was determined that deferring the opening of the school was unacceptable, and therefore an attempt was made to complete as much as possible within the timescale.

- As with Ysgol yr Hendre, problems with the building was also noted, mainly that the roof had been leaking. We are aware that work has been completed to rectify the situation, however members of the investigation note that consideration should be given to how this can be avoided in any future schemes, advising that all developments have a pitch roof or placed at an angle to avoid problems.
- Additionally, it was noted that there was an opportunity to improve the design of the building, mainly the consideration for a sufficient number of toilets and hand-washing basins - for the children and staff and community use.
- It was noted that specific matters had been raised with regards to the maintenance of the site outside, especially in terms of tree felling and hedge-cutting work, rectifying paths or any other problems that arise. In the opinion of the members of the investigation, full consideration needs to be given to all factors at the beginning of any project. The best use should be made of all resources, and this includes planning for the outside space and how to fund maintenance requirements. In response, the Head of the Housing and Property Department noted that extensive green areas had been included in order to satisfy the planning requirements of the National Park and the Government's grant conditions. He noted that this was unavoidable, and he agreed that it was impractical to expect new schools of this kind to be able to fund land maintenance without additional remuneration in their budget.

ESTYN RESULTS

8.6 The results of Estyn's recent inspections are noted below.

AREA	March 2016
SUMMARY	
The School's current performance	GOOD
The school's improvement prospects	GOOD
KEY QUESTION	
How good are the outcomes?	GOOD
How good is the provision?	GOOD
How good are the leadership and management?	GOOD

This is Ysgol Craig y Deryn's first report.

9 Case Study: Ysgol Bro Llifon

BACKGROUND

- 9.1 Ysgol Bro Llifon was opened in 2015 by merging the schools of Groeslon, Carmel and Bron y Foel, with capacity for 172 pupils from reception class to year 6. The buildings of Ysgol y Groeslon had come to the end of their lifespan, and the pupils were being taught in mobile units. Although repair and modification work was required, the buildings of Ysgol Carmel and Ysgol Bron y Foel were in a better condition. However, there were high numbers of vacancies in these schools.

QUALITATIVE EVIDENCE - STRENGTHS

- 9.2 See below a summary of the main strengths noted by the Headteacher, staff, children or governors during the visit.
- As a result of setting up a shadow governing body, the Headteacher and the shadow Governors received an opportunity to provide input into the plans that led to influencing some changes. They also had an opportunity to visit other new developments.
 - A gradual change was made, working jointly between the three schools initially, where all staff members got to know each other and worked as one team before moving to the new location.
 - Useful storage spaces have been planned into the space, so that things can be stored separately.
 - There is sufficient outdoor space outside the classrooms
 - The school received a slate roof, which has avoided the problems of having a leaking roof.
 - The pupils who had attended one of the three small schools before Ysgol Bro Llifon noted that they were happy with the school and that having everything on the same site was beneficial.

QUALITATIVE EVIDENCE - MATTERS REQUIRING ATTENTION

- 9.3 Similarly, see below a summary of the main matters requiring attention that were noted by the Headteacher, staff, children or governors during the visit.
- It was noted that problems had arisen with the playing field due to problems by the contractor who carried out the work. Although these are problems that cannot be anticipated and are beyond control, being unable to use the field for a long time is something that should be avoided.
- 9.4 Although it is not part of the brief, members of the investigation are aware that pupil numbers dropped temporarily, which led to the situation of over-staffing after a year, before the numbers increased once again. Members of the investigation note the need to carefully plan and work with the community in order to attempt to avoid a

situation where pupil numbers temporarily drop before increasing again, and to work with the Education Department to consider bridging funding for such a situation.

ESTYN RESULTS

9.5 The results of Estyn's recent inspections are noted below.

AREA	November 2018
Standards	GOOD
Well-being and attitudes to learning	GOOD
Teaching and learning experiences	GOOD
Care, support and guidance	GOOD
Leadership and management	GOOD

This is Ysgol Bro Llifon's first report.

