

**An Evaluation of  
Outreach Dental Education  
Volume Two**

**Michael Smith**

**Thesis submitted in total fulfilment of the requirements of  
The University of Sheffield for the degree of Doctor of Philosophy**

**Department of Oral Health and Development  
School of Clinical Dentistry  
Faculty of Medicine  
University of Sheffield**

**March 2007**

**SR No 030330171**

# References

Advisory Committee on the Training of Dental Practitioners (1996) Report and recommendations concerning clinical proficiencies required for the practice of dentistry in the European Union, XV/E/8316/6/93-EN. Brussels: European Commission, 1996.

Ali, N., Carter, J., Cheng, L., Coghlan, K., Hardee, P. and Holmes, S. Letter: Opportunistic and reprehensible. *British Dental Journal* 2006; 200(7): 359.

Altman, D.G. (1991) *Practical Statistics for Medical Research*. London: CRC Press.

Amano, H., Sano, T., Gotoh, K., Kakuta, S., Suganuma, T., Kimura, Y., Tsukaski, H., Miyashita, H., Okano, T., Goto, N. and Saeki, H. Strategies for Training Standardized Patient Instructors for a Competency. *Journal of Dental Education* 2004; 68(10): 1104-1111.

American Association of Dental Schools Curricular Guidelines for Extramural Programs. *Journal of Dental Education* 1980; 44(2): 92-95.

American Dental Association (1999) 1998 Survey of Dental School Satellite Clinics and the 1998 Dental Society Survey of Dental School Satellite Clinics. Chicago: ADA.

American Dental Association Satellite clinics offer hands-on instruction. *ADA News* 2000; 31(22/1): 16-18.

American Dental Education Association Best Practices in Dental Education.

American Dental Education Association. ADEA Policy Statements. *Journal of Dental Education* 2005; 69(7): 786-799.

American Dental Education Association. ADEA Policy Statements. *Journal of Dental Education* 2006; 70(7): 744-756.

- Andersen, R.M., Davidson, P.L., Atchison, K.A., Hewlett, E., Freed, J.R., Friedman J.A., Thind, A., Gutierrez, J.J., Nakazono, T.T. and Carreon, D.C. Pipeline, Profession and Practice Programme: Evaluating change in dental education. *Journal of Dental Education* 2005; 69(2): 239-248.
- Anderson, G. (1998) *Fundamentals of Educational Research*. Second edition. London: Falmer.
- Anderson, J.R., Reder, L.M. and Simon, H.A. Situated Learning and Education. *Educational Researcher* 1996; 25(4): 5-11.
- Anderson, J.R., Reder, L.M. and Simon, H.A. Situated Learning Cognitive Perspectives: Form Versus Substance. *Educational Researcher* 1997; 26(1): 18-21.
- Andrews, J.E., Garrison, D.R. and Magnusson, K. The Teaching and Learning Transaction in Higher Education: a study of excellent professors and their students. *Teaching in Higher Education* 1996; 1(1): 81-103.
- Ashcroft, K. and Palacio, D. (1996) *Researching into Assessment and Evaluation in Colleges and Universities*. London: Kogan Page.
- Ashley, F.A., Gibson, B., Daly, B., Lygo Baker, S. and Newton, J. T. Undergraduate and postgraduate dental students' 'reflection on learning': a qualitative study. *European Journal of Dental Education* 2006; 10: 10-19.
- Assmann, S.F., Pocock, S.J., Enos, L.E. and Kasten, L.E. Subgroup analysis and other (mis)uses of baseline data in clinical trials. *The Lancet* 2000; 355(9209): 1064-1969.
- Association for Dental Education in Europe (2002) Multiprofessional Education for the Dental Team, Proceedings of Working Group 5, Meeting of the ADEE, Ljubljana, Slovenia, 5–7 September 2002.
- Association for Dental Education in Europe Discussion Paper for September 2004 meeting, Taskforce II Document: Curriculum Structure & ECTS for European Dental Schools.
- Auburn, T., Ley, A. and, Arnold, J. Psychology undergraduates' experience of placements: A role-transition perspective. *Studies in Higher Education* 1993; 18(3): 265-285.
- Australian Dental Council and Dental Council of New Zealand (2005) *Accreditation Assessment Guidelines for University Programmes in Dentistry*.
- Ayers, C.S., Abrams, R. and Robinson, M. U.S. and Canadian dental school involvement in extramural programming. *Journal of Dental Education* 2001; 65: 1272-1277.
- Ayers, C.S., Abrams, R.A., McCunniff, M.D. and Goldstein, B.R. A comparison of private and public dental students' perceptions of extramural programming. *Journal of Dental Education* 2003; 67: 412-417.
- Bailit, H. Community-Based Clinical Education Programs. *Journal of Dental Education* 1999a; 63(12): 867-872.
- Bailit, H. Community-Based Clinical Education Programs: Major Findings and Recommendations. *Journal of Dental Education* 1999b; 63(12): 981-989.
- Bain, L. Preceptorship: a review of the literature. *Journal of Advanced Nursing* 1996; 24(1): 104–107.



- Bandara, K.M.W. Oral health status of students at the age of 12-15 years in Southern Highlands Province of Papua New Guinea: results of a descriptive epidemiological study. *Papua New Guinea Medical Journal* 1997; 40(3-4): 150-156.
- Barclays (2002) Barclays Client Survey. Press release: Where the affluent live 2002. <http://www.newsroom.barclays.co.uk/news/data/754.html> accessed August 2004.
- Barnes, J. (1999a) The Health Centre Programme, The School of Dentistry, The University of Liverpool. Report No.3: The perceptions of recently qualified dental surgeons and dental therapists. Liverpool: Evaluation and Assessment Unit, Department of Education.
- Barnes, J. (1999b) The Health Centre Programme, The School of Dentistry, The University of Liverpool. Report No.4: The perceptions of final year BDS and dental therapy students. Liverpool: Evaluation and Assessment Unit, Department of Education, University of Liverpool.
- Barnes, J. and Taylor, I. (1992) The Health Centre Programme: analysis of student perceptions (for the School of Dentistry). Liverpool: University of Liverpool Evaluation Unit.
- Barnes, J. and Taylor, I. (1993) The Health Centre Programme: evaluation of the student support initiative (for the School of Dentistry). Liverpool: University of Liverpool Evaluation Unit.
- Barnett, R. (1994) *The Limits of Competence: Knowledge, Higher Education and Society*. Buckingham: The Society for Research into Higher Education and Society and Open University Press.
- Barnett, R. (1999) Learning to work and working to learn. In Boud, D. and Garrick, J. (Eds) *Understanding Learning at Work*. London: Routledge.
- Barnsley, L., Lyon, P.M, Ralston, S.J., Hibbert, E.J., Cunningham, I., Gordon, F.C. and Field, M.J. Clinical skills in junior medical officers: a comparison of self-reported confidence and observed competence. *Medical Education* 2004; 38(4): 358–367.
- Barr, H. (2000) *Interprofessional Education: 1997-2000, a review*. London: Centre for the Advancement of Interprofessional Education.
- Barrows, H.S. An overview of the uses of standardized patients for teaching and evaluating clinical skills. *Academic Medicine* 1993; 68(6): 443-453.
- Bartlett, D.W. and Woolford, M. Team Training at an Outreach Dental Unit. *The European Journal of Prosthodontics and Restorative Dentistry* 2003; 11(3): 133-135.
- Bartlett, D.W., Coward, P.Y., Wilson, R., Goodsman, D. and Darby, J. Experiences and perceptions of vocational training reported by the 1999 cohort of vocational dental practitioners and their trainers in England and Wales. *British Dental Journal* 2001; 191(5): 265-270.
- Beach, K. Consequential Transitions: a socio-cultural expedition beyond transfer in education. *Review of Research in Education* 1999; 24: 101-139.
- Beach, K.D. and Vyas, S. (1998) Light pickles and heavy mustard: Horizontal development among students negotiating how to learn in a production activity. Paper presented at the Third International Conference on Cultural Psychology and Activity Theory, Aarhus, Denmark.



- Beard, R.M. and Hartley, J. (1984) *Teaching and Learning in HE*. London: Harper & Row.
- Beasley, J.W. Does teaching by family physicians in the second year of medical school increase student selection of family practice residencies? *Family Medicine (US)* 1993; 25(3): 174-175.
- Bellini, L.M. and Asch, D.A. The Philadelphia PRIME Program: A Model For Primary Care Education. *Medical Education Online* 1977; 2(2).
- Benbelaïd, R., Dot, D., Levy, G. and Eid, D. Difficulties encountered at the beginning of professional life: results of a 2003 pilot survey among undergraduate students in Paris Rene Descartes University (France). *European Journal of Dental Education* 2006; 10: 204–209.
- Bennard, B., Wilson, J.L., Ferguson, K.P. and Sliger, C. A Student-Run Outreach Clinic for Rural Communities in Appalachia. *Academic Medicine* 2004; 79(7): 666-671.
- Benner, P., Hooper-Kyriakides, P., Stannard, D. (1999) *Clinical Wisdom and Interventions in Critical Care: A thinking-in-action approach*. Philadelphia: Saunders.
- Bereiter, C. and Scardamalia, M. (1993) *Surpassing Ourselves: an inquiry into the nature and implications of expertise*. Chicago: Open Court.
- Berger, J. (1967) *A Fortunate Man*. Harmondsworth: Penguin.
- Bergqvist, M., Hansson, C., Leisner, L., Rohlin, M. and Stölten, C. (2006) *Lärande för livet – verksamhetsförlagd utbildning*. In Olausson, L. (Ed) *Kvalitetsarbete på Malmö högskola: Då och nu – med sikte på framtiden*. Malmö, Sweden: Malmö högskola: 89-100.
- Biddle, B.J. and Ellena, W.J. (1964) *Contemporary research on teacher effectiveness*. New York: Holt, Rinehart and Winston.
- Billett, S. (2004) *Learning through work*. In Rainbird, H., Fuller, A. and Munro, A. (Eds) *Workplace learning in context*. London: Routledge: 109-125.
- Bingham, R. and Ottewill, R. Whatever happened to peer review? *Revitalising the contribution of tutors to course evaluation*. *Quality Assurance in Education* 2001; 9(1): 32-39.
- Blackwell, A., Bowes, L., Harvey, L., Hesketh, A.J. and Knight, P.T. Transforming Work Experience in Higher Education. *British Educational Research Journal* 2001; 27(3): 269-285.
- Blinkhorn, A.S. Options for Change: A Review. A presentation at a conference Options for Change in Dental Education: Where are we now? The MANDEC Centre, University of Manchester, 29 November 2006.
- Blinkhorn, F.A., Blinkhorn, A.S. and Tickle, M. A profile of the dentists working in the community dental service in the United Kingdom in 1999. *British Dental Journal* 2001; 190(5): 266-268.
- Blinkhorn, F.A.. Evaluation of an undergraduate community-based course in family dentistry. *European Journal of Dental Education* 2002; 6(1): 40-44.
- Block, M.J. and Walken, J.W. Effect of an Extramural Program on Student Attitudes toward Dental Care for the Mentally Retarded. *Journal of Dental Education* 1980; 44(3): 158-161.

- Bloom, B.S. *Mastery learning*. New York: Holt, Rinehart & Winston.
- Bloor, M. (1997) *Techniques of Validation in Qualitative Research: a critical commentary*. In Miller, G. and Dingwall, R., *Context and Method in Qualitative Research*. London: Sage: 37-50.
- Bloor, M. On the analysis of observational data: a discussion of the worth and uses of inductive techniques and respondent validation. *Sociology* 1978; 12: 545-252.
- Blue, A.V. (2000) *The Provision of Culturally Competent Health Care*. [http://www.musc.edu/fm\\_ruralclerkship/culture.html](http://www.musc.edu/fm_ruralclerkship/culture.html) accessed May 2005.
- Boehm, D.M., Ni, J.A. and Neumann, L.M. (2005) Abstract. Trends Related to Dental School Satellite Clinics. *Journal of Dental Education* 2005; 69(1): 141(95).
- Bolton, G. (2001) *Reflective Practice*. London: Paul Chapman.
- Boorberg, N., Schroth, R.J., Odlum, O. and Lekik, P.C. Abstract. Bussing of children for the neighboring school improved the clinical training in pediatric dentistry. *Journal of Dental Education* 2000; 64(3): 184.
- Booth, D.R., Tandon, R. and Murray, H. (2003) Abstract. Evaluation of UWA's Undergraduate Year 5 Student Outplacement Program. *Journal of Dental Research* 2003; 82(Spec Iss B): 742.
- Born, D.O. and DiAngelis, A.J. Extramural education programs in the '80s. *Journal of Dental Education* 1986; 50(12): 731-733.
- Boston, D.W. and Marks, R.E. Preliminary Experience with a Social Work Rotation for Advanced General Dentistry Students. *Journal of Dental Education* 1993; 57(5): 366-368.
- Boud, D., Cohen, R. and Walker, D. (1993) *Understanding Learning from Experience*. In Boud, D., Cohen, R. and Walker, D. (Eds.) (1993) *Using Experience for Learning*. Buckingham: Oxford University Press: 1-17.
- Boud, D., Keough, R. and Walker, D. (1985) *Reflection: Turning Experience into Learning*. London: Kogan Page.
- Bourdieu, P. (1977) *Outline of a Theory of Practice*. Trans. Nice, R. Cambridge: Cambridge University Press.
- Bowling, A. (2002) *Research Methods in Health: Investigating health and health services, second edition*. Maidenhead: Oxford University Press.
- Boyle, F.M., Posner, T.N., Mutch, A.J., Dean, J.H., Nilsson, A.L. The building partnerships program: An approach to community-based learning for medical students in Australia. *Medical Education Online* 2002; 7: 12.
- Brennan, J. and Little, B. (1996) *A Review of Work Based Learning in Higher Education*. Milton Keynes: Quality Support Centre of the Open University.
- Brennan, J. and Little, B. (2006) *Towards a strategy for workplace learning*. London: Higher Education Funding Council.
- Brigley, S. (2003) *Developing reflective clinical practice*. In Sweet, J., Huttly, S. and Taylor, I. (Eds) *Effective learning & teaching in medical, dental & veterinary education*. London: Kogan Page: 180-195.
- British Dental Association (1999) *New BDA survey shows access to NHS dentistry getting worse*. Press release. London: BDA.



- British Dental Association (2003) BDA raises concerns in response to OFT private dentistry inquiry. Press release 20 June 2003. London: BDA.
- British Dental Association (2005b) British Dental Association response to Medical and Dental Students in the NHS: A guide on access to patients and clinical work. London: British Dental Association.
- British Dental Association and Learning and Teaching Support Network 01 (2002a) National Meeting of Dental Curriculum Co-ordinators/Educators, Notes of meeting 26th February 2002. [http://www.ltsn-01.ac.uk/docs/BDA\\_meeting\\_report1.rtf](http://www.ltsn-01.ac.uk/docs/BDA_meeting_report1.rtf) accessed June 2004.
- British Dental Association and Learning and Teaching Support Network 01 (2002) National Meeting of Dental Curriculum Co-ordinators/Educators, Abstracts for Meeting 26th February 2002. [http://www.ltsn-01.ac.uk/external\\_files/bdameeting/abstracts.pdf](http://www.ltsn-01.ac.uk/external_files/bdameeting/abstracts.pdf).
- Broder, H.L., Feldman, C.A., Saporito, R.A. and Stilwell, N. Implementing and evaluating a patient instructor program. *Journal of Dental Education* 1996; 60(9): 755-762.
- Brown, G., Rohlin, M. and Manogue, M. (2003) Culture, Collegiality and collaborative learning. In Sweet, J., Huttly, S. and Taylor, I. (Eds) *Effective learning & teaching in medical, dental & veterinary education*. London: Kogan Page: 18-35.
- Brown, G.A. and Atkins, M. (1991) *Effective Teaching in Higher Education*. London: Routledge.
- Brown, J.S., Collins, A. and Duguid, P. Situated cognition and the culture of learning. *Educational Researcher* 1989; 18(1): 32-42.
- Brown, L., Herd, K., Humphries, G. and Paton, M. The role of the lecturer in practice placements: what do students think? *Nurse Education in Practice* 2005; 5(2): 84-90.
- Brown, R.K., Hyland, P. and Piper, I.C. (2005) Eliciting and Specifying Requirements for Highly Interactive Systems using Activity Theory. Presentation at the 13 September Integrating Software Engineering and Usability Engineering workshop of the Interact 2005 conference, Rome, September 2005.
- Bulpitt, H. and Martin, P.J. Learning about reflection from the student. *Active Learning in Higher Education* 2005; 6(3): 207-217.
- Burns, S. and Bulman, C. (2000) *Reflective Practice in Nursing: The Growth of the Professional Practitioner*, second edition. London, Blackwell.
- Butters, J.M. and Vaught, R.L. The effect of an extramural education program on the perceived clinical competence of dental hygiene students. *Journal of Dental Education* 1999; 63(5): 415-420.
- Cabinet Office (1991) *The Citizen's Charter: Raising the Standard*. Cm 1599. London: HMSO, London.
- Caine, R.L. The Dental Externship: An Educational Methodology for Extramural Experiences. *Journal of Dental Education* 1975; 39(11): 737-739.
- Campos-Outcalt, D. and Snef, J.H. Characteristics of medical schools related to the choice of family medicine as a specialty. *Academic Medicine* 1989; 64: 610-615.
- Candy, P.C. and Crebert, R.G. Ivory Tower to Concrete Jungle: The Difficult Transition from the Academy to the Workplace as Learning Environments. *The Journal of Higher Education* 1991; 62(5): 570-592.



- Cant, S. and Sharma, U. Reflexivity, Ethnography and the Professions (Complementary Medicine). *Watching You Watching Me Watching You (and Writing About Both of Us)*. *Sociological Review* 1998; 46(2): 244-263.
- Carlisle, C. Reflecting on levels of confidence and competence in skills acquisition. *Medical Education* 2000; 34(11): 886-887.
- Carpenter, J. Doctors and nurses: stereotypes and stereotype change in interprofessional education. *Journal of Interprofessional Care* 1995; 9(2): 151-161.
- Carroll, J. A model for school learning. *Teacher College Record* 1963; 64(8), 723-733.
- Carver, C.S. and Scheier, M.F. Scaling back goals and recalibration of the affect system are processes in normal adaptive self-regulation: understanding 'response shift' phenomena. *Social Science and Medicine*. 2000; 50(12): 1715-22.
- Chambers, D.W. and Gerrow, J.D. Manual for developing and formatting competency statements. *Journal of Dental Education* 1994; 58(5): 361-366.
- Chambers, D.W. Issues in transferring preclinical skill learning to the clinical context. *Journal of Dental Education* 1987; 51(5): 238-243.
- Charles Clifford Dental Hospital and School of Clinical Dentistry, Sheffield (2002) Training the dental team in primary care settings away from dental hospitals: a bid to the National Purchasing Unit for Dental SIFT. University of Sheffield.
- Charmers, H., Swallow, V. and Miller, J. (2004) The theoretical perspective of Accredited Work Based Learning? In Swallow, V., Miller, J. and Chambers, H. (Eds) *Partnerships in Work Based Learning*. Newcastle upon Tyne: Northumbria University Press: 3-15.
- Chávez, E.M. and LaBarre, E.E. A predoctoral clinical geriatric dentistry rotation at the University of the Pacific School of Dentistry. *Journal of Dental Education* 2004; 68(4): 454-459.
- Christner, J.G., Takagishi, J.C., Dabrow, S. and McCoy, R. Lessons Learned From Community Site Administrators Involved in Pediatric Community Rotations. *Ambulatory Pediatrics* 2004; 4(1): 121-123.
- Cinotti, W.R., Saporito, R.A., Feldman, C.A., Mardirossian, G. and DeCastro, J. Community-based dental programs: University of Medicine and Dentistry of New Jersey-New Jersey Dental School. *Journal of Dental Education* 1999; 63(12): 969-975.
- Clark, R.C. (1999) *Developing Technical Training: A Structured Approach for Developing Classroom and Computer-Based Instructional Materials* (2nd ed.). Washington, DC: International Society for Performance Improvement.
- Cobb, P. and Bowers, J. Cognitive and Situated Learning Perspectives in Theory and Practice. *Educational Researcher* 1999; 28(2): 4-15.
- Cockrell, D.J., Lyle, D. and Lester, K.S. (2002) Abstract. Addressing rural NSW dental workforce needs through a Rural Placement Program for dental students of the University of Sydney. 5th Wonca World Conference on Rural Health, Melbourne, 1 May 2002.
- Coffield, F. (2004) Evidence-based policy or policy-based evidence? In Rainbird, H., Fuller, A. and Munro, A. (Eds) *Workplace learning in context*. London: Routledge: 279-298.



- Coles, C. A review of learner-centred education and its applications in primary care. *Education for General Practice* 1994; 5(1): 19-25.
- Collado, V., Faulks, D., Domejean, S., Roux, D., Woda, A, Mazille, M.N., Orliaguet, T. and Hennequin, M. Impact of teaching requirements for students on the activity of a university dental hospital. *European Journal of Dental Education* 2004; 8(4): 161–166.
- Collins, A., Brown, J.S., and Newman, S.E. (1987) *Cognitive apprenticeship: Teaching the craft of reading, writing and mathematics* (Technical Report No. 403). Cambridge, MA: BBN Laboratories, Centre for the Study of Reading, University of Illinois.
- Collins, J.P. and Harden, R.M. (1999) *The Use of Real Patients, Simulated Patients and Simulators in Clinical Examinations*, AMEE Education Guide No.13. Dundee: Association for Medical Education in Europe.
- Colwyn (Lord) (1999) Speech to the House of Lords. 24 Nov 1999. *Parliamentary Debates, Commons, Vol.24 November 1999*, col.518.
- Comer, R.W., Brown, J.C., Reed, M.J. and Sturdivant, D.W. Senior dental students in private practice: a preceptorship program. *Journal of the American College of Dentists* 1987; 54(3): 20-23.
- Commission on Dental Accreditation (2001) *Accreditation standards for dental education programs*. Chicago: CDA.
- Committee of Postgraduate Dental Deans and Directors (2006) *A Curriculum for UK Dental Foundation Programme Training*. COPDEND.
- Committee of Vice-Chancellors and Principals (2000) *The university/NHS partnership in the provision of health professional education*. London: Higher Education Briefing Service.
- Concato, J., Shah, N. and Horwitz, R.I. Randomized, Controlled Trials, Observational Studies, and the Hierarchy of Research Designs. *New England Journal of Medicine* 2000; 342(25): 1887-1892.
- Cook, T. Randomized experiments in education: A critical examination of the reasons the educational evaluation community has offered for not doing them. *Educational Evaluation and Policy Analysis* 2002; 24(3): 175–199.
- Cope, P., Cuthbertson, P. and Stoddart, B. Situated learning in the practice environment. *Journal of Advanced Nursing* 2000; 31(4): 850-856.
- Council for Deans of Dental Schools and South Yorkshire NHS Workforce Development Confederation (2003) *Undergraduate Dental Education in England: A Paper for Information*. Sheffield, UK: Council for Deans of Dental Schools and South Yorkshire NHS Workforce Development Confederation.
- Council of Heads and Deans of Dental Schools (2006) *CHDDS Dental Student Placement Survey 2006*. Unpublished report.
- Cox, K. Planning Bedside Teaching - 1. Overview. *Medical Journal of Australia* 1993; 158(5): 280-282.
- Cranmer, C. Enhancing graduate employability: best intentions and mixed outcomes. *Studies in Higher Education* 2006; 31(2): 169–184.

- Critical Appraisal Skills Programme (2002a) Critical Appraisal Skills Programme (CASP) 10 questions to help you make sense of qualitative research. [http://www.phru.nhs.uk/learning/casp\\_qualitative\\_tool.pdf](http://www.phru.nhs.uk/learning/casp_qualitative_tool.pdf) accessed November 2005. Milton Keynes: Milton Keynes Primary Care Trust.
- Critical Appraisal Skills Programme (2002b) Critical Appraisal Skills Programme (CASP) 10 questions to help you make sense of Randomised Controlled Trials. [http://www.phru.nhs.uk/learning/casp\\_rct\\_tool.pdf](http://www.phru.nhs.uk/learning/casp_rct_tool.pdf) accessed May 2004. Milton Keynes: Milton Keynes Primary Care Trust.
- Crossley, M.L. and Mubarik, A. A comparative investigation of dental and medical student's motivation towards career choice. *British Dental Journal* 2002; 193: 471-473.
- Cruickshank, D.R. Profile of an effective teacher. *Educational Horizons* 1986; 64(2): 80-86.
- Cubberley, E.P. (1909) *Changing Conceptions of Education*. Boston: Houghton Mifflin.
- Cubberley, E.P. (1919) *Public Education in the United States*. Cambridge, MA: Riverside Press.
- Curran, V., Christopher, J., Lemire, F., Collins, A., Barrett, B. Application of a responsive evaluation approach in medical education. *Medical Education* 2003; 37: 256-266.
- Cushing, A. (2002) Assessment of non-cognitive factors. In Norman, G.R., Van der Vleuten, D.I., Newble, D.I. (Eds). *Handbook of Research in Medical Education*. Dordrecht: Kluwer Academic Publishers: 711-755.
- Davis, K.J., Kuthy, R.A., Mcquistan, M.R., Qian, F. and Heller, K.E. Value of Extramural Experiences From an Alumni Perspective. *Journal of Dental Research* 2005; 84(Special Issue A): 79(0789).
- Dawis, R.V. Scale Construction. *Journal of Counseling Psychology* 1987; 34(4): 481-489.
- DeCastro, J.E., Bolger, D. and Feldman, C.A. Clinical Competence of Graduates of Community-Based and Traditional Curricula. *Journal of Dental Education* 2005; 69(12): 1324-1331.
- DeCastro, J.E., Matheson, P.B., Panagakos, F.S., Stewart, D.C. and Feldman, C.A. Alumni perspectives on community-based and traditional curricula. *Journal of Dental Education* 2003; 67(4): 418-426.
- Deep, P. Biological and Biopsychosocial Models of Health and Disease in Dentistry. *Journal of the Canadian Dental Association* 1999; 65(9): 496-497.
- Dental Practice Board NHS Dentistry - a snapshot. *Dental Profile* 2006; 50: 20-21.
- DePaola, D.P. and Slavkin, H.S. Reforming Dental Health Professions Education: A White Paper. *Journal of Dental Education* 2004 68(11): 1140-1150.
- Department of Health (1989) *The future development of the Community Dental Services*. Health Service Management Circular HC(89)2. London: HMSO.
- Department of Health (1991) *The Patient's Charter*. London: HMSO.
- Department of Health (1995) *The Patient's Charter*. London: HMSO.



- Department of Health (1997) Primary Care Dental Services. Department of Health Circular HSG(97)4. London: HMSO.
- Department of Health (2000a) The NHS Plan: a plan for investment, a plan for reform. Cm 4818-I. London: Department of Health.
- Department of Health (2000b) Modernising NHS dentistry: Implementing the NHS Plan.
- Department of Health (2001) Shifting the balance of power within the NHS: Securing Delivery; London: Department of Health.
- Department of Health (2002) NHS Dentistry: Options for Change. London: Department of Health.
- Department of Health (2003) An evolving Modernisation of Dentistry agenda, Options for Change: A new vision for Primary Care Dentistry – Health and Social Care (Community Health and Standards) Bill 2003. A supplement of CDO's Digest May 2003. London: Department of Health.
- Department of Health (2004a) Report of the Primary Care Dental Workforce Review. London: Department of Health.
- Department of Health (2004b) NHS Dentistry: Delivering Change. Report by the Chief Dental Officer (England). London: DH Publications.
- Department of Health (2004c) The NHS Improvement Plan. London: The Stationery Office.
- Department of Health (2005a) Chief Dental Officer for England's letter headed 'Increases in undergraduate dental numbers' to NHS Chief Executives, Deans of Dental Schools and University Vice Chancellors dated 19 January 2005.
- Department of Health (2005b) Institutions bid for additional dental study places. CDO Update 2005; 3: 11.
- Department of Health (2005c) The General Dental Services and Personal Dental Services Transitional Provisions Order 2005 (S.I. 2005/3435). London: The Stationery Office.
- Department of Health (2005d) Commissioning a Patient-Led NHS. Department of Health letter: Gateway reference number 5312. London: Department of Health.
- Department of Health and Higher Education Funding Council for England (1999) Developing a joint university/NHS planning culture, Task Group II report.
- Department of Health and National Audit Office (2004) Reforming NHS Dentistry: Ensuring effective management of risks. London: The Stationary Office.
- Desjardins, P.J. Creating a Community-Oriented Curriculum and Culture: Lessons Learned from the 1993-1996 Ongoing New Jersey Experiment. *Journal of Dental Education* 1996; 60(10): 821-826.
- Dewey, J. (1933) *How We Think*. New York: Heath & Co.
- DiBiaggio, J.A. Hospital training for dental student: problems and potentials. *Journal of Dental Education* 1973; 37(3): 13-16.
- Donoff, R.B. It Is Time for a New Gies Report. *Journal of Dental Education* 2006 70(8): 809-819.

- Doshi, M. and Brown, N. Whys and hows of patient-based teaching. *Advances in Psychiatric Treatment* 2005; 11(3): 223-231.
- Dreyfus, H.L. and Dreyfus, S.E. (1998) *From Socrates to Expert Systems: The Limits and Dangers of Calculative Rationality*. [http://ist-socrates.berkeley.edu/%7Ehdreyfus/html/paper\\_socrates.html](http://ist-socrates.berkeley.edu/%7Ehdreyfus/html/paper_socrates.html) accessed 4 January 2005.
- Dummett, C.O. Extramural Programs in Community Dentistry. *Journal of American College of Dentistry* 1974; 41(4): 264-268.
- Dworkin, S.F. The Dentist as Biobehavioral Clinician. *Journal of Dental Education* 2001; 65(12): 1417-1429.
- Dwyer, F.M. Selected criteria for evaluating teacher effectiveness. *Improving College and University Teaching* 1973; 21(1): 51-52.
- Eaton, K. Outreach Teaching - Coming soon to a practice near you. Editorial. *Primary Care* 2005; 12(4): 115-116.
- Eaton, K.A., de Vries, J., Widström, E., Gait, T.C., Bedi, R., Meyers, I., Feldman, C.A. and Hobson, R. 'Schools without walls?' Developments and challenges in dental outreach teaching – report of a recent symposium. *European Journal of Dental Education* 2006; 10(4): 186-191.
- Elkind, A. (2001) *Developing Dental Education in Primary Care. In The Role of Outreach Teaching in the Dental Curriculum of the Future. Report of a workshop held at the Manchester Dental Education Centre on 19 February 2001*. Eden Bianchi Press: Manchester: 4-5.
- Elkind, A. and Blinkhorn, A.S. Modernising dental education. *British Journal of Health Care Management* 2001; 7(12): 490-491.
- Elkind, A. Miniproject perspective: dental education in primary care. the newsletter of LTSN-01, 2003; (January) 15.
- Elkind, A. Outreach teaching: is this the future for dental education? *British Dental Journal* 2002; 193(2): 111-112.
- Elkind, A., Blinkhorn, A.S., Blinkhorn, F.A., Duxbury, J.T., Hull, P.S and Brunton, P.A. Developing dental education in primary care: the student perspective. *British Dental Journal* 2005b; 198(4): 233-237.
- Elkind, A., Blinkhorn, A.S., Watts, C. and Harvey, L. (2003) *Developing Dental Education in Primary Care: report of the first year of a pilot outreach course in restorative dentistry*. Manchester: University Dental Hospital of Manchester.
- Elkind, A., Blinkhorn, F., Duxbury, J. and Blinkhorn, A. (2006b) *Developing Dental Education in Primary Care: Final Report*. Manchester: University of Manchester School of Dentistry.
- Elkind, A., Blinkhorn, F., Duxbury, J., Hull, P. and Blinkhorn, A. (2005c) *Developing Dental Education in Primary Care: Final Report*. Manchester: University of Manchester School of Dentistry.
- Elkind, A., Blinkhorn, F., Mackie, I.C., Tickle, M., Duxbury, J.T. and Blinkhorn, A.S. Service quality implications of dental undergraduate outreach teaching for Primary Care Trusts. *Community Dental Health* 2006a; 23(2): 75-79.



- Elkind, A., Potter, C., Watts, C., Blinkhorn, F., Duxbury, J., Hull, P. and Blinkhorn, A.S. Patients treated by dental students in outreach: the first year of a pilot project. *European Journal of Dental Education* 2005a; 9(2): 49-52.
- Elkind, A., Watts, C., Potter, C., Duxbury, J., Blinkhorn, F., Qualtrough A., Taylor, I., Turner, R. and Blinkhorn, A. The use of outreach clinics for teaching restorative dentistry. *British Dental Journal* 2007 (in press).
- Elton, L.R.B and Laurillard, D.M. Trends in research on student learning. *Studies in Higher Education* 1979; 4(1): 87-102.
- Elzubeir, M.A. and Rizk, D.E.E. Assessing Confidence and Competence of Senior Medical Students in an Obstetrics and Gynaecology Clerkship using an OSCE. *Education for Health: Change in Learning and Practice* 2001; 14(3): 373-382.
- Engel, G.L. The clinical application of the biopsychosocial model. *American Journal of Psychiatry* 1980; 137(5): 535-544.
- Engeström, Y. (1993) Developmental studies of work as a testbench of activity theory: The case of primary care medical practice. In Chaiklin, S. and Lave, J. (Eds) *Understanding Practice: Perspectives on activity and context*. Cambridge: Cambridge University Press: 64-103.
- Engeström, Y. (1994) *Training for Change: new approach to instruction and learning in working life*. Geneva: International Labour Office.
- Engeström, Y. *Expansive Learning at Work: toward an activity theoretical reconceptualization*. *Journal of Education and Work* 2001; 14(1): 133-156.
- Engeström, Y. *Learning by Expanding: an activity-theoretical approach to developmental research*. Helsinki: Orienta-Konsultit.
- Engeström, Y. *New forms of learning in co-configuration work*.
- Engeström, Y. *Non scolae sed vitae discimus: toward overcoming encapsulation of school learning*. *Learning and Instruction* 1991; 1(3): 243-259.
- Engeström, Y., Engeström, R. and Karkkainen, M. Polycontextuality and boundary crossing in expert cognition: learning and problem solving in complex work activities. *Learning and Cognition* 1995; 5(4): 319-336.
- Engeström, Y., Meittinen, R. and Punamäki, R-L. (eds.) (1999) *Perspectives on activity theory*. Cambridge: Cambridge University Press.
- Engeström, Y., Virkkunen, J., Helle, M., Pihlaja, J. and Poikela, R. The change laboratory as a tool for transforming work. *Lifelong Learning in Europe* 2: 10-17.
- Entwistle, B.A. Are we creating socially responsible dental professionals? *Journal of Dental Education* 1992; 56(2): 109-111.
- Erney, S.L., Allen, D.L. and Siska, K.F. Effect of a Year-long Primary Care Clerkship on Graduates' Selection of Family Practice Residencies. *Academic Medicine* 1991; 66(4): 234-236.
- Ettinger, R.L., Beck, J.D., Kerber P. and Scandrett F.R. Dental students' confidence in prosthodontics and attitudes toward the elderly. *Journal of Dental Education* 1982; 46(9): 541-7.
- Evans, J. and Benefield, P. Systematic Reviews of Educational Research: does the medical model fit? *British Educational Research Journal* 2001; 27(5): 527-541.

- Everson, H.T., Tobias, S., Hartman, H. and Gourgey, A. Test Anxiety and the Curriculum: The Subject Matters. *Anxiety, Stress and Coping* 1993; 6: 1-8.
- Falk, B. and Lee Dow, K. (1971) *The assessment of university teaching*. London: Society for Research into Higher Education.
- Fanghanel, J. Capturing dissonance in university teacher education environments. *Studies in Higher Education* 2004; 29(5): 575-590.
- Farrell, C. (1999) The Patient's Charter: a tool for quality improvement? *International Journal of Health Care Quality Assurance* 1999; 12(4): 129-135.
- Feldman, C. (2004) Evaluating the educational effect of outreach. Presentation at International Association for Dental Research conference symposium on Outreach Teaching, March 2004. [www.dent.umich.edu/iadr/Documents/evaluating.pdf](http://www.dent.umich.edu/iadr/Documents/evaluating.pdf) accessed May 2004.
- Fell, A. and Kuit, J.K. Placement learning and the Code of Practice: Rhetoric or reality? *Active learning in higher education*, 2003; 4(3): 214-255.
- Felman, S. (1987) *Jacques Lacan and the adventure of Insight*. Cambridge, Massachusetts: Harvard University Press.
- Fiehn, N.E.. Perspectives on dental education in the Nordic countries. *Journal of Dental Education* 2002; 66(12), 1374-1380.
- Field, M.J. (editor) (1995) *Dental Education at the Crossroads: challenges and change*. An Institute of Medicine report. Washington DC: National Academy Press.
- Fielding, J. (1993) Coding and Managing Data. In Gilbert, N. (ed.), *Researching Social Life*, Sage, London, pp. 218-238.
- Finch, J.H., Helms, M.M. and Etkin, L.P. Development and assessment of effective teaching: an integrative model for implementation in schools of business administration. *Quality Assurance in Education* 1997; 5(3): 159-164.
- Fisher, K. Demystifying Critical Reflection: Defining criteria for assessment. *Higher Education Research and Development* 2003; 22(3): 313-325.
- Fitz-Gibbon, C.T. (1996) *Monitoring education: indicators, quality and effectiveness*. London: Cassell.
- Flavell, J.H. Metacognition and Cognitive Monitoring. *American Psychologist* 1979; 34(10): 906-911.
- Foreman, S. Social Responsibility and the Academic Medical Center: Building Community-based Systems for the Nation's Health. *Academic Medicine* 1994; 69(2): 97-102.
- Formicola, A.J., McIntosh, J., Marshall, S., Albert, D., Mitchell-Lewis, D., Zabos, G.P. and Garfield, R. Population-Based Primary Care and Dental Education: A New Role for Dental Schools. *Journal of Dental Education* 1999; 63(4): 331-337.
- Fox, D. Personal theories of teaching. *Studies in Higher Education* 1983; 8(2): 151-163.
- Frankl, S.N., Mann, M.L. and Wong, A.W. APEX: An Experiential Education Program. *Journal of Dental Education* 1993; 57(8): 637-642.



- Fredekind, R., Miller, C., Kirk, J. and Barnvi, Z. Expanding Community Services while increasing Dental School Clinic production. *Journal of Dental Education* 2004; 68(2): 249.
- Freeman, R., McWilliams, G., Gorter, R. and Williams, S. Dental students interacting with dental nurses: an investigation of the role of gender and ethnicity in inter-professional communication and working styles. *British Dental Journal* 2007; 202(2): 91-96.
- Friedrich, R.H., Gambuti, G.A. and Linz, A.M. Role of the hospital in the future of dental education. *Journal of Oral Surgery* 1967; 25(1): 47-53.
- Fuller, A. and Unwin, L. (2004) Expansive Learning Environments: integrating organizational and personal development. In Rainbird, H., Fuller, A. and Munro, A. (Eds) *Workplace learning in context*. London: Routledge: 126-144.
- Fuller, A. and Unwin, L. Fostering Workplace Learning: looking through the lens of apprenticeship. *European Educational Research Journal* 2003; 2(1): 41-55.
- Fuller, A. and Unwin, L. Learning as Apprentices in the Contemporary UK Workplace: creating and managing expansive and restrictive participation. *Journal of Education and Work* 2003; 16(4): 407-426.
- Fuller, A. and Unwin, L. Reconceptualising apprenticeship: exploring the relationship between work and learning. *Journal of Vocational Education and Training* 1998; 50(2): 153-173.
- Gadbury-Amyot, C.C., Simmer-Beck, M., McCunniff, M. and Williams, K.B. Using a Multifaceted Approach Including Community-Based Service-Learning to Enrich Formal Ethics Instruction in a Dental School Setting. *Journal of Dental Education* 2006; 70(6): 652-661.
- Gage, N., and Berliner, D. (1992) *Educational psychology* (5th ed.). Princeton, New Jersey: Houghton Mifflin Company.
- Gagne, R. (1985) *The Conditions of Learning*. New York: Holt, Rinehart & Winston.
- Gallagher, J.L. and Wright, D.A. General dental practitioners' knowledge of and attitudes towards the employment of dental therapists in general practice. *British Dental Journal* 2003; 194(1): 37-41.
- Gardiner, J.F. and Lotzkar, S. A survey of extramural experiences for dental students. *Journal of Dental Education* 1975; 39(8): 530-534.
- Gelbier, S. 125 years of developments in dentistry, 1880-2005 Part 5: Dental education, training and qualifications. *British Dental Journal* 2005; 199(10): 685-689.
- General Dental Council (1996) *General Visitation 1993-1995: General Report of the Visitors to the Undergraduate Dental Degree Programmes and Final Examinations in the United Kingdom*. London: GDC.
- General Dental Council (1999) *The first five years: a framework for undergraduate dental education, first edition*. London: GDC.
- General Dental Council (2001) *Visitation of the Dental Therapy Component of the Burkhart School of Dental Hygiene and Dental Therapy, Eastman Dental Hospital, University College London*.
- General Dental Council (2002) *The first five years: a framework for undergraduate dental education, second edition*. London: GDC.



- General Dental Council (2003) Report of the GDC Visitors on the Graduate Diploma in Dental Hygiene and Dental Therapy at the Leeds Dental Institute.
- General Dental Council (2004a) Letter to Dr Iain Mackie, Manchester, from A D Seth-Smith, GDC Director of Education, copied to the Deans of Dental Schools, 20 April 2004.
- General Dental Council (2004b) Developing the Dental Team: Curricula Frameworks for Registrable Qualifications for Professionals Complementary to Dentistry. London: GDC.
- General Dental Council (2004c) Visitation of the BDS Programme of Leeds Dental School: Report of the Visitors. London: GDC.
- General Dental Council (2004d) Visitation of the BDS Programme of Bristol Dental School: Report of the Visitors. London: GDC.
- General Dental Council (2004e) Visitation of the BDS Programme of the Dental School, University of Newcastle: Report of the Visitors. London: GDC.
- General Dental Council (2004f) Visitation of the BDS Programme of the Dental School, University of Birmingham: Report of the Visitors. London: GDC.
- General Dental Council (2004g) Visitation of the BDS Programme of the Manchester Dental School: Report of the Visitors. London: GDC.
- General Dental Council (2004h) Visitation of the BDS Programme of Glasgow Dental School: Report of the Visitors. London: GDC.
- General Dental Council (2004i) Visitation of the BDS Programme of Guy's, King's and St Thomas' Dental Institute: Report of the Visitors. London: GDC.
- General Dental Council (2005a) Visitation of the BDS Programme of Belfast School of Dentistry: Report of the Visitors. London: GDC.
- General Dental Council (2005b) Visitation of the BDS Programme of Barts and the London Institute of Dentistry, Queen Mary's School of Medicine and Dentistry: Report of the Visitors. London: GDC.
- General Dental Council (2005c) Visitation of the BDS Programme of Dundee Dental School: Report of the Visitors. London: GDC.
- General Dental Council (2005e) Visitation of the BDS Programme of School of Clinical Dentistry, University of Sheffield: Report of the Visitors. London: GDC.
- General Dental Council (2005f) Visitation of the BDS Programme of Liverpool Dental School: Report of the Visitors. London: GDC.
- General Dental Council (2005g) Visitation of the BDS Programme of Cardiff School of Dentistry: Report of the Visitors. London: GDC.
- General Dental Council (2005h) Roles of Dental Care Professionals, Standards Committee paper placed before Council 7 December 2005. London: GDC.
- General Dental Council (2006a) General Visitation 2003-2005: General Report of the Visitors to the Undergraduate Dental Degree Programmes and Final Examinations in the United Kingdom. London: GDC.
- General Dental Council (2006b) Dental schools pass the test but more funding needed. Press release dated 14 July 2006. London: GDC.



- Gerzina, T.M., McLean, T. and Fairley, J. Dental Clinical Teaching: Perceptions of Students and Teachers. *Journal of Dental Education* 2005; 69(12):1377-1384.
- Gibbons, D.E. (2001) *The First Five Years... In The Role of Outreach Teaching in the Dental Curriculum of the Future*. Report of a workshop held at the Manchester Dental Education Centre on 19 February 2001. Eden Bianchi Press: Manchester: 1-2.
- Golembiewski, R.T., Billingsley, K. and Yeager, S. Measuring change and persistence in human affairs: Types of change generated by OD designs. *Journal of Applied Behavioral Science* 1976; 12(2): 133-157.
- Goodlad, S. (1995) *The Quest for Quality: Sixteen Forms of Heresy in Higher Education*. Buckingham: Open University Press.
- Gordon, G. (1993) The audit and assessment of teaching quality: an auditor's view. In Knight, P.T. (Ed.), *The Audit and Assessment of Teaching Quality*. Birmingham: Standing Conference on Educational Development.
- Gordon, S.R. and Kress, G.C. Treatment planning in dental schools. *Journal of Dental Education* 1987; 51(5): 224-228.
- Grantham, E.V. and Block, M.J. Effect of Extramural Experiences on Dental Students' Attitudes. *Journal of Dental Education* 1983; 47(10): 681-684.
- Greeno, J.G. On claims that answer the wrong questions. *Educational Researcher* 1997; 26(1): 5-17.
- Griffiths, M. and Tann, C.S. Using Reflective Practice to link personal and public theories. *Journal of Education for Teaching* 1992; 18(1): 69-84.
- Griffiths, T. and Guile, D. A Connective Model of Learning: the implications for work process knowledge. *European Educational Research Journal* 2003; 2(1): 56-73.
- Guba, E.G. and Lincoln, Y.S. (1989) *Fourth generation evaluation*. Newbury Park, CA: Sage.
- Guba, E.G. and Lincoln, Y.S. (2001) Guidelines and checklist for constructivist (a.k.a. fourth generation) evaluation. <http://www.wmich.edu/evalctr/checklists/constructivisteval.pdf> accessed October 2006.
- Guile, D. and Griffiths, T. Learning Through Work Experience. *Work* 2001; 14(1): 113-131.
- Guile, D. and Young, M. Apprenticeship as a Conceptual Basis for a Social Theory of Learning. *Journal of Vocational Education and Training* 1998; 50(2): 173-192.
- Guile, D. Skill and Work Experience in the European Knowledge Economy. *Journal of Education and Work* 2002; 15(3): 251-276.
- Gutierrez, M.C. and Soto, R.G. Alligator attack: an illustration of the impact of early clinical exposure. *Medical Education* 2002; 36(12): 1182-1184.
- Hamby, C.L. and Miller, J.B. Preceptorship training: transition from student to practitioner. *Oklahoma Dental Association Journal*; 1990; 81(1): 42-45.
- Hamilton, C.B., Smith, C.A, and Butters J.M. Interdisciplinary student health teams: combining medical education and service in a rural community-based experience. *Journal of Rural Health* 1997; 13(4): 320-328.
- Hammersley, M. and Atkinson, P. (1983) *Ethnography: Principles in Practice*. London: Tavistock.

