Title: Using the Optometry clinic to provide visual difficulties awareness training for student teachers

Author(s): Julie McClelland, Lesley Doyle, Jacqueline Lambe, Delores Loughrey

Contact Details (school, faculty, email address and telephone number for lead contact)
Julie McClelland, School of Biomedical Sciences. Jf.mcclelland@ulster.ac.uk
Tel Ext: 24216

Keywords (Max 4)
Vision, teachers, children, eyes

OVERVIEW

Overview, Aims and Context

This project aimed to use the Optometry Clinic as a unique learning space to provide trainee teachers with an understanding of common visual disorders and advice on how they can accommodate the pupils' visual needs in the classroom.

Description

Student teachers are used to working in a variety of environments adapted to suit the various needs of the children, and therefore appreciate that learning outside the traditional classroom setting provides more embedded knowledge than that gained when the teaching space is unchanging. Evidence suggests that when student-centred, active learning approaches are incorporated into teaching, student learning improves. This project aimed to use a different learning space (the Optometry Clinic space) to provide trainee teachers with an understanding of common visual disorders and advice on how they can accommodate the pupils' visual needs in the classroom. To date, two sessions of the lectures and workshops with two separate groups of trainee teachers have been held. These sessions have worked well and received positive feedback. Additional funding was received from the Centre for Flexible and Continuing Education to support a further session with qualified teachers. This work has been evaluated and will be presented at the Child Vision Research Society meeting in June 2017.

Design

Combining clinical and research expertise in the assessment of children's vision, particularly in children with special educational needs (JMcC and LD) with teaching education academic knowledge (JL and DL), a novel programme was developed to raise awareness amongst teachers (trainee and qualified) of common visual problems in children. The programme included information on how these conditions may impact on classroom behaviours, how they may be identified and strategies to address them. The programme comprised of two parts; a one-hour lecture and a two-hour

workshop based within the Ulster University Optometry Clinic. The Optometry clinic is a fully equipped teaching environment used for demonstration and practice of clinical skills with undergraduate Optometry students. The workshop, was designed to simulate a range of different visual problems allowing teachers to gain an insight into how visual impairment may impact on learning.

The study was carried out in three phases as below:

Phase 1: A group of trainee teachers undertaking a Postgraduate Certificate in Education (PGCE) towards a qualification in primary school teaching (n=25) were invited to participate in a session in December 2015. Feedback was obtained informally from this session to inform future developments in the programme. Following the lecture and workshop the students were asked to report on any changes they felt should be incorporated into future sessions. Comments received were mainly positive, however one suggestion that came from a number of students was that they would have liked more information on how teachers can address visual problems in the classroom. This comment was discussed and an updated version of the lecture and workshop was produced. It was decided that a more formal method of collecting feedback should be used in future events.

Phase 2: A group of post-primary PGCE students (n=17) were invited to attend a session in February 2016. Formal feedback was collected using a questionnaire with both open and closed questions. The closed questions employed a 5-point Likert scale to grade responses (1=strongly agree, 2=agree, 3=neither agree nor disagree, 4=disagree, 5=strongly disagree).

Phase 3: Funding was obtained from the Centre for Flexible and Continuing Education to invite qualified and experienced teachers in the community to attend a lecture and workshop session in June 2016. Due to the association between refractive error, SES and academic achievement it was deemed appropriate to open the invitation to teachers from local schools identified as having low deprivation scores. The funding source facilitated nine teachers to attend with the School of Education also providing reimbursement for a substitute teacher for those attending the short course. The same questionnaire was used to assess engagement with the programme.

RESULTS

In total 51 teachers (in-training and qualified) attended the training programme.

Data were entered into an SPSS spreadsheet (IBM SPSS Statistics Version 22). Mean scores were calculated for each question and descriptive statistics were used to summarise data. Due to the small participant numbers involved, non-parametric analyses were applied (Mann-Whitney U).

Power calculations were not used to inform the sample size as this research was designed as a study to inform teaching provision.