10 Case Study: Ysgol Glancegin

BACKGROUND

- 10.1 The new buildings of Ysgol Glancegin were opened in September 2017, with capacity for 210 pupils from the reception class to year 6. The school's buildings had come to the end of their lifespan, and it was not cost-effective to continue repairing them. As a context, it is also important to note that the school has originally been designed for approximately 300 pupils, but with a drop in numbers to approximately 220 pupils, this meant that there was much space available. The additional space was being used and adapted by the staff as and when necessary.
- 10.2 The new buildings were built on the same site as the old school, on the playground and fields at the bottom of the site. Consequently, the school had to live with a building site for the 18 months from the construction period and the loss of the use of the playground and the field in the meantime. The Headteacher noted that there had been good collaboration with the construction contractor and the Property Service.

QUALITATIVE EVIDENCE - STRENGTHS

- 10.3 See below a summary of the main strengths noted by the Headteacher, staff, children or governors during the visit.
- The space has been relatively flexible, with changes having already been made to the use of resources in some places (e.g. pegs in the classroom have been moved to the corridors)
 - The construction and demolishing period of the old building was managed well, and although there was no outside provision temporarily, the school worked with the contractor in order to develop outside areas that would be ready from the outset. The school also kept reserve funding specifically to be spent on the outside area. As a result of the economic planning and effective collaboration, the most developed and complete outside areas, of the schools visited by the members of the investigation, were observed at Glancegin.
 - Once again, the pupils noted that they were generally happy with the new building, although they noted that the hall was smaller than at the old school.

QUALITATIVE EVIDENCE - MATTERS REQUIRING ATTENTION

- 10.4 Similarly, see below a summary of the main matters requiring attention noted by the Headteacher, staff, children or governors during the visit.
- The corridors are light and wide, however no educational use has been made of the corridors due to fire safety regulations and the lack of supervision resources outside the classrooms. As has already been seen, members of the investigation note that the long-term should be considered when planning, giving consideration to whether it would be possible to adapt wide corridors into storage space or for computer use.

- Concern was also noted about pupil safety with two specific matters and, although the matters were addressed, the members of the investigation note that lessons need to be learnt for the future in order to prevent such matters from arising again.
- No community space is part of the provision at Ysgol Glancegin in accordance with the grant provision and requirements and, although members of the investigation understand that money is scarce, they note that it is a shame that this requirement has now been withdrawn from the grant provision.

10.5 Although it is not part of the brief, members of the investigation are aware that there is frustration in light of the grant terms that controls the size of new developments, as the agenda of vacancies is a priority for Welsh Government. The school's pupil numbers are now higher than the capacity for which the school was built. We are pleased to understand that the Education Department and the Property Department had given consideration to the possibility of an increase in the pupil numbers whilst planning, although they had to operate within the grant conditions at the time. The school's design was created appropriately, identifying an easy way of erecting an extension at the side of the building without impairing on the rest of the provision should the need arise.

10.6 Members of the investigation note that they are very glad that appropriate consideration has been given to the situation in order to be able to adapt easily. However, frustration that the building needs to be adapted so early on was also noted by the members of the investigation. Members of the investigation note the need to lobby Welsh Government to attempt to slacken the grant conditions and planning for the longer term.

ESTYN RESULTS

10.7 The results of Estyn's recent inspections are noted below.

AREA	February 2013
SUMMARY	
The School's current performance	GOOD
The school's improvement prospects	GOOD
KEY QUESTION	
How good are the outcomes?	ADEQUATE
How good is the provision?	GOOD
How good are the leadership and management?	GOOD