- Hancock, M., Calnanz, M. and Manley, G. Private or NHS general dental service care in the United Kingdom? A study of public perceptions and experiences. *Journal of Public Health Medicine* 1999; 21(4): 415-420 (1999).
- Harden, R.M., Grant, J., Buckley, G. and Hart I.R. BEME Guide No.1: Best Evidence Medical Education. *Medical Teacher* 1999; 21(6): 553-562.
- Harrell, P.L., Kearl, G.W., Reed, E.L., Grigsby, D.G. and Caudill, T.S. Medical students' confidence and the characteristics of their clinical experiences in a primary care clerkship. *Academic Medicine* 1993; 68(7): 577-579.
- Harrington, J.P., Murnaghan, J.J. and Regehr, G. Applying a Relative Ranking Model to the Self-Assessment of Extended Performances. *Advances in Health Sciences Education* 1996; 2(1): 17-25.
- Harris, J. (2006) *Towards a strategy for workplace learning: Annex A - A Review of the Academic Literature on Workplace Learning* London: Higher Education Funding Council.
- Harris, R.V., Dailey, Y. and Lennon, M.A. Recording and understanding social histories by dental undergraduates in a community-based clinical programme. *European Journal of Dental Education* 2003; 7(1): 34-40.
- Hart, J.T. The inverse care law. *Lancet* 1971; 1(7696): 405-412.
- Hartley, S., Gill, D., Carter, F., Walters, K. and Bryant, P. (2003) *Teaching Medical Students in Primary and Secondary Care: a resource book*. Oxford: Oxford University Press.
- Harvey, L., Geall, V. and Moon, S. (1998) Work experience: expanding opportunities for undergraduates. <http://www.uce.ac.uk/crq/publications/we/zwecon.html> accessed November 2004.
- Hay, K.E. Legitimate Peripheral Participation, Instructionism, and Constructivism: Whose Situation Is It Anyway? *Educational Technology* 1993; 33(3): 33-38.
- Hayes, J. and Allinson, C.W. The implications of learning styles for training and development: a discussion of the matching hypothesis. *British Journal of Management* 1996; 7(1): 63-73.
- Heidenreich, C., Lye, P., Simpson, D. and Lourich, M. The Search for Effective and Efficient Ambulatory Teaching Methods Through the Literature. *Pediatrics (Journal of the American Pediatric Association)* 2000; 105(1): 231-237.
- Heitke, S.B. Marquette University's Extramural Clinical Program. *Journal of Dental Education* 1984; 48(6 supplement): 47-49.
- Helfer, R.E. and Hess, J. An experimental model for making objective measurements of interviewing skills. *Journal of Clinical Psychology* 1970; 26(3): 327-331.
- Helfer, R.E., Black, M.A. and Helfer, M.E. Pediatric interviewing skills taught by nonphysicians. *American Journal of Diseases of Children* 1975; 129(9): 1053-7.
- Helfer, R.E., Black, M.A. and Teitelbaum, H. A comparison of pediatric interviewing skills using real and simulated mothers. *Pediatrics* 1975; 55: 397-400.
- Heller K.E., Kuthy, R.A., Davis, K.J., and McQuistan, M.R. Abstract. Extramural Programs Effects on Attitudes Regarding Treating Special Needs Populations. *Journal of Dental Research* 2004; 83(Special Issue A): 2012.



- Hendricson, W.D. and Cohen, P.A. Oral Health Care in the 21st Century: Implications for Dental and Medical Education. *Academic Medicine* 2001; 76(12): 1181-1206.
- Henshaw, M.M., Frankl, C.S., Bolden, A.J., Mann, M.L., Kranz, S.M. and Hughes, B.L. Community-based dental education at Boston University Goldman School of Dental Medicine. *Journal of Dental Education* 1999; 63(12): 933-937.
- Herefordshire National Health Service (2006) NHS Dental Care, Herefordshire NHS. <http://www.herefordshire.nhs.uk> accessed June 2006.
- Herrington, J. and Oliver, R. (1995) Critical Characteristics of Situated Learning. Australasian Society for Computers In Learning In Tertiary Education Conference paper, Melbourne.
- Herzmark, G. (2004) Report contributing to research for paying for teaching dental students in out-reach settings in Scotland: a project for NHS Education for Scotland. Edinburgh: NHSES.
- Higher Education Statistics Agency (2004) Student Tables, Subject of Study table <http://www.hesa.ac.uk/holisdocs/pubinfo/stud.htm> accessed June 2005.
- Higher Education Statistics Agency (2005a) Higher Education Funding Councils Dental undergraduate intake returns 1993 to 2004. Data supplied by the Council of Heads and Deans of Dental Schools on personal request.
- Higher Education Statistics Agency (2005b) Performance Indicators in Higher Education in the UK 2003/4 dataset. Cheltenham: HESA.
- Hind, V., Waterhouse, P.J., Walton, G, Tabari, D., Lloyd, J. and Maguire, A. (2005) Abstract. Developing dental undergraduate outreach experience at Newcastle – the challenge. *International Journal of Paediatric Dentistry* 2005; 15(Supplement 1): 13.
- Hoffman-Kipp, P., Artiles, A.J. and Lopez-Torres, L. Beyond reflection: teacher learning as praxis. *Theory Into Practice* 2003; 42(3): 248-254.
- Hogan, H. (1999) Preparing for Practice: An analysis of the state of community-based medical education in the US, Nuffield Trust Travelling Fellowship Reports Series No. 1. London: The Nuffield Trust for Research and Policy Studies in the Health Services.
- Hogan, S. and Victoroff, K.Z. Effective Learning Experiences in Dental School: A Qualitative Study. *Journal of Dental Education* 2005; 69(1): 111(7).
- Holloway, P.J. and Dixon, P.A. Extra-mural experience for undergraduate dental students. *British Dental Journal* 1977; 143(5): 146-150.
- Holmes, D.C., Diaz-Arnold, A.M. and Williams, V.D. Alumni self-perception of competence at time of dental school graduation. *Journal of Dental Education* 1997; 61(6): 465-472.
- Horsburgh, M., Lamdin, R. and Williamson, E. Multiprofessional learning: the attitudes of medical, nursing and pharmacy students to shared learning. *Medical Education* 2001; 35(9): 876-883.
- House, E.R. Assumptions underlying evaluation models. *Educational Researcher* 1978; 7(3): 4-12.
- Howard, G.S. and Dailey, P.R. Response-shift bias: A source of contamination of self-report measures. *Journal of Applied Psychology* 1979; 64(2): 144-150.



- Howard, G.S., Ralph, K.M., Gulalnick, N.A., Maxwell, S.E., Nance, D.W. and Gerber, S.K. Internal invalidity in pre-test-post-test self-report evaluations and a re-evaluation of retrospective pre-tests. *Applied Psychological Measurement* 1979; 3(1): 1-23.
- Howard, G.S., Schmeck, R.R. and Bray, J.H. Internal invalidity in studies employing self-report instruments: a suggested remedy. *Journal of Educational Measurement* 1979; 16(2): 129-135.
- Howe, A. Teaching in practice: a qualitative factor analysis of community-based teaching. *Medical Education* 2000; 34(9): 762-768.
- Hunter, M.L., Lewis, R. and Hunter, B. Abstract. The effect of a Community Dental Service (CDS) outreach teaching programme on the confidence of undergraduate students: a pilot study. *International Journal of Paediatric Dentistry* 2005; 15(supplement 1): 13.
- Huynh-Vo, L., Rosenbloom, J.M., Aslanyan, G. and Leake, J.L. (2002) Une enquête sur la possibilité pour les étudiants de prodiguer des soins dentaires dans les cliniques communautaires. *Journal de l'Association dentaire canadienne* 2002; 68(7): 408-411.
- Illich, I. (1971) *Deschooling society*. New York: Harper & Row.
- Illich, I. (1976) *Limits to medicine: Medical nemesis: the exploration of health*. London: Marion Boyors.
- Inglehart, M.R., Gilbert, B. and Bagrimain, R.A. Attitude vs. Action - Long-term outcomes of community service learning in dental school. *Journal of Dental Research* 2003; 82(Special Issue B): 209(1575).
- Ismail, A.I. (2003) Implications of evidence based health care for education, research, and dental practice. In *Evidence based Dentistry for effective practice*, Clarkson, J., Harrison, J.E., Ismail, A.I., Needleman, I. and Worthington, H. London: Taylor and Francis: 165-178.
- Jacobson, J., Tedesco, L., Bagramian, R., Burgett, F. and Kotowicz, W. Advancing community-based education: curriculum issues. *Journal of Dental Education* 1999a; 63(12): 896-901.
- Jacobson, J.J., Inglehart, M.R., Newlin, S., Gould, K. and Bagramain, R.A. (2000) Abstract. Caring in our communities - service learning and senior dental students. *Journal of Dental Education* 2000; 64(3): 209(136).
- Jacobson, J.J., Kotowicz, W.E. and Turner, D.F. University of Michigan School of Dentistry's Community Practice 857. *Journal of Dental Education* 1999b; 63(12): 964-968.
- Janicik, R.W. and Fletcher, K.E. Teaching at the bedside: a new model. *Medical Teacher* 2003; 25(2): 127-130.
- Jessee SA., O'Neill, P.N. and Dosch, O.R Matching Student Personality Types and Learning Preferences to Teaching Methodologies. *Journal of Dental Education* 2006; 70(6): 644-651.
- Jessee, S.A. Letter to the Editor. *Journal of Dental Education* 2002; 66: 1240.
- Johnston, D.W., Bissell, G.D., Trithart, A.H. and O'Shea, R.M. Dental student orientation programme to community health problems. *Journal of Dental Education* 1970; 34(2): 157-164.
- Jolly, D.E. Preceptorships: students learn about the demands of the 'real world'. *Dental Student* 1978; 56(7): 55-56.



- Jones, C.M. Capitation registration and social deprivation in England. An inverse 'dental' care law? *British Dental Journal* 2001; 190(4): 203-206.
- Jones, J.E. The effect of a student summer assistantship program in family medicine on specialty selection. *Family Medicine (US)* 1993; 25(3): 174-175.
- Jones, S., Oswald, N., Date, J. and Hinds, D. Attitudes of patients to medical student participation: general practice consultations on the Cambridge Community-Based Clinical Course. *Medical Education* 1996; 30(1): 14-17.
- Jong, A. and Field, H. The role of a community health center in dental education. *Journal of Dental Education* 1972; 36(3): 36-39.
- Jorm, A.F. and Henderson, A.S. Memory bias in depression: implications for risk factor studies relying on self-reports of exposure. *International Journal of Methods in Psychiatric Research* 1992; 2(1): 31-38.
- Kay, E.J. Dental education – where it needs to be. *Dentistry for the community. British Dental Journal* 2007; 202(13): 1.
- Kell, D.B. and Oliver, S.G. Here is the evidence, now what is the hypothesis? The complementary roles of inductive and hypothesis-driven science in the post-genomic era. *BioEssays* 2003; 26(1): 99-105.
- Khosla, V.M. The education of dental students in modern community hospitals. *Journal of Dental Education* 1972; 36(6): 29-31.
- Kidd, P., Parshall, M.B., Wojcik, S. and Struttman, T. Assessing recalibration as a response-shift phenomenon. *Nursing Research* 2004; 53(2): 130-135.
- Kinirons, M. (2003) Description of Cork Dental School and Hospital extra-mural sessions. Personal correspondence.
- Kinne, R.D. and Stiefel, D.J. Assessment of Student Attitude and Confidence in a Program of Dental Education in Care of the Disabled. *Journal of Dental Education*, 1979; 43(5): 271-275.
- Kirkham, D. A fresh look at how dental schools prepare dentists for today's practice. *Journal of the American College of Dentists* 2001; 68(3): 16-19.
- Kiyak, H.A. and Brudvik, J. Dental Students' Self-Assessed Competence in Geriatric Dentistry. *Journal of Dental Education* 1992; 56(11): 728-734.
- Klein, R. (1995) *The New Politics of the NHS* (third edition). London: Longman.
- Kolb, D. (1984) *Experiential Learning: Experience in the Source of Learning and Development*. Englewood Cliffs, NJ: Prentice Hall.
- Kottak, C.P. (2004) *Window on Humanity: a concise introduction to anthropology*. Boston, MA: McGraw-Hill.
- Kramer, M. (1974) *The Reality Shock; Why Nurses Leave Nursing*. St Louis, Missouri: Mosby.
- Kuthy, R.A., McQuistan, M.R., Riniker, K.J., Heller, K.E. and Qian, F. Students' Comfort Level in Treating Vulnerable Populations and Future Willingness to Treat: Results Prior to Extramural Participation. *Journal of Dental Education* 2005; 69(12): 1307-1314.

- Lahn, L.C. (1998) Tacit professional knowledge and the learning environment of adult workers. In Tøsse, S., Falkencrone, P., Puurula, A. and Bergstedt, B. (Eds). *Corporate and nonformal learning: Adult education research in Nordic countries*. Trondheim: Tapir.
- Lalumandier, J.A., Victoroff, K.Z. and Thuernagle, O. Early Clinical Experience for First-Year Dental Students. *Journal of Dental Education* 2004; 68(10): 1090-1095.
- Larivaara, P., Taanila, A., Huttunen, I., Väisänen, E., Moilanen, I. and Kiuttu, J. From biomedical teaching to biopsychosocial education: a process of change in a Finnish medical school. *Journal of Interprofessional Care* 2000; 14(4): 375-385.
- Lave, J. (1993) The practice of learning. In Chaiklin, S. and Lave, J. (Eds) *Understanding Practice: Perspectives on Activity in Context*. Cambridge: Cambridge University Press.
- Lave, J. and Wenger, E. (1991) *Situated Learning: legitimate peripheral participation*. Cambridge: Cambridge University Press.
- Leach, J. (Ed) (2005) *Guardian University Guide 2006*. London: Guardian Newspapers.
- Leake, J.L., Rosenbloom, J.M., Aslanyan, G. and Huynh-Vo, L.N. (2001) Investigating the Student Potential for Providing Dental Services in Community Settings. Paper presented at Canadian Association of Public Health Dentistry Annual Scientific Conference, April 2001.
- Learning and Teaching Support Network 01 Twenty Twenty Vision – External clinical placements. 01 The newsletter of Itsn01 2004; June: 16-17.
- Lennon, M.A. (2003) Extending outreach teaching into general dental practice. Presentation at the Outreach Teaching Workshop 26 Mar 2003, University of Manchester. <http://www.itsn-01.ac.uk/docs/workshop/lennon.pdf> accessed September 2004.
- Lennon, M.A. An evaluation of the adequacy of the general dental service. *British Dental Journal* 1976; 141(7): 223-225.
- Lennon, M.A. and Turner, R. (2003) Extension of undergraduate teaching into the Personal Dental Service: Analysis of Patient Evaluation. Unpublished report.
- Lennon, M.A., Ireland, R.S., Tappin, J., Ratcliffe, P.M., Taylor, I., Turner, R. and Jenner, A.M. The personal dental service as a setting for an undergraduate clinical programme. *British Dental Journal* 2004; 196(7): 419-422.
- Lennon, M.A.. Outreach Programmes – Serving the Underprivileged. *European Journal of Dental Education* 2003; 7(2): 86.
- Leont'ev, A. (1981) *Problems of the development of mind*. Moscow: Progress Press. (English translation of 1947 Russian original).
- Lerner, M.J., Hall, D.S. and Young, W.O. Evaluating a field experience in Community Dentistry. *Journal of Dental Education* 1971; 35(7): 445-451.
- Levine, D.M., Becker, D.M., Bone, L.R., Hill, M.N., Tuggle, M.B. II and Zeiger, S.L. Community-Academic Health Center Partnerships for Underserved Minority Populations: One Solution to a National Crisis. *Journal of the American Medical Association* 1994; 272 (4): 309-311.



- Levine, N., Sigal, M.J. and Munroe, C.O. Outreach dental programs: A viable adjunct to dental faculty education. *Journal (Canadian Dental Association)* 1986; 52(8): 709-713.
- Likert, R. A technique for the measurement of attitude. *Archives of Psychology* 140: 5-55.
- Lindsay, R. (1989) Review and evaluation. In Watson, D. (Ed), *Managing the Modular Course*. Milton Keynes: Oxford University Press: 91-116.
- Little, B. Undergraduates' Work Based Learning and Skills Development. *Tertiary Education and Management* 2000; 6(2): 119-135.
- Little, B., Moon, S., Pierce, D., Harvey, L. and Marlow-Hayne, N. (2001) *Nature and Extent of Undergraduates' Work Experience*. London: Council for Industry and Higher Education and Department for Education and Skills.
- Locker, D. Issues in measuring change in self-perceived oral health status. *Community Dentistry and Oral Epidemiology* 1998; 26(1): 41-47.
- Logan, H.L., Muller, P.J., Edwards, Y. and Jakobsen, J.R. Using Standardized Patients to Assess Presentation of a Dental Treatment Plan. *Journal of Dental Education* 1999; 63(10): 729-737.
- Lucas, J.L. and Young, W.O. Community Laboratory Experience for Dental Students. *Journal of Dental Education* 1967; 31(1): 77-83.
- Lynöe, N., Sandlund, M., Westberg, K. and Duchek, M. Informed consent in clinical training - patient experiences and motives for participating. *Medical Education* 1998; 32(5): 465-471.
- MacEntee, M.I., Pruksapong, M. and Wyatt, C.C.L. Insights from Students Following an Educational Rotation Through Dental Geriatrics. *Journal of Dental Education* 2005; 69(12): 1368-1376.
- Macluskey, M., Slevin, M., Curran, M. and Nesbitt, R. Indications for and anticipated difficulty of third molar surgery: A comparison between a dental hospital and a specialist high street practice. *British Dental Journal* 2005; 199(10): 671-675.
- MacNeil, M., Christian, J., D'Ambrosio, J., Agar, J. and Mark, H. Introduction and initial assessment of a community-based mentoring program to augment an intramural curriculum. *Journal of Dental Education* 2000; 64(3): 176.
- Madaus, G.F. and Stufflebeam, D.L. (2000) Program Evaluation: a historical overview. In *Evaluation Models: viewpoints on educational and human services evaluation*, second edition. Stufflebeam, D.L., Madaus, G.F. and Kellaghan, T. London: Kluwer: 3-18.
- Manogue, M., Brown, G.A., Nattress, B.R. and Fox, K. Improving student learning in root canal treatment using self-assessment. *International Endodontic Journal* 1999 32(5): 397-405.
- Marshall, S.E. and Formicola, A. Managing Community Practice Programs: A Survey of Critical Issues. *Journal of Dental Education* 1999; 63(12): 909-916.
- Maudsley, G. and Strivens, J. Promoting professional knowledge, experiential learning and critical thinking for medical students. *Medical Education* 2000; 34: 535-544.
- May, G.D. and Kruger, M.J. The manager within. *Personnel Journal* 1988; 67(2): 57-65.



- Mays, N. and Pope, C. (2000) Quality in quantitative health research. In Pope, C. and Mays, N. (eds.), *Qualitative Research in Health Care*, second edition. London: BMJ: 89-101.
- McAlpine, L. Designing learning as well as teaching: A research-based model for instruction that emphasizes learner practice. *Active Learning in Higher Education* 2004; 5(2): 119-134.
- McCrorie, P., Lefford, F. and Perrin, F. (1993) ASME Occasional Publication No 3, *Medical Undergraduate Community-Based Teaching: A Survey for ASME on Current and Proposed Teaching in General Practice in UK Universities*. Edinburgh: Association for the Study of Medical Education.
- McCurdy F.A., Beck, G.L., Kollath, J.P. and Harper, J.L. Pediatric clerkship experience and performance in the Nebraska Education Consortium: a community vs university comparison. *Archives of Pediatrics and Adolescent Medicine* 1999; 153(9): 989-994.
- McCurdy F.A., Sell, D.M., Beck, G.L., Kerber, K., Larzelere, R.E. and Evans, J.H. A Comparison of Clinical Pediatric Patient Encounters in University Medical Center and Community Private Practice Settings. *Ambulatory Pediatrics* 2003; 3(1): 12-15.
- Melton, Rutland and Harborough National Health Service Primary Care Trust Where MRH Leads - Dental. <http://www.mrh.nhs.uk> accessed June 2006.
- Merrill, M.D. (1983) Component Display Theory. In *Instructional-Design Theories and Models. An Overview of their Current Status*. Reigeluth, C.M. (ed.). Hillsdale, N.J.: Lawrence Erlbaum: 61-95.
- Meyers, I. (2004) The 1+3+1 program at the University of Queensland. Presentation at International Association for Dental Research conference symposium on Outreach Teaching, March 2004. [www.dent.umich.edu/iadr/documents/queensland.pdf](http://www.dent.umich.edu/iadr/documents/queensland.pdf) accessed April 2004.
- Miller, S.L. and Heil, J. Effect of an extramural program of dental care for the special patient on attitudes of students. *Journal of Dental Education* 1976; 40(11): 740-744.
- Mofidi, M., Strauss, R., Pitner, L.L. and Sandler, E.S. Dental Students' Reflections On Their Community-Based Experiences: The use of Critical Incidents. *Journal of Dental Education* 2003; 67(5): 515-523.
- Moher, D., Schultz, F.S. and Altman, D.G. The CONSORT statement: revised recommendations for improving the quality of reports of parallel group randomised trials. *BMC Medical Research Methodology* (2001) 1: 2.
- Moon, J.A. (1999) *Reflection in Learning and Professional Development: Theory and Practice*. London: Kogan Page.
- Moosbruker, J.B. and Giddon, D.B. Effect of Experience with Aged, Chronically Ill, and Handicapped Patients on Student Attitudes. *Journal of Dental Education* 1966; 30: 278-286.
- Moran, A.J., Radford, D.R. and Ralph, J.P. The profile of patients referred to an outreach restorative dentistry clinic over the last 10 years has changed. *European Journal of Prosthodontics and Restorative Dentistry* 2005; 13(1): 4-8.
- Morgan, P.J. and Cleave-Hogg, D. Comparison between medical students' experience, confidence and competence. *Medical Education* 2002; 36(6): 534-539.



- Mossey, P. The First Five Years: Dawn of a new era? *British Dental Journal* 2003; 194(7): 350-351.
- Mullins, G., Wetherell, J. and Robbé, I. (2003) Learning in the clinical environment. In Sweet, J., Huttly, S. and Taylor, I. (Eds) *Effective learning & teaching in medical, dental & veterinary education*. London: Kogan Page: 164-179.
- Murray, E. Challenges in educational research. *Medical Education* 2002; 36(2): 110-112.
- Murray, H., Lloyd, K. and Booth, D.R. Abstract. Initial Evaluation of the UWA's BDS Sc Year 5 Student Outplacement Programme. *Journal of Dental Research* 2003; 82(Special Issue C): 16.
- Murray, J.J. Pressures on dental education — a personal view. *British Dental Journal* 2002; 192(8): 433-435.
- Nardi, B.A. (1996) Some Reflections on the Application of Activity Theory. In Nardi, B.A. (Ed) *Context and Consciousness: Activity Theory and Human-Computer Interaction*. London: MIT Press: 235-246.
- National Committee of Inquiry into Higher Education (1997) *Report of the National Committee of Inquiry into Higher Education (Dearing Report)*. London: HMSO.
- National Dental Workforce Unit (2005) *Dental Training Project - Consortia Outreach Teaching: Interim Lessons Learned Report*. Sheffield: National Dental Workforce Unit.
- National Dental Workforce Unit (2006) *Dental Outreach Education: Funding for the future of outreach. A video directed and produced by Rooper, J.* Sheffield: National Dental Workforce Unit.
- National Health Service (2003) *National Service Framework Grades of Evidence*. The NHS National electronic Library for Health [www.library.nhs.uk/mentalhealth](http://www.library.nhs.uk/mentalhealth) accessed September 2006.
- National Health Service (2005) *Statutory Instrument 2005 No. 3373 The National Health Service (Personal Dental Services Agreements) Regulations 2005*. London: The Stationery Office.
- National Health Service (2006) *Hospital Dental Service*. [http://www.nhs.uk/nhs-knowledge\\_base/data/5507.html](http://www.nhs.uk/nhs-knowledge_base/data/5507.html) accessed May 2006.
- National Institute of Adult Continuing Education (2004) *Catching Confidence: The Final Report*. Leicester: National Institute of Adult Continuing Education.
- Nau, D.S. Mixing Methodologies: Can Bimodal Research be a Viable Post-Positivist Tool? *The Qualitative Report* 1995; 2(3). <http://www.nova.edu/ssss/QR/QR2-3/nau.html> accessed May 2004
- Nelson, C.E. (1989) Skewered on the unicorn's horn: The illusion of tragic tradeoff between content and critical thinking in the teaching of science. In Crow, L. (Ed), *Enhancing Critical Thinking in the Sciences*. Washington, DC: Society for College Science Teacher: 17-27.
- Neumann, L.M., Nix, J.A., Wagner, K.S. and Cahill, J. (2000) Abstract. Status of Extramural Dental School Sponsored and Affiliated Clinics. *Journal of Dental Education* 2000; 64(3): 195.

- Norman, G. (2002) Introduction. In Norman, G.R., Van der Vleuten, D.I., Newble, D.I. (Eds). *Handbook of Research in Medical Education*. Dordrecht: Kluwer Academic Publishers: 1-3.
- Norman, G. Hi! How are you? Response shift, implicit theories and differing epistemologies. *Quality of Life Research* 2003; 12(3): 239-249.
- O'Brien, K., Mattick, R., Mandall, N., Wright, J., Conboy, F. and Gosden, T. Are specialist outreach clinics for orthodontic consultation effective? A randomised controlled trial. *British Dental Journal* 2002; 191(4): 203-207.
- O'Leary, J. (2004) *The Times Good University Guide 2005*. London: Times Books.
- O'Loughlin, M. Rethinking Science Education: Beyond Piagetian Constructivism toward a Sociocultural Model of Teaching and Learning. *Journal of Research in Science Teaching* 1992; 29(8): 791-820.
- Office of Fair Trading (2003a) *Survey of dental practices. Supplementary report OFT630a*. London: OFT.
- Office of Fair Trading (2003b) *The private dentistry market in the UK. Report OFT630*. London: OFT.
- Orr, J. (1990) *Sharing Knowledge, Celebrating Identity: War stories and Community Memory in a Service Culture*. In Middleton, D.S. and Edwards, D. (Eds.). *Collective Remembering: Memory in Society*. London: Sage: 169-189.
- Paré, A. and Le Maistre, C. Active learning in the workplace: transforming individuals and institutions. *Journal of Education and Work* 2006; 19(4): 363-381.
- Parker, W.A., Scott, R.W., Barnes, G.P. and Heid, T.H. Effects of an Outreach Dental Care Assessment System in a military population. *Military Medicine* 1988; 153(2): 91-96.
- Parry, J. and Greenfield, S. Community-based teaching: killing the goose that laid the golden egg? *Medical Education* 2001; 35(8): 722-723.
- Pau, A.K.H. and Croucher, R. A dental practice placement scheme: benefits for practitioners and undergraduates. *European Journal of Dental Education* 2001; 5(4): 155-161.
- Pavlov, I.P. (1927) *Conditioned Reflexes: An Investigation of the Physiological Activity of the Cerebral Cortex* (translated by Anrep, G.V.). London: Oxford University Press.
- Pawson, R. and Tilley, N. (1997) *Realistic Evaluation*. London: Sage.
- Pee, B., Woodman, T., Fry, H. and Davenport, E.S Appraising and assessing reflection in students' writing on a structured worksheet. *Medical Education* 2002; 36(6): 575-585.
- Perkins, D.N. (1992) *Smart Schools: Better thinking and learning for every child*. New York: The Free Press.
- Perry, W.G. (1970) *Forms of intellectual and ethical development in the college years: A scheme*. New York: Holt, Rinehart and Winston.
- Petersson, K., Nilner, M. and Rohlin, M. Abstract. Extramural Clinic in Comprehensive Care Education. *European Journal of Dental Education* 2003; 7(2): 95.



- Petraglia, J. The real world on a short leash: The (mis)application of constructivism to the design of educational technology. *Journal Educational Technology Research and Development* 1998; 46(3): 53-65.
- Pfeiffer, C., Madray, H., Ardolino, A. and Willms, J. The rise and fall of students' skill in obtaining a medical history. *Medical Education* 1998; 32(3): 283-288.
- Pfeiffer, C.A., Ardolino, A.J. and Madray, H. The impact of a curriculum renewal project on students' performances on a fourth-year clinical skills assessment. *Academic Medicine* 2001; 76(2): 173-175.
- Phares, E.J. Expectancy changes in skill and chance situations. *Journal of Abnormal and Social Psychology* 1957; 54(3): 339-342.
- Popham, W.J. (1975) *Educational Evaluation*. Englewood Cliffs, New Jersey: Prentice Hall.
- Popkewitz, T.S. (1984) *Paradigm and Ideology in Educational Research*. London: Falmer.
- Pratt, D. Conceptions of teaching. *Adult Education Quarterly* 1992; 42(4): 203-220.
- Pratt, D.D. and Associates (1998) *Five Perspectives on Teaching in Adult and Higher Education*. Malabar, FL: Krieger Publishing.
- Pring, R. The 'False Dualism' of Educational Research. *Journal of Philosophy of Education* 2000; 34(2): 247-260.
- Proctor, C.P. Teacher expectations: A model for school improvement. *Elementary School Journal* 1984; 84(4): 469-481.
- Quality Assurance Agency for Higher Education (2000a) *Subject Review Report, University of Sheffield, Dentistry*. Gloucester: QAA.
- Quality Assurance Agency for Higher Education (2000b) *Subject Overview Report: Dentistry 1998 to 2000*. Gloucester: QAA.
- Quality Assurance Agency for Higher Education (2001) *Code of practice for the assurance or quality and standards in higher education, Section 9: Placement Learning*. Gloucester: QAA.
- Quality Assurance Agency for Higher Education (2002) *Subject Benchmark Statements: Dentistry*. Gloucester: QAA.
- Quality Assurance Agency for Higher Education (2003) *Learning from subject review 1993-2001: sharing good practice*. Gloucester: QAA.
- Quality Assurance Agency for Higher Education (2004) *Code of practice for the assurance of academic quality and standards in higher education Section 2: Collaborative provision and flexible and distributed learning (including e-learning)*. Gloucester: QAA.
- Quality Assurance Agency for Higher Education (2006) *Handbook for institutional audit: England and Northern Ireland*. Gloucester: QAA.
- Qualtrough, A.J.E. Prepare to pair. *British Dental Journal* 1994; 177(6): 194-196.
- Qualtrough, A.J.E. Student operator-assistant pairs. *Journal of Dental Education* 1996; 60(6): 527-532.
- Qualtrough, A.J.E. Student operator-assistant pairs: an update. *British Dental Journal* 2001; 190(11): 614-618.

- Queen's University Belfast Academic Council Office (2004) University Subject Review Report: School of Dentistry. Belfast: Queen's University.
- Rabinowitz, H.K. Recruitment, Retention, And Follow-Up Of Graduates Of A Program To Increase The Number Of Family Physicians In Rural And Underserved Areas. *New England Journal of Medicine* 1993; 328(13): 934-939.
- Rainbird, H., Fuller, A. and Munro, A. (Eds) (2004) *Workplace learning in context*. London: Routledge.
- Rao, R. Dignity and impudence: How should medical students acquire and practise clinical skills for use with older people? *Medical Education* 2003; 37(3): 190-191.
- Rausch, J.R., Maxwell, S.E. and Kelley, K. Analytic Methods for Questions Pertaining to a Randomized Pretest, Posttest, Follow-Up Design. *Journal of Clinical Child and Adolescent Psychology* 2003; 32(3): 467-486.
- Reddy, P. and Moores, E. Measuring the Benefits of a Psychology Placement Year. *Assessment and Evaluation in Higher Education* 2006; 31(5): 551-567.
- Reder, L.M. and Klatzky, R. (1994) Transfer: Training for performance. In Drukman, D. and Bjork, R.A. (Eds), *Learning, remembering, believing: Enhancing team and individual performance*. Washington, DC: National Academy Press: 25-56.
- Reeves, S. Community-based interprofessional education for medical, nursing and dental students. *Health and Social Care in the Community* 2000; 8(4): 269-276.
- Regehr, G., Hodges, B., Tiberius, R. and Lofchy, J. Measuring self-assessment skills: an innovative relative ranking model. *Academic Medicine* 1996; 71(10 Supplement): 52-54.
- Remmen, R., Scherpbier, A., van der Vleuten, C., Denekens, J., Derese, A., Hermann, I., Hoogenboom, R., Kramer, A., Van Rossum, H., Van Royen, P. and Bossaert, L. Effectiveness of basic clinical skills training programmes: a cross-sectional comparison of four medical schools. *Medical Education* 2001; 35(2): 121-128.
- Rennie, J.S. (2002) *A Strategy for the Development of Education for the Dental Team in Scotland: A Paper for Discussion*. Edinburgh: NHS Education for Scotland.
- Revere, J.H. and Hunt, R.J. Recent graduates' self-assessment of competency as a tool for curriculum evaluation. *Journal of Dental Education* 2000; 64(3): 209.
- Rismark, M. and Sitter, S. Workplaces as Learning Environments: interaction between newcomer and work community. *Scandinavian Journal of Educational Research* 2003; 47(5): 495-510.
- Ritchie, J. and Spencer, E. (1993) Qualitative data analysis for applied policy research. In Bryman, A. and Burgess, R.G. (Eds.) *Analyzing Qualitative Data*. London: Routledge: 173-194.
- Robinson, E. and Bagramian, R.A. The Community Practice Program at the University of Michigan Ann Arbor USA. *Community Dentistry and Oral Epidemiology* 1974; 2(6): 269-272.
- Robinson, P.B. and Davies, B.R. Reflective practice in the teaching of conservative dentistry to undergraduate dental students – perceptions derived from a pilot study using personal development diaries. *European Journal of Dental Education* 2004; 8(2): 67-71.



- Robinson, P.G. (2006) The Sheffield Model. A presentation at a conference Options for Change in Dental Education: Where are we now? The MANDEC Centre, University of Manchester, 29 November 2006.
- Robinson, P.G. and Smith, M. Education for trainers in dental outreach, a mini project update. 01 the newsletter of the Subject Centre for Medicine, Dentistry and Veterinary Medicine 2005 October.
- Rock, W.P. and Foster, T.D. A programme of clinical work by undergraduate dental students in community dental clinics. *British Dental Journal*. 1982; 152(1): 12-14.
- Rodgers, B. (2002) Looking at the General Dental Service. *Dental Practice Board Annual Dental Review 2001-2002*: 10-16.
- Rogoff, B., Matusov, E. and White, C. (1996) Models of Teaching and Learning: Participation in a Community of Learners. In Olson, D. and Torrance, N. (Eds). *Handbook of Education and Human Development: New Models of Learning, Teaching, and Schooling*. Oxford: Blackwell: 388-414.
- Rømer, T.A. Learning Process and Professional Content in the Theory of Donald Schön. *Reflective Practice*, 2003; 4(1): 85-93.
- Rosenthal, R. and Jacobson, L. *Pygmalion in the classroom*. New York: Holt, Rinehart & Winston.
- Ross, M.K. The increasing demand and necessity for a team approach. *British Dental Journal* 2004; 196: 181.
- Ross, M.K., Ibbetson, R.J. and Turner, S. The acceptability of dually-qualified dental hygienist-therapists to general dental practitioners in South-East Scotland. *British Dental Journal* 2007 In Press.
- Roter, D.L. (2002) *The Roter Method of Interaction Process Analysis*. Baltimore: Department of Health Policy and Management, School of Hygiene and Public Health, The John Hopkins University.
- Roter, D.L., Larson, S., Shinitzky, H., Chernoff, R., Serwint, J.R., Adamo, G. and Wissow, L. Use of an innovative video feedback technique to enhance communication skills training. *Medical Education* 2004; 38(2): 145-157.
- Royal College of Surgeons of Edinburgh (2003) *A Short History of Dentistry in Edinburgh*. <http://www.rcsed.ac.uk/content/faciliti/museums/3092003112953.aspx> accessed January 2005.
- Royal College of Surgeons of England (2001) *Clinical guidelines and integrated care pathways for the oral health care of people with learning disabilities*. London: Faculty of Dental Surgery, Royal College of Surgeons.
- Rubin, R.W. Developing Cultural Competence and Social Responsibility in Preclinical Dental Students. *Journal of Dental Education* 2004; 68(4): 460-487.
- Rumelhart, D.E. and Norman, D.A. (1978) Accretion, tuning and restructuring: three modes of learning. In Klatzky, R., Cotton, J.W. (Eds). *Semantic factors in cognition*. Hillsdale, NJ: Lawrence Erlbaum Associates: 37-53.
- Sackett, D.L., Strauss, S.E., Richardson, W.S., Rosenberg, W.M.C. and Haynes, R.B. (2000) *Evidence-based medicine: how to practice and teach EBM*. 2nd ed. London: Churchill Livingstone.

- Samuel, O., Sackin, P., Salinsky J., Suckling, H.S., McKee, A. and Pinder, R. Balint in GP vocational training schemes. *Work Based Learning in Primary Care* 2004; 2(1): 26-37.
- Sandars, J. Work Based Learning: a social network perspective. *Work Based Learning in Primary Care* 2005; 3(1): 4-12.
- Sanders, R.M. and Ferrillo Jr, P.J. A new school's perspective on clinical curriculum. *Journal of Dental Education* 2003; 67(12): 1316-1319.
- Saunders, M. and Machell, J. Understanding emerging trends in higher education curricula and work connections. *Higher Education Policy* 2000; 13(3): 287-302.
- Saunders, M. From 'organisms' to 'boundaries': the uneven development of theory narratives in education, learning and work connections. *Journal of Education and Work* 2006; 19(1): 1-27.
- Schön, D.A. (1983) *The Reflective Practitioner*. New York: Basic Books.
- Schön, D.A. (1987) *Educating the Reflective Practitioner*. San Francisco: Jossey-Bass.
- School of Clinical Dentistry, University of Sheffield (2004) *Proposal to Support the Expansion of the Dental Workforce, a response to the Chief Dental Officer*.
- Schuwirth, L. and Cantillon, P. The need for outcome measures in medical education. *British Medical Journal* 2005; 331: 977-978.
- Scriven, M. (1967) The methodology of evaluation. In Tyler, R., Gagne, R. and Scriven, M. (Eds) *Perspectives of Curriculum Evaluation*. Chicago, Illinois: Rand McNally: 39-83.
- Scriven, M. (1983) *Evaluation Models*. Lancaster: Kluwer-Nijhoff.
- Scriven, M. (1995) *Using Student Ratings in Teacher Evaluation*. Washington, DC: Center for Research on Educational Accountability and Teacher Evaluation.
- Seager, J.M., Howell-Jones, R.S., Dunstan, F.D., Lewis, M.A.O., Richmond, S. and Thomas, D.W. A randomised controlled trial of clinical outreach education to rationalise antibiotic prescribing for acute dental pain in the primary care setting. *British Dental Journal* 2006; 201(4): 217-222.
- Seagraves, L., Osborne, M., Neal, P., Dockrell, R., Hartshorn, C. and Boyd, A. (1996) *Learning in Smaller Companies. Final Report*. Stirling: Educational Policy and Development, University of Stirling.
- Senate of Dental Specialties (2004) *Good practice in the dental specialties*. London: Royal College of Surgeons of England.
- Shapiro, S. and Hamby, C.L. The impact of extramural training programs on dental shortage areas. *Journal of Dental Education* 1983; 47(1): 43.
- Sharp, H.M., Kuthy, R.A. and Heller, K.E. Ethical dilemmas reported by fourth-year dental students. *Journal of Dental Education* 2005; 69(10): 1116-1122.
- Shaw, M. and Dorling, D. Who cares in England and Wales? The Positive Care Law: cross-sectional study. *British Journal of General Practice* 2004; 54(509): 899-903.
- Shuell, T.J. Toward a Unified Approach to Learning as a Multisource Phenomenon. *Review of Educational Research* 1990; 60(4): 531-547.
- Silver, H. and Silver, P. *Students: changing roles, changing lives*. Buckingham: Open University Press.



- Silverman, D. (2001) *Interpreting qualitative data: Methods for Analysing Talk, Text and Interaction*, 2nd edition. London: Sage.
- Silvester, S., Calnan, M., Manley, G. and Taylor-Gooby, P. Going Private? Exploring the Drift Away from the NHS. *Primary Dental Care* 2000; 7(2): 49-53.
- Simons, R.J., Imboden, E. and Martel, J.K. Patient attitudes toward medical student participation in a general internal medicine clinic. *Journal of General Internal Medicine* 1995; 10(5): 251-254.
- Skelton, J., Mullins, M.R., Kaplan, A.L., West, K.P. and Smith, T.A. University of Kentucky community-based field experience: program description. *Journal of Dental Education* 2001; 65(11): 1238-1242.
- Smith, C.S., Ester, T.V. and Inglehart, M.R. Providing Care for Underserved Patients: The Role of Dental Education. *Journal of Dental Education* 2005; 69(1): 112-113.
- Smith, M. An educational package for trainers in dental outreach placements. A miniproject update in the LTSN-01 newsletter 2004; June: 8-9.
- Smith, M. and Crossley, M. Public service values. Letter. *British Dental Journal* 2004; 196(8): 441.
- Smith, M., Brook, A. and Robinson, P.G. (2004c) Abstract. Dental Students' Activities on Outreach Training. Abstract 127 for British Society for Dental Research scientific meeting, Birmingham, April 6-8, 2004. ([www.dentalresearch.org](http://www.dentalresearch.org)).
- Smith, M., Brook, A. and Robinson, P.G. Abstract. Supervisors' perceptions of interdisciplinary outreach training in the dental curriculum. *Journal for Dental Research* 2004; 83(Spec Iss B): 129(2015).
- Smith, M., Lennon, M.A., Brook, A.H. and Robinson, P.G. (2005c) Abstract. Outreach Placement Increases Students' Clinical Activity. Abstract 198 for British Society for Dental Research scientific meeting, Dundee, April 5-7, 2005. ([www.dentalresearch.org](http://www.dentalresearch.org)).
- Smith, M., Lennon, M.A., Brook, A.H. and Robinson, P.G. A Randomized Controlled Trial of Outreach Placement's Effect on Dental Students' Clinical Confidence. *Journal of Dental Education* 2006; 70(5): 566-570.
- Smith, M., Lennon, M.A., Brook, A.H. and Robinson, P.G. Outreach Placements Increase Students' Confidence to Plan Treatment. *Journal of Dental Research* 2005; 84(Spec Iss A): 181(3235).
- Smith, M., Lennon, M.A., Brook, A.H. and Robinson, P.G. Perspectives of staff on student outreach placements. *European Journal of Dental Education* 2006; 10(1): 44-51.
- Smith, M., Lennon, M.A., Brook, A.H., Blinkhorn, F.A., Blinkhorn, A.S. and Robinson, P.G. Abstract. Outreach placements increase undergraduates' treatment planning ability. *Journal of Dental Research* 2005; 84(Spec Iss A): 181(3234).
- Smith, M., Lennon, M.A., Brook, A.H., Blinkhorn, F.A., Blinkhorn, A.S. and Robinson, P.G. A randomised controlled trial of the effect of outreach placement on treatment planning by dental students. *British Dental Journal* 2006; 201(Education sup): 27-31.
- Smith, M., Lennon, M.A., Brook, A.H., Ritucci, L. and Robinson, P.G. Student perspectives on their recent dental outreach placement experiences. *European Journal of Dental Education* 2006; 10(2): 80-86.



- Smith, M., Ritucci, L., Brook, A. and Robinson, P.G. Abstract. Dental students' experience of interdisciplinary outreach training. *Journal for Dental Research* 2004; 83(Spec Iss B): 129(2016).
- Smith, M., Tomlinson, M., Brook, A. and Robinson, P.G. (2003a) Abstract. Training the Dental Team Together – Initial Findings from Pilot. Presentation at South Yorkshire Workforce Development Confederation conference, Sheffield, 6 November 2003.
- Smith, M., Tomlinson, M., Brook, A. and Robinson, P.G. (2003b) Training the Dental Team Together in Outreach Placements. Presentation at South Yorkshire Workforce Development Confederation conference, Sheffield, 6 November 2003.
- Smith, P. (1995) Outcome-related performance indicators and organisational control in the public sector. In Holloway, J., Lewis, J. and Mallory, G. (Eds). *Performance, Measurement and Evaluation*. London: Sage: 192-216.
- Smith, R.C. The Biopsychosocial Revolution: Key Issues for Primary Care. *Journal of General Internal Medicine* 2002; 17(4): 309-310.
- Smithers, A.G. (1976) *Sandwich Courses: an integrated education?* Windsor: National Foundation for Educational Research.
- Snelgrove, A. (2005) Speech to the House of Commons. 29th June 2005. *Parliamentary Debates, Commons, 5th series, cm50629, cols 1336*.
- Soble, R.K. Extramural experience as an educational methodology in dentistry. *Journal of Dental Education* 1971; 35(6): 365-370.
- Social Science Research Centre (2000) *Sociologists in Placements: placement issues*. Newcastle upon Tyne: Social Science Research Centre, University of Northumbria. <http://www.unn.ac.uk/academic/ss/SIP> accessed June 2003.
- Soumerai, S.B. and Avorn, J. Principles of educational outreach ('academic detailing') to improve clinical decision making. *Journal of the American Medical Association* 1990; 263(4): 549-556.
- South Yorkshire Workforce Confederation, The University of Sheffield and Sheffield Hallam University (2003) *Placement Charter: A guide for students, clinical and teaching staff*. Sheffield: SYWC.
- Spencer, J. ABC of learning and teaching in medicine: Learning and teaching in the clinical environment. *British Medical Journal* 2003; 326: 591-594.
- Spielman, A.I., Fulmer, T., Elise, S. Eisenberg, E.S. and Alfano, M.C. Dentistry, Nursing, and Medicine: A Comparison of Core Competencies. *Journal of Dental Education* 2005; 69(11): 1257-1271.
- Spouse, J. Bridging theory and practice in the supervisory relationship: a sociocultural perspective. *Journal of Advanced Nursing* 2001; 3(4): 512-522.
- Sprangers, M. and Hoogstraten, J. Pretesting effects in retrospective pretest-posttest designs. *Journal of Applied Psychology* 1989; 74(2): 265-272.
- Sprangers, M.A.G. and Schwartz, C.E. Integrating response shift into health-related quality of life research: a theoretical model. *Social Science & Medicine* 1999; 48(11): 1507-1515.