Phase 2 results: The questionnaire asked the trainee teachers their opinion on their level of knowledge of 'visual impairment', 'different professionals involved in eyecare' and 'how to address visual problems in the classroom' before and after the session. Responses from each question were assigned a score from 1-5 (where 1=strongly agreed and 5=strongly disagreed). Seventeen questionnaires were returned and scores from each question were entered into SPSS and results analysed. Due to the small number of respondents, non-parametric analyses were applied (Mann-Whitney U). A significant improvement in the scores was obtained for all three questions ($p<0.05$). A lower score indicated stronger agreement with the statement.

Open comments were also invited on the aspects of the lecture and workshops that they found most and least useful. All comments were positive and related to gaining an insight into the learning experiences for children with visual problems. Examples of comments included;

Aspects of the lecture/workshops I found most useful;

'The tips on how to make lessons more accessible'

'...how to remove the barriers to learning'.

'We can now empathise with students knowing what it is like to have a visual impairment'

'How to adapt resources in the classroom was interesting.'

Phase 3 results: Eight questionnaires were returned and again a significant improvement in the scores was obtained for all three questions ($p<0.05$). A lower score indicated stronger agreement with the statement.

Similar to the phase 2 open comments, the qualified teachers responded positively to the lecture and workshop. Examples of comments included;

Aspects of the lecture/workshops I found most useful;

'Very interesting trying on the glasses. Really gave us a good understanding of what the different types of visual impairment might be like.'

'Practical and very helpful…'

'I will be more aware of how these eye problems affect children's learning in the classroom.'

'The various activities in the workshops were particularly beneficial.' (Principal)

'Being actually able to 'see' the vision problems was fantastic'.

'I will reconsider layout of classroom.'

'This should be available again to more teachers.'

Findings and Conclusions:

This novel initiative intended to increase teachers' awareness of visual problems that children may experience and discuss how these may impact on classroom behaviours. The evaluation provided positive feedback from trainee and qualified teachers suggesting that this approach offers a fresh insight and different perspective to the standard classroom based education for teachers. The use of the Optometry clinic space provided the teachers with an area where they could appreciate the impact a change in vision may have on pupils, for example by simulating blurred vision on a letter chart. During the sessions, the qualified teachers were able to discuss individual pupils they had taught and the difficulties they had faced in ensuring equal access to learning material. The discussion that ensued allowed the Optometrists (JMcC and LD) to provide further suggestions for particular situations.

The funding source for Phase 3 was aimed at widening access to education and increasing participation in areas of deprivation in light of the association between socioeconomic status, refractive error and academic performance (Doyle et al 2016) which are likely to further compound the effects of visual difficulties on education. It is essential that to optimise the learning environment for children, visual disorders are detected and remedied as early as possible to prevent permanent negative effects on academic achievement.

The use of an inter-professional approach to teaching and learning reminded the teachers that they are not working in isolation, but as part of a multidisciplinary team working with parents and healthcare professionals to provide the most appropriate learning environment for each individual child. Teachers are well placed to ensure that any vision reports from eyecare professionals are actioned in the classroom and that strategies to maximize the visual environment are employed. Evidence suggests that even in cases of a significant recognised visual impairment, information on the eyes and visual system may not reach the child's individual educational plan (or statement of educational need [Northern Ireland]) (Little & Saunders, 2015). By increasing teachers' awareness of potential visual problems they can discuss vision related issues competently with parents and ensure that any suggestions made by eyecare professionals are maintained in the child's record and followed through.

The lecture also provided teachers with a link to the widely used Ulster Vision Resources (http://biomed.science.ulster.ac.uk/vision/-Vision-in-Childhood-.html) which provides useful information on children's visual problems for parents and professionals. These webpages are open access and provide a wealth of information including sections such as 'Encouraging your child to wear spectacles' and 'Considerations for the classroom'.

The benefits of this programme for children's learning are immense. The authors suggest that similar training should be incorporated in the undergraduate programme

for trainee teachers and that qualified teachers would also benefit from a regular refresher course in this area to maintain knowledge and engagement with these issues.