11 Visit: Ysgol Trefferthyr

- 11.1 As noted in section 3.5 of the report, the members of the investigation decided to visit a site that required new buildings in order to be able to compare somewhat with the Case Studies seen.
- 11.2 Ysgol Trefferthyr is located in Cricieth and is a mixture of a turn of the 20th century building with extensions added in the 1970s, and a cabin that has been placed there more recently. The part of the building that was constructed in the 1970s has now reached the end of its lifespan, and is of the same construction as the buildings of Ysgol y Groeslon and Ysgol Glancegin. Recently, the Council has spent substantial amounts on the buildings in order to safeguard them in the short term. In April 2019, the Cabinet decided to open discussions on the future of education in the Cricieth area in order to look at the whole catchment area, with the intention of constructing a new school in Cricieth. A number of meetings have been held locally to identify the best option for any development with consideration given to possible locations.
- 11.3 The visit to Ysgol Trefferthyr highlighted considerable differences compared to the new buildings of the other schools. Although the school is very homely, it was clear that considerable work has had to be done over the years in order to provide for and meet the requirements of modern education. There were challenges with the access, such as stairs leading from one part of the school to the other, and although this can be seen in new buildings as well, there was no alternative way of going from one level to the other. This then created access problems to the school as well as increase the health and safety risks. There were also challenges with the areas for the foundation phase, especially for the outside space.
- 11.4 The Headteacher noted that she was looking forward to having new buildings, hoping that the location of the new school would be just as pleasant and central, with a suitable outside space to provide outdoor activities, such as a forest.

12 Conclusion and Recommendations

- 12.1 Members of the investigation wish to thank everyone for their input into the work, especially the welcome received at the schools visited. It can be seen that the new buildings offer flexible, safe facilities of a high standard that will not require any substantial maintenance for a long time. The opportunities and the spaces that have been created facilitate education provision in Gwynedd, and the pupils have reported that they are very proud of the facilities and the investment in their areas.
- 12.2 It became clear that it was difficult to prove the impact of the new buildings on the quality of education, and the conclusion was reached that the buildings was one element that contributes towards the quality of education.
- 12.3 However, we are pleased to see that the investment has brought more flexible learning conditions to our schools, as well as pride amongst the pupils, the staff and within the communities.
- 12.4 However, we are of the opinion that lessons can be learnt of the qualitative evidence gathered which has led to presenting the recommendations below.

13 Field: Design and planning

- 13.1 **Recommendation:**
That the Education Modernisation Service continues to evaluate projects by learning lessons whilst delivering them, and adapt in light of those lessons. The following points should be considered alongside the lessons learnt.
- 13.2 Members of the investigation note that the long-term should be considered when planning any new development, ensuring that users are consulted as soon as possible in the process, and designing flexible buildings and adaptable spaces. Attention should continue to be given to the latest construction guidelines produced, and to the principles included in Clever Classrooms.
- 13.3 Members of the investigation note that the full picture should be considered at the beginning of any project in order to ensure that the best use is made of all resources, including all considerations for the outside space and any other community provision.
- 13.4 Particular attention should be given to ensure that every effort is made to avoid delay when preparing land and playing fields for new school buildings. Additionally, there is a need to support the schools to ensure a sufficient budget to maintain the external resources.
- 13.5 Whilst it is understood that grant conditions have changed over the years, if a community provision was part of the conditions, or if this is raised again in future, the needs of the community should be considered as well as the means by which the school could fulfil them, and this should be provided during the design stage, as well

as promoting the provision more effectively and ensuring that the responsibility and management of the provision is clear to the relevant stakeholders.

14 Field: 21st Century Schools' grant guidelines

14.1 Recommendation:

That the Cabinet Member makes a formal request to Welsh Government in order to slacken the guidelines and 21st Century grant conditions somewhat, giving consideration to the methods of projecting the population of individual schools in the longer term.

14.2 The case studies demonstrated that pupil numbers had changed during the initial phase of any new school. The pupil numbers for the four new schools in question have increased since the buildings opened; however, grant conditions mean that it is not possible to plan for more than 10% of empty spaces. Members of the investigation note their frustration that it is not possible to plan for the longer term when designing a new school building.

14.3 Conversely, some cases can be contentious, creating an unsettling time in the short term, with the numbers temporarily dropping. Members of the investigation note that consideration be given to allocating bridging funding for a period (approximately 3 years) or until the staffing level is maintained according to the pupil numbers projection.