- Stake, R.E. (1967b) Toward a Technology for the Evaluation of Educational Programs. In Perspectives of Curriculum Evaluation, American Educational Research Association Monograph Series on Curriculum Evaluation, Tyler, R.W. *et al.* (Eds). Chicago: Rand McNally & Co.: 1-12.
- Stake, R.E. (1975) Program Evaluation: Particularly responsive evaluation. Center for Instructional Research and Curriculum Evaluation, Paper #5 in the Occasional Paper Series. Urbana-Champaign, Illinois: University of Illinois, CRICE.
- Stake, R.E. The Countenance of Educational Evaluation. *Teachers College Record* 1967; 68: 523-540.
- Stanton, F. and Grant, J. Approaches to experiential learning, course delivery and validation in medicine. A background document. *Medical Education* 1999; 33(4): 282-297.
- Steffe, L.P. and D'Ambrosio, B.S. Toward a working model of constructivist teaching: a reaction to Simon. *Journal for Research in Mathematics Education* 1995; 26(2): 146-159.
- Stewart, J., O'Halloran, C., Barton, J.R., Singleton, S.J., Harrigan, P. and Spencer, J. Clarifying the concepts of confidence and competence to produce appropriate self-evaluation measurement scales. *Medical Education* 2000; 34(11): 903-909.
- Stewart, K. and Treasure, E. (2005) Abstract. Introducing a Family Outreach Project in the Dental Undergraduate Curriculum. *Journal Dental Research* 2005; 84(Special Issue A): 3238. ([www.dentalresearch.org](http://www.dentalresearch.org)).
- Stewart, K.F., Morgan M.Z. and Treasure, E.T. Introducing a family case study to the dental undergraduate curriculum. *British Dental Journal* 2007; 202(3): 151-155.
- Stiefel, D.J. Inclusion of a program of instruction in care of the disabled in a dental school curriculum. *Journal of Dental Education* 1979; 43(5): 262-270.
- Stillman, P.L., Brown, D.R., Redfield, D.L. and Sabers, D.L. Construct validation of the Arizona Clinical Interview Rating scale. *Educational and Psychological Measurement* 1977; 37(4): 1031-1037.
- Stillman, P.L., Sabers, D.L. and Redfield, D.L. The Use of Paraprofessionals to Teach Interviewing Skills. *Pediatrics* 1976; 57(5): 769-774.
- Stillman, P.L., Sabers, D.L. and Redfield, D.L. Use of trained mothers to teach interviewing skills to first-year medical students: a follow-up study. *Pediatrics* 1977; 60(2): 165-169.
- Stone, D. and Campbell, H. Child health promotion and its challenge to medical education. *British Medical Journal* 1997; 315(7110): 694-695.
- Strauss, R., Mofidi, M., Sandler, E.S., Williamson 3rd, R., McMurtry, B.A., Carl, L.S. and Neal, E.M. Reflective learning in community-based dental education. *Journal of Dental Education* 2003; 67(11): 1234-42.
- Stringer, M. and Finlay, C. (1993) Assuring Quality through Student Evaluation. In Ellis, R. (Ed), *Quality Assurance for University Teaching*. Buckingham: Open University Press: 92-112.
- Stronach, I. and Morris, B. Polemical notes on educational evaluation in the age of 'policy hysteria'. *Evaluation and Research in Education* 1994; 8(1-22), 5-18.

- Susi, F.R. and Romberg, F. (2003) Abstract. Building Dental Student Competence and Confidence: Tufts Externship Program. *Journal of Dental Research* 2003; 82(Spec Iss B): 740.
- Taylor, I. and Turner, R. (2002) Extension of Undergraduate Clinical Programme into the P.D.S.: an evaluation of participant perceptions. Liverpool: University of Liverpool, School of Dentistry.
- Taylor, I., Barnes, J. and Astle, N. (1995) Promoting Independent Learning, The Role of the Workplace, a summary of the University of Liverpool Work-Based Learning Project. Liverpool: Liverpool University Press.
- Telegraph (2005) 800 queue for NHS dentists. *Telegraph* 2005; 5 May: 3.
- Tennant, M. and McGeachie, J.K. Australian dental schools: Moving towards the 21st century. *Australian Dental Journal* 1999; 44(4): 238-242.
- Tennant, M., Coombe, L. and Kruger, E. Rural Experience for Final Year Dental Students. *Journal of Dental Research* 2003; 82(Special Issue C): 20.
- Theaker, E.D., Kay, E.J. and Gill, S. Development and preliminary evaluation of an instrument designed to assess dental students' communication skills. *British Dental Journal* 2000; 188(1): 40-44.
- Thind, A., Atchison, K. and Andersen, R. What Determines Positive Student Perceptions of Extramural Clinical Rotations? An Analysis Using 2003 ADEA Senior Survey Data. *Journal of Dental Education* 2005; 69(3): 355-362.
- Thistlethwaite, J. and Leahy, C. Work based learning: learning from and in communities. *Work Based Learning in Primary Care* 2004; 2(3): 267-269.
- Thorne, S. Data analysis in qualitative research. *Evidence-Based Nursing* 2000; 3(3): 68-70.
- Thornton, J.B. UAB School of Dentistry: Reaching Outside the Walls. *Journal of the American College of Dentists* 2004; 71(1):17-19.
- Toy, A. and Richards, W. A specialism of Primary Dental Care? *Primary Dental Care* 2004; 11(1): 5-7.
- Trowler, P. (2004) Reinventing the University: visions and hallucinations. Keynote speech to the Rhodes Centenary conference, 6 December 2004 <http://www.ru.ac.za/academic/adc/conference/docs/PaulTrowler.pdf>. Accessed December 2006. Grabamstown, SA: University of Rhodes.
- Trowler, P. and Cooper, A. Teaching and Learning Regimes: Implicit theories and recurrent practices in the enhancement of teaching and learning through educational development programmes. *Higher Education Research and Development* 2002; 21(3): 221-240.
- Tyack, D. and Cuban, L. (1995) Tinkering toward Utopia. Cambridge, Massachusetts: Harvard University Press.
- UK Government (2003) Health and Social Care Bill, 70. London: The Stationery Office.
- Universities and Colleges Employers Association (2005) UCEA Health and Safety Guidance for the Placement of HE Students. London: UCEA.



- University of Bath Undergraduate Recruitment & Admissions (2004) Choosing a course. University of Bath undergraduate admissions web page <http://www.bath.ac.uk/admissions/undergrad/apply/coursechoice.html>, accessed November 2005.
- University of Glasgow (2004) Dentistry, Undergraduate Course Information. Glasgow: University of Glasgow, 2004.
- University of Manchester (2001) The Role of Outreach Teaching in the Dental Curriculum of the Future: Report of a workshop held at the Manchester Dental Education Centre on 19 February 2001. Eden Bianchi Press: Manchester (2001).
- University of New Mexico Center for Community Partnerships (2002) Dental Health in New Mexico, a summary of resources and initiatives on <http://hsc.unm.edu/som/outreach/dental/dental.html> accessed October 2004.
- University of Sheffield (2003) Guidelines for Departments on Placement Learning Based on the QAA Code of Practice: Section 9, Placement Learning, Revised August 2003. Sheffield: Teaching and Learning Support Unit, University of Sheffield.
- University of Sheffield (2004) The School of Clinical Dentistry, School's Outreach. Sheffield: University of Sheffield: 2004. <http://www.shef.ac.uk/dentalschool/outreach.html> accessed November 2004.
- University of Texas Health Science Center at San Antonio Dental School (2004) Community-Based Training Programs. <http://dental.uthscsa.edu/educprog> accessed October 2004.
- Unsworth, J. (2004) Developing primary health care: a role of Accredited Work Based Learning? In Swallow, V., Miller, J. and Chambers, H. (Eds) Partnerships in Work Based Learning. Newcastle upon Tyne: Northumbria University Press: 51-66.
- Vannatta, J.B., Smith, K.R., Crandall, S., Fischer, P.C. and Williams, K. Comparison of Standardised Patients and Faculty in Teaching Medical Interviewing. *Academic Medicine* 1996; 71: 1360-1362.
- Villat, C., Farge, P. and Bois, P. Outcome assessment of the French internship graduate programme. *European Journal of Dental Education* 2004; 8(1): 31-34.
- Vining, R.V. Comprehensive dental care: objectives, management, and financial impact. *Journal of Dental Education* 1984; 48(6 Suppl): 7-10.
- Vrahnos, D. and Maddux, M.S. Introductory Clinical Clerkship During the First and Second Professional Years: Emphasis in Clinical Practice and Writing. *American Journal of Pharmaceutical Education* 1998; 62(1): 53-61.
- Vygotsky, L.S. (1978) *Mind in society: the development of higher psychological processes* (translated from the Russian by Cole *et al.*).
- Wade, V., Silagy, C. and Mahoney, S. A prospective randomized trial of an urban general practice attachment for medical students. *Medical Education* 1998; 32(3): 289-293.
- Wagner, J., D'Ambrosio, J.A., Arteaga, S., Hodge, C., Ioannidou, E., Pfeiffer, C. and Reisine, S. (2005) Abstract. A Patient-Instructor Module to Promote Cross-Cultural Communication Skills. *Journal of Dental Education* 2005; 69(1): 131(70).
- Wall, A.L. Evaluating an undergraduate unit using a focus group. *Quality Assurance in Education* 2001; 9(1): 23-31.



- Wanigasooriya, N. Student self-assessment of essential skills in dental surgery. *British Dental Journal* 2004; 197(5): 11-14.
- Watt, S. and Paterson, L.C. Pathways and Partnerships: widening access to higher education. *Journal of Further and Higher Education* 2000; 24(1): 107-116.
- Weaver, R.G., Chmar, J.E., Harden, N.K. and Valachovic, R.W. Annual ADEA survey of dental school seniors: 2004 Graduating Class. *Journal of Dental Education*; 2005 69(5): 595-619.
- Weaver, R.G., Harden, N.K. and Valachovic, R.W. Annual ADEA survey of dental school seniors: 2003 Graduating Class. *Journal of Dental Education*; 2004 68(9): 1004-1027.
- Wenger, E. (1999) *Communities of Practice: Learning, meaning and identity*. Cambridge: Cambridge University Press.
- Wilcox, H.K., Browdie, G.S. and Meyers, M.A.. Dental Service and Dental Education In a Community Hospital. *Journal of Hospital Dental Practice* 1977; 11(2): 13-17.
- Wilson, N. (2006) Models for Funding for Outreach. A presentation at a conference Options for Change in Dental Education: Where are we now? The MANDEC Centre, University of Manchester, 29 November 2006.
- Wimpenny, S. (2004) Reflection in Accredited Work Based Learning for personal development. In Swallow, V., Miller, J. and Chambers, H. (Eds) *Partnerships in Work Based Learning*. Newcastle upon Tyne: Northumbria University Press: 99-112.
- Winkley, G.P., Brown, J.O., White, S.L. and Hoffman, L.A. Strategies: Externship as an Enrichment Experience. *Journal of Dental Education* 1991; 55(3): 215-216.
- World Health Organisation (1978) Declaration of Alma-Ata. International Conference on Primary Health Care, Alma-Ata, USSR. Geneva: WHO.
- Woronuk, J.I., Pinchbeck, Y.J. and Walter, M.H. University of Alberta dental students' outreach clinical experience: an evaluation of the program. *Journal of the Canadian Dental Association* 2004; 70(4): 233-236.
- Wright, C.C. and Sim, J. Intention-to-treat approach to data from randomized controlled trials: a sensitivity analysis. *Journal of Clinical Epidemiology* 2003; 56(9): 833-842.
- Wright, R.A. Community-Oriented Primary Care: The Cornerstone of Health Care Reform. *Journal of the American Medical Association* 1993; 269(19): 2544-2547.
- Wring, C. (1991) *Education, Schooling and the World of Work*, in Curson, D. (Ed), *Education for Work*. Clevedon, UK: Open University.
- Young, D., Gillett, A. and Pine, C. (2005) Abstract. Evaluation of the new Liverpool Dental Undergraduate Outreach Programme. Abstract 49 for the British Society for Dental Research scientific meeting, Dundee 2005. ([www.dentalresearch.org](http://www.dentalresearch.org)).
- Young, M. and Guile, D. (1998) Reflexivity, knowledge and learning: The challenge for specialist learning organisations (SLOs) and non-specialist learning organisations (NSLOs). In Easterby-Smith, M. and Burgoyne, M.J. (Eds) *Learning around Organisations*, London: Sage.
- Young, M. Contextualising a New Approach to Learning: some comments on Yrjo Engestrom's theory of expansive learning. *Journal of Education and Work* 2001; 14(1): 157-161.



# Appendices

## List of Appendices:

Appendix A	Publications and Presentations.....	259
Appendix B	Documents: Protocols, Letters and Questionnaires .....	310
Appendix C	Statistical Findings.....	328
Appendix D	Chronologies.....	336
Appendix E	Glossary.....	340

# Appendix A

## Publications and Presentations

### List of Presentations

- A1. South Yorkshire Workforce Confederation conference, Sheffield, November 2003, Poster 1 Training the Dental Team Together: Initial findings from Pilot ..... 259
- A2. South Yorkshire Workforce Confederation conference, Sheffield, November 2003, Poster 2 Training the Dental Team Together in Outreach Placements..... 260
- A3. International Association for Dental Research conference, March 2004, Abstract 1, Dental students' experience of interdisciplinary outreach training ..... 261
- A4. International Association for Dental Research conference, March 2004, Abstract 2, Supervisors' perceptions of interdisciplinary outreach training in the dental curriculum ..... 262
- A5. British Society for Dental Research, Birmingham, April 2004, Oral presentation, Dental students' activities on outreach training ..... 263
- A6. Research Led Teaching, Spotlight on Learning and Teaching Conference, Sheffield, May 2004, Oral Presentation, Student Placements in dental education: stakeholder perceptions ..... 264



- 
- A7. International Association for Dental Research conference, March 2005, Abstract 1, Outreach Placements Increase Students' Confidence to Plan Treatment ..... 265
- A8. International Association for Dental Research conference, March 2005, Abstract 2, Outreach placements increase undergraduates' treatment planning ability ..... 266
- A9 British Society for Dental Research, Dundee, April 2005, Oral presentation, Outreach Placement Increases Students' Clinical Activity.. 267
- A10 International Association for Dental Research conference, June 2006, Abstract, Do block outreach placements disadvantage students' school-based learning?..... 268
- A11 International Association for Dental Research Pan-European conference, September 2006, Abstract 1, Do outreach placements affect the quality of students' hospital-based work?..... 269
- A12 International Association for Dental Research Pan-European conference, September 2006, Abstract 2, Gender differences in students' self-reported estimates of clinical experience ..... 270
- A13 South Yorkshire Dental Network, Oral presentation to meeting, November 2004 Outreach Placement Initiative ..... 271
- A14 Annual meeting of the Directors of Schools of Hygiene and Therapy. Oral presentation to meeting, March 2005 Sheffield's Developments in Outreach Placements..... 272
- A15 British Association for the Study of Community Dentistry workshop, Outreach Teaching. Oral presentation. November 2005..... 274
- A16 Series of three posters for stakeholders reporting the RCT ..... 276
- A17 International Association for Dental Research, Pan-European Confederation Conference. Symposium presentation: Outreach Training Programmes – What do the data say? September 2006 ..... 279
- A18 International Association for Dental Research, Pan-European Confederation Conference. Oral presentation. September 2006. Gender differences in students' self-reported estimates of clinical experience..... 282

---

**List of Publications**

- A19 Smith, M., Lennon, M.A., Brook, A.H. and Robinson, P.G. Perspectives of staff on student outreach placements. *European Journal of Dental Education* 2006; 10(1): 44-51. .... 283
- A20 Smith, M., Lennon, M.A., Brook, A.H., Ritucci, L. and Robinson, P.G. Student perspectives on their recent dental outreach placement experiences. *European Journal of Dental Education* 2006; 10(2): 80-86. .... 291
- A21 Smith, M., Lennon, M.A., Brook, A.H. and Robinson, P.G. A Randomized Controlled Trial of Outreach Placement's Effect on Dental Students' Clinical Confidence. *Journal of Dental Education* 2006; 70(5): 566-570. 298
- A22 Smith, M., Lennon, M.A., Brook, A.H., Blinkhorn, F.A., Blinkhorn, A.S. and Robinson, P.G. A randomised controlled trial of the effect of outreach placement on treatment planning by dental students. *British Dental Journal* 2006; 201(Education supplement): 27-31. .... 303



---

## **A1 South Yorkshire Workforce Confederation conference, Sheffield, November 2003, Poster 1 Training the Dental Team Together: Initial Findings from Pilot**

Dental teams will need to develop and expand if they are to meet the needs of all communities. These challenges are at the heart of government policy and the Modernisation of Dentistry agenda as set out in The NHS Plan, NHS Dentistry: Options for Change, GCD's First Five Years, and the 2003 Health and Social Care Bill.

Outreach training is a significant and effective step in dental students' preparation for practice. Inter-professional working is a key element in this development. The proposal seeks to develop and embed an inter-professional approach to dental education through placements for teams of dental undergraduates, hygienists, therapists and nurses in NHS primary care settings.

Building on a successful spring 2003 pilot with twenty students across several locations, a half-cohort study in 2004 will inform further developments for full implementation the following academic year. The placements will expand dental services in areas of identified need and increase students' awareness of different communities.

A Team Training Group within the Dental School of the University of Sheffield is driving this initiative, developing training packages for supervising dentists, encouraging the production of learning materials for placement students and coordinating the changes needed to ensure coherence with other parts of students' programmes.

The influence of this model will extend beyond those students involved in developing inter-professional teams. The local supervising staff will be closely involved and neighbouring GDPs will be encouraged to observe the initiative through CPD activities.

This proposal aims to develop and evaluate inter-professional outreach placements for dental students in host clinics in areas of dental need. The poster illustrates experiences from the pilot drawn from the initial evaluation findings.

---

## **A2 South Yorkshire Workforce Confederation conference, Sheffield, November 2003, Poster 2 Training the Dental Team Together in Outreach Placements**

Dental teams will need to develop and expand if they are to meet the needs of all communities. These challenges are at the heart of government policy and the Modernisation of Dentistry agenda as set out in The NHS Plan, NHS Dentistry: Options for Change, GCD's First Five Years, and the 2003 Health and Social Care Bill.

Outreach training is a significant and effective step in dental students' preparation for practice. Inter-professional working is a key element in this development. The proposal seeks to develop and embed an inter-professional approach to dental education through placements for teams of dental undergraduates, hygienists, therapists and nurses in NHS primary care settings.

Building on a successful spring 2003 pilot with twenty students across several locations, a half-cohort study in 2004 will inform further developments for full implementation the following academic year. The placements will expand dental services in areas of identified need and increase students' awareness of different communities.

A Team Training Group within the Dental School of the University of Sheffield is driving this initiative, developing training packages for supervising dentists, encouraging the production of learning materials for placement students and coordinating the changes needed to ensure coherence with other parts of students' programmes.

The influence of this model will extend beyond those students involved in developing inter-professional teams. The local supervising staff will be closely involved and neighbouring GDPs will be encouraged to observe the initiative through CPD activities. This proposal aims to develop and evaluate inter-professional outreach placements for dental students in host clinics in areas of dental need. The poster illustrates the bringing together of the professionals into a team and links to those professions beyond the dental team.



### **A3 International Association for Dental Research conference, March 2004, Abstract 1, Dental students' experience of interdisciplinary outreach training**

Dental Schools are developing new undergraduate curricula, with interdisciplinary outreach placements replacing some of the hospital-based training.

Objectives: To explore students' experience of outreach placement.

Intervention: Six-week block placement for 20 undergraduate and therapy students in existing primary care clinics, in areas of need, to work supervised by local dentists.

Methods: Semi-structured interviews with all 20 students by staff independent of the course team. Interviews were audio-recorded, transcribed and then content analysed. Findings were triangulated by reviewing by a second observer, against a questionnaire-based survey and against peer-run focus groups.

Results: Overall students were very positive about their experience and the potential role of outreach training in dental education. Students described: gaining greater experience of new types of patients (children, special needs, phobics, asylum seekers, less affluent, drug users, etc.) and their communities; learning from broader clinical experience, alternative approaches and practicing or observing dentistry in different settings; the benefits of working as part of a multi-disciplinary team; and, acquiring a more holistic and pragmatic view of health care. Many students reported gaining greater confidence, wider awareness of potential careers in dentistry and a greater sense of realism from their experience. Some reflected on their own training needs.

Students also discussed the importance of preparation for, and return from, the placements and the relative merits of different styles of supervision.

Conclusion: Dental outreach training can provide students with valuable learning experience in a range of areas but requires careful management to ensure a common understanding of the programme's purposes and anticipated outcomes.

---

#### **A4 International Association for Dental Research conference, March 2004, Abstract 2, Supervisors' perceptions of interdisciplinary outreach training in the dental curriculum**

Dental education is changing; supplementing hospital-based undergraduate curricula with interdisciplinary outreach placements.

Objectives: To explore the perceptions of placement staff hosting students on dental outreach training.

Intervention: Six-week block placement for 20 undergraduate and therapy students, supervised by local dentists and supported by clinic nurses in 11 primary care clinics.

Methods: Semi-structured interviews with 32 staff across ten placements by a researcher independent of the organising team. Interviews were audio-recorded, transcribed and then content analysed. Interim findings were validated by presentation to placement representatives for comment.

Results: Overall placement staff were positive about the benefits to students including inculcating a more holistic, pragmatic view of health care and wider awareness of dental careers and the potential role of outreach training in dental education. Benefits to staff included a sense of satisfaction as host, contributing to dentistry's future and local recruitment, having to reconsider routine decisions for explanation to students and social benefits for the dental team.

Staff asked for greater attention to be paid to communicating students' prior competence and individual development needs; engaging interest in non-clinical work, and developing the supervisory role in checking work, providing feedback and assuring consistent grading standards. Supervisors stressed the importance of early preparation and logistic considerations.

Conclusion: Primary dental care settings can contribute more to dental education. Staff enjoyed helping students and regained an analytical approach to their work. Careful management is required to ensure a common understanding of the programme's purpose.



---

## **A5 British Society for Dental Research, Birmingham, April 2004, Oral presentation, Dental students' activities on outreach training**

UK Dental Schools are developing new undergraduate curricula, with interdisciplinary outreach placements replacing some of the hospital-based training.

Objectives: To record students' clinical and non-clinical activity on outreach placement.

Intervention: Six-week block placement for 20 undergraduate and therapy students in existing primary care clinics, in areas of need, to work supervised by local dentists.

Methods: A variety of methods were used: semi-structured interviews with all 20 students by staff independent of the course team; questionnaire-based survey of 17 students; and capture of categorised data on treatment episodes from students' clinical logbooks. Findings were triangulated by presentation to students and separately to their supervisors for discussions chaired by a second observer, and against peer-run focus groups.

Results: Outreach experiences were varied, often novel and frequently developmental for students. They included: ● gaining greater experience of new types of patients (children, special needs, phobics, asylum seekers, less affluent, drug users, etc.) and their communities; ● gaining broader clinical experience and alternative approaches; and practicing or observing dentistry and other health care in different settings. The need for mechanisms to build in to the outreach programme to encourage greater consistency of experience became apparent.

This Team Training in Primary Care Settings Project is National Dental Development Unit funded (grant EL1/EL2)

Conclusion: Dental outreach training provides students with valuable learning experience in a range of areas and requires mechanisms to ensure consistent anticipated outcomes.

---

## **A6 Research Led Teaching, Spotlight on Learning and Teaching Conference, Sheffield, May 2004, Oral Presentation, Student Placements in dental education: stakeholder perceptions**

Dental education, in common with some other vocational disciplines, is making increased use of placements to provide high-impact learning experiences for students.

Objectives: To explore stakeholder perceptions of phase one of an incremental development supplementing hospital-based curricula with outreach placements.

Intervention: Six-week block placements for 20 undergraduate and therapy students, supervised by local dentists in 11 clinics.

Methods: Semi-structured interviews with 32 placement staff, 20 students and 11 university tutors by a researcher independent of the curriculum team. Interviews were audio recorded, transcribed and content analysed. Interim findings were validated by presentation to respective stakeholder groups for comment.

Results: Placement staff were positive about benefits to students, identified benefits for themselves and were anxious to ensure high quality placements through improved management. Students anticipated high volumes of hands-on experience increasing their competence but not the extent of improvements in their team working, patient management and confidence. Academic staff supported the principle of outreach and appreciated the impact on the existing curriculum of increased outreach provision.

Conclusion: Placements can contribute to dental education and have spin-off benefits for staff. Careful management is required to fully integrate placement into the curriculum.



## **A7 International Association for Dental Research conference, March 2005, Abstract 1, Outreach Placements Increase Students' Confidence to Plan Treatment**

Dental Schools are developing new undergraduate curricula, with primary care placements complementing hospital-based training.

**Objectives:** To compare the effects of outreach placement and traditional exclusively hospital-based clinical experience on students' confidence in providing treatment for a range of patients presenting with common dental problems.

**Design:** Randomised controlled trial.

**Intervention:** Random allocation of senior dental undergraduates to existing hospital-based clinics (n=25) or five-week block placement in existing primary care clinics to work supervised by local dentists (n=24).

**Methods:** At baseline students self-rated their global confidence on a five-point Likert-scale. These measures were repeated at follow-up, augmented by a global transition judgement and a then-test (asking students to re-rate their baseline rating in the light of experience) of confidence.

**Results:** • Groups were comparable at baseline. The outreach group scored higher ( $P=0.08$ ) in the transition judgement (mean 3.7, SD 0.9) than the control group (mean 3.1, SD 1.1) indicating their perceived increase in confidence was greater.

• In the then-test, on reflection the outreach group considered their baseline ratings of confidence were over-optimistic (mean then-tests scores 3.2, SD 0.9 and baseline 3.7, SD 0.5) while the control group thought theirs were accurate (mean then-tests scores 3.8, SD 0.7 and baseline 3.6, SD 0.8). As follow-up scores for global confidence did not differ significantly between groups the implied increase in confidence for the outreach group was significantly greater ( $P=0.01$ ).

**Conclusion:** Dental outreach training in primary care settings is more effective than dental hospital training in improving their self-rated confidence in tackling clinical situations. Students' insight gained on outreach (for example through experiencing increased diversity of patients) shifts their internal scales of confidence so complicating the measurement of change.

---

**A8 International Association for Dental Research conference, March 2005, Abstract 2, Outreach placements increase undergraduates' treatment planning ability**

Dental Schools are developing new undergraduate curricula, with primary care placements complementing hospital-based training.

Objective: To compare the effects of outreach placement and traditional hospital-based training on students' treatment planning ability.

Design: Randomised controlled trial

Intervention: Random allocation of a cohort of senior dental undergraduates to existing hospital-based clinics (n = 25) or five-week block placement in existing primary care clinics, to work supervised by local dentists (n = 24).

Methods: At follow-up, students took a history from a standard simulated patient who rated their performance using the Arizona Clinical Interview Rating scale (ACIR) with second rating by an experienced dentist via audio recording. Students then discussed their treatment plan with assessors blind to the allocation. The assessors scored four aspects: dental history captured, social history captured, appropriateness of treatment plan (showing cognisance of full history) and inclusion of wider issues (patient's children's needs and wider health promotion).

Results: Groups were comparable at baseline. At follow up ACIR scores for interviewing skills did not differ significantly. The outreach group scored higher (mean 4.4, SD 2.1) than the control group (mean 2.8, SD 1.9) for capturing a social history ( $P = 0.01$ ) and appropriate treatment planning (means, SDs 5.6, 2.1 and 3.9, 2.3 respectively,  $P=0.01$ ). There were no significant differences between groups' scores for the dental history obtained, nor for inclusion of the wider issues.

Conclusion: Dental outreach training was significantly more effective than traditional hospital-based training in improving students' ability to capture relevant points of social history from a patient and to consider them when planning treatment.



## **A9 British Society for Dental Research, Dundee, April 2005, Oral presentation, Outreach Placement Increases Students' Clinical Activity**

Dental Schools are developing new undergraduate curricula, with primary care placements complementing hospital-based training.

Objectives: To compare students' clinical activities on outreach placement and traditional exclusively hospital-based training.

Design: Randomised controlled trial.

Intervention: Random allocation of senior dental undergraduates to existing hospital-based clinics (n=25) or five-week block placement in existing primary care clinics to work supervised by local dentists (n=24). Placements were in either community dental service clinics or dental access centres (n=17).

Methods: At baseline students' clinical experience and competence were noted from School records. The School clinical experience measure was repeated at follow-up when students also declared the number and categories of patients encountered during the intervention period.

### Results:

- Groups were comparable at baseline for all variables.
- Outreach students encountered more than twice as many patients during the intervention period (mean 68, SD 18) than the control group (mean 30, SD 23,  $P=0.01$  in t-test). Community dental service patients encountered were predominantly children and dental access centre patients, adults. Outreach students also encountered more exceptional categories of patient (mean 2.8, SD 1.7) than the control group (mean 1.7, SD 1.6,  $P=0.02$ ).
- For the semester including the intervention the outreach students' number of treatment episodes for simple plastic restorations (mean 44, SD 15) was almost three times that of the control group (16, SD 9,  $P=0.01$ ). Data for endodontic procedures and dentures displayed similar ratios. The difference was less pronounced for cast restorations: outreach mean 5.2 (SD 3.9), control 3.3 (SD 2.8,  $P=0.07$ ).

Conclusion: Dental outreach training in primary care settings provides greater numbers of patients and treatment episodes for students than dental hospital training. The patients encountered on outreach include greater numbers from exceptional patient categories. Dental access centres and community dental service settings provide contrasting patient profiles.

## **A10 International Association for Dental Research conference, June 2006, Abstract, Do block outreach placements disadvantage students' school-based learning?**

Dental schools are increasingly replacing hospital-based training with periods of placement in primary care. This could impact negatively on students' academic or clinical progress.

**Objective:** To compare the effects of outreach placement and traditional exclusively hospital-based clinical experience on students' final course assessment scores and hospital clinical activity.

**Design:** Randomised controlled trial.

**Intervention:** Random allocation of senior dental students to existing hospital-based clinics (n=24) or five-week block placement in existing primary care clinics working supervised by local dentists (n=25).

**Methods:** At baseline students' hospital-based clinical experience and clinical skill were measured. Follow-up assessments considered students' hospital clinical activity during the intervention semester and theoretical and clinical ability as presented at final examination board twelve months later. To reduce type I error, only 6 of 24 available measures were considered and multiple testing correction applied. Results were discussed with student representatives.

### **Results:**

- Groups were comparable at baseline.
- The number of hospital patient treatments during the semester for the outreach (mean 28, SD=6) and control groups (mean 29, SD=11) were similar ( $P=0.62$ ) as were their scores for the quality of that clinical work (means 62, SD=1 and 63, SD=2,  $P=0.66$ ).
- Groups' final clinical assessments were similar (mean scores 58, SD=3; 61, SD=5,  $P=0.04$  and Bonferroni corrected  $\alpha'=0.01$ ). Scores for children's dentistry (means 64, SD=6 and 64, SD=4,  $P=0.96$ ) and overall theoretical scores were also similar (means 54, SD=4 and 57, SD=4,  $P=0.08$ ). One outreach and 4 control students were awarded honours ( $P=0.14$ , Chi sq.)

**Conclusion:** Surprisingly, absences from the school arising from extended block placements did not reduce the quantity of hospital-based clinical experience. Student representatives reported students rescheduled patients' appointments avoiding outreach periods. Outreach did not impact negatively on students' theoretical assessments but did in one component of several clinical assessments. Analysis risked type I error.



---

## **A11 International Association for Dental Research Pan-European conference, September 2006, Abstract 1, Do outreach placements affect the quality of students' hospital-based work?**

Dental schools' students increasingly learn on outreach placements away from the dental hospital. These experiences may affect the quality of students' hospital-based clinical work.

Objective: Pilot study to compare the quality of students' clinical work before and after outreach placement.

Design: Uncontrolled pre-test, post-test comparison of routine formative assessments of students' clinical work and patient management in the dental hospital.

Method: Second-year Hygiene and Therapy students from the University of Sheffield's School of Clinical Dentistry undertook outreach placements for three days each week over ten weeks. Students mostly worked in pairs nursing for one another. The grades for students' last five restorative procedures before placements started and the first five after placement completion were extracted from archived records.

Results: There were seven students in this pilot cohort. For clinical ability the mean measure was 59.7% (SD=4.1) at pre-test and 62.4% (SD=2.8) at post-test,  $p=0.13$ . For patient management the corresponding values were 63.3% (SD=3.0) and 64.0% (SD=1.5),  $p=0.52$ .

Conclusion: The quality of students' hospital-based clinical work was similar before and after attending their hospital-based clinical for outreach placements. These data give an indication of the samples required to formally test the effect of outreach on clinical grades. The study's design does not differentiate between the effects of the outreach placements and concurrent school and hospital-based learning experiences and maturation.

---

## **A12 International Association for Dental Research Pan-European conference, September 2006, Abstract 2, Gender differences in students' self-reported estimates of clinical experience**

Dental staff may make supervisory judgments based on students' reports of their clinical experience. An exploratory analysis comparing students' reports of their experience in restorative dentistry suggested a gender related difference in the accuracy of students' estimates.

**Objective:** To compare the accuracy of male and female students' estimates of the volume their clinical work.

**Design:** Comparison of dental students' self-reports and existing departmental records.

**Method:** A single cohort was considered. Clinical records of amalgam, composite and glass ionomer restorations were totalled ( $T_o$ ) for the fourth year dental students to the end of the first semester of 2005/2006. Separately, within a week of that census, students reported to the School's outreach administrator their estimated numbers of completed simple plastic restorations ( $T_a$ , identified on the data collection form as amalgam, composite and glass ionomer restorations) with annotations to inform outreach supervisors of their clinical experience. Data reported later were excluded from the analysis. The percentage overestimate was calculated as  $100 \times (T_a - T_o) / T_a$  and tested for gender differences.

**Results:** Data were available from 55 of 63 students in the cohort. Lost to analysis were 5 males and 3 females. The students' average number of completed restorations ( $T_o$ ) was 47 (SD=15). For males the mean overestimate was 18% (SD=4%, n=37). For females the underestimate was 2% (SD=2%, n=18),  $p=0.05$  (t-test).

**Conclusion:** Male students over report their clinical experience while females slightly under report it. This may be a cautionary finding for supervising staff using such estimates to gauge students' abilities.



## A13 South Yorkshire Dental Network, Oral presentation to meeting, November 2004 Outreach Placement Initiative

Description of the trial intervention and the follow-up assessment followed by a presentation of the findings.

<p style="text-align: center;"><b>Outreach Placement Initiative</b></p> <p style="text-align: center;">Michael Smith, Programme Evaluator</p> <p style="text-align: center;">For the South Yorkshire Dental Network</p>	<p style="text-align: center;"><b>Outline</b></p> <ul style="list-style-type: none"> <li>• Environment</li> <li>• Phased development</li> <li>• Students and Staff</li> <li>• Team training</li> <li>• Research</li> <li>• Future</li> </ul>		
<p style="text-align: center;"><b>Environment</b></p> <ul style="list-style-type: none"> <li>• 1970s introduction of some community-based experience</li> <li>• GDC's The First Five Years – curriculum development               <ul style="list-style-type: none"> <li>• Primary care</li> <li>• Team working</li> </ul> </li> <li>• CCDH's location and patient base</li> <li>• Change – DACs, PDS.</li> </ul>	<p style="text-align: center;"><b>Phases of Development</b></p> <ul style="list-style-type: none"> <li>• 2003 Pilot 20 students 6 weeks 4½ days a week 13 locations</li> <li>• 2004 Trial 40 students 5 weeks 2 ½+ days a week 5 locations</li> <li>• 2005 60 students 6+ weeks</li> </ul>		
<p style="text-align: center;"><b>Students and Staff</b></p> <table border="0" style="width: 100%;"> <tr> <td style="vertical-align: top;"> <ul style="list-style-type: none"> <li>• 4<sup>th</sup> year, 2<sup>nd</sup> semester 5<sup>th</sup> year, 1<sup>st</sup> semester undergraduates</li> <li>• Second year Hygiene and Therapy students</li> <li>• Up to four students per supervisor</li> </ul> </td> <td style="vertical-align: top;"> <ul style="list-style-type: none"> <li>• Experienced, up-to-date local staff approved by the University</li> <li>• Staff development with external, placement and University input</li> <li>• Nurses included</li> </ul> </td> </tr> </table>	<ul style="list-style-type: none"> <li>• 4<sup>th</sup> year, 2<sup>nd</sup> semester 5<sup>th</sup> year, 1<sup>st</sup> semester undergraduates</li> <li>• Second year Hygiene and Therapy students</li> <li>• Up to four students per supervisor</li> </ul>	<ul style="list-style-type: none"> <li>• Experienced, up-to-date local staff approved by the University</li> <li>• Staff development with external, placement and University input</li> <li>• Nurses included</li> </ul>	<p style="text-align: center;"><b>Team Training</b></p> <ul style="list-style-type: none"> <li>• GDC's The First Five Years .. integral part of a greater dental team .. substantial assisted operating understanding primary dental care and routine clinical practice.</li> <li>• Referral</li> <li>• Paired working</li> <li>• Appreciating roles within small teams</li> </ul>
<ul style="list-style-type: none"> <li>• 4<sup>th</sup> year, 2<sup>nd</sup> semester 5<sup>th</sup> year, 1<sup>st</sup> semester undergraduates</li> <li>• Second year Hygiene and Therapy students</li> <li>• Up to four students per supervisor</li> </ul>	<ul style="list-style-type: none"> <li>• Experienced, up-to-date local staff approved by the University</li> <li>• Staff development with external, placement and University input</li> <li>• Nurses included</li> </ul>		
<p style="text-align: center;"><b>Research - Pilot</b></p> <ul style="list-style-type: none"> <li>• Greater clinical activity – productivity</li> <li>• 'Real-life' experience – more typical</li> <li>• Wider range of patient types</li> <li>• One of the team .. Treated like a dentist</li> <li>• Large increase in confidence</li> <li>• "Feel I can now tackle anything that comes through the door"</li> </ul>	<p style="text-align: center;"><b>Research - Trial</b></p> <ul style="list-style-type: none"> <li>• Randomised controlled trial</li> <li>• Over twice as many patients encountered</li> <li>• Significantly improved               <ul style="list-style-type: none"> <li>– Capture of key points of social history</li> <li>– Appropriateness of treatment planning</li> </ul> </li> <li>• Increase in confidence               <ul style="list-style-type: none"> <li>– Revised internal scale, Greater increase</li> </ul> </li> </ul>		
<p style="text-align: center;"><b>Future</b></p> <ul style="list-style-type: none"> <li>• 2003 Pilot 20 students 6 weeks</li> <li>• 2004 Trial 40 students 5 weeks</li> <li>• 2005 60 students 6+ weeks</li> <li>• 2006 90 students</li> <li>• 2007 100 students 6 months</li> <li>• New DACs • PDS? • CDS</li> </ul>	<p style="text-align: center;"><b>Summary</b></p> <ul style="list-style-type: none"> <li>• Becoming an integral part of the courses</li> <li>• Highly encouraging pilot and half-year phases</li> <li>• Growing, developing and evolving</li> <li>• Your involvement is welcome 0114 2268648 michael.smith@sheffield.ac.uk Prof Michael A Lennon, Prof Peter G Robinson</li> </ul>		
<p>The University of Sheffield School of Clinical Dentistry •</p>	<p>The University of Sheffield School of Clinical Dentistry 14</p>		

## A14 Annual meeting of the Directors of Schools of Hygiene and Therapy. Oral presentation to meeting, March 2005 Sheffield's Developments in Outreach Placements

Summary of the three phases of the development and key findings.