EVALUATION

Reflective Commentary

This project worked well as evidenced by positive feedback from both the trainee and qualified teachers. Following the first session of the project, feedback from the students and academic staff involved was used to inform several amendments to the subsequent phases of the project. The lecture worked well as it gave the participants a basic understanding of terminology related to eyes and vision prior to the workshop. The informal clinical setting of the workshop allowed the participants to fully engage and ask questions based on their experiences with pupils in school environments. The Optometry students helping with the workshops were appropriately informed to be able to address most questions and help to demonstrate equipment used during the practical session.

Small groups in the workshops worked well, i.e. 3-4 participants at each of six 'stations'. This allowed the participants to gain most value from the sessions and the opportunity to ask questions as they moved through each of the activities.

Student Engagement

Feedback from the PGCE students outlined the benefits of the programme. It highlighted how the project improved their knowledge of different eyecare professionals, types of visual disorders and how to identify and address visual problems in the classroom. It aimed to encourage the students to maintain a holistic view of children's education and to consider how health concerns may impact on the child's learning.

This project also introduced groups of students from different Schools to each other, increasing collaborations between both staff and students on the Colerain campus.

Learning Environment and Engagement:

It is well established that different learning styles should be facilitated to ensure that all students gain the maximum benefit from their education (Kolb and Kolb 2005). Recent evidence has emerged highlighting the advantages of alternative and flexible teaching spaces in order to immerse the student in the learning experience, enhancing engagement and knowledge (Garrett 2014).

This project is innovative in that it encourages student teachers to consider education holistically and as part of an inter-professional team working with children to optimise their educational abilities. This project also facilitates the movement of

knowledge gained from published research and clinical experience into the community via the PGCE students who will be the future educators of our children. It adds values to the current PGCE programme by encouraging trainee teachers to consider other professionals who may be an important part of children's health and well-being. The use of the Optometry clinic space provides the teachers with an area where they could appreciate the impact a change in vision may have on a pupil, for example by simulating blurred vision on a letter chart, or simulating a blind spot in the visual field.

Impact (please provide evidence of the impact on learning and/or teaching)

This project helped to establish strong collaborations between the department of Optometry and the School of Education at Ulster University.

The positive impact of this project was evidenced by the feedback questionnaires.

Ideally long term, this project could be incorporated into the PGCE programme and could also be offered as a short training course for qualified teachers and classroom assistants in Northern Ireland. This innovative development in teacher education would benefit future generations of children and ensure that education is optimised for each individual child's visual needs.

A further benefit of the project would be to arrange for final year Optometry students to participate in the delivery of the workshops. This would encourage the Optometry students to consider vision as part of an individual's overall being and consider how this impacts on other professional's work. This will encourage peer-to-peer teaching and introduce multi-professional education to both groups of students. This student centred learning approach will maximise student engagement and motivation.

STRATEGIC DEVELOPMENT

Transferability (consider how this activity might be used by colleagues in other schools/faculties and if it could be developed for a further Faculty interdisciplinary learning project)

This project could easily be transferred to other groups of undergraduates working with children particularly across all the education courses. An adapted version may also be of interest to trainee nurses, social workers etc.

Dissemination (internal and external) (School and Faculty briefings, workshops, resources developed)

An abstract based on this work has been accepted for the Child Vision Research Society meeting in June 2017 (international conference)

SUPPORTING INFORMATION

References (using Harvard style, list literature and other resources that influenced

your work)

Au Eong K. G., Tay T. H., Lim M. K. (1993). Education and myopia in 110,236 young Singaporean males. Singapore Medical Journal, 34, 489-492.

Cass H. D., Sonksen P. M. McConachie H. R. (1994). Developmental setback in severe visual impairment. Archives of Diseases in Childhood, 70, 192–196.

Dirani M., Shekar S. N., Baird P. N. (2008). The role of educational attainment in refraction: the Genes in Myopia (GEM) twin study. Investigative Ophthalmology and Vision Science, 49, 534-538.

Doyle L., McCullough S., Saunders K. (2106). Refractive Error & Academic Achievement. Investigative Ophthalmology and Vision Science, 57, 3984.