15 Field: Evidence of the impact of buildings on the quality of education

15.1 Recommendation:

That the Cabinet Member for Education makes a formal request to Welsh Government to carry out a study across the whole of Wales on the impact of new school buildings on the quality of education.

15.2 There has been a considerable investment throughout Wales through the 21st Century Schools scheme over the years. Members of the investigation note that they have faced a challenge when attempting to answer the question, 'What effect has new building development had on the quality of pupil education, and are there lessons to be learnt for the future?' Whilst we have identified lessons to be learnt, it is assumed that Welsh Government is in the best position to carry out further research to prove the impact of new building developments on the quality of education.

Throughout the case studies and the meetings with the experts in the field of education, the impact of good leadership on the quality of education became apparent, and therefore the members of the investigation note the importance of aiming towards strong leadership also.

THE BRIEF OF THE INVESTIGATION

**THE "IMPACT OF NEW BUILDING DEVELOPMENTS ON THE QUALITY OF
EDUCATION" INVESTIGATION**

BRIEF – 20 September 2018

A	<p>What is the matter being considered as a scrutiny item?</p> <p>Several members have asked whether we are able to ascertain a positive effect on the education of pupils as a result of recent developments in the structuring of schools in the County - be they new building developments for schools, and/or the development of new schools.</p> <p>Their questions focus on the effect the new provision has on the quality of the education and pupil experience, and ask</p> <ul style="list-style-type: none"> - whether the financial investment has led to an improvement in the quality - whether good practice or lessons can be learnt as the development programme continues. <p>With all the development work that has taken place to date, the time is right to look at what impact (if at all) the new buildings have had in Gwynedd.</p> <p>The opportunity should be taken to identify any good practices and any lessons/changes for the developments in future.</p> <p>Research into the field will look at the effect of new school developments / buildings on the following elements, which are</p> <ul style="list-style-type: none"> ➤ Quality of the Education ➤ Educational results ➤ Experience of the users in the new buildings ➤ Value for money
B	<p>Aim of the Investigation</p> <p>The main question to address is</p> <p>'What effect has new building development had on schools and the quality of pupil education, and are there lessons to be learnt for the future?'</p> <p>This will be achieved by asking the following questions:</p> <ul style="list-style-type: none"> - What are the features of a good education? - Are the educational results of the schools in question better/worse/stable after opening the new buildings? - How has the pupils' experience changed from the old building to the new building - How does the building affect education? - What were the success criteria of the developments? Were these achieved? - What was the general condition of the buildings?

	<ul style="list-style-type: none"> - What changed from the old school to the new school? - How did the teaching staff, the governors and GwE find the building improved the quality of education? - Do the developments offer value for money? - Are there lessons to be learnt for the future?
C	<p>Background</p> <p>There has been considerable investment in developing educational buildings in Gwynedd recently. Among the developments are:</p> <ul style="list-style-type: none"> • Ysgol yr Hendre, Caernarfon • Ysgol Craig y Deryn • Investing in improvements and renovations at Ysgol O M Edwards, Llanuwchllyn in 2013. • Ysgol Bro Llifon • Ysgol Hafod Lon, Penrhyndeudraeth • Ysgol Bro Idris, Dolgellau on six sites. <p>The programme continues with developments that are already in the pipeline in the areas of Bala and Bangor.</p>
CH	<p>Good Practice and Lessons to be Learnt</p> <ul style="list-style-type: none"> - Use the case study method, therefore it is intended to identify the necessary information and evidence (as noted below in Section D) and analyse it in accordance with the strategic context and the context of the individual developments.
D	<p>Gathering Evidence</p> <p>The questions will be answered using case study methodology for three or four developments. By combining recent and less recent developments, the intention is:</p> <ul style="list-style-type: none"> • To gather data to measure the effect the building has on the experience of pupils of recent developments, since the change is still fresh in the mind • To measure the impact of less recent developments on quality, since time has elapsed and quantitative data can be generated. <p>It is also intended to:</p> <ul style="list-style-type: none"> - Investigate the success criteria of the schools reorganisation/building schemes - Analyse the schools' situation before the development (using category/Estyn/GwE/results) - Gather qualitative data from school leaders, teaching staff, governors and GwE. - How can the quality of education be measured - what are the characteristics of good quality education? - Have results improved because of the change? <p>Bro Llifon, Craig y Deryn, Glancegin, and Hendre schools will be looked at.</p>