### Outreach Placements

**Michael Smith**  
michael.smith@sheffield.ac.uk  
0114 2268648

### Overview

- Context
- Pilot Year
- Randomised Controlled Trial
- Subsequent Years
- Future plans
- Conclusions

### ‘Outreach’

Student clinical working  
in a primary care setting

- Extra-mural rotation
- Community-based experience
- Outplacement
- Patient diversity

### National Context

- Modernisation Agenda
- Workforce problems
- Workforce distribution
- Inequalities of access

### Sheffield's Developments

- Builds on ‘community’ programme
- Curricular change
- Requirement for patients
- Local proposals to increase access
- Funding:  
Training the Dental Team in Primary Care

### Sheffield's Outreach

		<i>n</i> <sub>H&amp;T</sub>		<i>n</i> <sub>BDS</sub>
2003	Volunteers	10	Pilot, 3 weeks	10
2004	Full-time	11	3 weeks	25
2005	Part-time	7	10 three-day weeks	48

### Management

### Pilot Placements

- 10 H&T students, 10 BDS
- Three- and six-week block placements
- Primary care settings
- Areas of high dental need
- Supervised by local dentists
- Local protocols

### Evaluation Method

- Semi-structured interviews and focus groups
  - Supervising dentists and nurses
  - Students
- Content analysis
- Identification of themes
- Validated by Triangulation

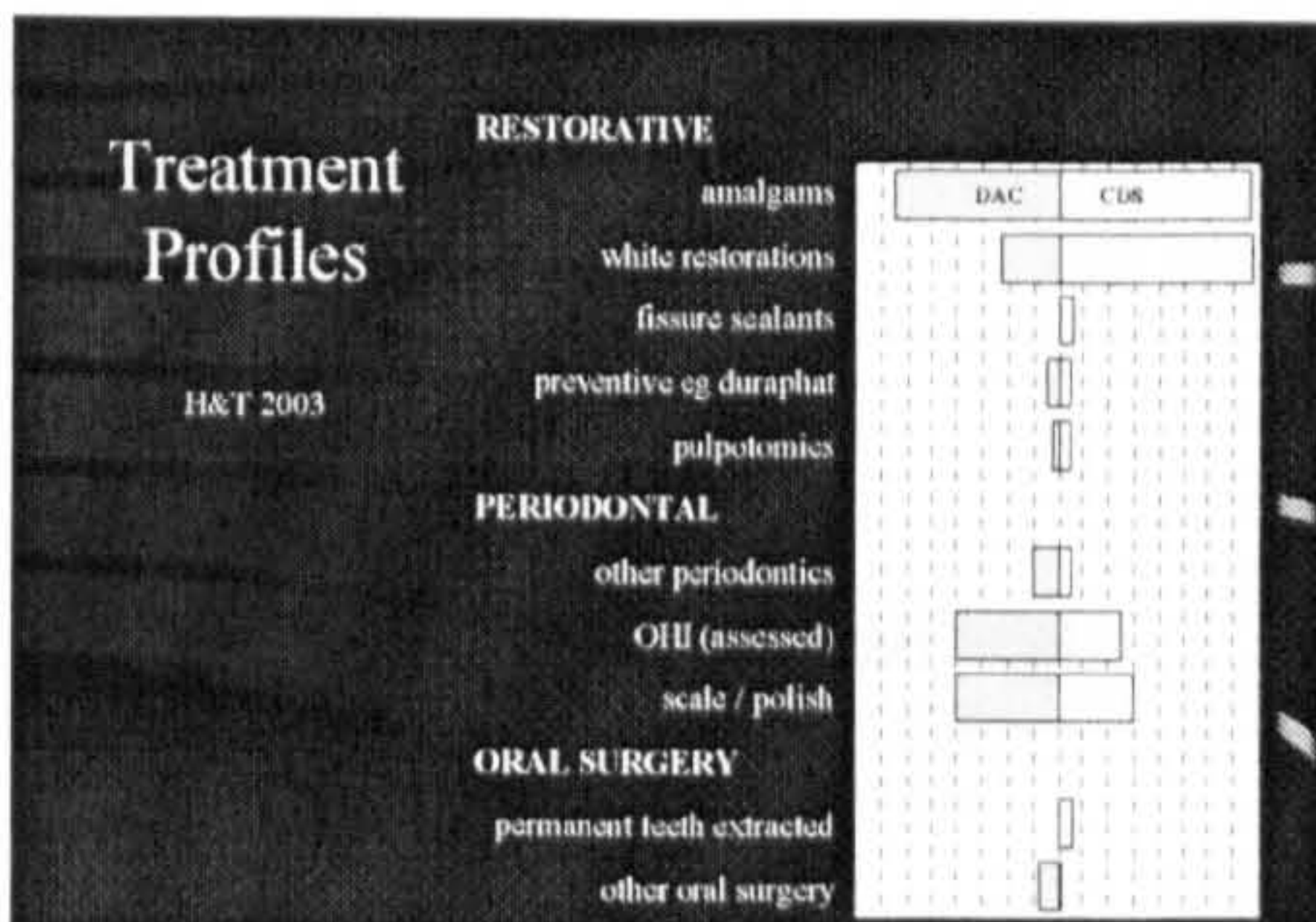
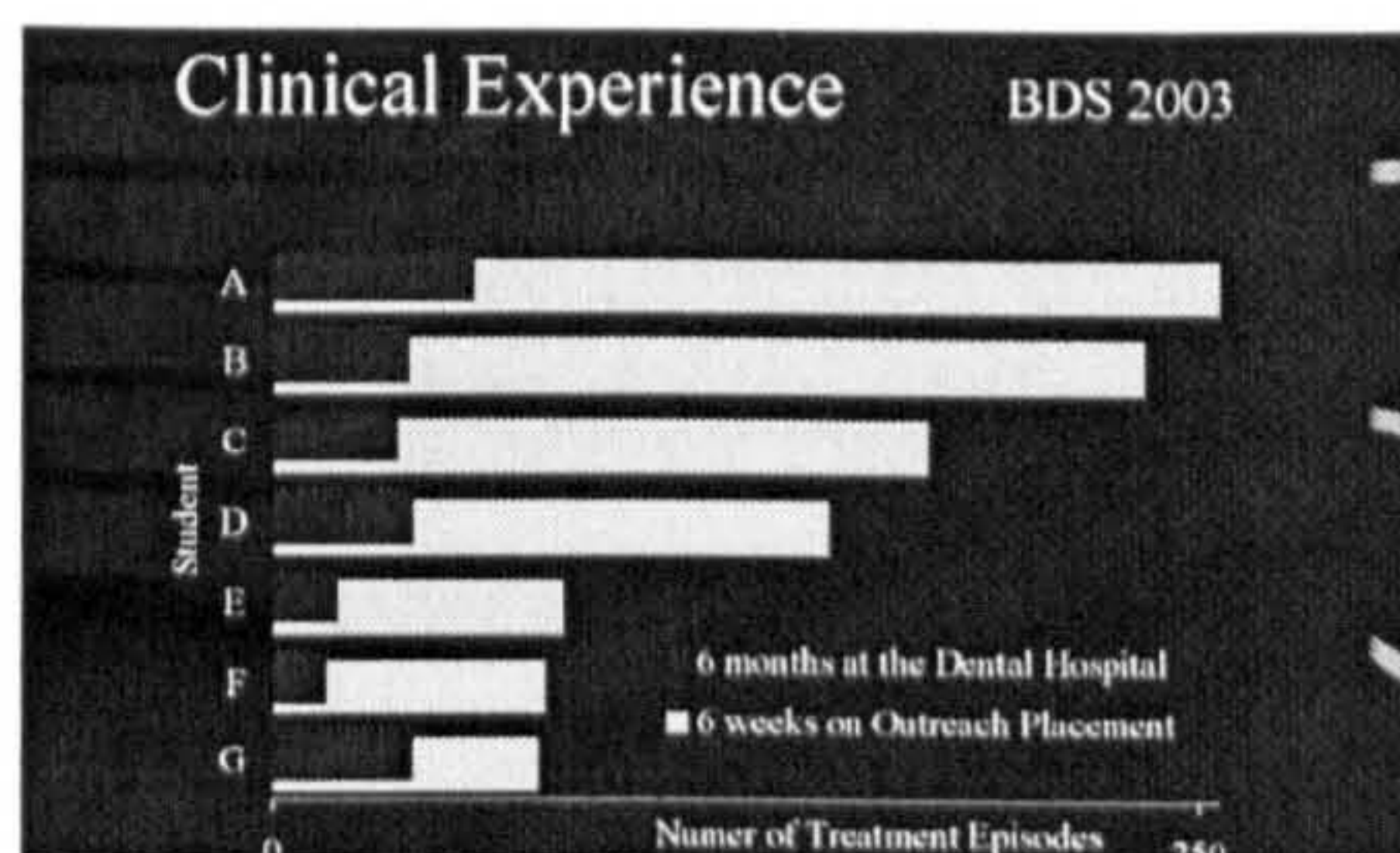
### H&T Students' Perceptions

- Increased competence
- Variety of patient types
- Improved patient management
- Increased confidence
- Emphasise the clinical over other aspects
- Accorded greater status
- Appreciate supervisors' input



### Placement Staff Perceptions

- benefits to students
- identified benefits for themselves
- anxious to ensure high quality placements
- keen to continue partnership

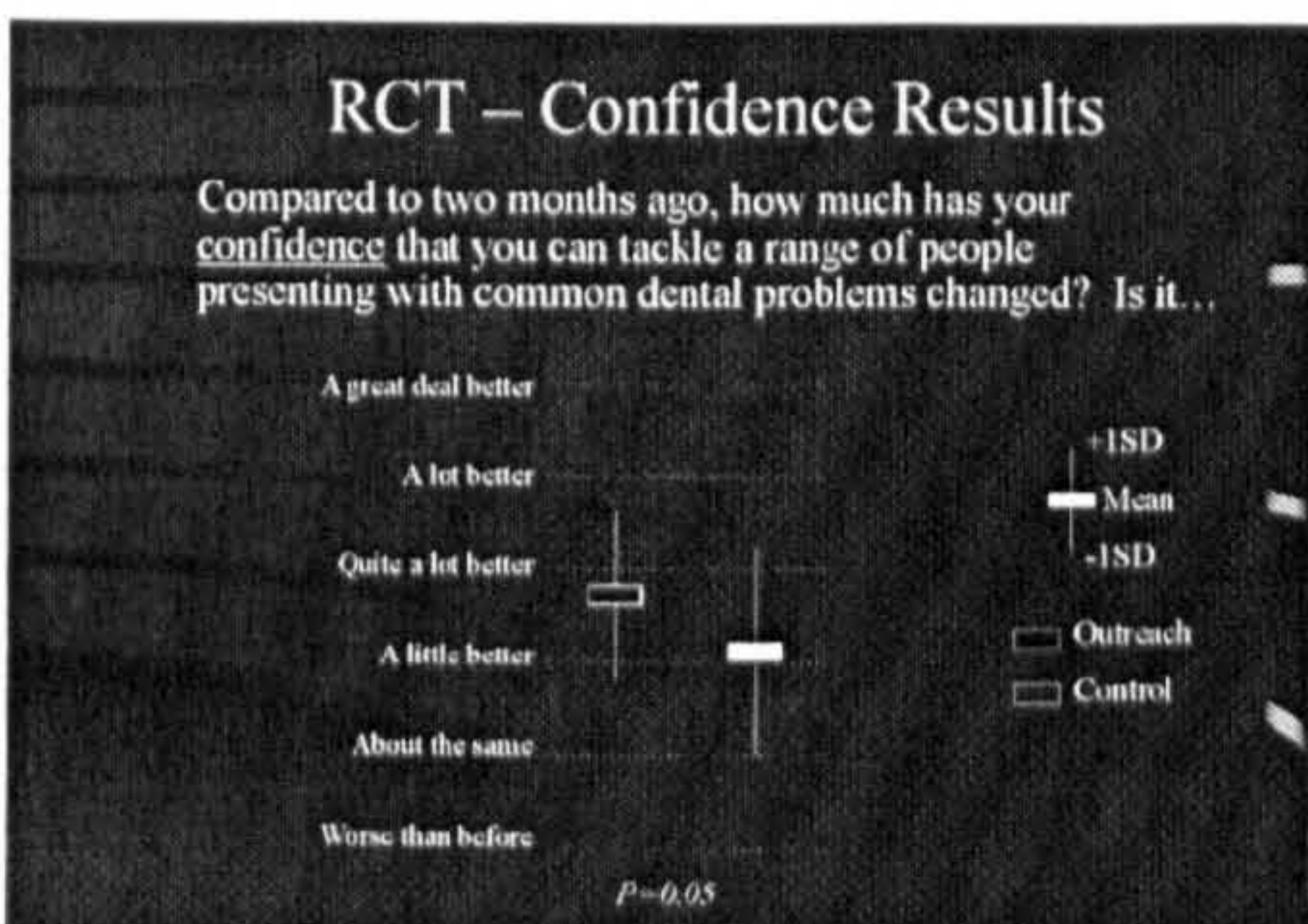


### RCT - Aim

Compare effectiveness of outreach in primary care settings and traditional hospital-based training to increase

- confidence
- competence

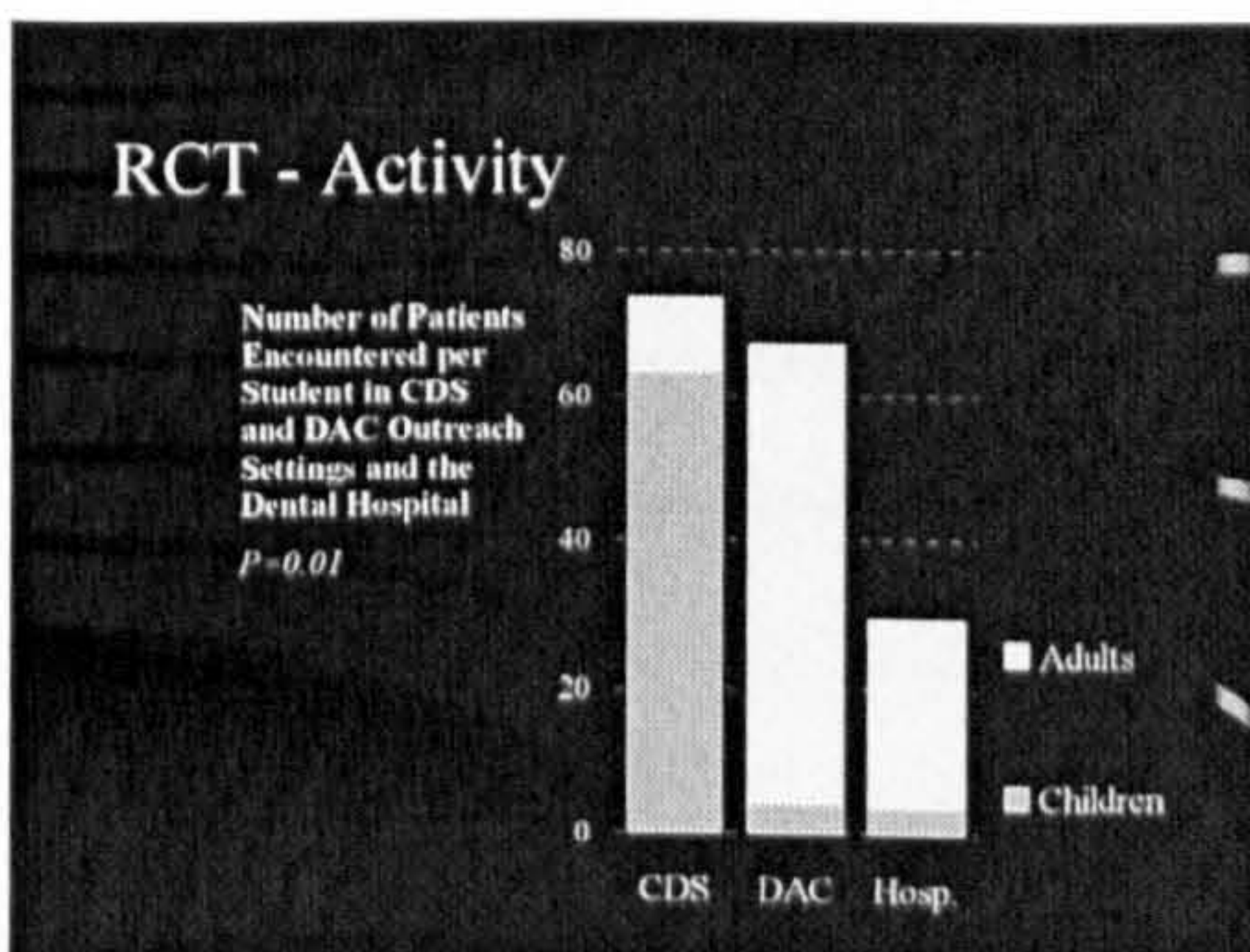
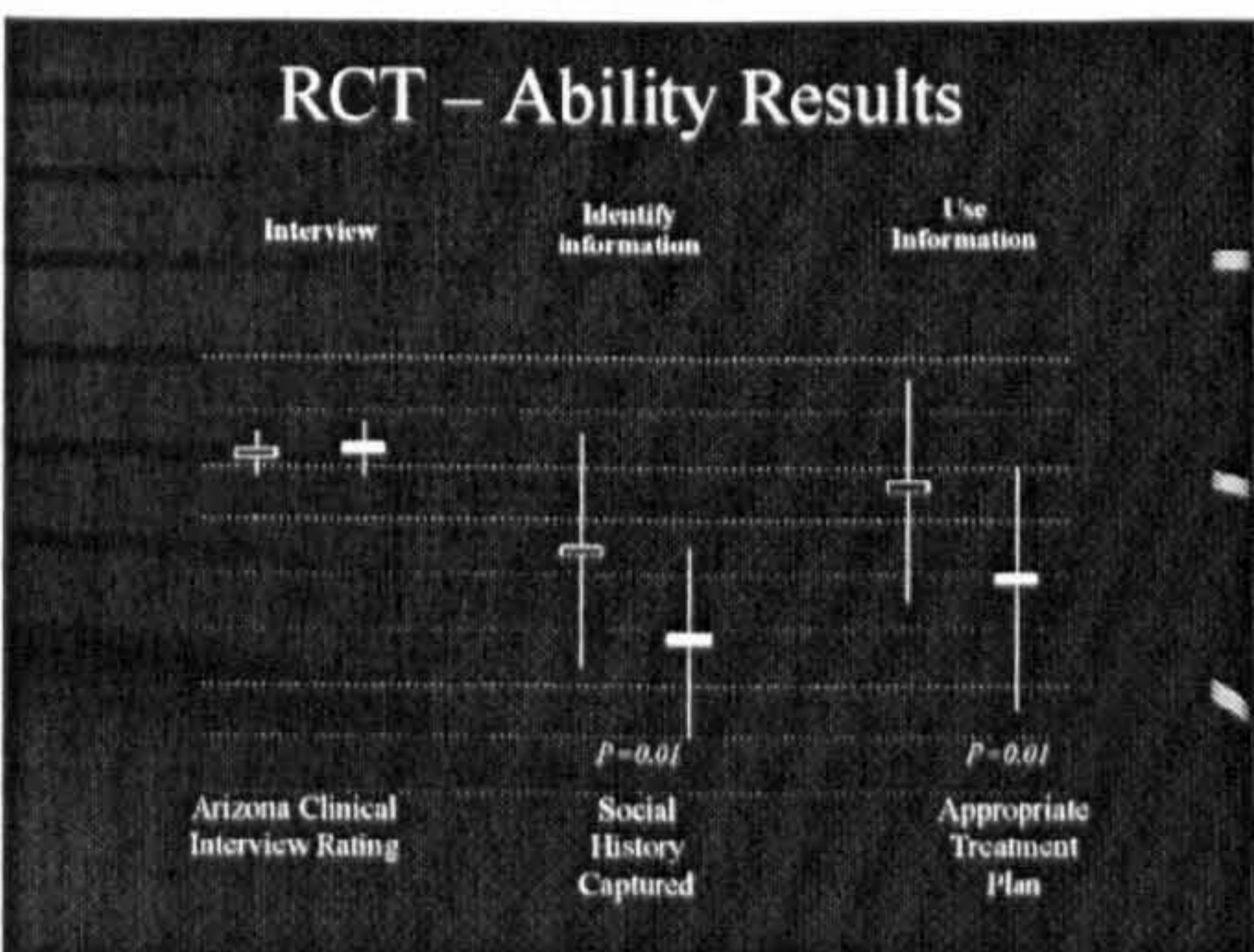
in treating a variety of patients with common problems



### RCT - Ability Method

Standard simulated patient

- Dental Chart, Radiograph and Medical History
- Student
  - interviews
  - formulates treatment plan
- Patient and dentist rate interview skills
- Discussion with two assessors (blind to intervention)
  - dental history captured
  - social history captured
  - appropriateness of treatment plan re histories
  - inclusion of wider issues



### 2004 H&T Outreach

- 5 travelled daily, 6 in accommodation. 5 locations.
- "Far more patients than the dental hospital"
- "Good to be part of a great team"
- Screening worked well. Plenty of therapy work.
- Nurses helped students cope.
- Exposure to new patient types appreciated.
- Supervision "very helpful, making detailed practical suggestions for improving technique."
- Improved students' time management, versatility and patient management.

### 2005 H&T Outreach

- "Valuable" "really enjoyable"
- "Freedom and respect from the staff and from the patients"
- Valued "nurses popping in every 5 or 10 minutes"
- Supervision "brilliant" and "less picky"
- Encouraged to consider employment
- Empowered to shape learning experiences

### The Future

- Benefits of longer placements
- Quantify patient types
- Qualitative: Aspects of the experience contributing to students' development
- Pilot in Personal Dental Service

### Conclusions

- Placements piggy-backed onto services provide valuable and enjoyable learning experience
- Primary care dentists supervise well
- Breadth of 'realistic' experience increased students' confidence and competence
- Students need to be proactive
- Good communication essential



# A15 British Association for the Study of Community Dentistry workshop, Outreach Teaching. Oral presentation. November 2005

Outreach Learning – a randomised controlled trial of outreach placements.  
 Summary of the three phases of the development and key findings from the research.

Guy's Campus, London.

**Outreach Teaching**  
*A randomised controlled trial of outreach placements*

Michael Smith  
 University of Sheffield, School of Clinical Dentistry  
 Department of Oral Health and Development  
 michael.smith@sheffield.ac.uk

**Acknowledgements**

<p><b>Researchers</b></p> <ul style="list-style-type: none"> <li>Andy Blinkhorn</li> <li>Fiona Blinkhorn</li> <li>Alan Brook</li> <li>Mike Lennon</li> <li>Luke Ritucci</li> <li>Peter G Robinson</li> </ul>	<p><b>Placements</b></p> <ul style="list-style-type: none"> <li>Sheffield CDS</li> <li>Chesterfield CDS</li> <li>Rotherham CDS</li> <li>Hull DAC</li> <li>Lincoln DAC</li> <li>Deame Valley DAC</li> </ul>
--	--

NHS Directors of Dental Services, the students and patients

**Context**

- ▀ Builds on 'community' programme
- ▀ Curricular change
- ▀ Requirement for patients
- ▀ Local proposals to increase access
- ▀ Funding: Training the Dental Team in Primary Care Settings

**Outreach Programme Aims**

- ▀ **Develop Professional Responsibility**  
 ... appreciate their ethical responsibility for the oral health of the whole community
- ▀ **Understand Public Health Dentistry**  
 ... understand the principles and practice of public health dentistry
- ▀ **Understand Practice Environment**  
 ... appreciate the responsibilities and requirements of the practice environment
- ▀ **Develop Clinical Skills**  
 ... provide comprehensive dental care for a range of patients

**Qualitative Study**

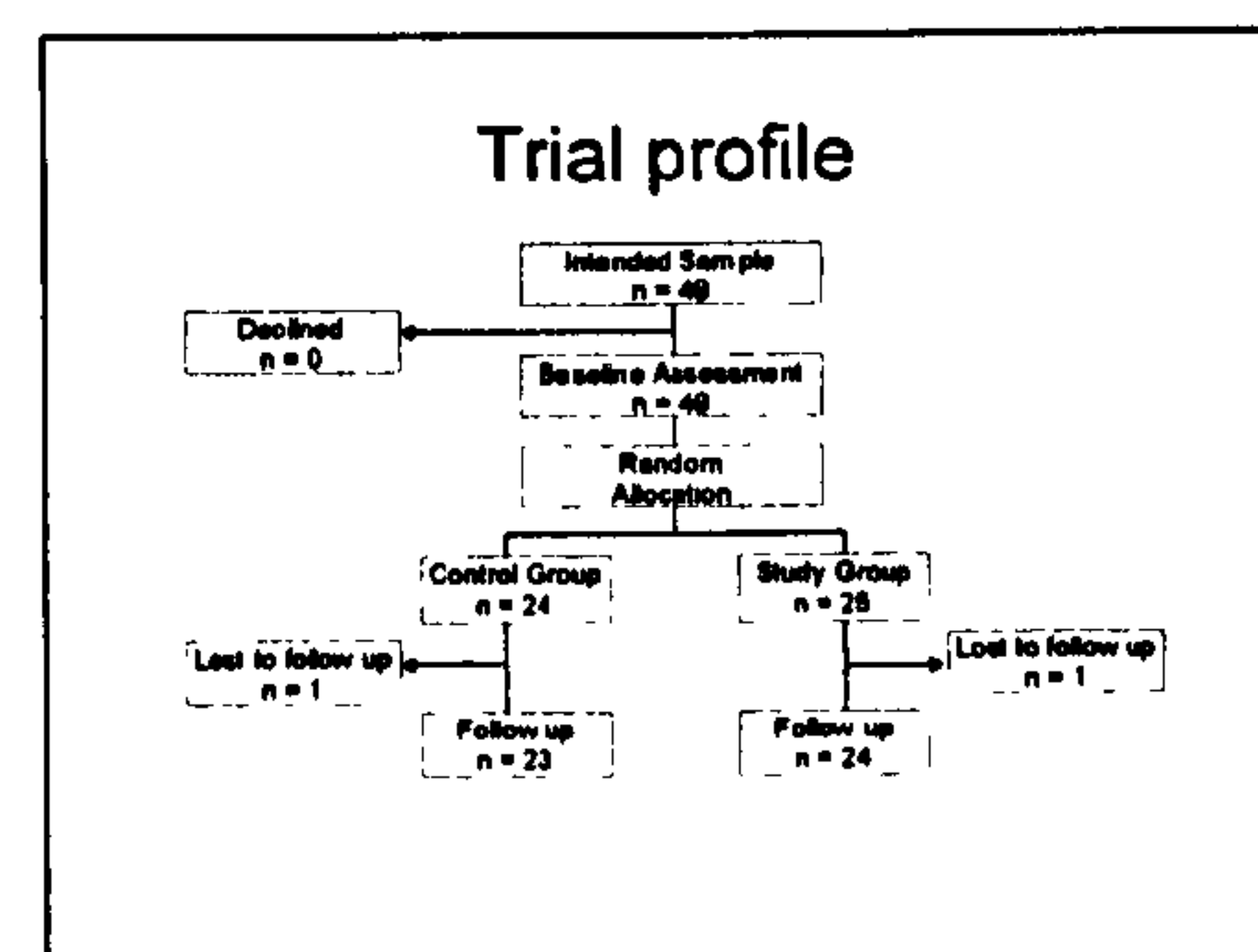
- ▀ Volunteers
- ▀ Sought hands-on experience
- ▀ Found pragmatic approaches, how to work with people, how to apply learning, a new confidence.
- ▀ Accorded respect
- ▀ CSFs Communication & Resourcing
- ▀ Disruption but unanticipated benefits

**RCT**

Compare effectiveness of outreach in primary care settings and traditional hospital-based training to increase

- confidence
- competence

in treating a variety of patients with common problems



**RCT – Confidence**

How much has your confidence that you can tackle a range of people presenting with common dental problems changed? Is it

- A great deal better
- A lot better
- Quite a lot better
- A little better
- About the same
- Worse than before

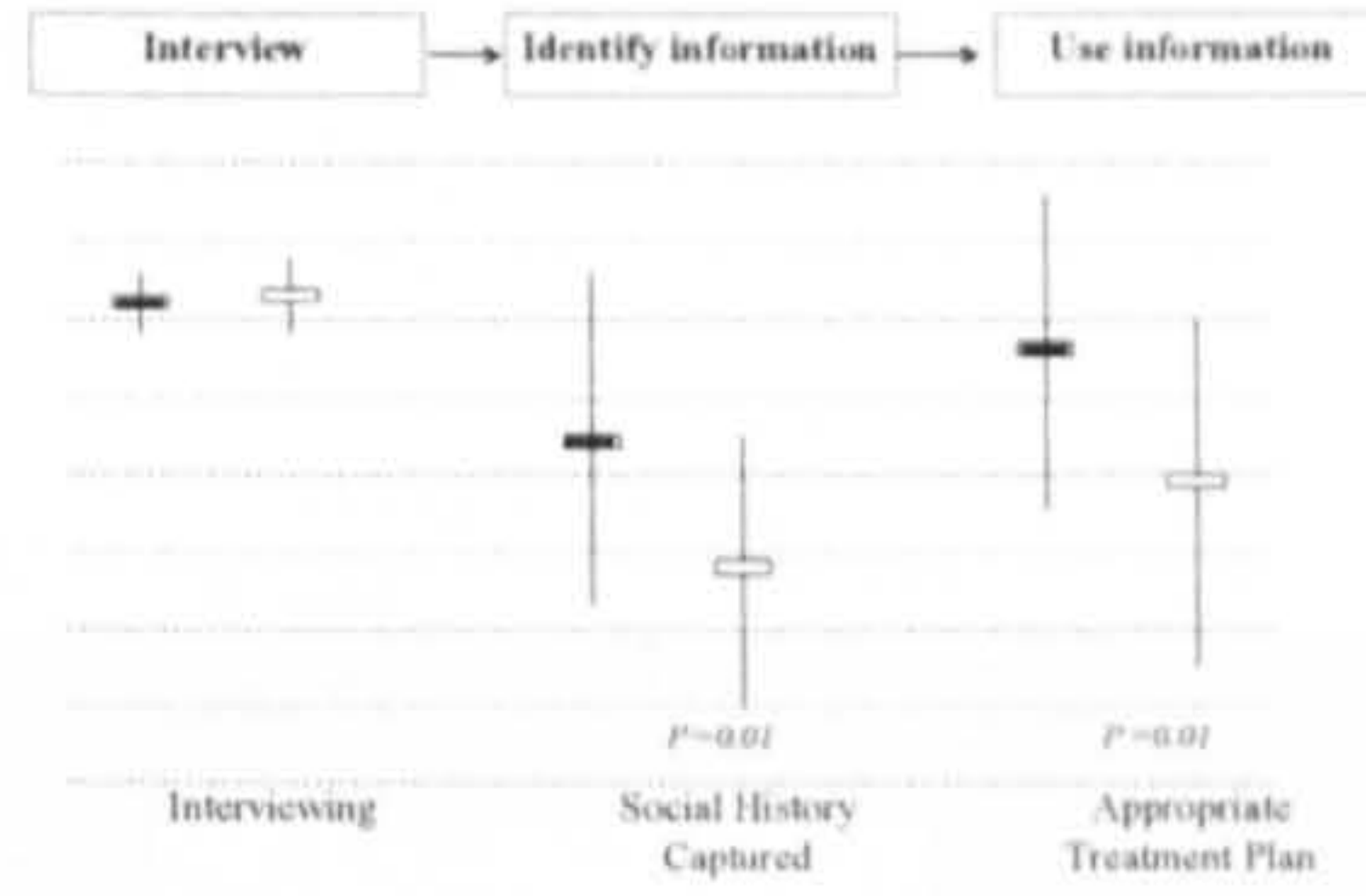
Outreach
Dental Hospital



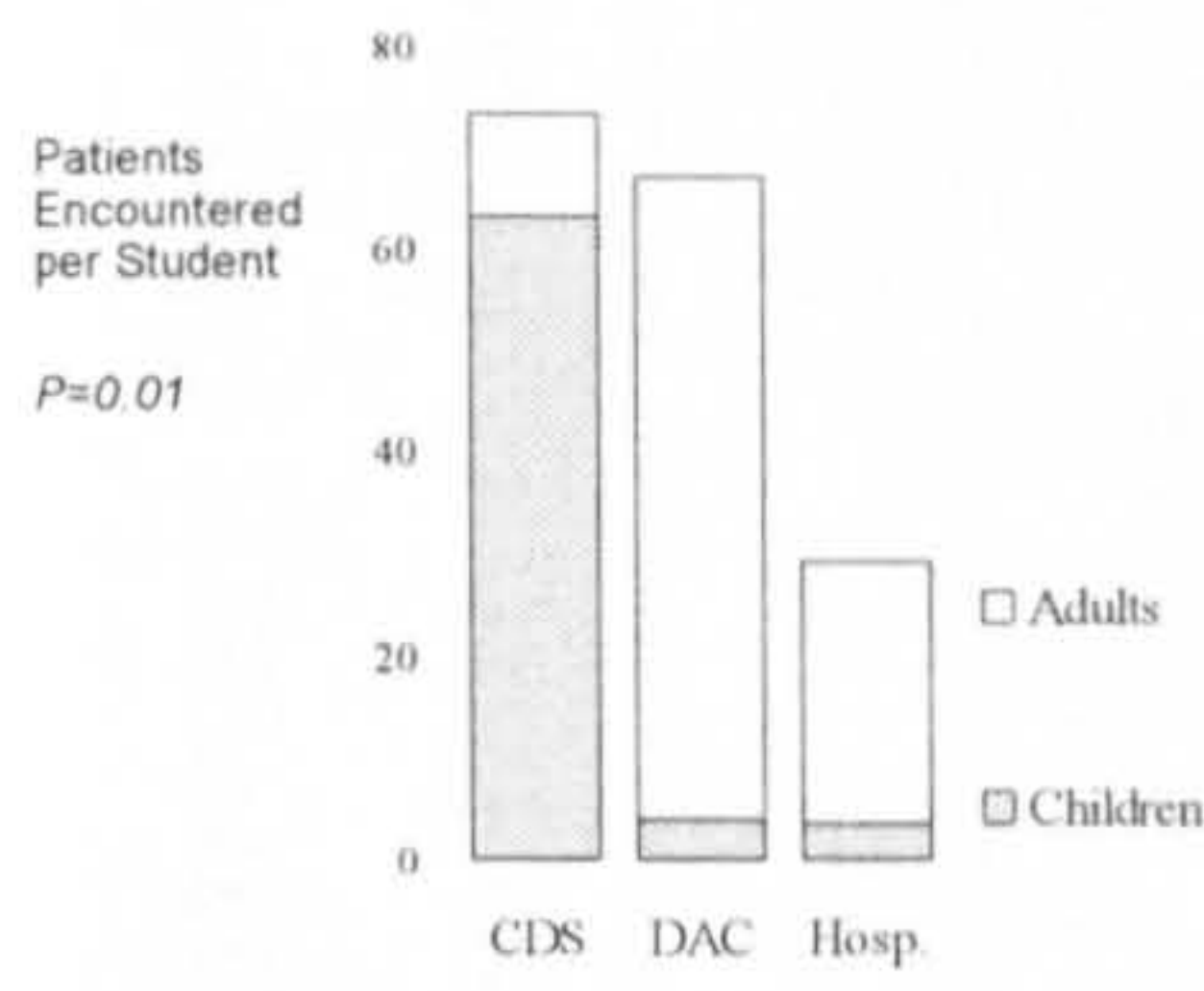
### Competence Assessment

- Standard simulated patient
- Dental Chart, Radiograph and Medical History
- Student
  - interviews
  - formulates treatment plan
- Patient and dentist rate interview skills
- Discussion with two assessors (blind to intervention)
  - dental history captured
  - social history captured
  - appropriateness of treatment plan re histories
  - inclusion of wider issues

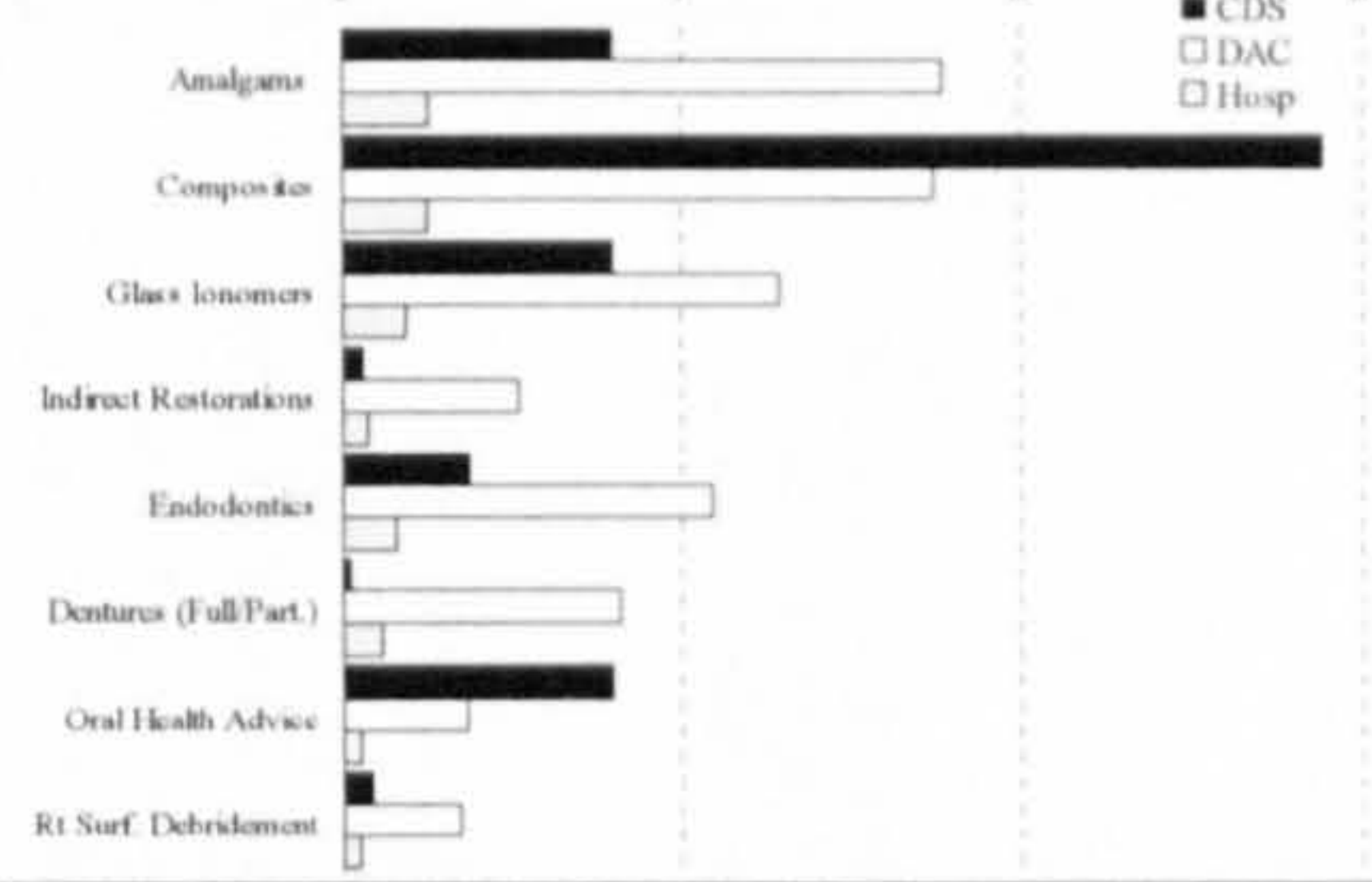
### RCT - Treatment Planning



### RCT - Activity



### RCT - Clinical Profiles



### RCT - Findings

- Dental outreach training in primary care settings:
  - Improves clinical confidence more effectively
  - Improves treatment planning more effectively
  - Provides more patients and treatment episodes
  - Provides greater variety of patients
- Contrasting experiences in DAC and CDS settings

### Conclusion

- Outreach provides experiences the dental hospital and School can't
- Those experiences enhance students' learning
- There may be advantages in each student experiencing contrasting settings
- Further research needed to identify of the most beneficial aspects of the experience



## A16 Series of three posters for stakeholders reporting the RCT

## 1 – Outreach Increases Students Ability to plan Treatment

**School of Clinical Dentistry, The University of Sheffield**

## Outreach increases undergraduates' treatment planning ability

### Some initial findings from the 2004 research into Outreach - No.1

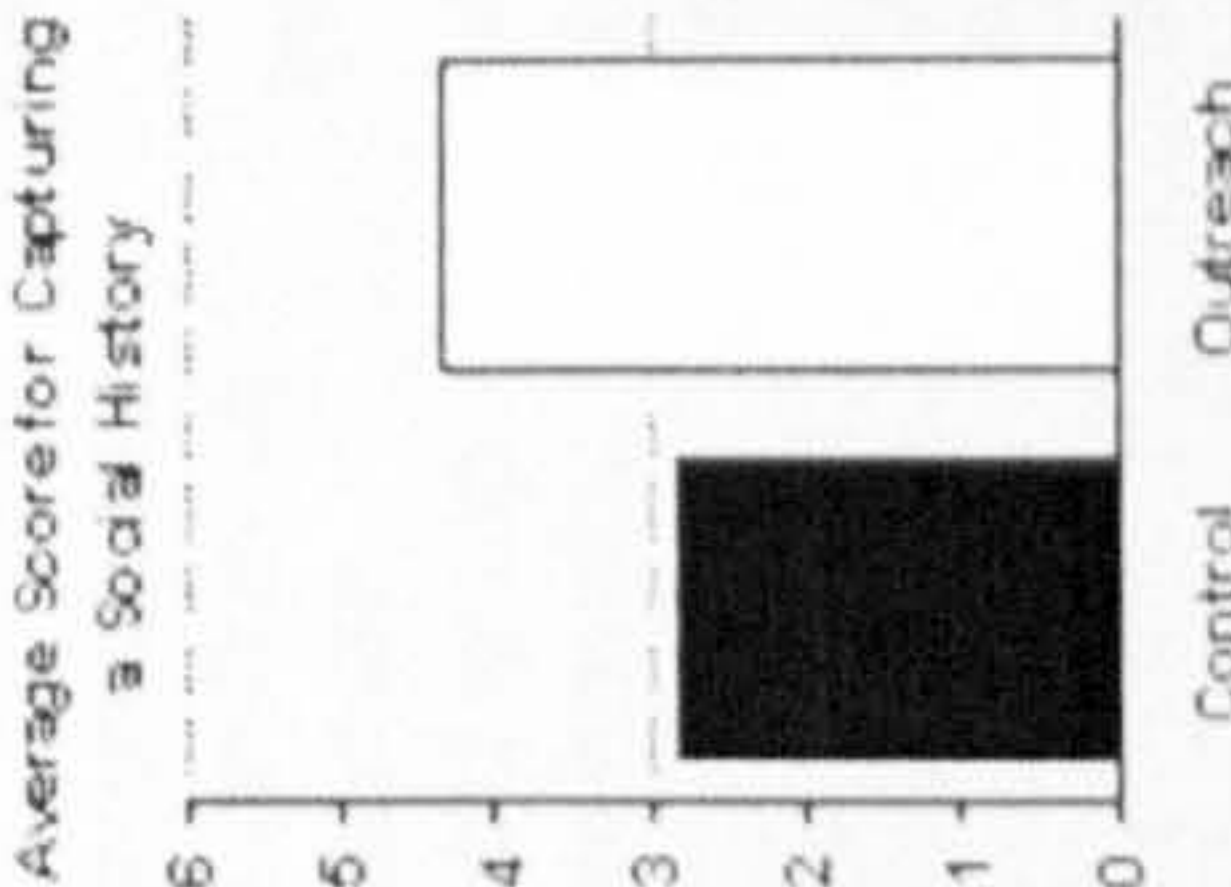
The two groups scored the same for capturing a dental history and were rated equally by the patient for their interviewing skill.

Yr4 dental students were randomly allocated to the usual hospital clinics or a 5 week block placement in Hull DAC, Lincoln DAC, Sheffield CDS or Rotherham CDS to work supervised by local dentists.

Afterwards students took a history from a patient then discussed their treatment plan with assessors. The assessors scored them on:

- the dental history captured,
- the social history captured, and
- the appropriateness of the treatment plan.

**Result 1:**  
Outreach students' scores for capturing the patient's social history were significantly higher.




Group	Average Score
Control	~2.5
Outreach	~4.5

An Outreach student wrote:

- *I have been... creating practical treatment plans which the patient can afford and manage... balancing patients' demands with what is realistically achievable*

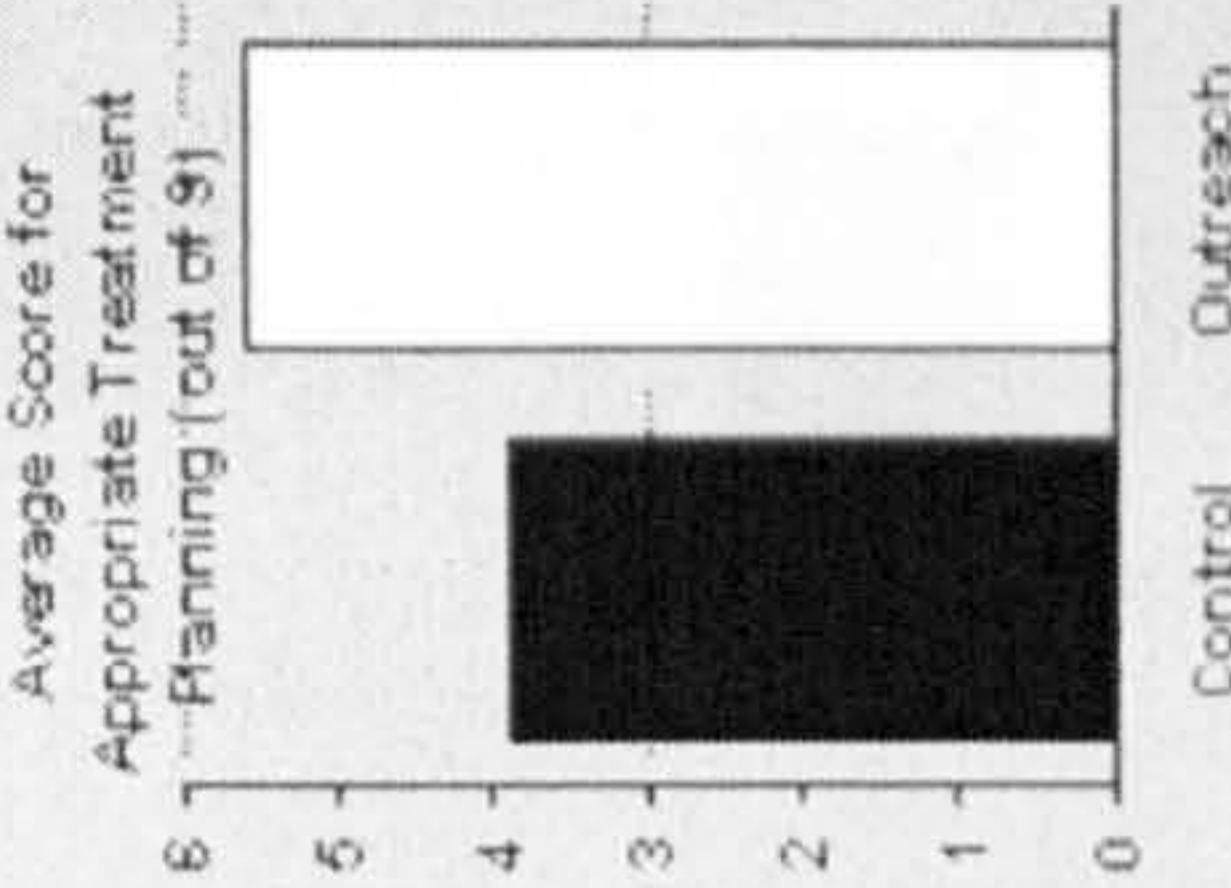
The 'patient' was an actor trained to give the same 'performance' every time.



The external assessors did not know which students had been on Outreach.

**Result 2:**  
Outreach students' scores for appropriate treatment planning were significantly higher.

The probability of either result being found by chance was under 1:100.



Group	Average Score
Control	~3.5
Outreach	~5.5

**Conclusion:**  
Outreach was significantly more effective than hospital-based training in improving students' ability to capture relevant points of social history from a patient and to consider them when planning treatment.



2 – Outreach Increases Students' Confidence to plan Treatment

## Outreach Increases Students' Confidence to Plan Treatment

### Some initial findings from the 2004 research into Outreach - No.2



School of Clinical Dentistry, The University of Sheffield

Yr4 dental students were randomly allocated to the usual hospital clinics or a 5 week block placement in Hull DAC, Lincoln DAC, Sheffield CDS or Rotherham CDS to work supervised by local dentists.

Before they started and after they finished, students rated their level of confidence on a five-point scale. At follow-up they also rated how much their confidence had improved and re-rated their starting confidence rating in the light of experience.

The two groups had practically identical levels of confidence before starting.

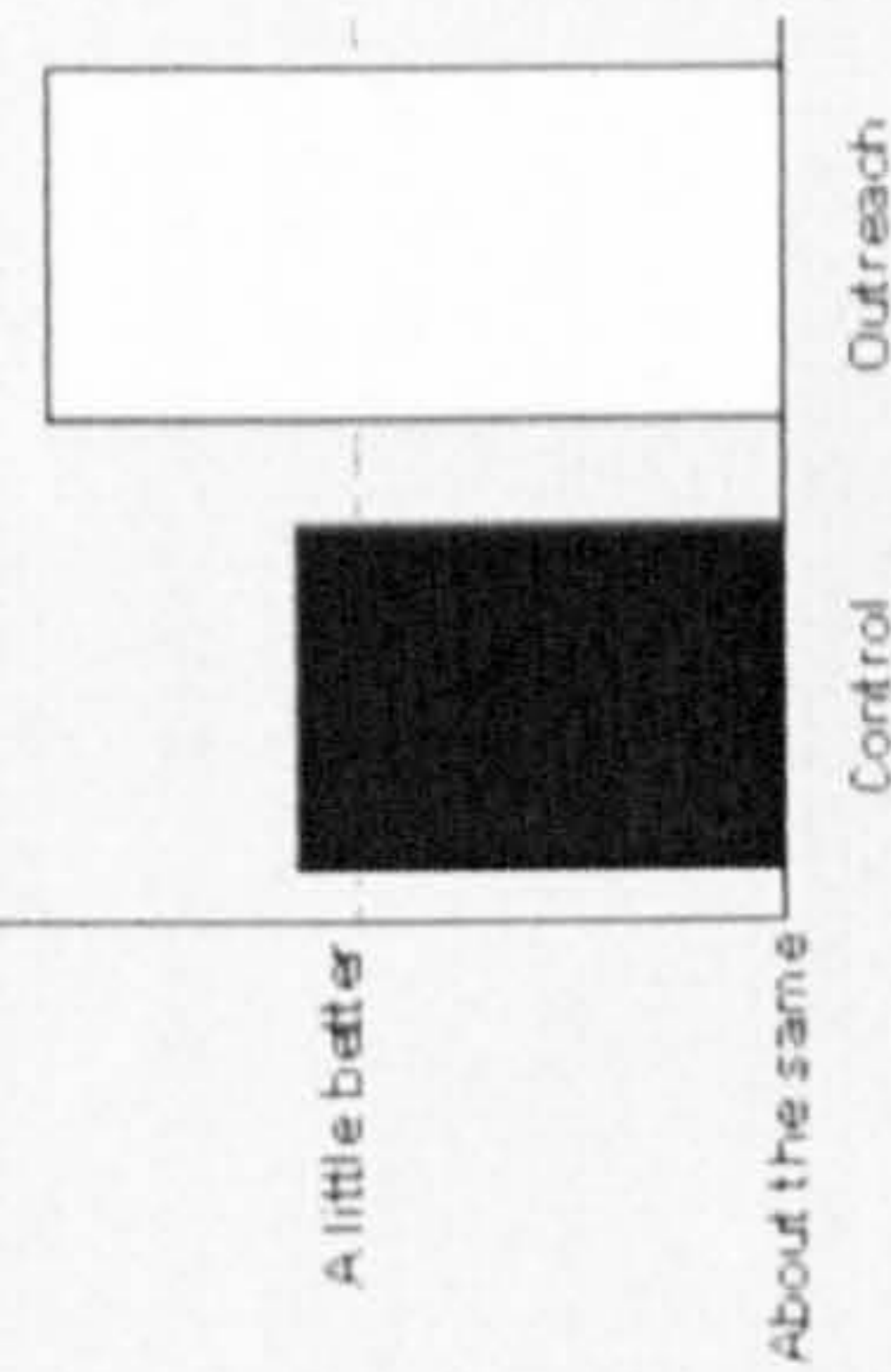
**Result 1:**  
The outreach group felt their level of confidence had improved more than the control group who stayed in hospital clinics.  
The probability of this result being found by chance was under one in twenty.