Holden B. A., Fricke T. R., Wilson D. A., Jong M., Naidoo K. S., Sankaridurg P., Wong T. Y., Naduvilath T. J., Resnikoff S. (2016). Global Prevalence of Myopia and High Myopia and Temporal Trends from 2000 through 2050. Ophthalmology, 123, 1036-1042.

Little J. A., Saunders K. J. (2015). A lack of vision: evidence for poor communication of visual problems and support needs in education statements/plans for children with SEN. Public Health, 129, 143-148.

McClelland J. F., Saunders K. J., Hill N., Magee A., Shannon M., Jackson A. J. (2007). The changing visual profile of children attending a regional specialist school for the visually impaired in Northern Ireland. Ophthalmic and Physiological Optics, 27, 556-560.

McCullough S,J., O'Donoghue L., Saunders K.J. (2016). Six Year Refractive Change among White Children and Young Adults: Evidence for Significant Increase in Myopia among White UK Children. PLoS One, 11(1):e0146332. doi: 10.1371/journal.pone.0146332.

O'Donoghue L., McClelland J.F., Logan N.S., Rudnicka A.R., Owen C.G., Saunders K.J. (2010). Refractive error and visual impairment in school children in Northern Ireland. British Journal of Ophthalmology, 94(9):1159-9.

Ofsted (2013). Unseen children: access and achievement 20 years on. Available from https;//www.gov.uk/government/publications/unseen-children-access-and-achievement-20-years-on.

Orlansky G., Wilmer J., Taub M. B, Rutner D, Ciner E, Gryczynski J. (2015). Astigmatism and early academic readiness in preschool children. Optometry and Vision Science, 92, 279-285.

Rahi J. S., Cumberland P. M., Peckham C. S. (2011). Myopia over the lifecourse: prevalence and early life influences in the 1958 British birth cohort. Ophthalmology, 118, 797-804.

Roch-Levecq A. C., Brody B. L., Thomas R. G., Brown S. I. (2008). Ametropia, preschoolers' cognitive abilities, and effects of spectacle correction. Archives of Ophthalmology, 126, 252-258.

Rosner J., Rosner J. (1997). The relationship between moderate hyperopia and academic achievement: How much plus is enough? American Journal of Optometric Association, 68, 648-650.

Stewart-Brown S., Haslum M. N., Butler N. (1985). Educational attainment of 10-year-old children with treated and untreated visual defects. Developmental Medicine and Child Neurology, 27, 504-513.

Wensor M., McCarty C. A., Taylor H. R. (1999). Prevalence and risk factors of myopia in Victoria, Australia. Arch Ophthalmol. 1999 May;117(5):658-63.

Williams W. R., Latif A. H. A., Hannington L., Watkins, D. R. (2005). Hyperopia and educational attainment in a primary school cohort. Archives in Diseases of Childhood, 90, 150-153.

Williams K. M., Bertelsen G., Cumberland P., Wolfram C., Verhoeven V. J., Anastasopoulos E., Buitendijk G. H., Cougnard-Grégoire A., Creuzot-Garcher C., Erke M. G., Hogg R., Höhn R., Hysi P., Khawaja A. P., Korobelnik J. F., Ried J., Vingerling J. R., Bron A., Dartigues J. F., Fletcher A, Hofman A., Kuijpers R. W., Luben R. N., Oxele K., Topouzis F., von Hanno T., Mirshahi A., Foster P. J., van Duijn C. M., Pfeiffer N., Delcourt C., Klaver C. C., Rahi J., Hammond C. J. European Eye Epidemiology (E(3)) Consortium. (2015). Increasing Prevalence of Myopia in Europe and the Impact of Education. Ophthalmology, 122, 1489-1497.

Acknowledgements

The authors would like to acknowledge the Centre for Flexible and Continuing Education, Ulster University, who provided funding for Phase 3 of the study. The authors would also like to thank Shelley Black, Emma McConnell and Ulster University final year Optometry students (Leah Gavin, Leanne Ellison, Rachel Herbison, Rebecca Emerson and Michaela Magee) who helped with the workshops.

Attachments List and attach relevant documents/images in support of project activities