DD	<p>Analysis</p> <ul style="list-style-type: none"> - Consider whether the developments have delivered on the success criteria of their business plans, the aims of the education modernising strategy, and the aims of the 21st Century schools plan - As regards value for money, improving the quality of education is what drives the modernisation programme and this must be borne in mind. It is, however, a valid question given the current financial climate.
E	<p>Writing the Report</p> <ul style="list-style-type: none"> - Note and provide evidence of the main findings - Note recommendations - Discuss and agree on the draft report with relevant stakeholders - Submit the final draft report to the Committee - Publish the report
F	<p>Action Plan</p> <ul style="list-style-type: none"> - Dependent on the results of the investigation
FF	<p>Track Progress</p> <ul style="list-style-type: none"> - Dependent on the results of the investigation

Main Activities

The main activities of the investigation are noted below:

Date	Location	Purpose
23/1/18	Siambr Hywel Dda, Council Offices	Education and Economy Scrutiny Committee - Commission the investigation and receive a draft brief
20/9/18	Siambr Hywel Dda, Council Offices	Education and Economy Scrutiny Committee - Receive the full brief.
9/10/18	Ystafell Gwyrfai, Council Offices	Receive a presentation on the field by Dafydd Gibbard (Senior Corporate Property Manager) and Hedd Tomos (Education Modernisation Unit Manager) and draw up a work programme.
22/10/18	Ystafell Gwyrfai, Council Offices	Receive a presentation from Gwern ap Rhisiart and Diane Jones (Area Education Officers) on the features of good quality education
12/11/18	Ystafell Ogwen, Council Offices	Discuss school visits, the direction of enquiries and possible questions
23/5/19	Siambr Hywel Dda, Council Offices	Final preparations before visiting the schools
4/6/19	Ysgol yr Hendre, Caernarfon	School visit
13/6/19	Ysgol Bro Llifon, Y Groeslon	School visit
17/6/19	Ysgol Craig y Deryn, Llanegryn	School visit
26/6/19	Ysgol Glancegin, Bangor	School visit
9/7/19	Ysgol Treferthyr, Cricieth	School visit
25/7/19	Siambr Hywel Dda, Council Offices	Consider the themes that emerged from the school visits and discuss next steps, including arrangements to have another discussion with Dafydd Gibbard
9/9/19	Ystafell Gwyrfai, Council Offices,	A discussion with Dafydd Gibbard following the school visits. A discussion with Geraint Evans (Core Leader - Primary) about GwE's viewpoint on the schools in question
24/10/19	Ystafell Gwyrfai, Council Offices	Discuss the first draft of the investigation report
4/11/19	Ystafell Gwyrfai, Council Offices	Discuss a further draft of the investigation report
March 2020		Confirm the final draft investigation report

Clever Classrooms

- 1 Members of the investigation decided to look for other studies on the impact of school buildings on the quality of education/educational outcomes. Given all the developments in the field, it was astonishing that so few quality studies and research had been undertaken in the field. Although some research has been carried out on the impacts of some specific aspects of buildings on the outcomes, there was only one study that attempted to assess the impact of each aspect on buildings together, namely *Clever Classrooms*, Salford University, 2015².