**Outreach students wrote:**

- *I feel more confident in tackling patients' problems*
- *An enormous boost to my confidence as I now realise I can do work to time.*
- *Areas which I felt confident in, I learnt were still weak and could be improved.*

**Result 2:**  
Looking back as they finish Outreach students realised they'd overestimated their confidence at the start. The average improvement from their revised estimate to their final confidence was much greater than the control group's average improvement.

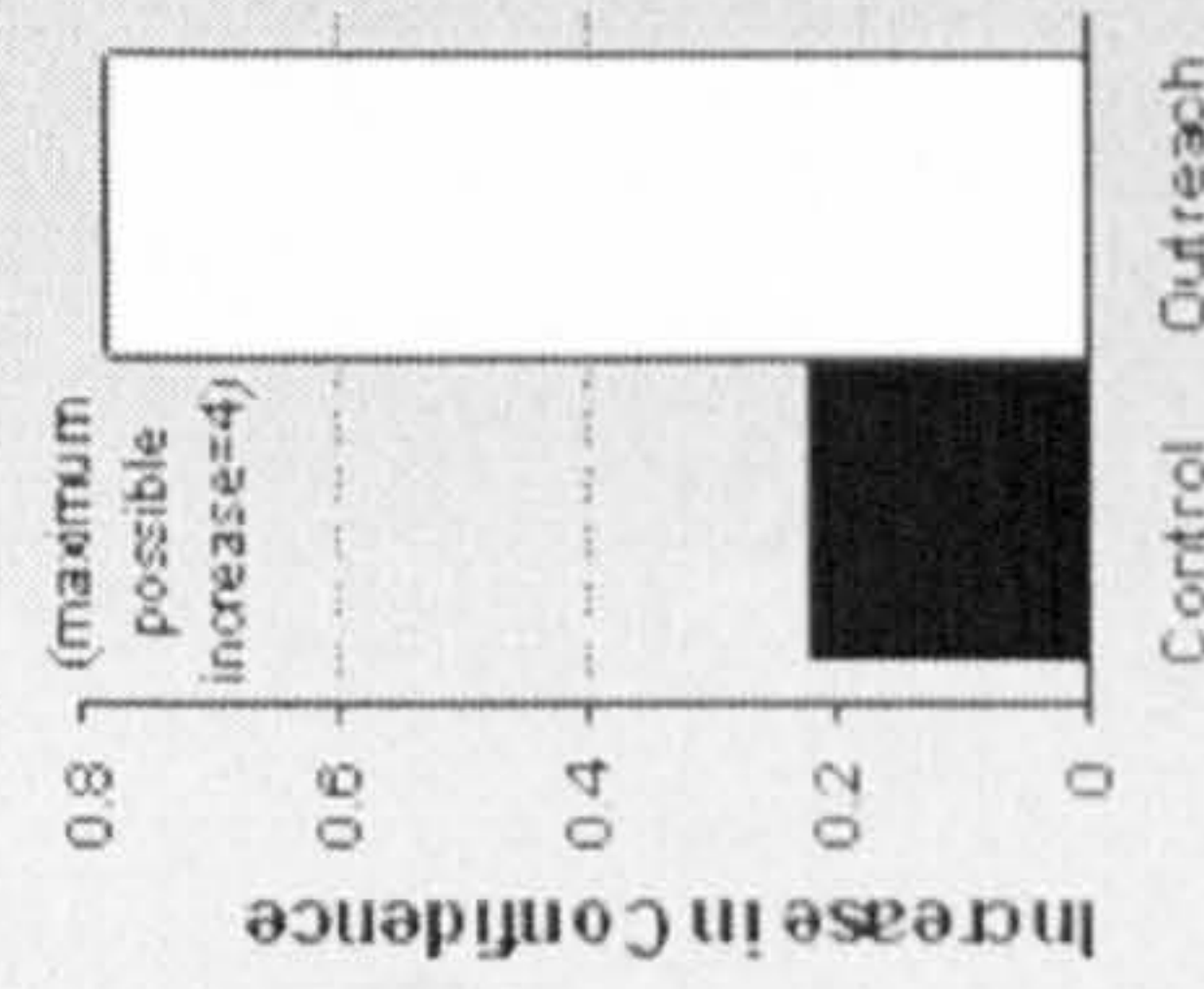
Average Change in Confidence over the 5 weeks



**Conclusions:**

- Outreach is more effective than dental hospital training in improving students' confidence in tackling clinical situations.
- Measuring this change in confidence is complicated by Outreach students' experiences on placement, away from the sheltered hospital environment, making them realise they were not as confident as they thought they were before starting.

The probability of this result being found by chance was under 1:100.





3 – Students’ Experiences on Outreach Compared to in the Hospital

## Students’ Experiences on Outreach Compared to in the Hospital

### Some initial findings from the 2004 research into Outreach - No.3

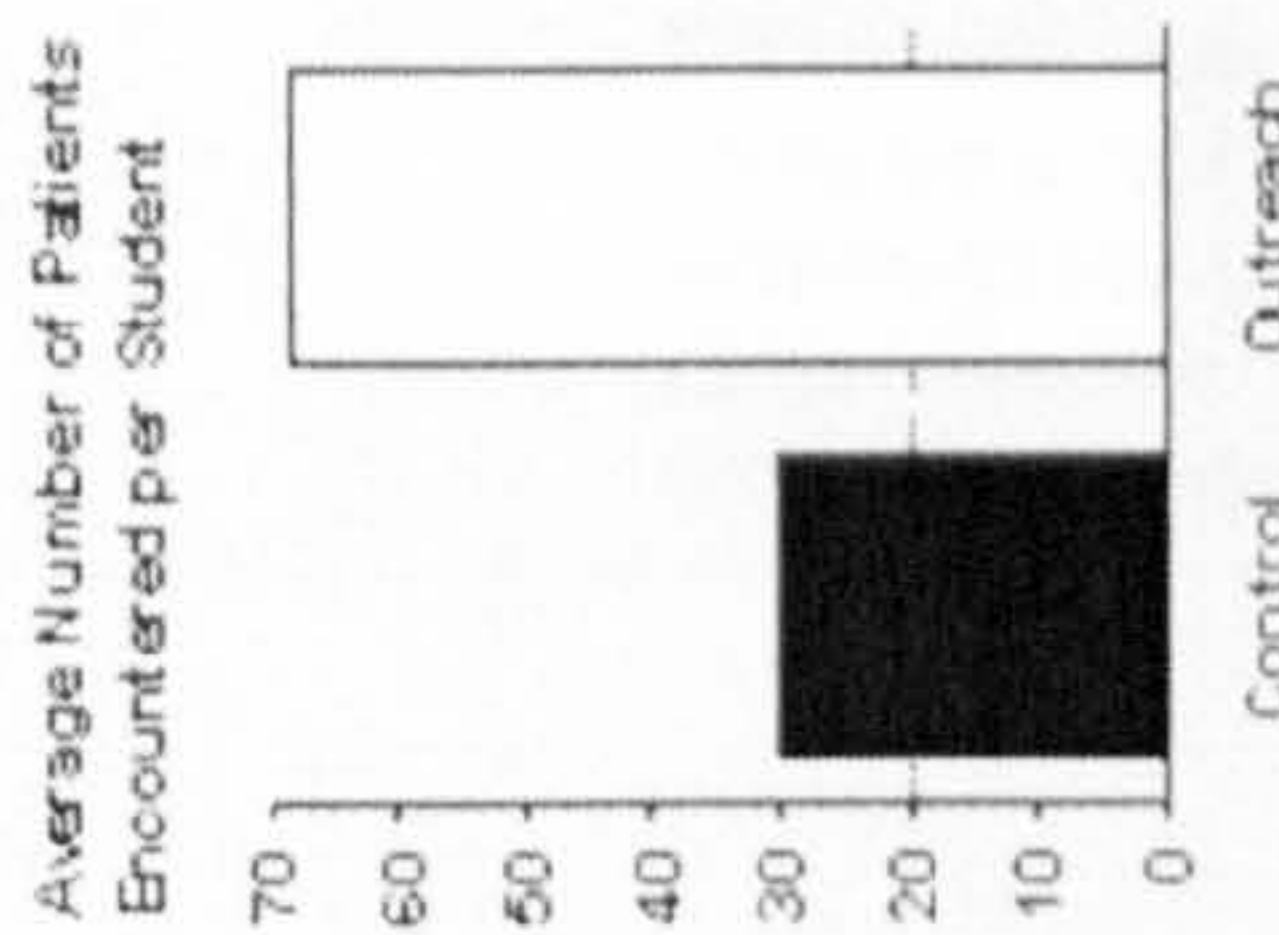


School of Clinical Dentistry, The University of Sheffield

Yr4 dental students were randomly allocated to the usual hospital clinics or a 5 week block placement in Hull DAC, Lincoln DAC, Sheffield CDS or Rotherham CDS to work at least 5 sessions a week supervised by local dentists.

**Result 1:**

Outreach students encountered more than twice as many individual patients during their placement compared to the hospital-based students



Outreach students wrote:

- *I've gained so much extra clinical experience... patients from all backgrounds some had not seen a dentist for years... varying ages*
- *Good to get on top of basic skills... no advancement in the level of clinical skill, more an increase in patient volume.*
- *Treating patients with special needs successfully was highly rewarding*

Afterwards students reported their five weeks of clinical experience as numbers of patients encountered in various categories.

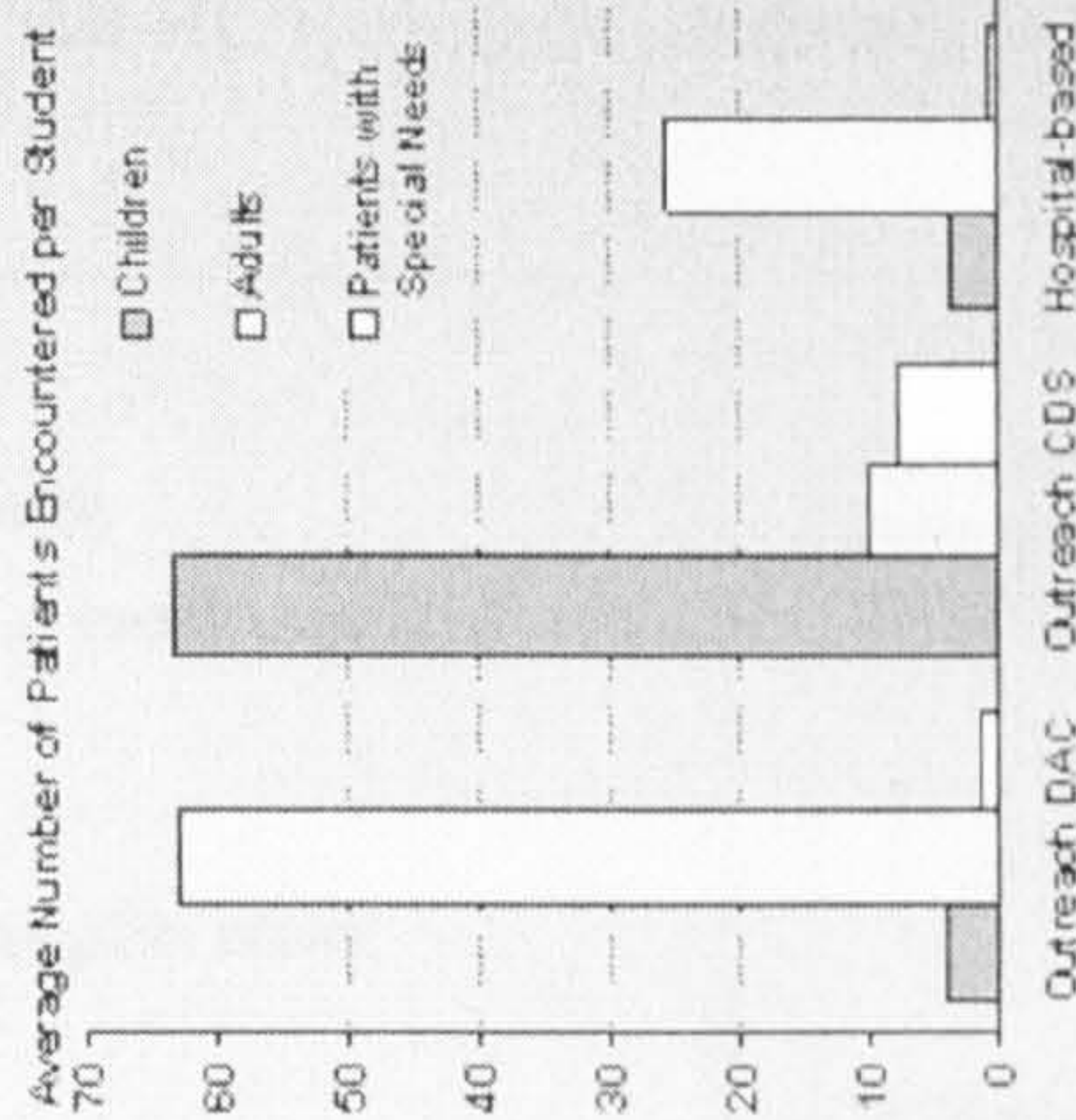
**Result 2:**  
Outreach students in DACs did encounter some children but far more adults

Outreach students in CDS encountered more younger patients and patients with special needs.

Individually, Outreach students generally experienced a wider variety of patient types than hospital-based students when categories such as non-English speakers and the age groups of children and adults were taken into account.

**Conclusions:**

- Outreach provides students with opportunities to increase and widen their clinical experience by encountering new types of patient.
- CDS and DACs provide different Outreach experiences.





## A17 International Association for Dental Research, Pan-European Confederation Conference. Symposium presentation: Outreach Training Programmes – What do the data say? September 2006

Outreach Rotations: An RCT of their contribution to undergraduates' learning

### Outreach Training

- **Primary care placements**

5 week block, ~3 days a week clinical working

New community

Local protocols, local supervision

Project work in DPH<sup>†</sup>

- **Increased experience**

<sup>†</sup> Harris *et al.* Euro J Dent Educ 2003; 7(1): 34-40.

### Aim of the RCT

*Compare the effectiveness of outreach in primary care with traditional hospital-based training to increase*

- **Confidence**

- **Competence**

in treating patients with common problems

### Confidence - Baseline assessment

Self-rated global confidence

Your training should prepare you to be able to diagnose, plan and provide treatment for a range of people presenting with common dental problems.

How confident do you feel that you can tackle a range of people presenting with common dental problems?

### Confidence - Follow-up assessment

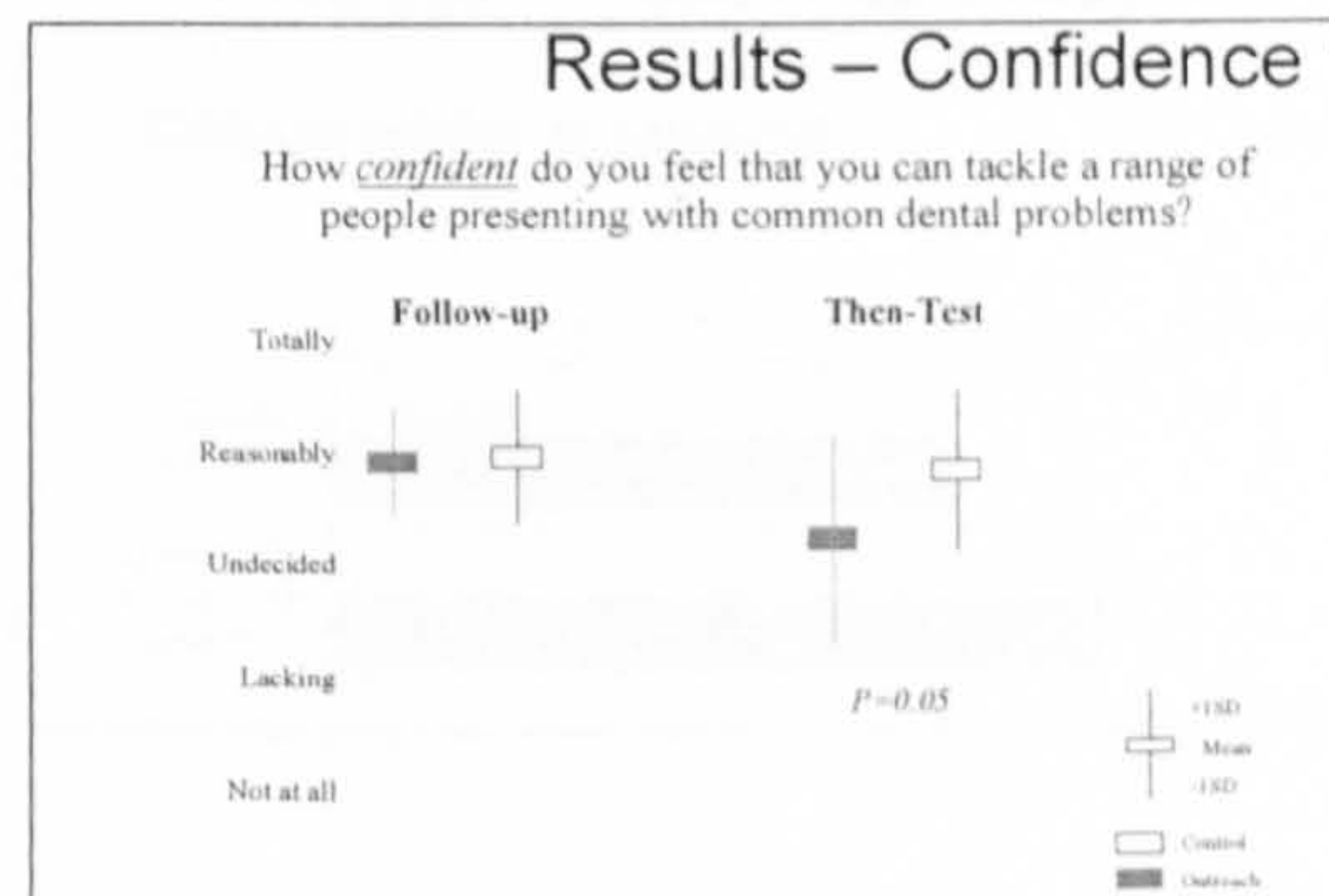
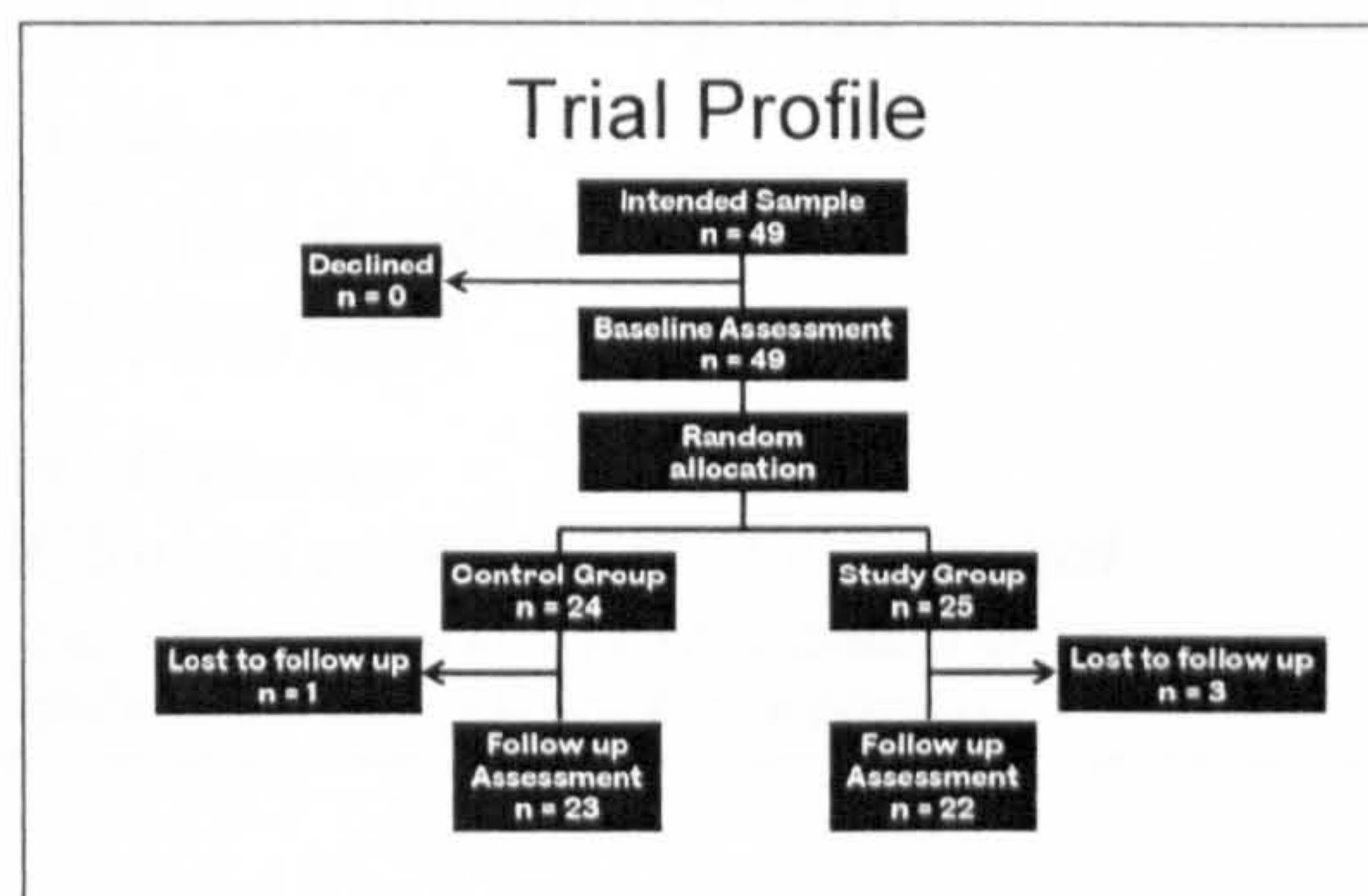
- **Self-rated confidence**

- **Then-test**

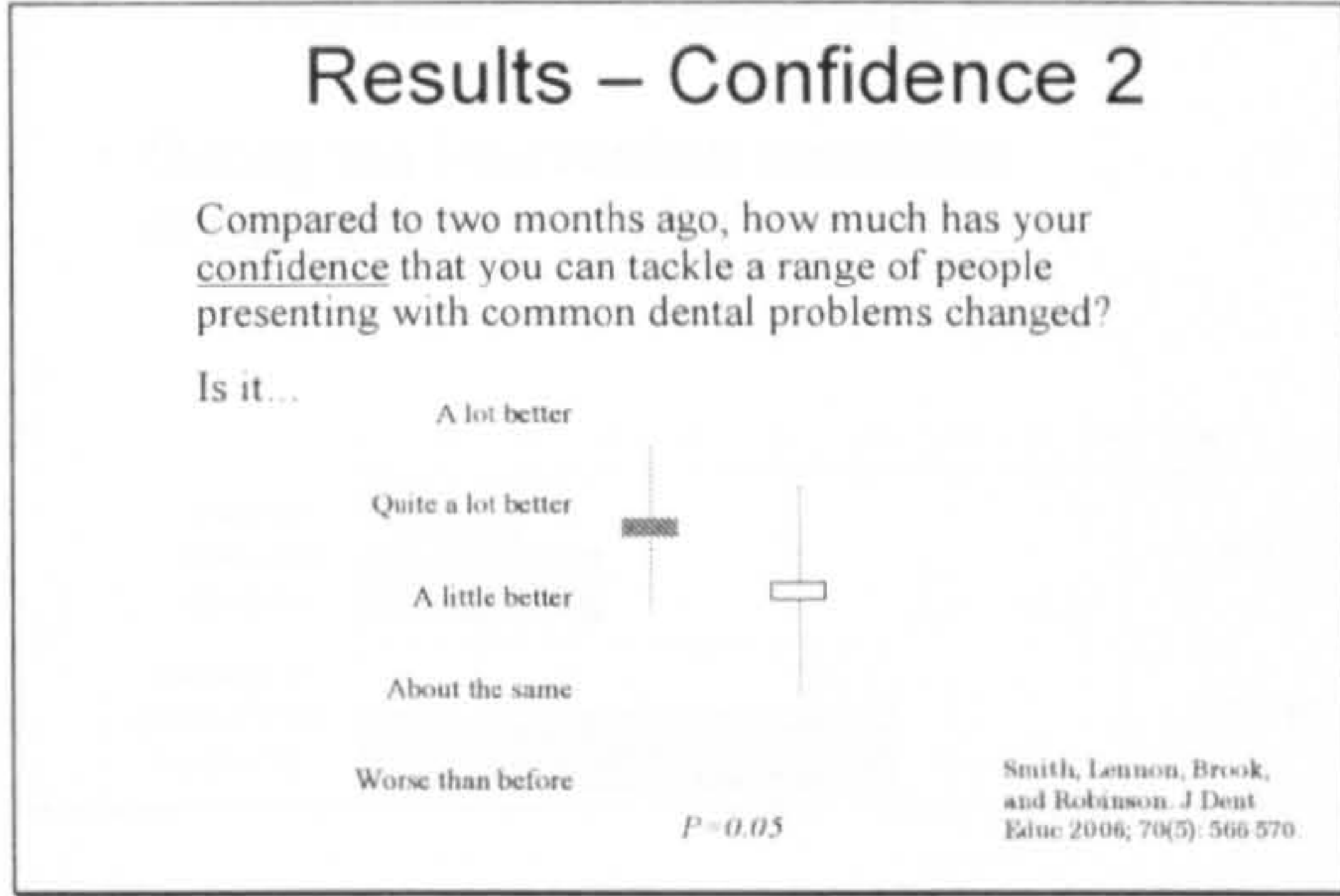
How confident do you now think you were at tackling a range of people presenting with common dental problems two months ago?

- **Transition judgement of confidence**

Think back two months. Compared to two months ago, how much has your confidence that you can tackle a range of people presenting with common dental problems changed?



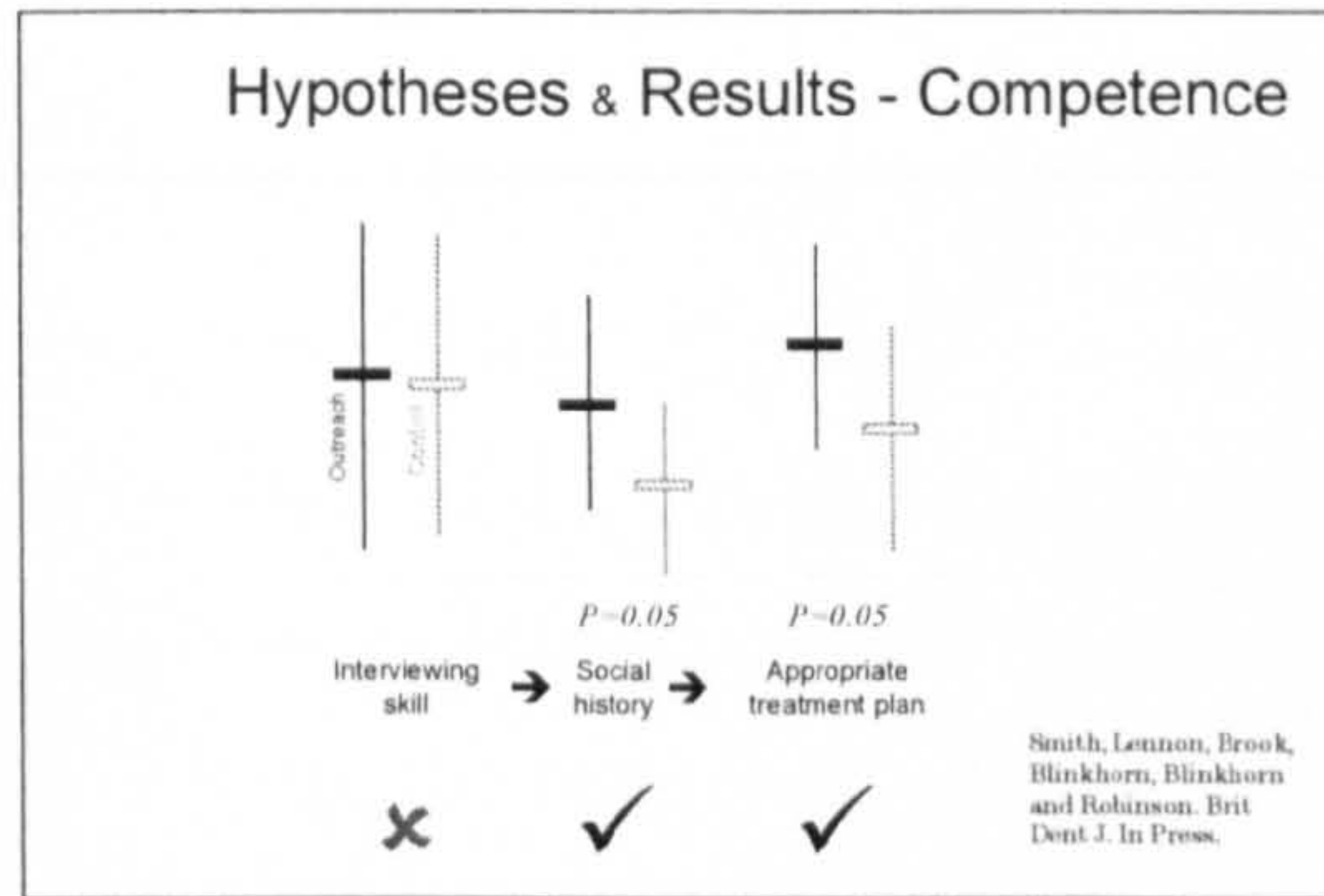




### Competence: Ability to plan dental treatment

- Standard simulated patient
- Dental chart, radiograph & medical history
- Student interviews & formulates treatment plan

- Patient and dentist rate interview skills
- Discussion with two assessors (masked to the intervention)*

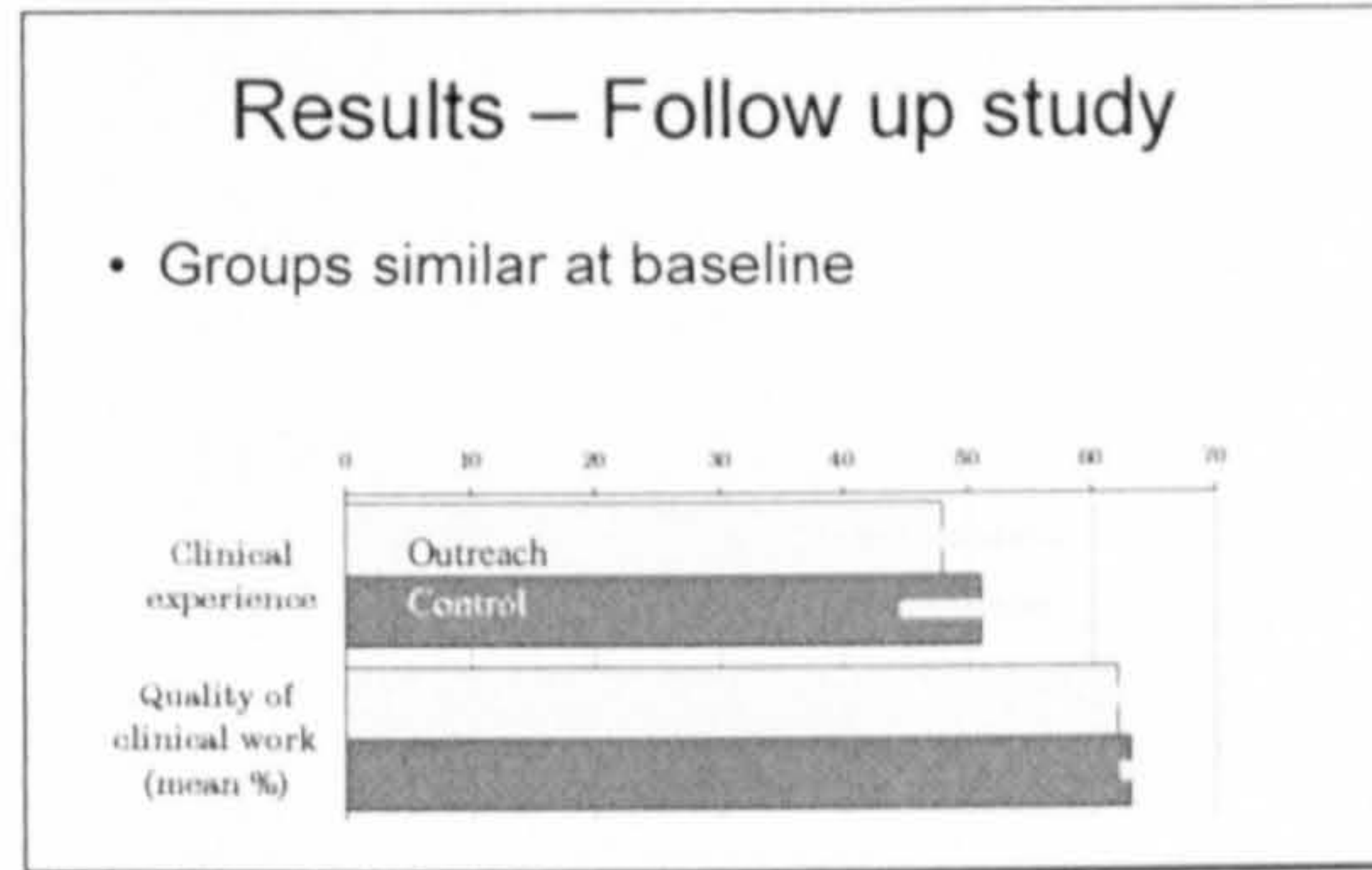


### Follow up study

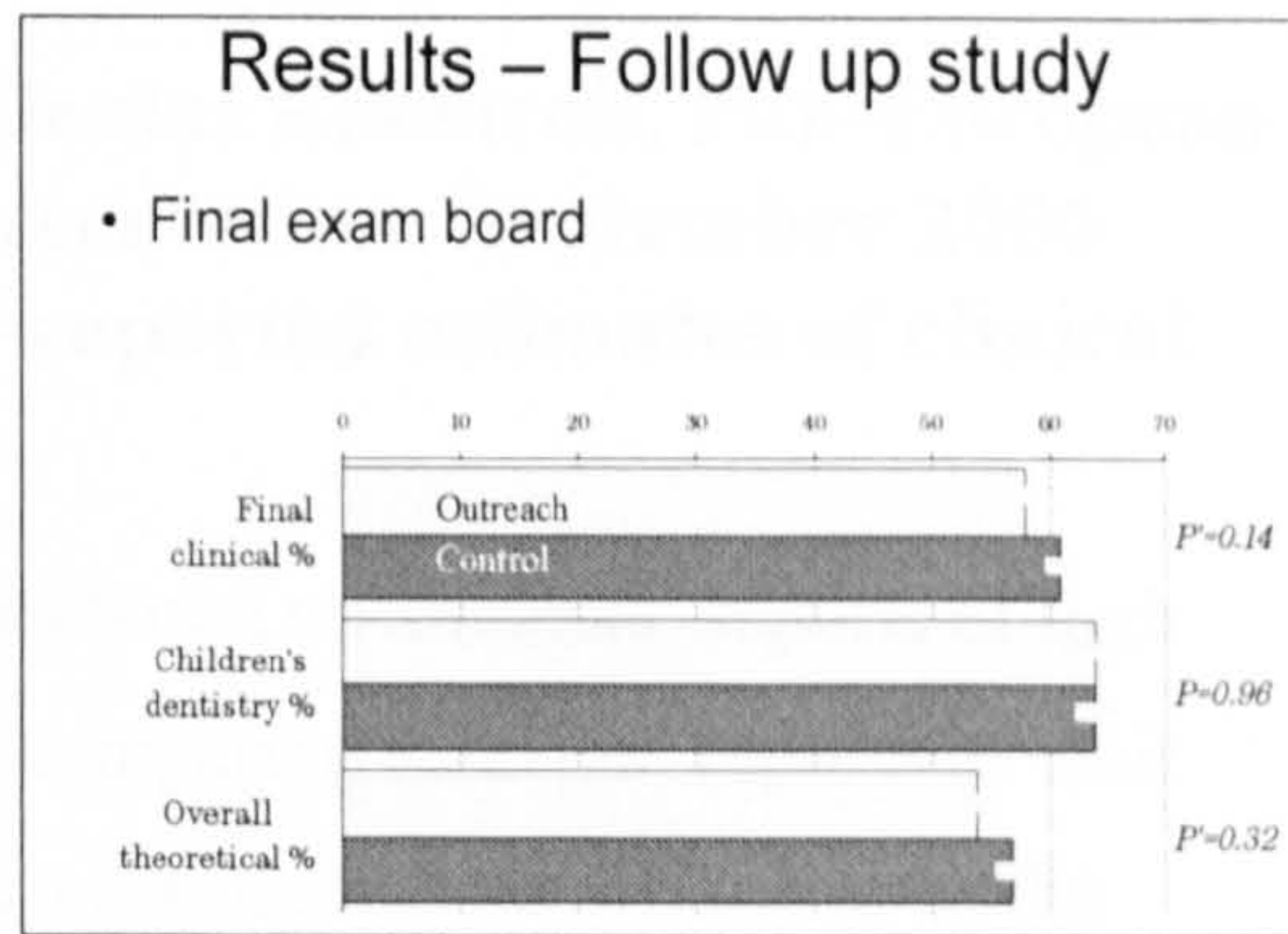
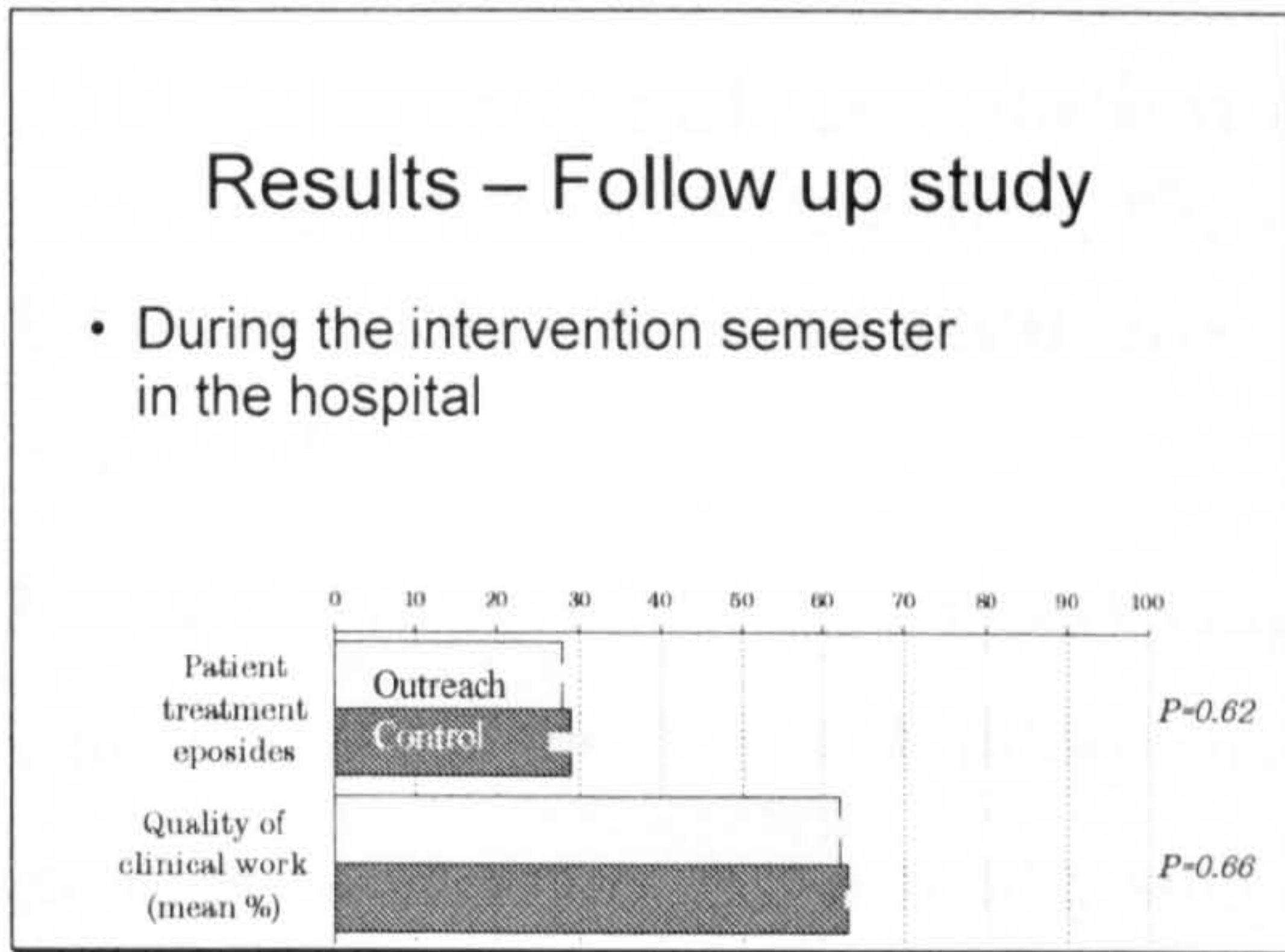
To compare the effects of outreach and hospital-based clinical experience on students' hospital clinical activity and final assessments.

### Method – Follow up study

- **Baseline**  
Clinical experience  
Clinical skill
- **Follow-up**  
Clinical activity *in the hospital*  
*Exam Board: theoretical ability, clinical ability and multiple testing correction applied*







### Summary

- *Wider experience*
- *Benefits for confidence and competence*

**No negative impact on theoretical assessments or clinical work in the hospital**

### Conclusions

- *Outreach training has demonstrable benefits*
- *Achieved without educational costs to traditional programme*

**Further research needed into the effects of longer programmes, different setting and different modes of attendance**

---

**A18 International Association for Dental Research, Pan-European Confederation Conference. Oral presentation. September 2006  
Gender differences in students' self-reported estimates of clinical experience**

Dental staff may make supervisory judgments based on students' reports of their clinical experience. An exploratory analysis comparing students' reports of their experience in restorative dentistry suggested a gender related difference in the accuracy of students' estimates.

Objective: To compare the accuracy of male and female students' estimates of the volume their clinical work.

Design: Comparison of dental students' self-reports and existing departmental records.

Method: A single cohort was considered. Clinical records of amalgam, composite and glass ionomer restorations were totalled ( $T_o$ ) for the fourth year dental students to the end of the first semester of 2005/2006. Separately, within a week of that census, students reported to the School's outreach administrator their estimated numbers of completed simple plastic restorations ( $T_a$ , identified on the data collection form as amalgam, composite and glass ionomer restorations) with annotations to inform outreach supervisors of their clinical experience. Data reported later were excluded from the analysis. The percentage overestimate was calculated as  $100 \times (T_a - T_o) / T_a$  and tested for gender differences.

Results: Data were available from 55 of 63 students in the cohort. Lost to analysis were 5 males and 3 females. The students' average number of completed restorations ( $T_o$ ) was 47(SD=15). For males the mean overestimate was 18%(SD=4%,n=187). For females the underestimate was 2%(SD=2%,n=37),  $p=0.05$  (t-test).

Conclusion: Male students over report their clinical experience while females slightly under report it. This may be a cautionary finding for supervising staff using such estimates to gauge students' abilities.



**A 19 Smith, M., Lennon, M.A., Brook, A.H. and Robinson, P.G.  
Perspectives of staff on student outreach placements. *European Journal of Dental Education* 2006; 10(1): 44-51.**

*Eur J Dent Educ* 2006; 10: 44-51  
All rights reserved

Copyright © Blackwell Munksgaard 2006  
EUROPEAN JOURNAL OF  
Dental Education

## Perspectives of staff on student outreach placements

M. Smith, M. A. Lennon, A. H. Brook and P. G. Robinson

*Department of Oral Health and Development, School of Clinical Dentistry, University of Sheffield, Sheffield, UK*

**Objective:** To explore the perspectives of placement staff on outreach training.

**Intervention:** Block clinical placements in primary care settings for dental undergraduates and hygiene and therapy students.

**Method:** After completion of the placements, 32 participating staff across nine primary care locations took part in qualitative interviews and focus groups. The staff provided data on placement organisation, the students' development and their supervision, and any effects on themselves as hosts.

**Results:** The major themes included the learning environment, supervision and communication. The staff saw benefits to students in working in a smaller primary care clinic with nursing support and immediately available supervision by a dental generalist. Other benefits included increased confidence, broad-

er clinical experience and applying theoretical learning to new communities. Effective communication and adequate resourcing were critical success factors. There was some disruption of clinics' normal working, but many unanticipated benefits. Staff supported the outreach placements in primary care settings to enhance students' dental education.

**Conclusions:** These findings provide a planning and evaluation framework for dental educators involved in outreach

**Key words:** outreach; dental student; community-based education; staff; perceptions.

© Blackwell Munksgaard, 2006

Accepted for publication, 2 August 2005

**O**UTREACH TRAINING, in which primary care settings away from dental hospitals provide supervised opportunities for students to practise on consenting patients, may enhance undergraduates', hygienists' and therapists' preparation for modern practice (1, 2). Similar developments are occurring worldwide. For example, students' entire final year on outreach forms part of an Australian course (3) and an 8-month voluntary outreach programme is underway in the US (4).

Whilst outreach has not been researched with the rigour familiar to clinicians using an evidence-based approach, there has been some evaluation. Claimed benefits of outreach for students include contact with typical and diverse patients, improved clinical confidence (5) and speed, the development of communication and teamworking skills, a wider appreciation of dentistry and other healthcare services (6) and increased social responsibility (7-10). For host services anticipated benefits include improved recruitment opportunities (11) and preparedness of new recruits (8, 9) plus the development of existing staff (12). Perceived benefits for communities are improved access and potential increase in dental schools' throughput (13). Despite international differences in the context of outreach, there

are many similarities amongst programmes' claimed benefits.