- 2 In this study, surveys were held on 3,766 pupils in 153 classes in 27 very different primary schools in three education authorities in England; namely Blackpool, Hampshire and London Borough of Ealing. The investigators describe their methodology as a "novel approach" namely addressing the complexities in two ways:

First the "holistic" aspect of the practical experience of a space was taken fully on board. Second, a multilevel statistical modelling approach was used to isolate effects at the classroom level.³

- 3 Performance statistics were gathered from pupil records over the year, teacher-assessed grades. This data was not available for the investigation, and therefore it was not possible to conduct a similar analysis on pupil progress in the schools in question in Gwynedd. Data was received for only three subjects, namely reading, writing and mathematics; therefore, extensive parts of the curriculum were not included in the research. It is important to keep this in mind. The study came to the following conclusion:

"clear evidence has been found that well-designed primary schools boost children's academic performance in reading writing and maths. Differences in the physical characteristics of classrooms explain 16% of the variation in learning progress over a year ... it is estimated that the impact of moving an 'average' child from the least effective to the most effective space would be around 1.3 sub-levels, a big impact when pupils typically make 2 sub-levels progress a year.⁴

- 4 The physical features of the classrooms were assessed to see which ones were the most important, and research-based recommendations were made on future schools planning. Dafydd Gibbard has reported that Gwynedd Council naturally considers all factors that are part of the report when considering any design. The Property Service also receives regular builders' bulletins which contain the latest recommendations on designs as well, which are considered for any new developments.

² [Clever Classrooms: Summary report of the HEAD Project \(Holistic Evidence and Design\)](#) by Peter Barrett, Yufan Zhang, Fay Davies and Lucinda Barrett, Salford University, Manchester, February 2015

³ *Clever Classrooms*, Page 7

⁴ *Clever Classrooms*, Page 3

5 Three groups of factors were considered: naturalness; namely light, noise, temperature, air quality, and contact with nature - is responsible for half the impact on learning; Individualism; namely ownership, flexibility and connection - is responsible for around a quarter; and an appropriate level of stimulation; namely complexity and colour - is also responsible for around a quarter.

6 The report noted:

“A surprising finding is that physical design factors at the school level of analysis did not come through as being of sufficient importance to appear amongst the main factors at all. These covered the size of the school, the provision of shared specialist rooms, routes through the school, the scale and quality of external spaces, etc.”⁵

7 As a result of this, when designing a school, it should mostly be ensured that each individual classroom is well-designed. A situation where the impact of the design of various classes on the learning of the pupils is varied should be avoided; for example, the direction they are facing, putting some classes under a disadvantage.

“It is easy to over-stimulate pupils with vibrant colours and overly busy displays, but a white box is not the answer either.”⁶

8 Minor changes, at very low or no cost at all, can make a major difference; for example, changing the layout of a room, the displays or the wall colours. Therefore, there are some matters that require attention when designing a school, and there are other matters that the teachers can address.

9 It was found that there were three relatively trivial planning parameters; namely noise, contact with nature and connection between rooms, compared to the seven other parameters above.

10 **Naturalness**

11 **Light:** In addition to ensuring that pupils can see, good natural lighting creates a comfortable atmosphere. According to the study: “Of all the design parameters considered, lighting has the strongest individual impact.”⁷ There should be a great deal of natural light, and glare from natural sunlight should be avoided by using suitable blinds.

12 *Recommendations for designers:* large, north-facing windows should be installed in classrooms, and they should be avoided in south-facing rooms. If south-facing rooms have large windows, shade should be created on the external side.