Outreach forms one challenge of the UK Government's modernisation agenda (14). Consequently there is interest in the experiences of those dental schools operating outreach programmes (6, 15, 16)

Primary dental care in the UK's National Health Service (NHS) is changing from the long-standing system of general practitioners paid under a fee for item service and the Community Dental Service (CDS). The CDS, now renamed the salaried primary dental care service, caters for children in otherwise under-served areas and patients with special dental needs. It also has an oral health promotion role. Dental access centres (DACs) are staffed by salaried dentists and provide care including emergency care for people experiencing difficulty in accessing NHS dental care. Personal dental service settings (PDS) are a recently introduced form of general dental practice providing local autonomy for practitioners who provide services under contract from the health authority. Dental hospitals provide mainly specialist care. Dental schools are linked with dental hospitals for students' clinical training.

In the UK, Manchester has long placed undergraduates in primary care settings dentistry (17-19). Liverpool's outreach programme for undergraduates and

## Staff perspectives on outreach training

therapy students includes tutorials, guided projects and working alongside other health professions (20, 21). Whilst attendance on the above is 1 day a week, Cardiff's and Glasgow's outreach programmes include block placements (M.L. Hunter, personal communication, Cardiff Dental School, Cardiff, UK; 22). Elsewhere in the UK, outreach developments appear, based on the limited published information located, to be mainly detached extensions to dental hospital provision simulating general dental practice (23, 24). Likewise, the US scheme uses faculty staff to supervise simulated practice (4) whilst the Australian and a Swedish scheme use existing primary care staff and premises (3, 25).

The University of Sheffield's School of Clinical Dentistry is developing a situated learning (26) approach to dental education for undergraduates and hygiene and therapy students through outreach placements grafted onto existing NHS primary care services. The placements expand dental services in areas of identified need and increase students' awareness of communities other than those served by the dental hospital. Students spend five or more half-day sessions of clinical experience each week supervised by approved dentists already working in 11 centres. Importantly, this supervision and the opportunity of working alongside primary care staff gave the dental hospital-trained students a perspective that contrasted with that prevalent in secondary care (5, 9).

A pilot intervention in the spring of 2003 placed students in outreach settings in conveniently available DAC or CDS clinics across northern England. Ten dental students spent 6 weeks on placement full-time and 11 hygiene and therapy students, 3 weeks. All students maintained a clinical record and undergraduate students also undertook projects related to community health.

The lack of published research into staff perceptions and the intention of developing the pilot intervention into a full programme both suggested a need for study of staff perceptions of outreach provision. With this in mind, the aim of this research was to identify the range of experiences of staff supervising or supporting students, and the range of staff interpretations of the placements. This research formed part of a larger investigation of outreach which used qualitative and quantitative methods with students and placement staff.

## Methods

A qualitative approach employed semi-structured, exploratory interviews and focus groups with place-

TABLE 1. Preliminary topic guide

Students' development whilst on placement
School's organisation of the placement
Hosts' organisation of the placement
Supervision of the students
Any effects on the hosts

ment staff usually about 1 month (range 2 weeks to 4 months in one case after a vacation) after the end of the placement. To ensure a sample encompassing a wide range of well informed experiences data were collected from the supervisors and nurses considered by local managers to have been most closely involved with the students daily throughout their placements. A number of managers and administrators were also included. Data were collected at nine of the 11 locations that were used. Ten undergraduates and nine of the student therapists were supervised in these placements. Table 1 outlines the preliminary topic guide used to frame open-ended questions.

Data were collected from 32 staff in seven individual interviews and six focus groups of two to eight staff. The interviews typically lasted 45 min and focus groups 40–75 min, and were conducted in the placements to reduce evaluation apprehension. Early interviews were with those placements with longer standing connections with the School and those taking the greatest number of students. Focus groups tested consensus and the range of views. Emerging lines of inquiry refined later questioning, corroborated data and identified exceptions. Further data were collected until data saturation was achieved with the last two interviews generating no new analytical categories.

Data were transcribed verbatim from audio tapes and content analysis involved coding the transcribed responses and grouping similar coded responses into categories. An experienced second researcher (PGR) reviewed early coding against transcripts to ensure reliability. A tentative thematic framework was identified from the categories and data indexed for mapping and interpretation for reporting, after Ritchie and Spencer (27).

Observer bias was minimised by the recruitment of an experienced interviewer from outside the Dental School who was thoroughly briefed on the outreach project and by the second researcher checking the analysis. A presentation of the findings was made on two occasions to groups of the original participating staff from several placements for respondent validation (28).



Smith et al.

TABLE 2. Themes amongst staff perceptions of outreach placements

Main themes
Outreach as a learning environment
Contrasts between environments
Practical arrangements
Teamworking
Supervision
Protecting patients
Promoting learning
Communication
Strands running through the themes
The 'real-life' nature of students' learning experiences
Tailoring of learning experiences to students' individual needs
Effects on the hosts

## Results

Of the 32 participating staff, there were 17 dentists, three therapists, one hygienist, 10 nurses and an administrator (half the dentists were male and all remaining staff were female) from nine placement clinics of which two were DACs and the remainder were CDSs.

Overall, the staff felt the placements had been of clear benefit to the students and had generally operated smoothly despite initial organisational difficulties. They had found the experience of hosting students rewarding if a little disruptive. Most considered themselves fortunate in having a 'good' student who contributed to the success of the placement.

The results are presented in the themes identified in the analysis of reported experience (see Table 2) and supported by anonymised quotations from the interviews. The first main theme, the learning environment of the outreach placement, includes arrangement placements made to accommodate students and perceived contrasts with students' experiences in the dental hospital. The supervision theme explores strategies for protecting patients by appropriate selection, oversight and intervention. The sub-theme, promoting learning through supervision, describes approaches used to take students beyond their immediate clinical experiences. The communication theme identifies some prerequisites for successful placements.

Three strands running through these themes were identified during analysis: the 'real-life' nature of students' learning experiences; the tailoring of learning experiences to students' individual needs; and the effects on the hosts. Findings relating to these strands are reported within the above framework.

### *Outreach as a learning environment*

Supervisors thought that primary care placements gave students a wider appreciation of everyday dentistry, dental careers and of how dental teams worked and developed in the students a more prag-

matic view of providing for patients' needs. Applying knowledge to unfamiliar populations was believed to reinforce students' learning.

Within the dental school... you have different departments... But that's where this sort of teaching in community could be so useful to get them looking at the whole picture... I think it will produce better dentists as a result. (CDS dentist)

### *Contrasts between environments*

Staff perceived contrasts between their settings and the dental hospital. The contrasts were characterised by less compliant patients, different solutions, simpler procedures, shorter appointments and a less restrictive environment for students on the placements. Staff perceptions of dental hospital-based learning drew on their own training and, in a few cases, working there supporting students.

It may not be according to the text book, but it will be a learnt behaviour... adapted to working in the real world. (CDS dentist)

There were apparent differences between settings. In CDS clinics staff were more likely to integrate links with other health professionals as part of students' core experience. They also referred to the family or patient's behaviour as one of the selection criteria for suitability. DAC staff were more likely to maximise students' clinical contact, to comment on their pace of work and to stress pragmatic short-term treatments.

Staff perceived a need to shift students from their perception of the hospital's approach to dental treatment to the more holistic approach predominant in their service. Some were concerned that their methods may differ from the hospital's and so be unacceptable or confusing for students.

Overall, staff found the experience of hosting students stimulating. They were required to explain procedures to students unfamiliar with primary care. Sometimes they had to recall the rationale for routine actions and this too was considered beneficial.

### *Practical arrangements*

Visits by students to the placements before starting reassured both parties and clarified their expectations of the placement. Induction tours and observation of working for a session were found to help students settle in. Staff described students as initially tense and formal in the unfamiliar setting, but generally fitting in well surprisingly quickly. Many participants commended students for their ease in dealings with staff and patients and these students were soon treated as 'just another member of staff'.

## Staff perspectives on outreach training

Whilst some disturbance of normal working in the placement clinics was inevitable, most staff described this as minor. However, staff in clinics with only a single chair tended to develop a backlog of appointments. Managers envisaged future resourcing problems for supervision where placements took just one or two students.

The staff observed that students' pace improved to about one-third of a dentist's work rate but without the difficult cases. Failure of booked patients to attend caused some quiet sessions, but busy times in the 'drop-in' DACs saw staff protecting students from stressful overload.

*Teamworking*

A key member of the dental team was observed to be the dental nurse. Where resources allowed the provision of an experienced dental nurse, this was reported to be invaluable.

Nurses' knowledge of the surgery and patients allowed students to concentrate on patient care. Furthermore, later sections will describe how nurses were also helpful in the supervision and assessment of students.

We needed a nurse who knew the patients and knew the surgery so the student didn't have to think about any of that. So the right instruments and the right forms would be to hand. (CDS dentist)

The dental teams found unanticipated benefits from hosting students. They mentioned refreshing diversions from routines and social gains from the presence of 'new faces'. Moreover, staff reported a fillip engendered by the students' enthusiasm.

Another reported benefit related to recruitment. Outreach provided opportunities to raise students' awareness of the career possibilities in the setting and the attractions of working locally. Several staff made offers of future employment to the students they hosted

*Supervision*

Two main facets of the supervisory role were described: providing clinical services for patients and learning experiences for students. Occasionally the two facets conflicted and patients' needs took precedence. Some supervisors who were new to the role found it more onerous than anticipated.

If a patient started to get a little bit agitated then... we would go and sit in the corner. With one pulpotomy we had to take over as the patient was getting restless from having been in the chair too long... (CDS dentist)

*Protecting patients*

Supervisors' strategies for the protection of patients being treated by students involved a combination of patient selection, observation and, where necessary, intervention. Staff and students were familiar with checking agreed steps of clinical procedures. This process assured the quality of patient care and allowed assessment and feedback for educational purposes.

Criteria for selecting suitable patients often centred on behavioural rather than clinical factors with amenable patients known to supervisors being preferred. An appreciation of individual students' clinical experience and capabilities was also important. Supervising staff went so far as to commend students for their professionalism in highlighting their own limitations and seeking assistance before problems arose. Patients almost invariably consented to being seen by a student: most readily when a familiar nurse explained the situation.

The preferred arrangement for working allowed the supervisor to move unobtrusively from being alongside a student, sometimes nursing for them, through to out of sight but still in earshot and easily summoned. One CDS dentist commented:

She actually asked would I chairside for her to start with. So she wanted a lot of input. And by the end... I did stand back and I could see she was a lot more confident.

This example is typical as staff reduced the intensity of supervision as their confidence in each student's abilities grew.

Dental hygiene and therapy students were already experienced dental nurses. Consequently they could assist. Conversely, undergraduates were inexperienced in surgery routines and patient management, and so supervisors preferred to have an experienced nurse present to assist and ensure attention to patients' needs. All supervisors valued the nurses' chairside vigilance and appraisals of students' developing capabilities.

*Promoting learning*

Supervisors promoted students' learning by tailoring the learning experiences, support, feedback and coaching as each student progressed. Where students pressed for more or increasingly complex work placements accommodated these where practicable.

They enjoyed having a bit more freedom here. They realised they're appreciated... enjoyed building their confidence and understood that they could come to you if they had a problem. (DAC senior nurse)



Smith et al.

Staff identified distinct changes in the students during the placement. Students mastered new treatments, gained confidence in checking their own work and managed unfamiliar types of patients more effectively. Staff attributed part of this development to the sheltered, supportive learning environment they had provided.

Techniques for promoting learning varied between individuals and between situations. Supervisors used socratic questioning, discussion, closed- and open-questioning, occasional didactic instruction and demonstration, besides acting as role models.

I think they need that sort of nurturing and fostering at this stage It's having to allow them to develop. It wasn't a matter of saying 'You should have done this', 'You should have done that.' No, it was 'How did you see that?'... 'Well I felt that in that situation I might...' (DAC dentist)

They encouraged reflection through pre- and post-treatment discussions and emphasised the need to provide constructive feedback. Best practice included staff explicitly extending students' reflection on cases to generalising and building their working knowledge. Students' engagement with such interaction was a significant factor in developing increasingly productive relationships with supervisors. Some supervisors felt uncomfortable checking and being judgemental about students' work and giving critical feedback.

It was slightly nicer... to write it down and she would have time to ponder it herself and then she could ask me any questions... (CDS dentist)

Feedback is... as I understand it, is turning every negative into a positive. (DAC dentist)

Staff perceived advantages for students' breadth of experience in seeing varied approaches from a number of dentists.

Some supervisors suggested the School adopt a more prescriptive approach in specifying the clinical contact time, target numbers for procedures and suitable visits. This was one of several examples where staff were anxious to meet their responsibilities to the student and to the School.

Staff were committed to, and proud of, providing valuable and enjoyable learning experiences tailored for individual students. Motivators for placement staff all related to the students; namely their contribution to the work of the clinic, being appreciative and being seen to improve.

It does depend on the student because you are willing to put in a lot from our point of view

when you know that the student is really interested. Then you don't mind putting yourself out... (CDS dentist)

We didn't want to let the students down... and the staff, as a team, I think they worked hard. . But we've enjoyed it (DAC dentist)

As described previously, staff found hosting students demanding, refreshing and rewarding

I took over and it made me feel quite wonderful to have to a chance to demonstrate how to do it. (CDS dentist)

They knew... so much more than me from the textbook that it kept you on your toes... Quite challenging but not a bad thing really for trying to keep you up to date. (CDS dentist)

#### *Communication*

A shared understanding of the placement's purposes and more practical information were considered important in both placement-School and staff-student communication.

Supervisors were aware of channels of support from the School and the few using them reported prompt and helpful responses.

In most cases supervisors and staff had received sufficient information on students' clinical experience before students started. This was then supplemented by discussion with students on arrival. Placements uncertain of individual students' abilities and those inexperienced in working with therapists made initial appointments for simpler procedures for the purposes of formative assessment. Some of these supervisors requested more information about students from the School in the form of discussion or pen portraits.

Communication between staff and students was considered effective with a good rapport being achieved during the placement. Staff enjoyed the evident interest students had in their clinics' work.

They were fantastic. The whole social thing was just great, the nurses loved it... especially the interest they showed in our work (CDS dentist)

#### **Discussion**

This qualitative exploration of the perceptions of placement staff involved in outreach training found that staff saw benefits to students in working in a smaller primary care clinic with nursing support and immediately available individual supervision by a dental generalist. There was some disruption of

## Staff perspectives on outreach training

clinics' normal working but many unanticipated benefits. These findings can be used by dental educators who are planning or evaluating outreach programmes.

Whereas most research into stakeholder perceptions of outreach placements has focused on students (29, 30) or patients (19, 21), only five studies report the perceptions of placement staff. Lennon et al. (21) investigated pilot PDS placements and noted the practice principals' positive attitudes and staff perceptions of unspecified benefits to both the practice and the volunteer students. The evaluation reported by Elkind et al. (31) focused on operational matters and noted that students worked in pairs without nursing support. A US evaluation reported mentoring of students renewing staff enthusiasm for dentistry (32) and a Swedish one stressed the importance of placement-faculty cooperation (25). The fifth study did not evaluate a clinical working placement but day visits to interview staff, who reported being encouraged to reflect critically on their practice, and patients (12). The Sheffield placements differed from these studies in being full time rather than 1 day per week. Whilst the findings of all six studies are consistent, the present study obtained in-depth data from a greater number and wider range of staff. Moreover, its method and narrower scope permitted greater rigour and investigation of the phenomena. Caution though is required in drawing international comparisons as the contexts in which placements occur differ markedly.

Supervisors' emphasis reflected the priorities of their settings: CDS providing continuing care and treating more children and anxious patients, DACs providing prompt access to care for acute cases. There may be advantages to the breadth of available learning experiences by placing students in both settings.

Hosting students full time over several weeks and discussion of visits to other health services may well have encouraged helpful supervisory relationships. Staff perceived students developing increasingly productive relationships with supervisors, an appreciation of teamwork and an awareness of careers. These outcomes and students' professionalism have not been reported in the other studies but were reported by students taking part in this pilot (33).

The tensions created in balancing the needs of patients and students are well known (34-37). Staff strove to maintain normal service levels, gained patients' consent to be treated by students and intervened if problems arose. The integrity of patient care was not compromised.

There was a variety of supervisory practice and low staff confidence in some aspects of their role.

These findings suggest a role for professional development (CPD) in building on the pilot and this would be an additional benefit to placement staff. However, staff concerns would appear to be ill-founded, students taking part in this pilot universally praised the staff, their supervision and the feedback they were given (33). A main aim of CPD may be to reassure staff.

Increasing, as some staff suggested, emphasis on using hospital protocols and procedures could risk subverting the placements' primary care perspective (1). These individuals may not have fully appreciated the key aim of providing experience in primary care settings and again CPD could be used to reaffirm the staff of the valuable insights they bring to undergraduate training.

The reported best practice in going beyond providing students with feedback on their experiences with individual patients, and encouraging them to develop generalised solutions followed Cox's model (38) for clinical teaching to broaden working knowledge.

Outreach students stress the importance of nurse assistance (20, 24, 33). Not cited in other research is the invaluable role of nurses in supervising students both in terms of protecting patients and in providing feedback to students. However, this exciting opportunity for team working development carries a cost. To get the most from outreach an adequate supply of nurses requires funding. This finding also argues against the approach of students working in pairs used in some outreach programmes.

The method of interviewing staff some period after the placement ended may encourage detachment and reflection but may introduce some recall bias. Staff members' own training experiences may bias their perceptions of placement experiences, especially when contrasting these with students hospital training experiences. The cross-checking by multiple participants in focus groups and later validation should reduce any such biases.

Limitations on the wider application of these findings arise from the context of this research. The placements took place at a time of change in therapists' duties whilst many dentists were unfamiliar with therapists' roles. In addition, the nature of primary dental care is changing in the UK with a new general dental service contract being introduced, a greater role for DACs and a review of salaried primary care services. The DAC and CDS settings provided contrasting experiences. The emergent nature of the programme probably exacerbated communication problems and limited host placements' preparations.



Smith et al.

Staff actively supported the outreach placements in primary care settings as an enhancement to students' dental education. They identified benefits to students in increased and broadened clinical experience, team-working and in applying theoretical studies to new communities. Staff also discovered unexpected benefits from hosting students. Effective communication and adequate resourcing were perceived as critical success factors.

In addition to the CPD areas already indicated, several points discussed above may be pertinent to planning outreach placements: implementation varying by setting; productive supervisory relationships; good practice in generalising learning; and the important role of nurses.

The findings of this study prompt further investigation of the relative merits of block and longitudinal placements, the variation in learning experiences by setting and quantifying the effects of placements compared with the traditional curriculum. The last of these is being addressed by the authors.

In conclusion, placement staff in this pilot held encouragingly positive attitudes towards outreach and reported productive teaching and learning experiences. Further, the study suggests potential benefits from the development of measures to increase consistency in some aspects of teamworking and communications. More importantly these findings provide an invaluable framework for dental educators who are planning or evaluating outreach programmes.

## Acknowledgements

The authors extend grateful thanks to the staff in all the placements for their permission for the study and their extensive feedback. The School is indebted to them for providing students with learning opportunities in such a supportive manner.

## References

1. General Dental Council. *The first five years: a framework for undergraduate dental education*, 2nd edn. London: GDC, 2002.
2. General Dental Council. *Developing the dental team: curricula frameworks for registrable qualifications for professionals complementary to dentistry*. London: GDC, 2004.
3. Meyers I. The 1 + 3 + 1 program at the University of Queensland. Presentation at International Association for Dental Research Symposium on Outreach Teaching, 2004 <http://www.dent.umich.edu/iadr/Documents/queensland.pdf>.
4. Feldman C. Evaluating the educational effect of outreach. Presentation at IADR symposium on Outreach Teaching, 2004 <http://www.dent.umich.edu/iadr/Documents/evaluating.pdf>.
5. Bault H. Community-based clinical education programs. Major findings and recommendations. *J Dent Educ* 1999; 63: 981-989.
6. Elkind A. Outreach teaching: is this the future for dental education? *Br Dent J* 2002; 193: 111-112.
7. Mofidi M, Strauss R, Pitner LL, Sandler ES. Dental students' reflections on their community-based experiences: the use of critical incidents. *J Dent Educ* 2003; 67: 515-523.
8. Thind A, Atchison K, Andersen R. What determines positive student perceptions of extramural clinical rotations? An analysis using 2003 ADEA senior survey data. *J Dent Educ* 2005; 69: 355-362.
9. Lerner MJ, Hall DS, Young WO. Evaluating a field experience in community dentistry. *J Dent Educ* 1971; 35: 445-451.
10. Jong A, Field H. The role of a community health center in dental education. *J Dent Educ* 1972; 36: 36-39.
11. Rabinowitz HK. Recruitment, retention, and follow-up of graduates of a program to increase the number of family physicians in rural and underserved areas. *N Engl J Med* 1993; 328: 934-939.
12. Pau AKH, Croucher R. A dental practice placement scheme benefits for practitioners and undergraduates. *Eur J Dent Educ* 2001; 5: 155-161.
13. National Dental Workforce Unit. *Dental Training Project - Consortia Outreach Teaching: Interim Lessons Learned Report*. Sheffield: National Dental Workforce Unit, 2005.
14. Department for Health. *NHS dentistry: options for change*. London: Department of Health, 2002.
15. Learning and Teaching Support Network 01. *Twenty twenty vision - external clinical placements. A conference report in the newsletter of LTSN01*, 2004; June: 16-17. [http://www.ltsn-01.ac.uk/external\\_files/pdfs/01\\_newsletter/LTSN015\\_lo\\_res.pdf](http://www.ltsn-01.ac.uk/external_files/pdfs/01_newsletter/LTSN015_lo_res.pdf).
16. British Dental Association and Learning and Teaching Support Network 01. *National Meeting of Dental Curriculum Co-ordinators/Educators*. 2002. Report of meeting 26th February 2002. [http://www.ltsn-01.ac.uk/docs/BDA\\_meeting\\_report1.rtf](http://www.ltsn-01.ac.uk/docs/BDA_meeting_report1.rtf).
17. Holloway PJ, Dixon PA. Extra-mural experience for undergraduate dental students. *Br Dent J* 1977; 143: 146-150.
18. Elkind A, Blinkhorn AS. Modernising dental education. *Br J Health Care Manage* 2001; 7: 490-491.
19. Elkind A, Potter C, Watts C, et al. Patients treated by dental students in outreach: the first year of a pilot project. *Eur J Dent Educ* 2005; 9: 49-52.
20. Lennon MA. Outreach programmes - serving the underprivileged. *Eur J Dent Educ* 2003; 7: 86.
21. Lennon MA, Ireland RS, Tappin J, et al. The personal dental service as a setting for an undergraduate clinical programme. *Br Dent J* 2004; 196: 419-422.
22. University of Glasgow. *Dentistry: undergraduate course information*. 2004. <http://www.gla.ac.uk>.
23. British Dental Association and Learning and Teaching Support Network 01. *National Meeting of Dental Curriculum Co-ordinators/Educators*. 2002. Abstracts for meeting 26th February 2002. [http://www.ltsn-01.ac.uk/external\\_files/bdameeting/abstracts.pdf](http://www.ltsn-01.ac.uk/external_files/bdameeting/abstracts.pdf).
24. Bartlett DW, Woolford M. Team training at an outreach dental unit. *Eur J Prosthodont Restor Dent* 2003; 11: 133-135.

## Staff perspectives on outreach training

25. Petersson K, Nilner M, Rohlin M. Extramural clinic in comprehensive care education. *Eur J Dent Educ* 2003; 7: 95.
26. Lave J, Wenger E. *Situated learning: legitimate peripheral participation*. Cambridge: Cambridge University Press, 1991.
27. Ritchie J, Spencer E. Qualitative data analysis for applied policy research. In: Bryman A, Burgess RG, eds. *Analyzing qualitative data*. London: Routledge, 1993: 173-194.
28. Bloor M. Techniques of validation in qualitative research: a critical commentary. In: Miller G, Dingwall R, eds. *Context and method in qualitative research*. London: Sage, 1997: 37-50.
29. Blinkhorn FA. Evaluation of an undergraduate community-based course in family dentistry. *Eur J Dent Educ* 2002; 6: 40-44.
30. Elkind A, Blinkhorn AS, Blinkhorn FA, Duxbury JT, Hull PS, Brunton PA. Developing dental education in primary care: the student perspective. *Br Dent J* 2005; 198: 233-237.
31. Elkind A, Blinkhorn AS, Watts C, Harvey L. *Developing dental education in primary care: report of the first year of a pilot outreach course in restorative dentistry*. Manchester: University Dental Hospital of Manchester, 2003.
32. Frankl SN, Mann ML, Wong AW. APEX: an experiential education program. *J Dent Educ* 1993; 57: 637-642.
33. Smith M, Ritucci L, Brook A, Robinson PG. Dental students' experience of interdisciplinary outreach training. *J Dent Res* 2004; 83 (Spec. Iss B): 129.
34. Hartley S, Gill D, Carter F, Walters K, Bryant P. *Teaching medical students in primary and secondary care: a resource book*. Oxford: Oxford University Press, 2003.
35. Spencer J. ABC of learning and teaching in medicine. learning and teaching in the clinical environment. *Br Med J* 2003; 326: 591-594.
36. General Dental Council. *Letter to the deans of dental schools*. London: GDC, 2004.
37. Senate of Dental Specialties. *Good practice in the dental specialties*. London: Royal College of Surgeons of England, 2004.
38. Cox K. Planning bedside teaching - 1. Overview. *Med J Aust* 1993; 158: 280-282.

## Address:

Michael Smith  
 Department of Oral Health and Development  
 School of Clinical Dentistry  
 Claremont Crescent  
 Sheffield S10 2TA  
 UK  
 Tel: +44(0)114 2268648  
 Fax: +44(0)114 2717844  
 e-mail michael.smith@sheffield.ac.uk



**A 20 Smith, M., Lennon, M.A., Brook, A.H., Ritucci, L. and Robinson, P.G. Student perspectives on their recent dental outreach placement experiences. *European Journal of Dental Education* 2006; 10(2): 80-86.**

*Eur J Dent Educ* 2006; 10: 80-86  
All rights reserved

Copyright © Blackwell Munksgaard 2006  
EUROPEAN JOURNAL OF  
Dental Education

## Student perspectives on their recent dental outreach placement experiences

M. Smith, M. A. Lennon, A. H. Brook, L. Ritucci and P. G. Robinson

*Department of Oral Health and Development, School of Clinical Dentistry, University of Sheffield, Sheffield, UK*

**Background:** Dental schools are developing new curricula, with outreach placements enhancing the hospital-based training.

**Objectives:** To assess the students' experience of outreach as one component of determining the value and feasibility of outreach placements.

**Intervention:** Six-week block placements for 10 undergraduates and 3 weeks for 11 hygiene and hygiene and therapy students in existing primary care clinics, in areas of need, to work supervised by local dentists.

**Methods:** Semi-structured interviews with 20 students by staff independent of the course team. Interviews were audio-recorded, transcribed and content analysed before being verified by a second observer. Findings were triangulated against a peer-run focus group and students' clinical records.

**Results:** Students were very positive about their experience and the potential role of outreach training in dental education. They described: gaining greater experience of new types of patients and their communities; learning from broader clinical experience,

alternative approaches and practicing or observing dentistry in different settings, the benefits of team working, and, acquiring a more holistic and pragmatic view of health care. Many students reported gaining greater confidence, wider awareness of potential careers in dentistry and a greater sense of realism in their experience. Some reflected on their own training needs. Students also discussed the importance of preparation for the placements and the merits of different styles of supervision.

**Conclusion:** Dental outreach training can provide students with valuable learning experience in a range of areas. It requires careful management to ensure those experiences match individuals' needs and the programme's purposes.

**Key words:** outreach; community-based education; extramural; dental student, perceptions.

© Blackwell Munksgaard, 2006

Accepted for publication, 10 November 2005

### Introduction

DENTAL EDUCATION is developing to meet the challenges of governments' modernization agendas (1-3). Outreach placements, in which students undertake supervised practice on consenting patients away from the dental hospital in primary care settings have been said to enhance undergraduates', hygienists' and therapists' learning (4-6) and to help develop their competence for later dental practice (7).

Student perceptions are central to both assessing quality and targeting development in educational programmes (8, 9). Most published evaluations of UK outreach dental education programmes include students' perceptions and almost all of those describe either the Manchester (10-12) or Liverpool (13) programmes. Recurring findings in these and other reports (7, 14-17) include students' appreciation of nursing support and closer supervision, students improving their confidence, pace of working, team working and patient management, and students experiencing new types of patients and procedures.

Internationally, there is considerable overlap among the purposes of outreach schemes. Addressing inequalities in workforce distribution through raising students' awareness of the underserved is widespread (18, 19). Serving unfamiliar cultures and providing additional access to care often feature in US extramural programmes (20). Some schemes stress comprehensive care and holistic approaches (12) and others, practice management (21). Consequently, care must be exercised in generalising findings given the differences in dental services between nations and in schemes' objectives.

The University of Sheffield's School of Clinical Dentistry is developing outreach placements in National Health Service (NHS) primary care settings in areas of identified need. Besides providing opportunities to extend students' clinical experience, the placements' objectives were to enhance their understanding of community dentistry, comprehensive care, the factors involved in health behaviours, the profession's ethical responsibility and a working environment.

## Student perspectives on dental outreach

This research was part of a larger evaluation which used qualitative and quantitative methods with the students and placement staff (22). It aimed to assess the students' experience of outreach as one component of determining the value and feasibility of primary care outreach.

## Methods

The intervention placed students in outreach clinics in locations across northern England to work with a primary care ethos and to local protocols. Placements were identified *ad hoc* from within existing networks of contacts to provide conveniently located placements matched to students' needs. Most had not previously offered student placements. Starting after Easter 2003, 10 fourth-year dental students spent 6 weeks on placement full-time and 11 second-year hygiene and therapy students (H&T students) spent 3 weeks. Seven students were the only student at their placement, six attended in pairs and eight in fours. Their placement supervisors were approved dentists, briefed and offered additional development for supervision, already working in the two dental access centres or nine community dental service clinics (DACs providing care including emergency care for people experiencing difficulty in accessing NHS dental care, or CDS serving children in otherwise underserved areas, patients with special needs and having an oral health promotion role). Students maintained a clinical record but had no quotas of procedures to meet. They experienced at least five half-day sessions per week of supervised clinical practice and increased their awareness of a new community distant from the Dental School. Undergraduates undertook projects related to community health and made observational visits to related health services. Whilst the undergraduates individually volunteered for outreach as their elective study, H&T students' participation was a group decision.

There were two qualitative arms to this study: semi-structured, exploratory interviews with students returning from placements and a smaller scale peer-run focus group exploring their experiences. The latter was included to reduce the risks of reactive effects. The interviews were held within 2 weeks of students' return from outreach placements to reduce recall bias.

The intention was to identify the range of experiences and students' interpretations of those experiences. The preliminary topic guide for interviews listed key areas chosen from the initiative's documentation. Those areas were placement organisation, team work-

ing, clinical experience, patient management, student supervision and any effects on students. However, using elements of constant comparative analysis (23), new leads were followed as they arose.

The students were informed of the study before placements commenced and gave their individual consent to participate. All students were interviewed in an annexe to the Dental School. To minimise observer bias and social desirability bias the interviewer was not previously known to the students being one of a newly appointed team from outside the School though briefed on the outreach initiative.

The data were transcribed verbatim by the interviewer and subjected to content analysis through line by line coding (24). Similar coded responses were grouped into categories iteratively for reporting. At an early stage a second observer (PGR) read all available transcripts and checked about one-fifth of the codes for appropriateness and consistency of application. This was repeated at a later stage to further validate the data.

Additional techniques to assure the quality of the data were triangulation against the results from the peer-run focus group and against a quantitative analysis of data from students' clinical records. Then subsequent validation by presentation of the findings to the students.

## Results

Of the 21 participants, data were gathered from 10 dental students and 10 H&T students. The four males were dental students. All but one of the dental students entered their course directly after leaving school, whereas the therapists had several years dental nursing experience.

The results of the interviews and those of the parallel peer-run focus groups were so similar that they are not distinguished in the data.

All students recommended the value of outreach placements for gaining career enhancing 'real' experience. Key features of outreach were the number and variety of patients seen and the opportunity to 'get out there and do it' integratively putting their training into practice in a new and workplace setting. The sense of realism was linked to teamworking, a busy schedule and a single surgery with everything to hand.

It's like finishing off for me...I don't feel like a dental student. I feel like a dentist in many ways because I have had this experience...All the parts of the course fit together, its not bits of the syllabus but



Smith et al.

one thing. It is definitely the best way to train dentists'. Undergraduate I

'When you get out there it's a big eye-opener...good experience'. H&T student C

The results, illustrated by anonymised quotations, are reported in the six categories identified in the data: dentistry in community settings, patients and their needs, learning through reflection, building confidence, supervision and organisation.

#### *Dentistry in community settings*

The communities encountered on placement were new and formative experiences for students who gained an impression of the impact on these populations' dental health arising from cultural, educational and economic factors.

'I was shocked at how much dental disease there was'. H&T student D

Increased clinical experience was students' main motivation given for volunteering. Their clinical records indicated that undergraduates treated between 47 and 111 patients and H&T students, nine to 53 patients.

'I probably got more work done in those six-weeks than in two years...at the hospital'. Undergraduate F

Students quickly felt part of their dental team and, through individual nursing assistance, appreciated the value of teamworking. Where dental students worked with or observed H&T students, hygienists, therapists or other health professionals it gave them insights into the others' capabilities.

The new learning environment, volume of clinical work and frequent interactions from teamworking were all believed to enhance and accelerate students' development. They felt they missed little by being away from the School.

#### *Patients and their needs*

Patients encountered on placement were considered more typical of general practice than those at the dental hospital, more likely to have other problems or poor dental health or to be simply seeking relief from pain.

Students discovered a more holistic approach to dentistry; concentrating less on clinical technique and more on finding practicable solutions. Taking detailed histories and background information from staff helped students appreciate the need to plan treatment compatible with patients' lifestyles and expectations.

'Very different from the hospital where you do the textbook treatment because you have got good patients to do it on...Out there you just have to do what you can'. H&T student D

#### *Learning through reflection on experiences*

Often supervisors encouraged students to reflect on the day's anticipated work using styles which varied from a simple statement of requirement to a problem-based learning approach.

'We'd read through the notes and if there was something we didn't understand they would talk us through it'. Undergraduate N

Undergraduates were also helped to use appropriate vocabularies and registers to improve their rapport with patients, especially children.

'I can laugh and joke with patients now whereas before I was very high-handed and wouldn't talk to patients during treatment'. Undergraduate I

Working on outreach, students realised how the various parts of their course fitted together and noted that experiential learning reinforced earlier theoretical learning. They also became more self-critical of the adequacy of their clinical skills. Some considered themselves better placed to make future career decisions.

'It did make me realise that if we were so lucky with the people we were working with there then I'd have to be very careful where I choose to go for my VT which is for a whole year so if I get that wrong it could be a really miserable experience'. Undergraduate L

Most students reflected on their visits and shadowing though attitudes to this varied with a few deeming these a poor substitute for clinical practice. Learning from observation was greatest when students helped organise it, its timing 'broke the week up' or discussion integrated it with clinical work.

'One of the dentists there did a really good job for those kids...made their dental visit special for them...I learnt a lot from her'. Undergraduate K

#### *Building confidence*

Despite being nervous before starting, students' apprehensions regarding speed of working, unfamiliar patient types and unfamiliar procedures had disappeared within a few days. For example, treating children...

'...was quite scary at the beginning but we picked up the skills and patient management. Something I really enjoyed...gradually'. Undergraduate F

## Student perspectives on dental outreach

Increased confidence was attributed to repeated opportunities to re-apply skills, appreciative comments from patients and, crucially, supportive supervision. Placement was viewed as a significant step towards becoming competent to practice with being accepted as a working member of a dental team being an important factor in this progress. Students noted they became more focussed as their confidence improved.

'What I wanted and got was a realistic view of what dentistry is like without the confines and artificiality of the dental school...What has developed most is my ability to make decisions...I wanted to apply what I've learnt for myself and see if I could sort it out...It seemed so much easier there and to tell you the truth, I think it all revolves around the nurses. They knew what I needed and they were like our training wheels'. Undergraduate N

*Supervision*

All students valued the prompt availability of encouraging supervision and contrasted this with the inevitable delays in the larger dental hospital setting. Students accepted and could see value in a wide range of approaches from apparently mutual learning experiences to formal tutoring. Supervision was provided in a manner that gave many students a sense of freedom to practice in a controlled environment.

'A nice environment to do things for the first time because it was very chilled out...it wasn't obvious that...they were watching...He had no qualms about telling us if...we had done something stupid...He'd make you do a tutorial on the subject so that he could understand exactly where you were coming from...It made you think...Because you wanted to impress them it makes you really try and...push the boundaries'. Undergraduate I

'We started to realise...that you can actually decide to do something different and not have the same opinion as your tutor provided you can argue your point'. Undergraduate L

Usually, the intensity of supervision reduced as supervisors' confidence in the student's ability increased though this trend varied depending on the treatment and patient. Dental nurses supplemented supervisors' support and supervisors nursed for students where close observation was needed. Those supervisors not beside the student were available nearby if needed. Students perceived supervisors' reluctance to stand watch over them

was intended to reduce their stress and, in some cases, the supervisors' embarrassment.

'They left us, to an extent, to just get on with it, because they knew that we could do things'. H&T student E

Students reported oral feedback often being given after each patient including useful tips, explanations or discussion and being supplemented by formal wider-ranging review meetings particularly in the early days. This frequent, close contact helped students form productive supervisory relationships with staff who became...

'...our friends...advising us...and giving insights into why they chose their career path. It was quite interesting to hear their points of view and just speak to them on...level terms'. Undergraduate M

*Organisation*

Those students most involved in arranging their placement and their learning experiences found their placements most fulfilling. With placement staff they were

'...working out what we were doing as we went along. A lot of the trips we organised ourselves...I really enjoyed it and got a lot out of it'. Undergraduate L

Visits to placements before starting were valued by students generally unfamiliar with the settings. A suggested development was moving students round contrasting placements to further broaden their experience.

'There was all the information before I went. It was brilliantly organised...I turned up and they were ready for me'. Undergraduate H

Given the emergent nature of the programme, it is unsurprising that students identified variation in its organisation. Broken chains of communication meant a few placements initially could not match experiences to students' needs. Usually, this was due to a lack of information on individuals' capabilities resulting in cautious bookings which were often rearranged over the first weeks.

'We did have a one-to-one with the clinical director at the end of the first day. Very open...He asked what did we expect from being here'. H&T student E

Students credited the dental hospital with having educated and trained them appropriately to benefit from their placements. A few also saw implications for development of their programmes towards inter-professional learning.



Smith et al.

'[Greater integration] would be excellent because we're having to work together. The whole of dentistry is changing with more emphasis on...a team effort...So why shouldn't we be together for some of the clinical and the lectures'. Undergraduate I

Overall, students considered placements would certainly benefit everyone on their courses provided, in a few cases, that the organisational difficulties were addressed.

## Discussion

This research assessed the students' perceptions of the value and feasibility of primary care outreach learning through qualitative semi-structured interviews. Students valued the volume and variety of clinical experience in a primary care clinic gained while working with nursing support and immediately available supervision. They reported teamworking, increasing confidence and developing more holistic, pragmatic views of treatment planning. Attitudes to shadowing and observation were more varied. Many students shaped their placements and developed rewarding experiences and relationships. Organisational or communication problems in some cases limited the intended learning experiences.

Amongst UK studies these data are unique in two respects. First, they report a 6-week full-time placement with most students distant from the dental school and immersed in the placement culture rather than making day visits (12, 28). Second, that culture allowed students to gain new insights into a primary care ethos largely undistorted by the influence of dental school staff, protocols or treatment quotas.

As noted in this study, applying learned theories in a new setting appears popular (11, 16, 25, 26) and is said to increase students' understanding (17, 27). In particular, theories relating to patient management and public health gain meaning once applied in clinical settings (10, 28, 29). Students in this study were encouraged to move beyond routine procedures to dealing with problematic situations in typical ways. In this respect placements matched the characteristics of the higher level of Schön's practicums (30) for developing the key professional skill of reflective practice (4, 5, 31).

The students in this study lacked the concerns regarding meeting clinical treatment requirements reported elsewhere with placements (11, 32).

The students reported developing their skill in teamworking despite limited opportunities for team training. These skills and the holistic and pragmatic

approaches to treatment planning are emphasised by the profession (4, 31). The students related the depth of impression their experiences made on them to immersion in a longer, full-time placement. The relative merits of full-time placement and the 1 day a week placements of other schools (12, 28) cannot be compared in this study.

Given the reported variation in supervision and with supervisors evolving their roles there may be benefits in training supervisors to establish a common understanding over learning experiences and styles of supervision. One approach could consider the key factors in developing students' confidence and competence through critical incident case studies.

Students' perceived benefits in this study translate well with those reported by others evaluating similar developments in dental education (12, 13, 33). The use of the phrase 'real-life' to describe such experiences is widespread in describing outreach (7, 15, 34-36) and this perceived realism's *strong sensory component* enhances learning (37). Matched in evaluations elsewhere are students' anticipated easier transition towards practice and their greater awareness of possible careers (13, 16, 38, 39).

The developments suggested by students have been proposed elsewhere. For example, by increasing the variety of experiences by rotating students around settings (6) and increasing sharing of learning experiences (4, 5, 31).

Optimal communication of individual students' experience and requirements to placements would allow matching of learning experiences to students' needs. If students are to help shape their placements they may need development to negotiate improvements.

As with any study, these findings should be generalised with care. The placements were located at a time of change in therapists' duties when many dentists remained unfamiliar with their role. Some placements could not provide opportunities for team training and others' preparations were limited by the emergent nature of the programme. Furthermore, these placements did not benefit from being fully integrated into the timetable. The students' emphasis on developing clinical skills may reflect a predisposition among these volunteers but may also be a common trait among dental students. However, the steps taken to minimise recall, social desirability and observer bias may have restricted other threats to validity.

In conclusion, outreach training can provide students with valuable learning experience in a range of

areas. However, careful preparation is required to ensure all learning experiences are matched to students' needs and the programme's objectives.

## Acknowledgements

The authors thank the students for their permission for the study and their time giving feedback. The School is indebted to the staff in the placements for providing students with the learning opportunities in such a supportive manner.

## References

1. Department for Health. NHS Dentistry: Options for Change. London: Department of Health, 2002: 47-58.
2. O'Neil EH. Health Professions Education for the Future: Schools in Service to the Nation. San Francisco, CA: Pew Health Professions Commission, 1993.
3. Health Department of Western Australia. Health Department of Western Australia. Foundations for a Healthier Future. Perth: HDWA, 1997.
4. General Dental Council. The first five years: a framework for undergraduate dental education, 2nd edn. London: GDC, 2002: 6, 13, 38, 42.
5. General Dental Council. Developing the dental team: curricula frameworks for registrable qualifications for professionals complementary to dentistry. London: GDC, 2004: 7, 11, 34.
6. Tennant M, McGeachie JK. Australian dental schools: moving towards the 21st century. *Aust Dent J* 1999; 44: 238-242.
7. Mofidi M, Strauss R, Pitner LL, Sandler ES. Dental students' reflections on their community-based experiences: the use of critical incidents. *J Dent Educ* 2003; 67: 515-523.
8. Gordon G. The audit and assessment of teaching quality: an auditor's view. In: Knight PT ed. *The audit and assessment of teaching quality*. Birmingham: Standing Conference on Educational Development, 1993.
9. The Quality Assurance Agency for Higher Education. Learning from subject review 1993-2001: sharing good practice. Gloucester: QAA, 2003: 51, 52.
10. Holloway PJ, Dixon PA. Extra-mural experience for undergraduate dental students. *Br Dent J* 1977; 143: 146-150.
11. Elkind A, Blinkhorn AS, Blinkhorn FA, Duxbury JT, Hull PS, Brunton PA. Developing dental education in primary care: the student perspective. *Br Dent J* 2005; 198: 233-237.
12. Blinkhorn FA. Evaluation of an undergraduate community-based course in family dentistry. *Eur J Dent Educ* 2002; 6: 40-44.
13. Lennon MA, Ireland RS, Tappin J, Ratcliffe PM, Taylor I, Turner R, Jenner AM. The personal dental service as a setting for an undergraduate clinical programme. *Br Dent J* 2004; 196: 419-422.
14. Bailit H. Community-based clinical education programs. Major findings and recommendations. *J Dent Educ* 1999; 63: 981-989.
15. Elkind A. Outreach teaching: is this the future for dental education? *Br Dent J* 2002; 193: 111-112.
16. Desjardins PJ. Creating a community-oriented curriculum and culture: lessons learned from the 1993-1996 ongoing New Jersey experiment. *J Dent Educ* 1996; 60: 821-826.
17. Murray H, Lloyd K, Booth DR. Initial evaluation of the UWA's BDS year 5 student outplacement programme. *J Dent Res* 2003; 82(Special Issue C): 16.
18. Bailit HL, Formicola AJ, Herbert KD, Stavinsky JS, Zamora G. The origins and design of the dental pipeline program. *J Dent Educ* 2005; 69: 232-238.
19. Tennant M, Coombe L, Kruger E. Rural experience for final year dental students. *J Dent Res* 2003; 82(Special Issue C): 20.
20. Boehm DM, Ni JA, Neumann LM. Trends related to dental school satellite clinics. *J Dent Educ* 2005; 69: 141.
21. Pau AKH, Croucher R. A dental practice placement scheme: benefits for practitioners and undergraduates. *Eur J Dent Educ* 2001; 5: 155-161.
22. Smith M, Lennon MA, Brook AH, Robinson PG. Perspectives of staff on student outreach placements. *Eur J Dent Educ* 2006; 10: 44-51.
23. Thorne S. Data analysis in qualitative research. *Evidence-Based Nursing* 2000; 3: 68-70.
24. Bowling A. *Research methods in health: investigating health and health services*, 2nd edn. Maidenhead: Oxford University Press, 2002: 385-390.
25. Stringer M, Finlay C. Assuring quality through student evaluation. In: Ellis R ed. *Quality assurance for university teaching*. Buckingham: Open University Press, 1993: 92-112.
26. Jacobson JJ, Kotowicz WE, Turner DF. University of Michigan School of Dentistry's Community Practice 857. *J Dent Educ* 1999; 63: 964-968.
27. Jacobson JJ, Inglehart MR, Newlin S, Gould K, Bagramian RA. Caring in our communities - service learning and senior dental students. *J Dent Educ* 2000; 64: 209.
28. Harris RV, Dailey Y, Lennon MA. Recording and understanding social histories by dental undergraduates in a community-based clinical programme. *Eur J Dent Educ* 2003; 7: 34-40.
29. Stone D, Campbell H. Child health promotion and its challenge to medical education. *Br Med J* 1997; 315: 694-695.
30. Schön DA. *Educating the reflective practitioner*. San Francisco, CA: Jossey-Bass, 1987: 39-40.
31. Quality Assurance Agency for Higher Education. Subject benchmark statements for dentistry. Gloucester: QAA, 2002: 1, 6.
32. Grantham EV, Block MJ. Effect of extramural experiences on dental students' attitudes. *J Dent Educ* 1983; 47: 681-684.
33. Elkind A, Potter C, Watts C, Blinkhorn F, Duxbury J, Hull P, Blinkhorn AS. Patients treated by dental students in outreach: the first year of a pilot project. *Eur J Dent Educ* 2005; 9: 49-52.
34. DeCastro JE, Matheson PB, Panagakos FS, Stewart DC, Feldman CA. Alumni perspectives on community-based and traditional curricula. *J Dent Educ* 2003; 67: 418-426.
35. American Dental Association. Satellite clinics offer hands-on instruction. *ADA News* 2000; 31: 16-18.
36. University of Glasgow. *Dentistry, Undergraduate Course Information*. Glasgow: University of Glasgow, 2004.