5 *Clever Classrooms*, Page 15

6 *Clever Classrooms*, Page 15

7 *Clever Classrooms*, Page 18

- 13 *Recommendations for teachers:* too many displays should not be placed on windows, and large furniture should not be placed in front of them, especially external windows. If glare is a problem, it should be managed by using internal blinds with convenient controls. When there is no glare, the blinds should be opened rather than turning on the light in order to improve the quality of the lighting and to save energy.
- 14 Hedges could be planted or plant pots could be placed outside south-facing windows in order to avoid excessive lighting.
- 15 **Air quality:** Children are more sensitive to all types of pollutants, and in schools there are many of them in a restricted space. Poor air quality is a common problem in schools, and research is quoted which shows better performance amongst pupils when rooms are well ventilated⁸. Poor air quality is defined as 1000 ppm CO₂ or more. With 30 pupils, in unventilated rooms, it was seen that CO₂ levels reached this measure after 30 minutes in 'medium-sized' rooms (181 m³) and 55 minutes in a very large room (300 m³).
- 16 *Recommendations for designers:* Regulations restrict the floor surface area of classrooms, and therefore, if possible, a higher ceiling should be obtained. Even with the largest rooms, ventilation is required and it should be ensured that windows can be opened, on different levels, especially those in the roof, with convenient controls. Should this not be possible (e.g. due to noise or safety), a mechanical ventilation system will be required and teachers will need to be trained on how to use it properly.
- 17 *Recommendations for teachers:* with 30 pupils, a window will need to be opened before the end of a lesson. Should this not be possible, windows should be opened between lessons. Items that prevent access to the windows should be avoided. Installing a CO₂ sensor could help teachers and possibly pupils to know when they should open the windows.
- 18 **Temperature:** Extensive research shows that performance deteriorates if the room is too hot. According to the NASUWT Union:

“Excessive heat in classrooms has also been shown in many studies to impact on pupils’ learning, with a 1°C increase in temperatures linked to a 2% decline in learning. The effects of extreme temperatures are even more striking, when considering that each additional school day with a temperature in the 30s (°C) reduces pupil achievement by one sixth of a percent of a year’s worth of learning. Disadvantaged pupils also suffer up to three times the impact of excessive temperatures than other pupils.”⁹

8 Bakó-Biró, Z., D. J. Clements-Cromme, N. Kochhar, H. Awbi, M. Williams, “Ventilation rates in schools and pupils’ performance,” *Building and Environment* 48(2012): 215-223 – quoted in *Clever Classrooms*, Page 20

9 <https://www.nasuwt.org.uk/advice/health-safety/excessive-working-temperatures.html> quoting Goodman, J., Hurwitz, M., Park, J. and Smith, J. (2018). *Heat and Learning*. National Bureau of Economic Research. Accessed 13.10.2019

- 19 According to the *Clever Classrooms* report, the most important factor was that a teacher could manage the temperature in his/her classroom¹⁰.
- 20 *Recommendations for designers:* radiators with a thermostat in each room enables teachers to control the temperature and keep it at a comfortable level. Rooms facing the north, east or west in Gwynedd are not likely to overheat. For the south-facing rooms, shade will be required, e.g. a canopy or overhang.
- 21 *Recommendations for teachers:* if they can control the temperature, e.g. with a thermostat, the best conditions for learning is a mild but comfortable temperature. If the sun is too hot, hedges could be planted or plant pots could be placed outside windows, or blinds could be used with ventilation.
- 22 **Noise (less important):** Although the research does not show that noise is an important factor, apart from potentially for pupils with additional learning needs, steps should be taken to manage it.
- 23 *Recommendations for designers:* the school should be located far away from busy roads or other noise sources. Classes could be located further away from external noise sources, e.g. by locating toilets, storage rooms and corridors between them. Rectangular rooms provide more flexibility to teachers for presentations compared to square rooms. A false ceiling with acoustic tiles could be installed.
- 24 *Recommendations for teachers:* the internal noise could be reduced by placing rubber feet on mobile furniture such as chairs, using textiles such as noise absorbing carpets.
- 25 **Contact with nature (less important):** Although the research finds that this is less important than the other factors, it could be beneficial for creative writing, and it is certainly important for the Foundation Phase and the new curriculum.
- 26 *Recommendations for designers:* It should be ensured that the pupils can go outside immediately to see natural things such as grass, gardens, ponds and trees. Windows should be installed at their eye-level.
- 27 *Recommendations for teachers:* too many displays should not be placed on external windows, and large furniture should not be placed in front of them. Natural items should be placed in the classroom such as plants and timber desks and chairs.
- 28 **Individuality**
- 29 **Flexibility:** Flexible classrooms can offer a variety of different learning methods. Adaptation will be required in future as pedagogy methods, and educational programmes and strategies develop. The research found that the following elements had a positive impact on performance:

10 *Clever Classrooms*, Page 22

- spaces for small groups or one-to-one teaching - clear spaces in the room or adjacent rooms. Areas in corridors or separate from the classroom were not effective
- storage - in the classroom or on corridors
- learning areas - especially for young pupils
- the room's shape and surface area - a complicated shape helps to create different areas for activities with young pupils; squarer rooms work better with older pupils
- walls - large, accessible walls provide flexible opportunities to display information and pupils' work.

30 *Recommendations for designers:* enclosed spaces should be created for small groups or for one-to-one teaching. Sufficient storage is required, including coat pegs, and wide corridors could be used for this. A complicated shape is useful for Foundation Phase rooms, with squarer rooms for Key Stage 2. A large wall, without a window and door, is useful for displays.

31 *Recommendations for teachers:* young pupils need clear and varied learning spaces. If the furniture is low, there will be more room available on the walls for displays.

32 **Ownership:** namely features that help pupils to feel that the classroom belongs to them.

33 *Recommendations for designers:* rooms should have distinctive features, so that the pupils can relate to *their* room. E.g. shape, design, distinctive ceiling, interesting furniture.

34 *Recommendations for teachers:* the classroom can be made different to other rooms and promote a sense of ownership by including displays by the pupils and elements such as lockers, pegs, drawers and the names/photos of the children.

35 **Connection (less important):** because, in primary schools, the pupils spend most of their time learning in one room, rather than moving through the school.

36 *Recommendations for designers:* wide corridors, with distinctive features, help pupils to move safely through the school, especially if there are windows. They could provide cupboards and pegs and save space in the classrooms. Providing library facilities in a natural place could help with progress in reading.

37 *Recommendations for teachers:* corridors should be kept clear with clear sightlines and landmarks to help pupils see where they are.

38 **Stimulation**

39 **An appropriate level of complexity:** Complexity can make it more difficult to focus on a task, but it can also stimulate pupils to collaborate. The study noted: "high or low

levels of complexity produced poorer learning conditions, whereas an intermediate level of visual complexity was optimal.”¹¹

40 *Recommendations for designers:* the shape and form of the floor plan of the classroom can create a reasonable level of visual interest - without being uninteresting but without being too exciting. The complexity could be increased or decreased by designing the ceiling.

41 *Recommendations for teachers:* the wall displays should be vibrant but not cluttered. Approximately 20-50% of the walls' surface area should be left clear, and using the windows should be avoided for this purpose. The complexity level of the room should be considered when determining the complexity level of the displays.

42 ***An appropriate level of colour:*** Bright colours create a higher level of stimulation and, once again, similarly to complexity, the best learning is gained with a medium level of colour. According to the study: “Large, brightly coloured areas rated poorly as did white walls with few colour elements. The intermediate case with light walls generally, plus a feature wall in a brighter colour was found to be most effective for learning.”¹². There should be a great deal of natural light, and glare from natural sunlight should be avoided by using suitable blinds.

43 *Recommendations for designers:* an appropriate level of stimulation can be achieved with light coloured walls and a feature wall in a brighter colour. Colour can be added with carpets and furniture.

44 *Recommendations for teachers:* colour elements that cannot be easily changed should be assessed, and then it should be decided how many bright colours should be introduced, e.g. in the background for displays. The stimulation should be increased if there is not enough, or it should be reduced if it is already a little bright.

45 **Conclusion**

46 The study demonstrated how buildings affect the performance of pupils, and a summary of the recommendations for designers can be found on pages 40-41, and recommendations for teachers are on pages 42-43 of the *Clever Classrooms* report. The research was carried out in England, where a different education system is used, especially in the Foundation Phase, and only reading, writing and mathematics were considered. Although this should be borne in mind, we believe that the recommendations are valuable and designers or teachers should consider them when planning their learning rooms.

11 *Clever Classrooms*, Page 34

12 *Clever Classrooms*, Page 36