## Student perspectives on dental outreach



Smith et al.

37. Soble RK. Extramural experience as an educational methodology in dentistry. *J Dent Educ* 1971; 35: 365-370.
38. Thind A, Atchison K, Andersen R. What determines positive student perceptions of extramural clinical rotations? An analysis using 2003 ADEA senior survey data. *J Dent Educ* 2005; 69: 355-362.
39. Woronuk JL, Pinchbeck YJ, Walter MH. University of Alberta dental students' outreach clinical experience: an evaluation of the program. *J Can Dent Assoc* 2004; 70: 233-236.

Address:

Michael Smith  
Department of Oral Health and Development  
School of Clinical Dentistry  
Claremont Crescent  
Sheffield S10 2TA, UK  
Tel: +44 114 2268648  
Fax: +44 114 2717844  
e-mail: michael.smith@sheffield.ac.uk

**A 21 Smith, M., Lennon, M.A., Brook, A.H. and Robinson, P.G. A Randomized Controlled Trial of Outreach Placement's Effect on Dental Students' Clinical Confidence. *Journal of Dental Education* 2006; 70(5): 566-570.**

## A Randomized Controlled Trial of Outreach Placement's Effect on Dental Students' Clinical Confidence

Michael Smith, B.Ed.; Michael A. Lennon, M.D.S.; Alan H. Brook, M.D.S.; Peter G. Robinson, Ph.D.

*Abstract:* This randomized controlled trial compared the effects of outreach placement with traditional, exclusively dental school-based clinical experience on students' confidence in providing treatment for patients presenting with common dental problems. Senior dental students ( $n=49$ ) were allocated at random to existing dental school-based clinics or placement in primary care clinics to work supervised by local dentists. At baseline, students self-rated their global confidence on a five-point scale. These measures were repeated at follow-up, augmented by a transition judgment and a then-test of confidence (asking students to look back and re-rate their pre-placement confidence). Groups were comparable at baseline. Follow-up scores for global confidence were similar between groups. The outreach group scored higher in the transition judgment (mean 3.7, SD 0.9) than the control group (mean 3.1, SD 1.1,  $P=0.05$ ). In the then-test, on reflection, the outreach group considered their baseline ratings of confidence were overoptimistic (mean then-test scores 3.2, SD 0.9 and baseline 3.7, SD 0.5) while the control group thought theirs were accurate (mean then-test scores 3.8, SD 0.7 and baseline 3.6, SD 0.8,  $P=0.01$ ). The findings suggest dental outreach training in primary care settings is more effective than dental school training alone in improving students' confidence in tackling clinical situations. The measurement of change in confidence is complicated by shifts in students' internal scales arising from insights gained on outreach.

Mr. Smith is Outreach Programme Evaluator, Department of Oral Health and Development, School of Clinical Dentistry; Dr. Lennon is Outreach Programme Manager, Department of Oral Health and Development, School of Clinical Dentistry; Dr. Brook was Dean of the Faculty of Medicine; and Dr. Robinson is Professor of Dental Public Health, Department of Oral Health and Development, School of Clinical Dentistry—all at the University of Sheffield, Sheffield, UK. Direct correspondence and requests for reprints to Mr. Michael Smith, Department of Oral Health and Development, School of Clinical Dentistry, University of Sheffield, Sheffield, UK; 44(0)114-226-8648 phone; 44(0)114-271-7843 fax; michael.smith@sheffield.ac.uk.

The development of this outreach program and the trial were funded by the UK's National Dental Development Unit grants EL1/EL2.

*Key words:* undergraduate dental education, senior dental student, extramural, community-based, outreach, confidence

*Submitted for publication 11/21/05; accepted 2/6/06*

Curricula in dental schools increasingly include clinical experiences in primary care settings outside the school.<sup>1,2</sup> These arrangements are called outreach, extramural, or community-based experience. There is ample anecdotal evidence from program evaluations that hands-on outreach experiences increase students' confidence in coping with clinical situations,<sup>3-7</sup> but hard data on outreach's educational outcomes are lacking.<sup>8</sup>

Confidence in providing oral health care for patients is considered important as an educational outcome.<sup>9-11</sup> Among medical students, increased confidence has been associated with increased clinical competence,<sup>12</sup> though the relationship between the two is not well understood.<sup>13</sup>

The University of Sheffield School of Clinical Dentistry is developing an outreach program for senior dental students. Besides providing opportunities

to extend students' clinical experience, the objectives of the program were to enhance students' understanding of community dentistry, comprehensive care, health-related behaviors, professionals' ethical responsibility, and a working environment. The first group of returning students claimed increased confidence in tackling common dental problems.<sup>14</sup>

Confidence cannot be directly measured, but student self-reporting of perceived confidence is commonplace.<sup>15,16</sup> Its measurement in intervention studies may be complicated by a response shift in which the experimental group recalibrates its baseline impression of confidence as a consequence of the intervention itself.<sup>17</sup> Transition judgments in which subjects assess the degree of change itself, or assessments known as "post-then tests," which retrospectively assess pre-intervention levels at follow-up, are recommended methods for avoiding errors arising from response shift.<sup>18,19</sup>



This randomized controlled trial aimed to assess the effectiveness of outreach placement on students' confidence in providing treatment for patients using transition judgments and post-then tests.

---

## Methods and Materials

The intended sample was the fifty-four dental students of the University of Sheffield School of Clinical Dentistry's penultimate year. Five students who attended overseas dental schools during the year's second semester were excluded from the sample, resulting in a final sample of forty-nine students.

Students were involved in the design of the study in two phases. First, a draft of the protocol was discussed with class officers, and then a refined protocol was presented to the intended sample before recruitment commenced. No faculty were involved in the conduct of the study, and students were reassured that neither their decisions about participation nor their allocations to outreach or control groups would adversely affect assessment of their degree program.

Students were randomized into the dental school or outreach placements by an assistant with no knowledge of individual students, using electronically generated random numbers. Allocations were concealed from students until baseline assessments were completed. Twenty-five students were randomized to the study group (outreach group as described below) and twenty-four to the control, dental school-based group who completed regular rotations in hospital dental clinics.

The outreach group attended National Health Service (NHS) salaried primary dental care placements full time for five weeks. Eighteen placements were in two Dental Access Centers (DACs provide care including emergency care for people experiencing difficulty in accessing NHS dental care) and seven in two Community Dental Services (the CDS provides community-based specialist services such as oral health promotion and caters to children in otherwise underserved areas and patients with special dental needs). All placements were in urban areas of identified need in northeastern England. Each week students had between five and seven half-day clinical sessions with dental nurse support, performed health care according to local protocols, and were supervised by local dentists. In addition they ob-

served allied health care services and completed a report in which they analyzed two patients' case studies in relation to community health data.<sup>20</sup>

The outreach group attended the placements consecutively throughout the 2004 summer term. Concurrently, the dental school group continued their normal hospital clinics including restorative and dental emergency clinic rotations.

At baseline, students' clinical competence and confidence were assessed. Competence was assessed using each student's average mark in dental school clinical assessments throughout the previous semester. Self-assessed confidence was measured using question A in Figure 1 with its five-point Likert-style scale ranging from "not at all confident" to "totally confident."

At follow-up, students' confidence was measured using three questions displayed in Figure 1: a global self-assessment (question A), a then-test (question B), and a transition judgment (question C) with responses given on five- and six-point Likert-style scales scored using the item codes shown in the figure.

These assessments were pretested on a convenience sample of students ( $n=32$ ) from a previous cohort to estimate their discriminant power. The transition judgment predicted that a sample of twenty (40 percent of the intended sample) would suffice (power=0.8,  $\alpha=0.05$ ).

To reduce reactive effects, the assessment was administered by staff not involved with the students' course and in an annex to the school the day after the study group completed its outreach placements.

After undertaking simple descriptive analyses of all variables in the two groups and simple comparisons of potential confounding variables, statistical analysis compared the outcomes measures between the groups using the t-test. Data were compared between groups using analysis of covariance and checks made of the effects of potential confounders and mediators using stratified and multiple regression analyses. These analyses were carried out on an intention to treat basis using sample means to substitute for any missing values.

The protocol for this study gained ethical approval in March 2004 and was followed throughout.

---

## Results

All forty-nine eligible students consented to participate. Fourteen of the twenty-five students in

Your training should prepare you to be able to diagnose, plan, and provide treatment for a range of people presenting with common dental problems.

A. How confident do you feel that you can tackle a range of people presenting with common dental problems?

1	2	3	4	5
Not at all confident	Lacking in confidence	Undecided	Reasonably confident	Totally confident

B. How confident do you now think you were at tackling a range of people presenting with common dental problems two months ago?

1	2	3	4	5
Not at all confident	Lacking in confidence	Undecided	Reasonably confident	Totally confident

C. Think back two months. Compared to two months ago, how much has your confidence that you can tackle a range of people presenting with common dental problems changed? Is it...

1	2	3	4	5	6
Worse than before	About the same	A little better	Quite a lot better	A lot better	A great deal better

Figure 1. Assessments of confidence

the study group and fifteen of the twenty-four in the control group were female.

Following recruitment and baseline data collection, students started their allocated experiences in three waves with each wave returning for follow-up assessment five weeks later. Lost to follow-up were one student who fell ill while on placement and another from the dental school group who was attending a family event at the time of the follow-up assessment. So twenty-four of twenty-five outreach students and twenty-three of twenty-four in the dental school group provided data for analysis.

The groups had similar clinical confidence and competence at baseline (see Table 1). Data collected at follow-up met the assumptions required for parametric analysis. At follow-up, there was no significant difference between groups for self-assessed global confidence (Table 2). However, the outreach group retrospectively re-scored their baseline confidence lower in the then-test than the dental school group (3.2 cf 3.8,  $p=0.05$ ) and rated their increase in confidence significantly higher for the transition judgment (3.7 cf 3.1,  $p=0.05$ ).

The ancillary analyses revealed no significant variation in scores by wave of attendance, number of years of teaching experience of placement supervisors, placement setting, or student gender.

## Discussion

This randomized controlled trial demonstrated that outreach training significantly increased students' confidence in providing everyday dental care for patients. These experimental data confirm anecdotal reports that community outreach experiences increase dental students' confidence and so address concerns about the rigor of evaluations.<sup>8</sup>

The measurement of self-assessed change in confidence was complicated by shifts in students' internal scales of confidence. Whilst simple cross-sectional comparisons at follow-up revealed no difference between the groups, the then-test indicates that the experience of community-based outreach encouraged students to revise their internal scales of confidence. Therefore, the simple comparison at follow-



up was undermined because perceptions of confidence had changed in one group of students presumably as a consequence of their educational experience. Moreover, the then-test indicates that students who have been on outreach now believed they had been overoptimistic about their confidence before their placement. Put simply, they realized afterwards that some of their earlier confidence was misplaced. This newly gained insight is reflected in the difference in transition judgments between groups.

Other aforementioned studies had linked increased confidence with increased competence. Such a parallel increase in competence was found in a separate study of these students' outreach placements. The outreach students were better at planning treatment for a simulated patient that took her lifestyle and wishes into account.

The previous cohort of students who participated in a pilot version of the community outreach placements attributed their increase in confidence to repeated opportunities to reapply skills, appreciative comments from patients, and especially, support from both dental nurses and supervising dentists.<sup>14</sup> Features of the outreach experience that contrast with students' school-based clinical experience include about four times the number of patients per week, individual dental nurse support, fewer students per supervisor, and a more intimate working environment with fewer surgeries and a smaller dental team.

While these studies identify an educational benefit from outreach, there are associated costs to academic programs. Additional resources are required for favorable levels of supervision and nursing support, and students' absence from the dental school may represent lost opportunities to enhance their learning in other areas.

As in any research, these data should be viewed with care. There may be limitations on generalizing these data to dental education programs operating in different ways. Recall and social desirability bias may affect the validity of the follow-up assessments. However, other features of the trial increase its validity: four independent outreach locations were used, and there was no recruitment bias. In addition, in-

Table 1. Baseline measures

	Outreach Group		Dental School-Based Group	
	$\bar{x}$	(SD)	$\bar{x}$	(SD)
n, number of students	25		24	
Clinical confidence	3.7	(0.5)	3.6	(0.8)
Clinical competence	62.4	(1.5)	62.6	(2.3)

Table 2. Follow-up measures

	Outreach Group		Dental School-Based Group	
	$\bar{x}$	(SD)	$\bar{x}$	(SD)
n, number of students	24		23	
A Global assessment	3.9	(0.5)	4.0	(0.6)
B Then-test	3.2	(0.9)	3.8	(0.7)*
C Transition judgment	3.7	(0.9)	3.1	(1.1)*

\*Significant at the 95% level, P=0.05

corporation of the then-test was able to compare shifts in students' internal scales of confidence.

## Conclusion

This trial suggests primary care outreach experiences were effective as an adjunct to traditional dental school-based training in improving students' confidence in providing treatment. These findings encourage further development of outreach as a component in dental education.

## Acknowledgments

The authors wish to acknowledge the support of staff and patients in the placements in providing suitable learning opportunities for students. The students are thanked for their participation in the trial.

## REFERENCES

1. American Dental Association. 1998 survey of dental school satellite clinics and the 1998 dental society survey of dental school satellite clinics. Chicago: American Dental Association, 1999.
2. Boehm DM, Ni JA, Neumann LM. Trends related to dental school satellite clinics. *J Dent Educ* 2005;69(1):141.
3. Comer RW, Brown JC, Reed MJ, Sturdivant DW. Senior dental students in private practice: a preceptorship program. *J Am Coll Dent* 1987;54(3):20-3
4. DeCastro JE, Matheson PB, Panagakos FS, Stewart DC, Feldman CA. Alumni perspectives on community-based and traditional curricula. *J Dent Educ* 2003;67(4):418-26.

5. Mofidi M, Strauss R, Pitner LL, Sandler ES. Dental students' reflections on their community-based experiences: the use of critical incidents. *J Dent Educ* 2003;67(5): 515-23.
6. Lennon MA, Ireland RS, Tappin J, Ratcliffe PM, Taylor I, Turner R, et al. The personal dental service as a setting for an undergraduate clinical programme. *Br Dent J* 2004;196(7):419-22.
7. Elkind A, Blinkhorn AS, Blinkhorn FA, Duxbury JT, Hull PS, Brunton PA. Developing dental education in primary care: the student perspective. *Br Dent J* 2005;198(4): 233-7.
8. Bailit H. Community-based clinical education programs: major findings and recommendations. *J Dent Educ* 1999;63(12):981-9.
9. Manogue M, Brown GA, Nattress BR, Fox K. Improving student learning in root canal treatment using self-assessment. *Int Endod J* 1999;32(5):397-405.
10. Packer ME, Scott BJ, Davis DM. An assessment of the influence of clinical demonstrations on the confidence of undergraduate dental students, when treating patients requiring removable partial dentures. *Eur J Dent Educ* 1999;3(3):133-9.
11. Stewart J, O'Halloran C, Barton JR, Singleton SJ, Harrigan P, Spencer J. Clarifying the concepts of confidence and competence to produce appropriate self-evaluation measurement scales. *Med Educ* 2000;34(11):903-9.
12. Elzubeir MA, Rizk DEE. Assessing confidence and competence of senior medical students in an obstetrics and gynaecology clerkship using an OSCE. *Educ Health* 2001;14(3):373-82.
13. Carlisle C. Reflecting on levels of confidence and competence in skills acquisition. *Med Educ* 2000;34(11):886-7.
14. Smith M, Lennon MA, Brook AH, Ritucci L, Robinson PG. Student perspectives on their recent dental outreach placement experiences. *Eur J Dent Educ* 2006;10(2): 80-6.
15. Cushing A. Assessment of non-cognitive factors. In: Norman GR, Van der Vleuten DI, Newble DI, eds. *Handbook of research in medical education*. Dordrecht: Kluwer Academic Publishers, 2002:711-55.
16. Morgan PJ, Cleave-Hogg D. Comparison between medical students' experience, confidence, and competence. *Med Educ* 2002;36(6):534-9.
17. Howard GS, Ralph KM, Gulalnick NA, Maxwell SE, Nance DW, Gerber SK. Internal invalidity in pre-test-post-test self-report evaluations and a re-evaluation of retrospective pre-tests. *Appl Psychol Measure* 1979;3(1):1-23.
18. Sprangers M, Hoogstraten J. Pretesting effects in retrospective pretest-posttest designs. *J Appl Psychol* 1989;74(2):265-72.
19. Locker D. Issues in measuring change in self-perceived oral health status. *Community Dent Oral Epidemiol* 1998;26(1):41-7.
20. Harris RV, Dailey Y, Lennon MA. Recording and understanding social histories by dental undergraduates in a community-based clinical programme. *Eur J Dent Educ* 2003;7:34-40.



**A 22 Smith, M., Lennon, M.A., Brook, A.H., Blinkhorn, F.A., Blinkhorn, A.S. and Robinson, P.G. A randomised controlled trial of the effect of outreach placement on treatment planning by dental students. *British Dental Journal* 2006; 201(Education supplement): 27-31.**

## A randomised controlled trial of the effect of outreach placement on treatment planning by dental students

M. Smith,<sup>1</sup> M. A. Lennon,<sup>2</sup> A. H. Brook,<sup>3</sup> F. A. Blinkhorn,<sup>4</sup> A. S. Blinkhorn<sup>5</sup> and P. G. Robinson<sup>6</sup>

**"...there is a widespread belief that outreach placements can broaden the base of available clinical material and enhance the educational experience."**

Undergraduate dental students' curricula are being supplemented with primary care placements

**Objective** To compare the effect of outreach placement and traditional hospital-based training alone on students' treatment planning ability

**Design** Randomised controlled trial

**Setting** Four existing primary care placements in England during 2004

**Subjects and methods** At follow-up the fourth-year students took a history from a standard patient, then recorded a treatment plan. Interview skill was scored. The history and plan were assessed by clinicians blind to the intervention

**Intervention** Five-week block outreach placements for 25 of 49 students

**Main outcome measures** Interviewing skill, quality of dental and social histories, the appropriateness of planned treatments and the consideration of wider issues

**Results** The two groups were similar in the scores for interviewing and taking a dental history. The outreach group scored higher for capturing a social history (outreach mean 4.4, SD = 2.1, n = 22 and hospital 2.8, SD = 1.9, n = 23,  $p = 0.01$ ) and for developing an appropriate treatment plan (5.6 [SD = 2.1] and 3.9 [SD = 2.3],  $p = 0.01$ ). There were no differences in scores relating to the wider issues

**Conclusion** Dental outreach training was significantly more effective than traditional training alone in improving students' ability to capture relevant points of social history from a patient and to consider them when planning treatment.

### INTRODUCTION

Many dental schools are increasing the role of primary care placements in new curricula to enhance students' learning<sup>1</sup> and prepare them to meet communities' needs.<sup>2</sup> Such placements complement students' traditional hospital-based training and are variously termed outreach, extramural or community-based placements. Most students will later work in primary care settings.

Surveys of outreach programmes encourage their development<sup>3,4</sup> and there is a widespread belief that such placements can broaden the base of available clinical material and enhance the educational experience.<sup>1</sup> This view is supported by many positive programme evaluations<sup>5-8</sup> and the occasional cautionary one.<sup>9</sup> There is limited evidence on the impact of outreach programmes and a call for further research.<sup>1</sup>

The University of Sheffield's School of Clinical Dentistry is developing an undergraduate outreach programme. The first phase saw returning students claiming increased understanding of pragmatic treatment planning with increased appreciation of patients' social circumstances.<sup>10</sup> These skills and understanding are essential components in dental curricula<sup>1,11,12</sup> and

similar observations have been made in other uncontrolled programme evaluations.<sup>13,14</sup>

The aim of this randomised controlled trial was to compare the effectiveness of dental outreach in a primary dental care setting and a traditional, hospital-based training in increasing the competence of dental students to plan treatment for patients with common dental problems.

The construct of treatment planning underpinning this study has three stages.

- Interviewing
- Identifying relevant information in dental and social histories, and
- Using that information to formulate a treatment plan.

The first stage and the associated capture of a dental history are familiar and well practiced tasks for senior dental students. Consequently, we hypothesised that outreach experiences would not improve performance in these respects. The remaining stages, collecting relevant information from the social history and using that information to plan appropriate treatment, were hypothesised to benefit.

<sup>1</sup>Outreach Programme Evaluator, <sup>2</sup>Outreach Programme Manager, <sup>3</sup>Dean of the Faculty of Medicine, Department of Oral Health and Development, School of Clinical Dentistry, University of Sheffield, Claremont Crescent, Sheffield, S10 2TA, <sup>4</sup>Clinical Director of Dental Services, Lance Burn Health Centre, Churchill Way, Salford, Manchester, M6 5AU; <sup>5</sup>Professor of Oral Health, School of Dentistry, The University of Manchester, Higher Cambridge Street, Manchester, M15 6FH, <sup>6</sup>Professor of Dental Public Health, Department of Oral Health and Development, School of Clinical Dentistry, University of Sheffield, Claremont Crescent, Sheffield, S10 2TA

\*Correspondence to: Mr Michael Smith  
Email michael.smith@sheffield.ac.uk

### MATERIALS AND METHODS

The intended sample was all 54 fourth year, senior students at the University of Sheffield's School of Clinical Dentistry. Excluded from the sample were any students who declined to participate or who attended overseas dental schools during the semester.

Student representatives were involved in the experiment's design, which was then presented to the whole cohort before recruitment. Students were reassured throughout that participation decisions and allocations would not adversely affect their studies. The study gained ethical approval from the North Sheffield Research Ethics Committee in March 2004 and the protocol was followed throughout.

#### Allocation

Students in three timetable blocks were randomised into the hospital or outreach placements using electronically generated random numbers. Allocations were concealed from students until baseline assessments were completed.

#### Intervention

The outreach group attended National Health Service (NHS) salaried primary dental care placements full time for five weeks. Eighteen placements were in two Dental Access Centres (DACs provide care including emergency care for people experiencing difficulty in accessing NHS dental care) and seven in two Community Dental Services (the CDS provides community-based specialist services such as oral health promotion and caters for children in otherwise underserved areas and patients with special dental needs) in locations in urban areas of identified need. Each week students had between five and seven half-day clinical sessions with dental nurse support, working to local protocols and supervised by local dentists. In addition they observed other local healthcare services and completed a written project relating two patients' case studies to community public health data.<sup>15</sup>

The outreach group attended the placements consecutively throughout the 2004 summer term. The hospital group continued their normal dental hospital clinics including restorative and casualty clinics for the five weeks while the outreach blocks were on placement.

#### Baseline measures

Students' clinical competence was established through two pragmatically selected measures to check randomisation. Self-assessed competence was measured using a five-point Likert scale ranging from poor to excellent and scored 1, poor, to 5, excellent, to the question "Your training aims to help you plan treatment for patients taking into consideration the clinical states of their mouths and relevant factors in their everyday lives. How good do you think you are at treatment planning?" Competence of the student was also assessed using average formative marks in dental hospital clinical assessments throughout the previous semester.

#### Follow up assessments

Follow up assessments considered interviewing skills, capture of social history and treatment planning. Interviewing skills were assessed practically with a standardised patient. Performance in the remaining two stages was by written report and oral assessment. The assessments were held the day after each placement ended and students were aware of the assessments being made.

Measures of the type used at follow-up were not conducted at baseline in case repeated assessments might prime the students.

#### The trial

The 'patient' was selected from a bank of actors, who simulate patients, to match the history: a disadvantaged young mother presenting with poor oral health, several decayed teeth and severe pain (see Fig 1).

*The patient is a 25 year old mother and single-parent to children aged seven and three, with no other family living in the same city. The family live in disadvantaged circumstances in an apartment in an area of social housing served by a few small shops and an infrequent bus service. Their home is three miles (five kilometres) from the surgery and as they do not have access to a car the journey entails a change of buses.*

*The family diet of convenience foods and sweet drinks is evident from the shopping in her bag. The mother is a moderate smoker and drinks about seven units of alcohol a week. Unemployed, she has poor educational attainment.*

*The elder child has poor oral health and rarely cleans his teeth. Neither child visits the dentist.*

*The mother has no history of regular dental treatment and poor attendance for appointments. She wants such things 'over and done with' even if that requires the extraction of posterior teeth. She has many severely decayed teeth. This visit to the dentist is prompted by persistent severe pain in the upper left quadrant.*

Fig. 1 The history portrayed by the standardised patient

Students were instructed to take a complete history of the 'patient' and formulate a treatment plan on a standardised clinical recording sheet but without examining the patient-actor's mouth. They were then introduced to the patient and left alone for 10 minutes. Students interviewed the 'patient' in a surgery with her completed dental chart, orthopantomograph and standard self-completion medical history form. The patient's shopping bag on the floor contained convenience foods and soft drinks. Afterwards the student had five minutes alone to prepare and record the history and treatment plan before being assessed for 10 minutes by two clinicians experienced in children's and community dentistry (ASB, FAB).

Students were asked not to discuss the case with their peers and the assessment timetable reduced the opportunities for contact between students.

Assessment of the interview by the 'patient' used the Arizona Clinical Interview Rating (ACIR), a construct validated 16-item scale measuring interviewing skill<sup>16</sup> with good discriminative validity and responsiveness



<b>Dental history captured</b>
<ul style="list-style-type: none"> <li>• Diet of the patient</li> <li>• Attendance pattern of the patient</li> <li>• Oral hygiene of the patient</li> </ul>
<b>Social history captured</b>
<ul style="list-style-type: none"> <li>• Patient's access – transport problems</li> <li>• Patient's access – childcare problems</li> </ul>
<b>Treatment plan</b>
<ul style="list-style-type: none"> <li>• An appropriate solution for pain relief</li> <li>• A plan for repeated patient visits that is cognisant of social factors including:               <ul style="list-style-type: none"> <li>• Unlikely to attend for many visits</li> <li>• Patient's wishes</li> </ul> </li> <li>• A plan for prevention of dental disease for the patient that is cognisant of her social factors</li> </ul>
<b>Wider issues within the plan</b>
<ul style="list-style-type: none"> <li>• Identifying if her children have unmet dental treatment/preventive needs</li> <li>• A multi-disciplinary approach to health promotion in this family</li> </ul>
<p><i>Codes 0-3 were applied to each of the eleven items marked *.</i>  <i>The items were coded 0 if not present in the written or oral report, 1 if hesitantly present only on prompt, 2 if readily present on prompt or 3 if spontaneously present.</i></p>

Fig. 2 Grading the oral assessment

in evaluating dental curricular developments.<sup>17,18</sup> This 'patient' assessment was supplemented by subsequent second rating by an experienced clinician (FAB) via unobtrusive, but visible, audio recording of the interviews. Second ratings omitted the two non-verbal communication scale items.

Students' record sheets were independently read by the two clinicians (ASB, FAB). The written histories and treatment plans were awarded provisional codes 0, absent, to 3, spontaneously present, for items listed in Figure 2. An agenda was then agreed for questioning the student to clarify any areas of uncertainty. After 10 minutes questioning the assessors independently revised and recorded their assessment codes before discussing any differences and agreeing a joint assessment. The histories and treatment plans were scored as the sums of codes in each of the four areas.

The development of these assessments occupied four days. After initial training to portray her role consistently the patient was trained and calibrated as an ACIR assessor by first rating experienced clinicians and then other dental students. Later, adjustments were made to the patient description (Fig. 1), the simulation and the assessment criteria and codes (Fig. 2) during refine-

ment and calibration<sup>17,18</sup> with other students until the assessors were confident the assessment was valid and reliable.

To reduce reactive effects, all assessments and administration were conducted by staff not involved with the students' course and student anonymity was maintained. To increase the assessment's validity, follow up data were collected in a simulated general practice in a dental school annex with students wearing clinical uniform.

Follow up assessment was blind to group assignment and carried out by staff from a different dental school. The effectiveness of this blinding was evaluated by the assessors' stating their perception of the probable allocation at the end of each interview. One assessor could not predict 37 of 45 students' allocations, identified 7 correctly and 1 incorrectly. The other assessor could not predict 24, identified 11 correctly and 10 incorrectly. Blinding of the assessors to the intervention was therefore deemed to be effective.

After describing all variables for the two groups and making simple comparisons of potential confounders, statistical analysis by t test was used to compare the outcome measures between the groups. Data were also compared between groups using analysis of covariance and checks made of the effects of likely potential confounding and mediating factors using multiple regression analyses. Those potential confounding factors, identified in findings from earlier studies, were the placement setting, number of student co-workers, number of years of teaching experience of placement supervisors, number of visits to other healthcare activities and student attendance.

Finally, intention to treat analyses (substituting data for those lost to follow-up) of group comparisons were made for the outcome variables using two imputations for missing data. The first used substitution of the sample mean<sup>20</sup> and the second with the sample mean plus one standard deviation for the control group and the mean minus one standard deviation for the outreach group.<sup>21</sup>

## RESULTS

All 49 eligible students consented to participate. Fourteen of the 25 students in the outreach group were female as were 15 of the 24 in the hospital group. The groups were similar at baseline for both measures of clinical competence (Table 1).

Following recruitment and baseline data gathering in March 2004, students started their allocated experiences in April, May or June and returned for follow

	Outreach n = 25 mean (SD)	Hospital n = 24 mean (SD)
Self-assessed clinical competence	2.6 (0.6)	2.8 (0.9)
Clinic-based competence measure	62.4 (1.5)	62.6 (2.3)

"...outreach training was more effective than traditional hospital-based training alone in improving students' ability to capture relevant points of social history from a patient and to consider these when planning treatment."

	Outreach n = 22 mean (SD)		Hospital n = 23 mean (SD)	
Stage 1 - Interviewing skill				
Patient's rating	62	(4)	63	(5)
Dentist's rating	40	(12)	40	(8)
Stage 2 - Information capture				
Dental history obtained	5.0	(3.5)	4.8	(3.0)
Social history obtained	4.4	(2.1)**	2.8	(1.9)**
Stage 3 - Treatment planned				
Treatment planning was appropriate	5.6	(2.1)**	3.9	(2.3)**
Inclusion of wider issues	2.6	(1.7)	2.3	(1.4)
**Significant at p = 0.01				

up assessment five weeks later. One student failed to complete the allocated experience through illness. A further three students were unable to attend the assessment due to personal commitments or illness. So 22 of 25 outreach students and 23 of 24 in the hospital group provided data for analysis.

At follow up interviewing skills, as measured using the ACIR, were similar in the outreach and hospital groups whether assessed by the patient or the dentist (Table 2). Further, the patient's and dentist's scores showed moderate correlation (Pearson  $r$  0.49,  $p$  <0.01,  $n$  = 45). Distributional requirements for parametric analysis were met for all measures.

The scores for capture of a dental history were similar in both groups. However, the outreach group's score for the capture of the social history was higher than the hospital group's (4.4 *cf* 2.8,  $p$  = 0.01).

The outreach group scored significantly higher for first part of appropriate treatment planning (5.6 *cf* 3.9,  $p$  = 0.01) but not for the inclusion of wider issues.

The ancillary analyses revealed no significant variation in scores by date of attendance, student gender or any of the factors identified in earlier studies and listed above with the exception of placement setting. One way ANOVA of the primary outcomes by placement setting for the outreach group indicates that CDS experiences were more influential than DAC ones in capturing a dental history and including the wider issues in treatment planning.

Intention to treat analyses for the capture of social history gave  $p$  = 0.01,  $n$  = 49, using the sample mean as a substitute value. The more parsimonious imputation using one standard deviation above mean for the outreach group and one standard deviation below for the hospital group gave a  $p$  value of 0.07. The corresponding values for appropriate treatment planning were  $p$  = 0.01 and 0.09.

## DISCUSSION

This randomised controlled trial found outreach training more effective than traditional hospital-based training alone in improving students' ability to capture relevant points of social history from a patient and to consider these when planning treatment.

Our hypotheses that outreach experiences would not improve competence in the familiar tasks of interviewing and taking a dental history but would have a beneficial effect on capturing a social history and planning appropriate treatment were supported.

Our findings provide robust support for the widespread belief in the value of placements and in policy makers' recommendations to use outreach in primary care to develop 'professionals who are best suited to providing appropriate... care'<sup>22</sup> through heightening students' awareness of community needs.

DeCastro *et al.* in a recent US study<sup>23</sup> finding that outreach students graduated with higher examination board score suggested this improvement may be due to increased clinical experiences. This is also a plausible explanation in our study, though perhaps the favourable supervision ratio, nursing support and the location of the learning in a working environment are other relevant factors.

While the study does identify educational gains from outreach placements there are associated educational costs. For example, there may also be lost opportunity costs to students' learning in other fields resulting from these being away from the dental school and research into this may be valuable. There is also a need for further research into the specific educational benefits arising from different types of primary care settings as suggested by the exploratory analysis.

The outreach experience in this study involved working three or more days a week as a member of a primary care team separate from the dental school and



hospital, and completing a community public health project. Students were supervised by local staff and had experienced, individual dental nursing support. There may be limitations on generalising the findings to other schemes operating in different ways or in contexts where producing graduates prepared to address social issues is not a high priority. However, other features of the trial increase the external validity of this study: the patient's case was unexceptional, the skills assessed were everyday requirements of many dentists, the assessment setting was a typical surgery, four independent outreach locations were used, students were not selected to participate, and blinding of the assessors to the intervention was successful. Further, the measure of treatment planning achieved construct validity and reliability through thorough development and practice. A factor in ensuring this validity was assessment by clinician assessors familiar with the NHS primary care sector that engages most of the dental workforce. While other treatment plans might be argued, the assessments rewarded approaches that acknowledged the patients' condition, preferences and circumstances.

The benefits of outreach experience did not extend to the more frequent inclusion in treatment plans of the wider issues of the patient's children's needs or multi-disciplinary health promotion. It may be that while five weeks outreach experience had helped students move to a more holistic consideration of the patient's needs, this improvement had neither extended to consideration of the family as a whole nor to matters which were not predominantly dental in nature. Alternatively, the students may have deemed these issues of secondary importance whilst considering a patient experiencing severe pain.

Debate remains regarding different approaches to intention to treat analysis.<sup>20,24</sup> What is clear is that a loss to follow up which is less than 10% and which is random has little effect on comparisons.<sup>20</sup> This was confirmed by substitution with sample means and only challenged when the imputations assumed a worst case outcome for missing data.

## CONCLUSION

This trial found outreach experiences as an adjunct to traditional hospital-based training were effective in improving students' ability to capture a patient's social history and to plan appropriate treatment in the light of that social history. These findings support further development of outreach in dental education as a contribution to achieving community public health objectives.

*The authors wish to acknowledge the support of placements staff and patients in providing suitable learning opportunities for students, Jackie Shaw's contribution in developing the patient's role, Hilary Broder's advice regarding simulated patients and the students for their cooperation. This study was supported by NDDU grants EL1/EL2.*

- 1 General Dental Council *The first five years a framework for undergraduate dental education* 2nd ed pp 13 London GDC, 2002
- 2 Andersen R M, Davidson P L, Atchison Y A *et al* Pipeline, profession and practice programme: evaluating change in dental education *J Dent Educ* 2005, 69: 239-248
- 3 Bailit H. Community-based clinical education programs: Major findings and recommendations *J Dent Educ* 1998, 63: 981-989
- 4 Hogan H. *Preparing for practice: an analysis of the state of community-based medical education in the US*. Nuffield Trust Travelling Fellowship Reports Series No 1 pp 109-116 London The Nuffield Trust for Research and Policy Studies in the Health Services, 1999
- 5 Pau A K H, Croucher R. A dental practice placement scheme: benefits for practitioners and undergraduates. *Eur J Dent Educ* 2001, 5: 155-161
- 6 Skelton J, Mullins M R, Kaplan A L, West K P, Smith T A. University of Kentucky community-based field experience program description. *J Dent Educ* 2001, 65: 1236-1242
- 7 Lennon M A, Ireland R S, Tappin J *et al* The personal dental service as a setting for an undergraduate clinical programme *Br Dent J* 2004, 196: 419-422
- 8 Woronuk J I, Pinchbeck Y J, Walter M H. University of Alberta dental students' outreach clinical experience: an evaluation of the program *J Can Dent Assoc* 2004, 70: 233-236
- 9 Miller S L, Heil J. Effect of an extramural program of dental care for the special patient on attitudes of students. *J Dent Educ* 1976, 40: 740-744
- 10 Smith M, Lennon M A, Bronk A H, Ritucci L, Robinson P G. Student perspectives on their recent dental outreach placement experiences. *Eur J Dent Educ* 2006, 10: 83-86
- 11 Commission on Dental Accreditation. *Accreditation standards for dental education programs* pp 5-7, 15 Chicago CDA, 2001
- 12 Plasschaert A J M, Holbrook W P, Delap E, Martinez C, Wainmsley A D. Profile and competences for the European dentist: Association for Dental Education in Europe. *Eur J Dent Educ* 2005, 9: 98-107.
- 13 Elkind A, Blinkhorn A S, Blinkhorn F A *et al*. Developing dental education in primary care: the student perspective. *Br Dent J* 2005; 198: 233-237
- 14 DeCastro J E, Matheson P B, Panagakos F S, Stewart D C, Feldman C A. Alumni perspectives on community-based and traditional curricula. *J Dent Educ* 2003, 67: 418-426
- 15 Harris R V, Dailey Y, Lennon M A. Recording and understanding social histories by dental undergraduates in a community-based clinical programme. *Eur J Dent Educ* 2003, 7: 34-40
- 16 Stillman P L, Brown D R, Redfield D L, Sabers D L. Construct validation of the Arizona clinical interview rating scale. *Educ Psychol Meas* 1977; 37: 1031-1038
- 17 Broder H L, Felman C A, Saporito R A, Stilwell N S. Implementing and evaluating a patient instructor program. *J Dent Educ* 1996, 60: 755-762.
- 18 Pfeiffer C, Madray M, Ardolino A, Wilms J. The rise and fall of students' skill in obtaining a medical history. *Med Educ* 1998, 32: 283-288
- 19 Barrows H S. An overview of the uses of standardized patients for teaching and evaluating clinical skills. *Acad Med* 1993, 68: 443-453
- 20 Wright C C, Sim J. Intention-to-treat approach to data from randomized controlled trials: a sensitivity analysis. *J Clin Epidemiol* 2003, 56: 833-842
- 21 Sackett D L, Richardson W S, Rosenberg W M C, Haynes R B. *Evidence-based medicine: how to practice and teach EBM* 2nd ed pp 109 London: Churchill Livingstone, 2000
- 22 Department of Health. *NHS dentistry: options for change* pp 50 London: Department of Health, 2002
- 23 DeCastro J E, Bolger D, Feldman C A. Clinical competence of graduates of community-based and traditional curricula. *J Dent Educ* 2005, 69: 1324-1331
- 24 Higgins J P T, Green S (eds). *Cochrane handbook for systematic reviews of interventions* 4.2.5 section 8.4. In *The Cochrane library* Issue 3 Chichester: John Wiley & Sons

# Appendix B

## Documents: Protocols, Letters and Questionnaires

### List of Documents:

B1	Student perception study: Letter of Invitation to Participate .....	309
B2	Categories used in Summarising Students' Clinical Experience .....	310
B3	Student information: Letter of Invitation to Participate.....	311
B4	Student information: Description of the RCT Intervention .....	312
B5	Student information: Description of the Research Project.....	313
B6	Consent form.....	315
B7	RCT Patient Information used in the case study .....	316
B8	RCT Simulated patients' notes of case to be portrayed .....	318
B9	RCT OSCA assessment record sheet .....	320
B10	RCT Arizona Clinical Interview Rating Scale.....	322
B11	RCT Baseline Assessment Questionnaire.....	324
B12	RCT Follow-up Assessment Questionnaire .....	325
B13	Aims and Objectives of the Sheffield Outreach Training Programme .....	327



**B1 Student perception study: Letter of Invitation to Participate**

THE UNIVERSITY OF SHEFFIELD

**Oral Health and Development**

School of Clinical Dentistry  
Claremont Crescent  
Sheffield S10 2TA  
Tel: (0114) 271 7885 (office)  
Fax: (0114) 271 7843

1 May 2003

Dear ,

**Letter of invitation to participate in the research into outreach**

You should now be settled in your placements and busy treating patients. I am sure all will be progressing smoothly but if you have any problems or questions do contact the Team Training Programme Office (0114 22 68648). The programme evaluator and research assistant, Mr Michael Smith, is now in post and will respond to your queries.

Mr Smith will contact you around the time of your return to the School to invite you to attend an interview to provide feedback on your experiences on placement and to explore your views on this type of training. The topics likely to be covered in the interview include:

- your clinical work
- the patients you encountered and their match to your expectations
- the support and supervision you experienced
- your views on team training.

We would like you to take part in the interview because the research should contribute to our understanding of outreach training.

Mr Smith is not a member of the School faculty so you can give your feedback in confidence. However, your decision to take part or decline to take part in the research is independent of any course requirements or assessments. Whatever your decision, it will:

- not influence any School assessments of your performance and
- not result in any personal information being revealed to myself, your lecturers, administrators, or anyone other than the researcher, Michael Smith.

Should you have any queries please contact me.

Research assistant, Michael Smith, will be contacting you shortly to seek your agreement to participate in this research.

Yours sincerely,

Professor Peter G Robinson,



## B2 Categories used in Summarising Students' Clinical Experience

The following classes will be used for the analysis of the baseline characteristics of students.

1. Restorations
  - a. simple plastic restoration \*  
i.e. amalgam / composite / glass ionomer
  - b. endodontics
  - c. complex restoration \*  
i.e. inlay / overlay / crown / veneer
  - d. other restoration \*
2. Prosthetics
  - a. denture / overdenture
  - b. addition / reline / impression / adjustment / other
3. Periodontal
  - a. Review / monitoring
  - b. OHC
  - c. Non-surgical periodontics  
i.e. scaling / irrigation / polish / root surface debridement
  - d. Surgical periodontics
  - e. other periodontics
4. Oral Surgery
  - a. permanent teeth extracted
  - b. other oral surgery
5. Sedation
  - a. RA IS operator
  - b. RA IS assist
  - c. IV sedation operator
  - d. IV sedation assist
6. Children's Dentistry
  - a. fissure sealant
  - b. simple restoration \*
  - c. complex restoration \* (e.g. steel crown)
  - d. preventative treatment (eg Duraphat)
  - e. prevention advice
  - f. deciduous extractions
  - g. pulpotomies / root treatments
7. Radiograph taken

\* indicates the classes of treatment contributing to the principal measure of clinical experience in this study

### Classifications of Patients

1. Special Needs
2. Children
3. Adult



**B3 Student information: Letter of Invitation to Participate****THE UNIVERSITY OF SHEFFIELD****Oral Health and Development**

School of Clinical Dentistry  
 Claremont Crescent  
 Sheffield S10 2TA  
 Tel: (0114) 271 7885 (office)  
 Fax: (0114) 271 7843

1 March 2004

Dear ,

**Letter of invitation to participate in the outreach research project**

You may recall our meeting early in January in when we outlined the proposed research in outreach dental education when you helped shape the research. That proposal has received ethics committee and research governance approval.

We can now formally invite you to participate in the natural experiment of outreach placement for undergraduate dental education which has Sheffield Teaching Hospitals Research Department reference code STH13657 and North Sheffield Research Ethics Committee reference code NS2004 2 1862.

We would like you to take part because the research should make a significant contribution to our understanding of outreach training, a field lacking rigorous research, and in addition, some of the assessments used in the research are similar in format to assessments you will encounter later in your course and the practice may be valuable experience.

May I remind you that taking part or declining to take part in the research will:

- not influence the School's random allocation of students to outreach or dental hospital groups and
- not result in any personal information being revealed to myself, your lecturers, administrators, or anyone other than the researcher, Michael Smith.

Enclosed with this letter is an information sheet describing the research project. It answers most of the common questions likely to be raised. Should you have any queries please contact me or any of the research team, your personal tutor or senior School staff.

Research assistant, Michael Smith, will be contacting you shortly to seek your consent to participate in this research.

Yours sincerely,

Professor Peter G Robinson,

Principal Researcher



## **B4 Student information: Description of the RCT Intervention**

All fourth year students will attend a preparatory series of lectures.

Students allocated to outreach will be divided into three waves to attend placements sequentially for five weeks full time starting 19 April, 24 May and 28 June 2004. Students will be placed singly, in pairs, threes or fours in the following locations:

- Lincoln Dental Access Centre
- Hull Dental Access Centre
- Sheffield Community Dental Service's Wheata Clinic
- Rotherham Community Dental Service

Placements will provide students with at least 5 half-day sessions of clinical experience with dedicated nursing support per week. Clinical experience will involve providing comprehensive dental care (within the student's capability) to appropriate patients attending the setting. Students will have a dedicated clinical supervisor throughout this clinical work. Supervisors will be experienced and qualified dental practitioners who already work at the setting and who will be appointed by the University as Honorary Lecturers. Supervisors will have undertaken adequate continuing professional development in the years before appointment and will attend development in the field of supervision including the giving of feedback and grading clinical work.

Students and placement staff will be provided with access to paper and electronic copies of relevant information such as:

- aims and objectives of the placement;
- guidance on roles, rights and responsibilities;
- protocols for standard procedures;
- contact points for further assistance.

During their non-clinical time students will be provided with opportunities for non-clinical activities to include some or all of the following:

- Shadowing of dental practitioner within placement setting
- Visit to observe dentistry in a clinic allied to the placement
- Visit to observe dentistry practices in a residential setting
- Visit to observe dentistry or dental survey work in a school setting
- Visit to observe dentistry in a hospital setting
- Visit to observe oral health instruction or promotion
- Visit to a general dental practice
- Shadowing of dental practitioner or visit to dental work within another setting not identified above
- Attendance at a training session for dental staff
- Attendance at a multi-professional case conference
- Attendance at a meeting of, say, mothers with infants or hospice day-clinic
- Observing or participating in day care facilities for infants or seniors
- Observing care facilities for drug abusers
- Visit to observe the work of health visitors
- Observing or participating in a smoking cessation session

Finally, students will conduct project work in public health dentistry agreed in advance with the placement supervisor and University tutor.



## B5 Student information: Description of the Research Project



### THE UNIVERSITY OF SHEFFIELD

#### Oral Health and Development

School of Clinical Dentistry

Claremont Crescent

Sheffield S10 2TA

Tel: (0114) 271 7885 (office)

#### Information on a Research Project

#### A Natural Experiment in Outreach Placement

We would like to invite you to take part in this important research project. We are asking all fourth year BDS students to take part but before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read this information carefully and discuss it with your friends and tutors if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

If you have any questions about this project please ask any of the following or your personal tutor:

- Michael Smith, Programme Evaluator, Ext.68648, michael.smith@sheffield.ac.uk
- Professor Michael Lennon, Programme Manager Ext.68649, m.a.lennon@sheffield.ac.uk
- Professor Peter Robinson, Ext.17892, peter.g.robinson@sheffield.ac.uk

#### **What is the purpose of the study?**

While there is widespread belief that BDS students benefit from experience of working away from the teaching hospital, there are few quality data to support or refute that belief. As this year, half of the fourth year students are going on outreach and half are enjoying similar experiences based in the CCDH, there is a window of opportunity to compare the outcomes between the two groups – a natural experiment.

#### **What will be involved if I agree to take part in the study?**

Taking part involves:

- The information in your fourth year clinical logbooks (excluding patients' names) being used in the research
- Some anonymised marks from your examinations being used as part of the evaluation
- A 30 minute practice case study based viva and an assessment similar to an OSCE
- We may wish to contact you later on during your VT year to enquire about any long-term benefit of the programme.

As well as providing us with information about the Outreach, the extra assessments such as the viva and the OSCE have been designed to assist you in your preparation for finals. But their primary purpose is to assess the outreach, not you.

Faculty staff need not know whether or not you are taking part in the evaluation.

#### **Do I have to take part in the study?**

**NO.** You are free to decline to join the study and may withdraw at any time or choose not to answer certain questions. You will receive the same quality of tuition at the School whether you join the study or not.



However, whether you take part in the research experiment or not, students selected for outreach will be expected to take part in the outreach training programme.

### **When and where will I complete the questionnaires?**

We would like to send you the questionnaires through the internal mail in February or March and in the summer as the outreach placements finish and later by post to the contact address you leave with the School. The OSCE-type assessment and the viva will take place in the School. The audio recording of this and the questionnaires will be archived for ten years.

### **What other information will be collected in the study?**

We intend to ask VT trainers about the level of preparedness for VT of students from your year group. In doing this the response will remain confidential and the purpose of the enquiry will be made clear to the VT trainer.

### **Will there be effects on my studies?**

**NO**, your participation in the research will not affect your studies in any way. If you were, or were not, to be allocated a place on outreach, participation in the research will not affect that decision which is based on random number tables. Your decision to participate in the research or not will not be communicated to your tutors.

### **Will the information obtained in the study be confidential?**

Anything you say will be treated in confidence, no names will be mentioned in any reports of the study and care will be taken so that individuals cannot be identified from details in reports of the results of the study.

### **How will it help me?**

There is no payment for taking part.

The benefits from taking part will be that you are;

- helping us in our research to improve the training of future dentists
- invited to participate in an extra-curricular viva and other assessments that require no preparation but may well prove worthwhile practice for you before finals.

### **What if I am not happy about the way the study has been conducted?**

If you have any reason to complain about any aspect of the way you have been approached or treated during this research, the normal University complaints mechanisms are available to you and are not affected because you have taken part in the research. If you have any complaints or concerns, please contact Professor Peter G. Robinson on 0114 268 7885 or Professor Michael Lennon (not a tutor here but manager of the Outreach programme) on 0114 2268649. To use the normal University complaints procedure send your complaint in writing addressed to "The Registrar and Secretary, University of Sheffield, Firth Court, Western Bank, Sheffield, S10 2TN".

### **What do I do now?**

Mr Michael Smith (a researcher working for the university) will tell you about the research and ask you to sign a form to show you agree to take part. If you don't want to take part, just tell Mr Smith. If you need time to discuss this project with someone, just tell Mr Smith.

### **Keep this sheet for reference.**

**We will also give you a copy of a signed consent form to keep.**

*Thank you for your help!*



**B6 Consent form****THE UNIVERSITY OF SHEFFIELD****Oral Health and Development**

School of Clinical Dentistry

Claremont Crescent

Sheffield S10 2TA

Tel: (0114) 271 7885 (office)

Study Number:

Student Identification Number for this study:

**CONSENT FORM**

Title of Project:

***Natural Experiment in Outreach Placement***

Name of Researcher: Professor Peter G Robinson

Please  
initial box

1. I confirm that I have read and understand the information sheet dated 9 January 2004 (version 1) for the above study and have had the opportunity to ask questions
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my studies or legal rights being affected.
3. I understand that the marks awarded for sections of my examinations may be looked at by responsible researchers associated with this project. I give permission for these individuals to have access to those records.
4. I agree to take part in the above study.

_____	_____ 2004	_____
Name of Participant	Date	Signature
<b>Michael Smith</b>	_____ 2004	_____
Name of Person taking consent	Date	Signature
<b>Peter G Robinson</b>	_____ 2004	_____
Researcher	Date	Signature







**Medical History (self completed):****ARE YOU CURRENTLY**

Yes No Give details

Pregnant? ✓

Receiving treatment from a hospital, doctor, clinic? ✓

Taking any prescribed medicines (eg tablets, inhalers ointments, injections, contraceptives or HRT)? ✓

Carrying a medical warning card? ✓

**DO YOU SUFFER FROM**

Yes No Give details

Allergies to any medicines (e.g. penicillin) or substances (e.g. latex rubber) or foods? ✓

Hay fever or eczema? ✓

Bronchitis, asthma or other chest condition? ✓

Fainting attacks, giddiness, blackouts or epilepsy? ✓

Heart problems, angina, blood pressure or stroke? ✓

Diabetes, or does anyone in your family? ✓

Arthritis? ✓

Bruising or persistent bleeding following injury, tooth extraction or surgery? ✓

Any infectious diseases (including HIV, hepatitis)? ✓

**DID YOU, AS A CHILD OR SINCE, HAVE**

Yes No Give details

Rheumatic fever or chorea? ✓

Liver (e.g. jaundice, hepatitis) or kidney disease? ✓

Any other serious illnesses? ✓

Blood refused by the blood transfusion service? ✓

A bad reaction to local anaesthetic? ✓

A joint replacement or other implant? ✓

Treatment that required you to be in hospital? ✓

Heart surgery? ✓

Brain surgery? ✓

Growth hormone treatment before the mid-1980s? ✓

Close relative (parent, sibling, child, grandparent or grandchild) with Creutzfeldt Jakob disease? ✓

**DRINKING**

How many units of alcohol do you drink per week? (a unit is half a pint, a single measure of spirits or a single glass of wine)

**2** units per week**SMOKING AND CHEWING**

Yes No In Past

Do you smoke any tobacco products now or in the past? ✓

**8**  
times per day

Do you chew tobacco, pan or supari now or in the past? ✓

times per day

Please give any other details which your dentist might need to know about such as self-prescribed medicines (e.g. Aspirin)

***only for toothache and headaches.***

## **B8 RCT Simulated patients' notes of case to be portrayed**

Female aged in mid twenties. Date of Birth 2 Mar 1979

### **Community**

Lives on an extensive 1960s Council housing estate is served only by a small corner shop / post office, hairdresser, community association office and two shuttered retail outlets. Five minutes in the opposite direction away from their home is an infant/junior school and large Working Men's Club. The estate is almost 3 miles from the dental setting which is on an arterial A road lined with larger detached 1930s private housing.

### **Home**

First floor apartment in a block of four, one in a crescent of blocks arrayed in a crescent rising from reasonably tidy open grassy areas.

### **Family**

Two children Keanu, aged 7, and Lola, 3, by different fathers neither now around. Childcare is a problem with no available adult family members close by. The elder of her children has bad teeth and rarely cleans teeth. Good attendance at school, but not attending at dentist. Favourite drink – Cola.

Employment/Education/Affluence Not currently employed. Unless working for an income over £14kpa there would be less in the family purse each week than at present. Got on alright at school but the teachers never seemed to bother about whether we worked or got on. Liked Mrs Pendle, Geography and got a GCSE D in that and something in English and Business Studies. She has no car. Bus service is hourly during the day but that leaves a 7 minute uphill walk/push back to her crescent.

### **History**

Originally from near Grimsby but moved to Sheffield soon after the birth of first child with the father for him to take work maintaining sewing machinery.

Firm then closed. He drifted off and she was better off without him both financially and less trouble.

Parental generation still near Grimsby but brother and sister in Hull and Leicester respectively. Little contact.

Left school, started work in a couple of shops – neither lasted – and later tried a hairdressing course left course when pregnant. Then there were kids.



### What the children like

Diet: Convenience foods with some fast-food when out. Child at school has free school meals and likes the pizza and chips. Doesn't like Thursdays when it's salads or quiche. "Can't afford to give them what they don't like"

### Mother

A young woman who is not well educated. She is a single mother of a pre-school child and another child. She has a plastic carrier bag with sugary convenience foods by the chair. Alcohol consumption: not usually at home, socially when she gets out – which is rare, perhaps monthly – even then not too much as it is expensive. Smoking: perhaps several cigarettes a day and has been doing since school.

### Attitude/Approach to dental health

She does not like the idea of dental treatment (but is more likely to mention kids and buses if asked) she does not have a history of regular dental treatment. Brushes before 'going out' but this often makes the gums bleed – unsettling. She wants to keep her front teeth – not bothered too much about the back ones. Avoids going to the dentists, doctors, school offices and usually gets tense and snappy before visits like these. She wants such things 'over and done with' - preferably quickly. The school dentist did most of the work she has had done.

### Reason for this visit to the dentist

First double tooth on top left hurts badly despite taking headache tablets which only dulled the pain. No idea why this is now worse – always some pain or other in mouth but nowhere near this bad normally. Food does get caught in and between teeth but no gum swelling or particularly bad tastes. Tetchy – not having slept. Some of her decayed teeth need immediate treatment for pain relief and others that may need care over several visits.

### Previous visits to the dentist

She has several fillings and some untreated decayed teeth. About seven years ago she has made two visits to this dental practice on her own behalf. On one of those she attended for the next appointment and on the other she did not.

**B9 RCT OSCA recording sheet**

Student ID \_\_\_\_\_ Rated By \_\_\_\_\_

Student Task: Take and record a history from a (simulated) patient.

Draw up a treatment plan for that patient

Grading codes: 0 Not present, 1 Hesitantly on prompt,  
2 Readily on prompt, 3 Spontaneously present

**Dental History**

9 marks

- Diet of the patient.....
- Attendance pattern of the patient.....
- Oral hygiene of the patient.....

**Social History**

6 marks

- Patient's access – transport problems.....
- Patient's access – childcare problems.....

**Treatment Plan**

12 marks

- An appropriate solution for pain relief.....
- A plan for repeated pt visits that is cognisant of social factors including:  
Unlikely to attend for many visits.....
- Patient's wishes.....
- A plan for prevention of dental disease (e.g. via diet, OH, F<sup>-</sup>) for the patient  
that is cognisant of her social factors (e.g. income, wishes, family)

**Wider Issues**

6 marks

- Identifying if her children have unmet dental treatment/preventive needs
- A multi-disciplinary approach to health promotion in this family  
(possibly including other carers both formal and informal).....

Maximum of 33 marks

PTO



## Global assessments of performance:

Cognisance of social factors 

- 5 Spontaneously identifies all of the relevant social factors.
- 4 Identifies most of the relevant social factors.
- 3 Identifies some of the relevant social factors.
- 2 Some recognition of the relevance of social factors on prompting.
- 1 Shows no recognition of social factors.

Acceptability of treatment plan that is cognisant of social history 

- 5 Spontaneously identifies an appropriate solution to meet all needs with no extraneous care included
- 4
- 3
- 2
- 1 After heavy prompting identifies a solution meeting no needs, consisting of irrelevant care

Did you gain the impression that the student had attended an outreach placement or not?

Yes,  unassisted    Yes  because they mentioned this or I knew beforehand.     Don't know    Not  because they mentioned this or I knew beforehand.    Not,  unassisted

Add any comment for feedback to the student on their performance:

## B10 RCT Arizona Clinical Interview Rating Scale

Student ID Number \_\_\_\_\_ Rated by \_\_\_\_\_

1	Progresses through the major subsections in sequence	5 0	4 0	3 0	2 0	1 0	Omits major subsections of the history
2	Questions directed to areas which are primarily relevant to the subsection of concern	5 0	4 0	3 0	2 0	1 0	Questions directed to irrelevant areas, lack of organisation
3	Complete information obtained logically re chief complaint, systematically, chronologically obtaining most of the pertinent information	5 0	4 0	3 0	2 0	1 0	Information obtained in a haphazard fashion, resulting in the omission of pertinent data
4	Progresses from one subsection to another using transitional statements which assure you that the information being sought is necessary and important	5 0	4 0	3 0	2 0	1 0	Progresses through subsections illogically, you are left feeling uncertain of the purpose of questions
5	In areas with a lot of potential information, asks forced choice Qs so narrowing in on points needing further elaboration	5 0	4 0	3 0	2 0	1 0	The interviewer asked all leading questions (e.g., "Your child has never had diarrhoea, has he?")
6	Asks questions or takes notes in a manner which results in an interview that progresses smoothly with few unnecessary delays in the dialogue	5 0	4 0	3 0	2 0	1 0	Interview is conducted with long pauses which break the continuity of the interview
7	Did not repeat questions, seeking duplication of earlier information provided, unless to clarify / summarise	5 0	4 0	3 0	2 0	1 0	Repeated several questions seeking information previously provided but forgotten / lost
8	At the end of a line of inquiry (e.g., history of present problem) he summarised (section) data obtained to check accuracy / completeness	5 0	4 0	3 0	2 0	1 0	At the end of a specific line of inquiry, the interviewer failed to summarise the data obtained
9	Questions asked and information provided were concise, understandable; jargon-free (or jargon immediately explained).	5 0	4 0	3 0	2 0	1 0	Questions asked/information given were confusing, difficult to understand or used much jargon
10	Seeks verification of your responses with specific information	0	0	0	0	0	No attempt at verification, accepting information at face value
11	Maintained good eye contact with you	0	0	0	0	0	No attempt to maintain eye contact
12	Attentive to your responses, allowed completion of statements without undue interruptions	5 0	4 0	3 0	2 0	1 0	Often interrupted you preventing you completing your train of thought
13	Alert, sensitive and responsive to possible concerns expressed regardless of whether such concerns were immediately relevant to the present problem; e.g., marital problems, child discipline problems, depression, and explored them sufficiently	5 0	4 0	3 0	2 0	1 0	Deaf / insensitive to concerns expressed if not directly related to the present physical problem Avoided discussing possible problems areas which could have implications for treatment plan
14	Provided positive social reinforcement and feedback e.g., occasional smile, nodding, praise	5 0	4 0	3 0	2 0	1 0	Provided little support or positive social reinforcement Stress was on negative attributes
15	At the end, encourages you to raise any additional questions and provides her with an opportunity e.g. "Is there anything else you would like to bring up or discuss further?"	5 0	4 0	3 0	2 0	1 0	At the end of the complete interview, the interviewer does not provide you the opportunity to discuss/ask anything else
16	At the end of the complete interview, summarises all main information for you, allowing you to confirm/correct it	5 0	4 0	3 0	2 0	1 0	At the end of the interview, makes no attempt to summarise

See reverse for more detail.



	5	3	1
1. Sequence	Progresses through the major subsections in sequence.	Covers all of the major sections but out of sequence	Omits major subsections of the history
2. Relevance	Questions directed to areas which are primarily relevant to the subsection of concern	Generally seeks information relevant to the section concerned, but occasionally requests information related to other areas	Questions directed to irrelevant areas, indicating an apparent lack of organisation
3. Timeline	Complete information obtained logically re chief complaint, systematically, and chronologically obtaining most of the pertinent information	At times pertinent information on complaint not obtained in a chronological order, but obtained most of the information	Information obtained in a haphazard fashion, resulting in the omission of pertinent data
4. Transitional Statements	Progresses from one subsection to another using transitional statements which assure you that the information being sought is necessary and important	Sometimes introduces subsections with transitional statements, but fails to do so at other times	Progresses through subsections illogically, you are left feeling uncertain of the purpose of questions
5. Non-directive	In areas with a lot of potential information asks forced choice Qs so narrowing in on points needing further elaboration	The interviewer uses forced choice and leading questions to obtain information	The interviewer asked all leading questions (e.g., "Your child has never had diarrhoea, has he?")
6. Flow / continuity	The interviewer asks questions and / or takes notes in a manner which results in an interview that progresses smoothly with few unnecessary delays in the dialogue.	At times, the interview is marked with unnecessary pauses which temporarily break the continuity of the interview	Interview is conducted with long pauses which break the continuity of the interview
7. Non-repetitive	Did not repeat questions, seeking duplication of earlier information provided, unless to clarify / summarise	Occasionally repeated questions seeking duplicate information because of the interviewer's failure to remember the data	Repeated several questions seeking information previously provided because he failed to remember data already obtained
8. Sections summarised	At the end of a line of inquiry (e.g., history of present problem) he summarised data obtained to check accuracy / completeness	Sometimes summarised data at the end of a line of inquiry, but failed to do so consistently	At the end of a specific line of inquiry, the interviewer failed to summarise the data obtained
9. Jargon-free	Questions asked and information provided were concise, understandable; jargon-free (or jargon immediately explained)	Sometimes used medical jargon, failing to spontaneously define the terms for you unless you asked him to	Questions asked and information provided to you were confusing, difficult to understand or used much jargon
10. Documentation	Seeks verification of your responses with specific information	At times will seek verification of data, but not always	No attempt at verification, accepts information at face value
11. Eye-contact	Maintained good eye contact with the mother during interview	Did make some eye contact; however, this could be increased	Made no attempt to maintain eye contact with the mother
12. Attentive	Attentive to your responses, allowed completion of statements without undue interruptions	Usually attentive but occasionally interrupted you unnecessarily	Often interrupted you preventing you completing your train of thought
13. Sensitive	Alert, sensitive and responsive to possible concerns expressed regardless of whether such concerns were immediately relevant to the present problem (marital problems, child discipline, depression) and explored them sufficiently	Able to detect concerns expressed unrelated to the child's present physical problems, but failed to explore them in sufficient depth	Un-alert / insensitive to possible concerns expressed if not directly related to the present physical problem Tended to avoid discussing possible problems areas which could have implications for the treatment planned
14. Encouraging	Provided positive social reinforcement and feedback e.g., occasional smile, nodding, praise	Neither overly positive nor negative in dispensing feedback and reinforcement	Provided little support or positive social reinforcement Stress was on negative attributes
15. Anything else?	At the end, encourages you to raise any additional questions and provides her with an opportunity e.g. "Is there anything else you would like to bring up or discuss further?"	At the end, provides an opportunity to discuss/ask anything else but neither encourages nor discourages this (e.g., "Is there anything else?")	At the end of the complete interview, the interviewer does not provide you the opportunity to discuss/ask anything else
16. Summarises	At the end of the complete interview, summarises all main information for you, allowing you to confirm/correct it	At the end of the interview, summarises all main information for you, but does not give her the opportunity to respond to it	At the end of the interview, makes no attempt to summarise



**B11 RCT Baseline Assessment Questionnaire**

THE UNIVERSITY OF SHEFFIELD

**Oral Health and Development**

School of Clinical Dentistry

Claremont Crescent

Sheffield S10 2TA

Tel: (0114) 271 7885 (office)

Date \_\_\_/\_\_\_/2004

Research Number \_\_\_\_\_

**A natural experiment of outreach placement  
for undergraduate dental education**

**Baseline Questionnaire**

This questionnaire is part of the evaluation of the outreach training. There are just 2 questions that take about 3 minutes. It asks about you undertaking different aspects of dental care.

There are no risks to taking part. Whether or not you take part the teaching you receive will not be affected in any way. All information gathered in the study will be confidential. No one will have access to this information except the researchers.

If you have any questions about this project please ask the person who gave you the questionnaire or contact Professor Peter G Robinson by telephoning 0114 271 7885

**PLEASE REMEMBER:**

- Don't write your name on the questionnaire
- It's **not a test** and so there are no right or wrong answers

1. **Your training aims to help you plan dental treatment for individual patients taking into consideration the clinical states of their mouths and all relevant factors in their everyday lives.**

How good do you think you are at treatment planning?

Poor       Fair       Good       Very Good       Excellent

2. **Your training should prepare you to be able to diagnose, plan and provide treatment for a range of people presenting with common dental problems.**

How ***confident*** do you feel that you can tackle a range of people presenting with common dental problems?

Totally confident       Reasonably confident       Undecided       Lacking in confidence       Not at all confident

**Thank you for your help**



**B12 RCT Follow-up Assessment Questionnaire****THE UNIVERSITY OF SHEFFIELD****Oral Health and Development**

School of Clinical Dentistry

Claremont Crescent

Sheffield S10 2TA

Tel: (0114) 271 7885 (office)

Date \_\_\_ / \_\_\_ / 2004

Research Number \_\_\_\_\_

**A natural experiment of outreach placement  
for undergraduate dental education****Follow up Questionnaire**

This questionnaire is part of the evaluation of the outreach training. There are just 6 questions that take about 5 minutes. It asks about you undertaking different aspects of dental care.

There are no risks to taking part. Whether or not you take part the teaching you receive will not be affected in any way. All information gathered in the study will be confidential. No one will have access to this information except the researchers.

If you have any questions about this project please ask the person who gave you the questionnaire or contact Professor Peter G Robinson by telephoning 0114 271 7885

**PLEASE REMEMBER:**

- Don't write your name on the questionnaire
- It's **not a test** and so there are no right or wrong answers
- There are questions on both sides of the paper

**Your training aims to help you plan dental treatment for individual patients taking into consideration the clinical states of their mouths and all relevant factors in their everyday lives**

1 How good do you think you are at treatment planning?

- Poor       Fair       Good       Very good       Excellent

2 Think back two months. Compared to two months ago, how much has your ability to treatment plan for patients changed? Is it...

- Worse than before       About the same       A little better       Quite a lot better       A lot better       A great deal better

3. How good do you now think you were at treatment planning two months ago?

- Poor       Fair       Good       Very good       Excellent

The next three questions are about your confidence.

**Your training should prepare you to be able to diagnose, plan and provide treatment for a range of people presenting with common dental problems.**

4. How confident do you feel that you can tackle a range of people presenting with common dental problems?

- Totally confident       Reasonably confident       Undecided       Lacking in confidence       Not at all confident

5. How confident do you now think you were at tackling a range of people presenting with common dental problems two months ago?

- Totally confident       Reasonably confident       Undecided       Lacking in confidence       Not at all confident

6. Think back two months. Compared to two months ago, how much has your confidence that you can tackle a range of people presenting with common dental problems changed? Is it...

- Worse than before       About the same       A little better       Quite a lot better       A lot better       A great deal better

**Thank you for your help**





# Appendix C

## Statistical Findings

### List of Tables of Statistical Findings

Table C.1	Allocation of 25 students by setting and location.....	329
Table C.2	Number of adults and children treated by students in each setting and location.....	330
Table C.3	Comparison of UK dental schools by key indicators .....	331

### List of Figures of Statistical Findings

Figure C.1	Number of clinical half-day sessions worked per week on placement or in the dental hospital .....	332
Figure C.2	Number of patients encountered by students during the intervention period .....	333
Figure C.3	Number of treatments per student during the intervention period by setting .....	334
Figure C.4	Annual number of treatments per student in the Dental Hospital during the year of the intervention by setting .....	335



**Table C.1 Allocation of 25 students by setting and location**

Placement	Percentage of Study Group	Number of students attending the placement together
<b>Dental Access Centres</b>		
DAC 1	48	4
DAC 2	24	2 <sup>†</sup>
Access Centres' total	72	
<b>Community Dental Services</b>		
CDS 1	24	2
CDS 2	4	1
Community Services' total	28	

<sup>†</sup> One student's absence for the whole of their placement apart from the two-day induction meant their partner was effectively working unpaired.

**Table C.2 Number of adults and children treated by students in each setting and location**

Placement	Number (N°) of students	Average N° of Patients per student, (SD)	N° of Adult Patients, (SD)	N° of Child Patients, (SD)
<b>Dental Access Centres</b>				
DAC 1	12	73 (17)	69 (16)	4 (1)
DAC 2	6	53 (23)	48 (23)	4 (1)
DAC total	18	67 (21)	63 (26)	4 (1)
<b>Community Dental Services</b>				
CDS 1	6	72 (7)	11 (9)	61 (13)
CDS 2	1	80	5	75
CDS total	7	72 (7)	10 (9)	63 (13)
Dental Hospital (control)	24	30 (23)	26 (21)	4 (3)

NB The distribution of number of patients encountered per student for the control group was a bimodal distribution (Fig. C.1 below). The cluster of students seeing the greater number of patients was assigned to the Dental Hospital's Accident and Casualty clinic during the intervention period.



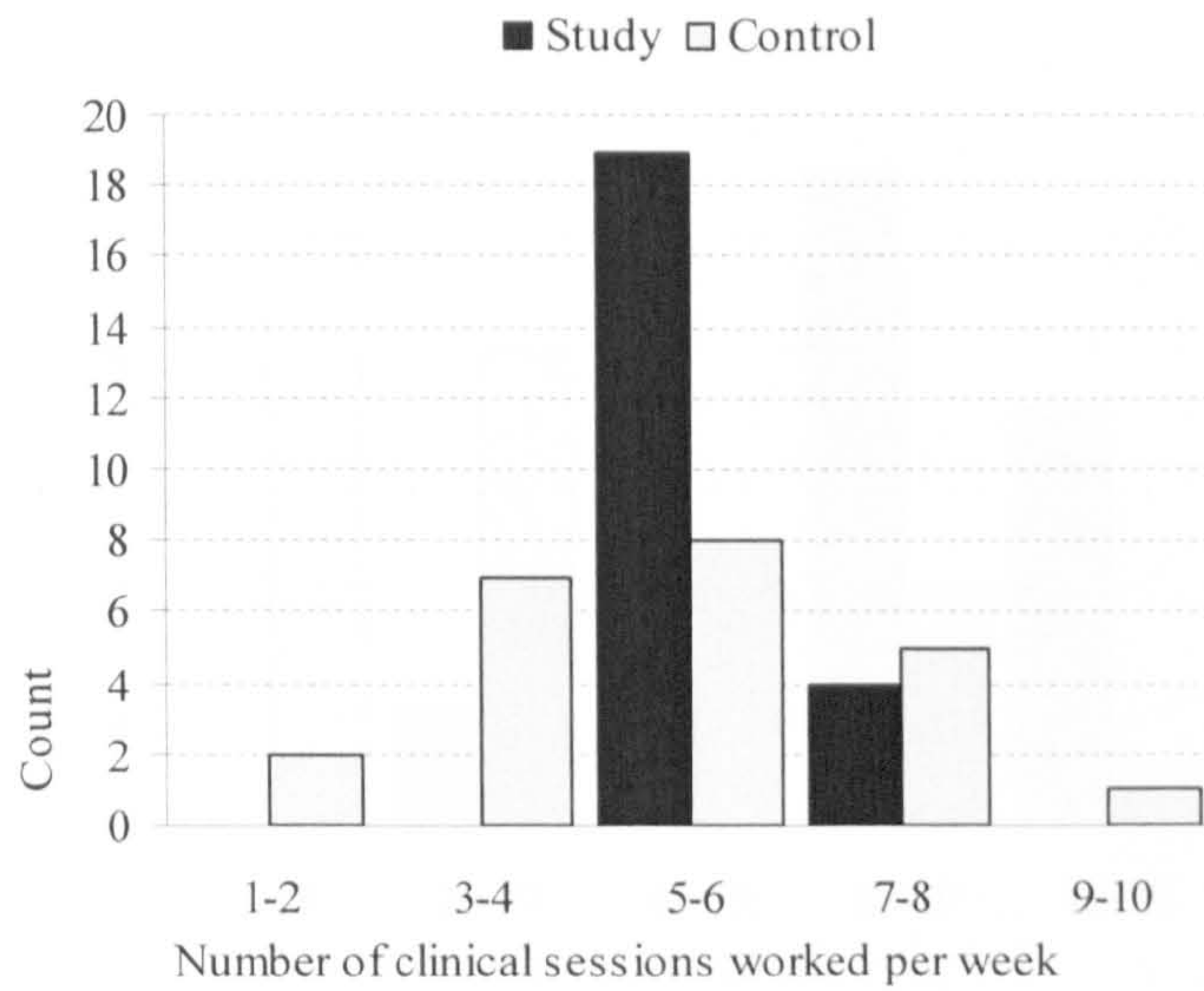
**Table C.3 Comparison of UK dental schools by key indicators**

	Annual Undergraduate Intake of Students	Total A level Points of Entrants (old system)	Typical A level Grades of Entrants	QAA Subject Review score	Research Assessment Exercise rating	Undergraduate Guide for Applicants Global Score
	151					
	94	29.4	AAAa	24		
	82	28.4	AABc	24		
	76	28.2	AAB	24	6	
	75	28.2	AAB	24	6	100
	72	27.3	AAB	23	5	99.4
Sheffield	72	27.2	AAB	23	5	99.2
	67	27	AAB	23	5	98.3
	62	26.9	AAB	22	5	97.9
	62	26.6	ABB	21	4	97.5
	60	26.3	ABB	19	4	97.5
	59	26	ABB		4	97.3
	38	25.6	ABB		4	95.1
			ABC		4	94.7
					3	94.5
					3	94.4
						92.9

The data relate to UK undergraduate dentistry programmes (Hon BDS or BChD) at the time of this research. They are presented anonymised and ranked with the position of the University of Sheffield's School of Clinical Dentistry highlighted.

Sources: HEFCE Dental Returns 1993 to 2004 (bespoke analysis by HESA); O'Leary, 2004; UCAS, 2004; Leach, 2005; QAA, 2005.

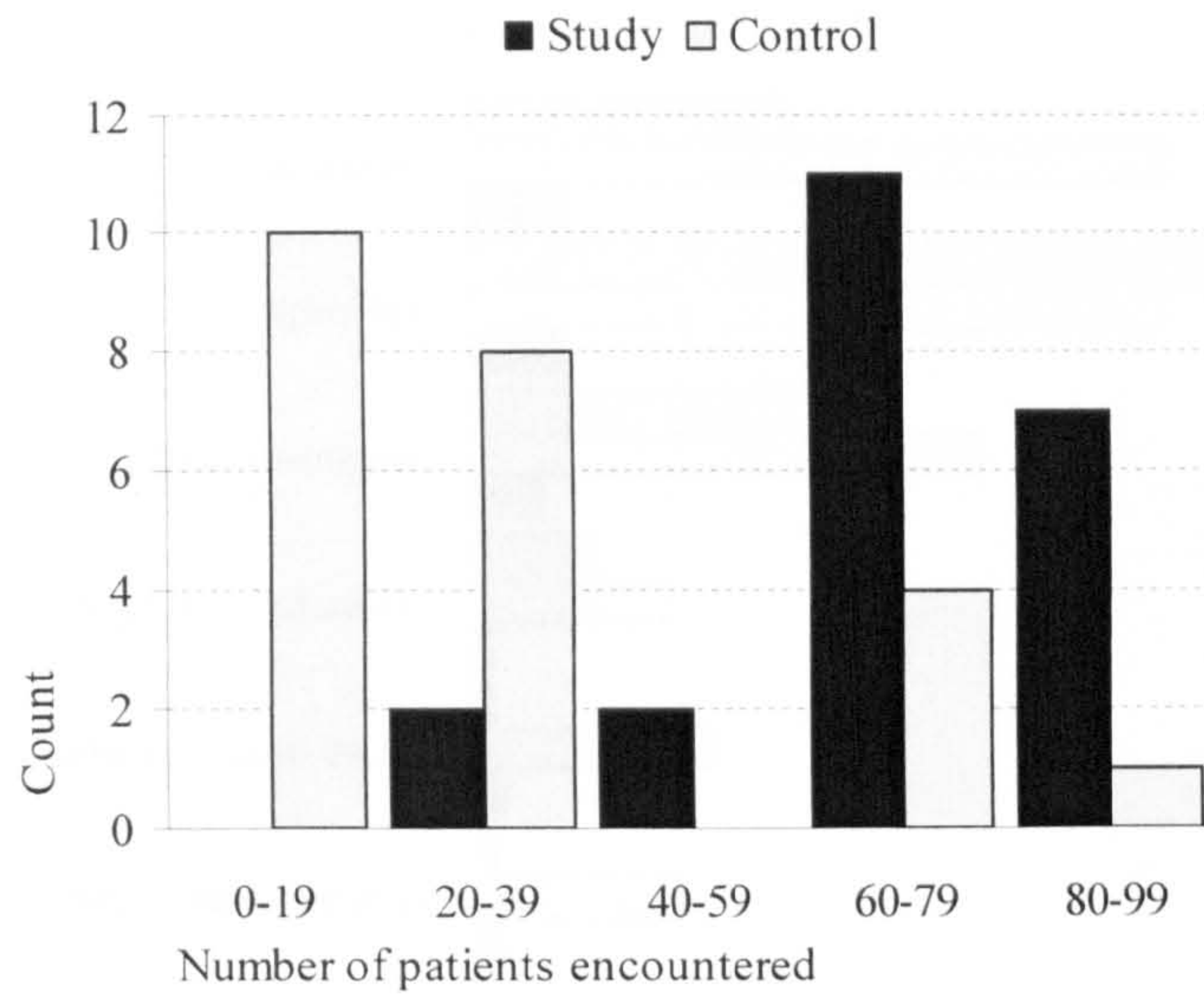
**Figure C.1 Number of clinical half-day sessions worked per week on placement or in the dental hospital**



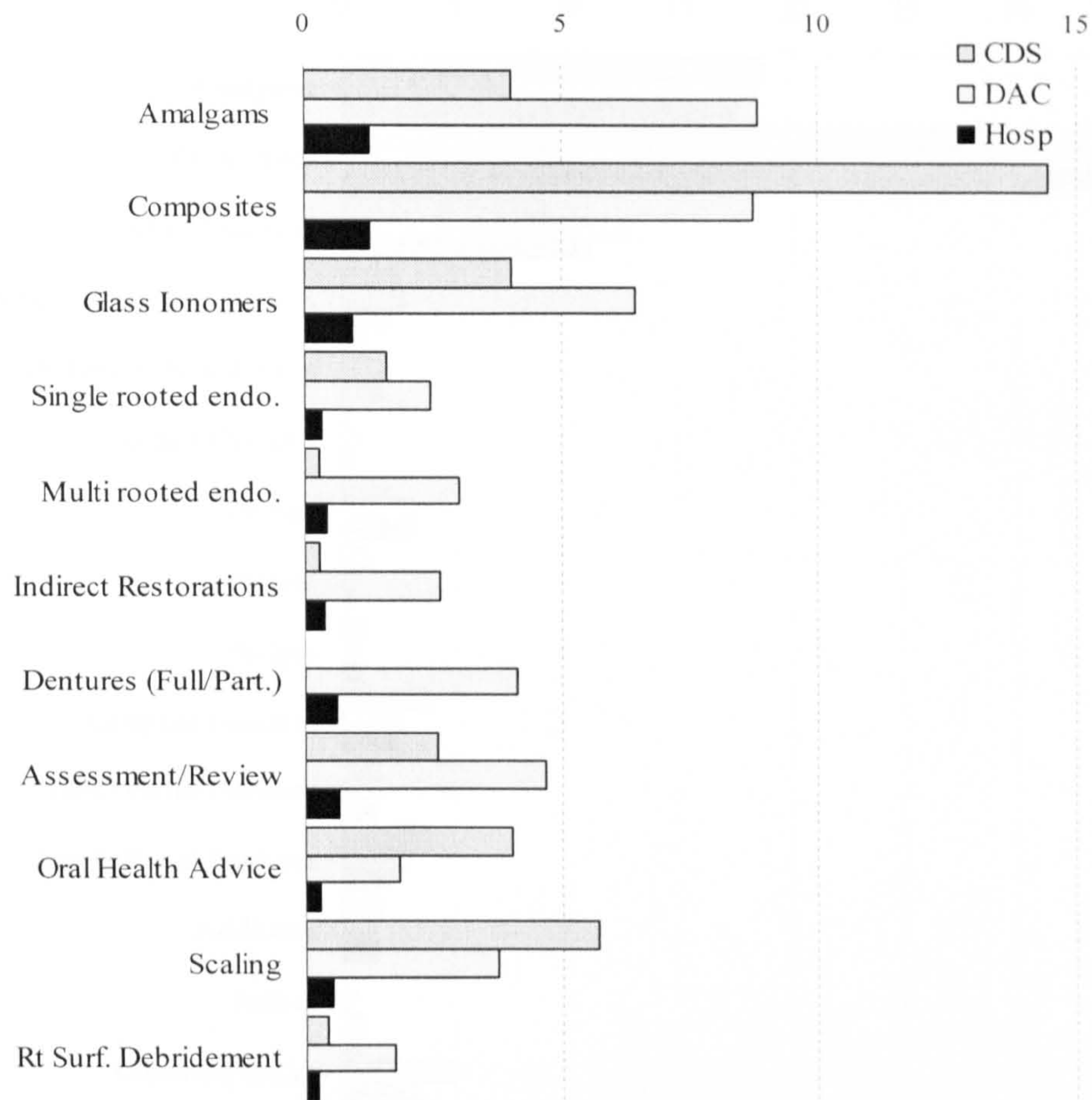
NB The simple count of clinical sessions makes no allowance for the length of sessions differing between settings.



**Figure C.2 Number of patients encountered by students during the intervention period**



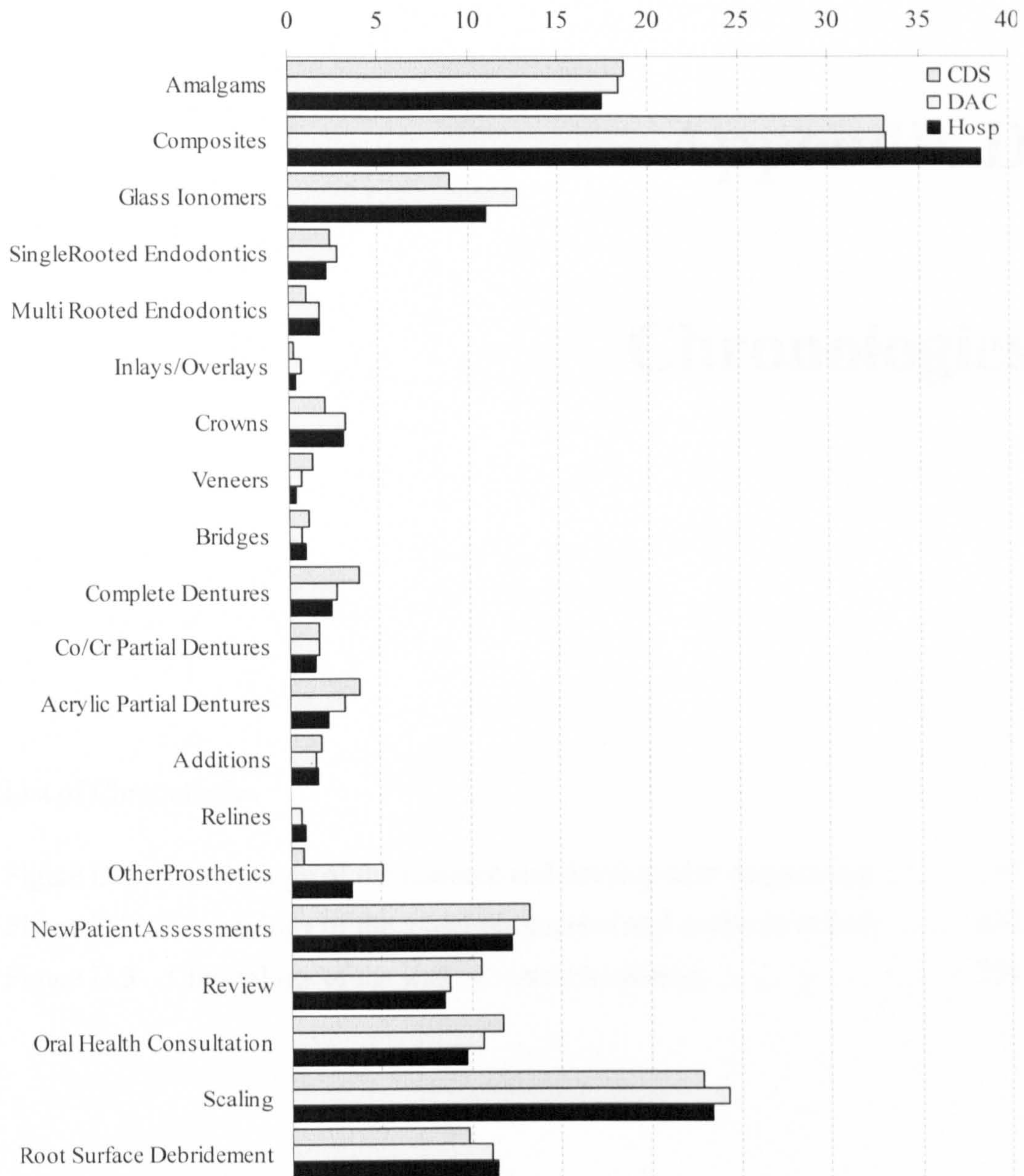
**Figure C.3 Number of treatments per student during the intervention period by setting**



NB The data above include only the treatments undertaken in the placement setting for the study groups, CDS and DAC, but the treatments undertaken in the Dental Hospital for the control group during the intervention period.



**Figure C.4 Annual number of treatments per student in the Dental Hospital during the year of the intervention by setting**



NB The data above include only treatments undertaken in the Dental Hospital (Hosp.) and do not include treatments undertaken on outreach training placements. Group averages are shown for the students allocated to the CDS and DAC study groups and the Hospital control group.

# Appendix D

## Chronologies

### List of Chronologies

Figure D.1	Chronology of the research and development programme .....	337
Figure D.2	Chronology of the initial placements and qualitative study .....	338
Figure D.3	Chronology of the trial of outreach training .....	339



**Figure D.1 Chronology of the research and development programme**

	Outreach programme	Qualitative study	RCT of outreach education
2002			
Dec	Recruitment		
2003			
Jan			
Feb	Pre-placement briefings		
Mar			
Apr	Volunteer placements	Intervention	
May			
Jun			
Jul	Evaluation	Interviews and Focus groups	
Aug			
Sep			
Oct			
Nov		Initial Analysis	Consultation Protocol agreed
Dec			
2004			
Jan		Presentation of interim Findings to participants	
Feb			
Mar	Supervisor development		Approval, Recruit, Baseline assessment, Allocation
Apr			
May	Half-cohort placements	Further Analysis	Intervention in 3 waves and follow-up assessments
Jun			
Jul			
Aug			Initial analysis
Sep			
Oct			Clinical data collection
Nov			
Dec			
2005			
Jan			Analysis
Feb			
Mar	Staff development	Reporting	
Apr			
May			
Jun	Full cohort placements		
Jul			
Aug			
Sep			
Oct			
Nov			
Dec			Reporting
2006			
Jan			
Feb			
Mar	Staff development		
Apr			
May	Full cohort placements		
Jun			
Jul			

**Figure D.2 Chronology of the initial placements and qualitative study**

2002		
	December	Students recruited to the programme.
2003		
	February	Placements identified and allocated.
	March	Pre-placement briefings and visits.
	April	Placements commenced.
	May	Placements completed.
	July to September	Interviews and focus groups with placement staff and students.
	October to December	Qualitative data analysis and validation.
2004		
	January	Presentations to staff and students of the findings.



### Figure D.3 Chronology of the trial of outreach training

<b>2003</b>	
September	Students enter Year 4 and maintain usual records of clinical activity. Discussions with student year-group representatives.
November	Programme evaluation survey of motives for choice of career. Initial drafting of confidence and competence questions. Training for researcher in the organisation of OSCEs.
December	Students consulted on draft protocol. 1 <sup>st</sup> pilot of confidence and competence questions 2 <sup>nd</sup> pilot of confidence and competence questions.
<b>2004</b>	
January	Ethical and Research Committee approval application lodged.
February	Briefing for year group. Allocation to groups/placement locations by School (unpublished) End of Semester 1.                      Start of Semester 2.
March	Discussion with year-group on implications for DPU. Ethical and Research Committee approval granted. Information sheet distributed to students. Recruitment to trial. Baseline data collected from students. Disclosure to students of allocations to groups/locations Import of programme evaluation data on motivation to study. Discussions with two individuals re their allocations. <i>Study group students supply their clinical profiles to placements.</i> <i>Study group students meet placement staff.</i> Training of simulated patient and development of follow-up assessment. Series of lectures for all students describing the delivery of UK dental services, history taking, behavioural sciences and ethics. Development event for placement staff.
April 12	Further development of follow-up assessment and calibration of assessors.
19	Wave 1 students start their allocations.
May	Final development of follow-up assessment and calibration of assessors.
19/20	Wave 1 students finish their allocations.
20/21	Wave 1 Follow-up assessments.
24	Wave 2 students start their allocations.
June 23/24	Wave 2 students finish their allocations.
24/25	Wave 2 Follow-up assessments.
28	Wave 3 students start their allocations.
July 28/29	Wave 3 students finish their allocations.
29/30	Wave 3 Follow-up assessments. End of Semester 2.
August	Data entry of baseline and follow-up data.
September	Collection of School clinical data for Semester 1.
November	Collection of School clinical data for Semester 2.
December	Feedback to students on early findings and OSCA performance.
<b>2005</b>	
Spring	Presentations to staff and students of the findings.

# Appendix E

## Glossary

ACIR – Arizona Clinical Interview Rating scale (Stillman *et al.*, 1977)

Activity diagram – in a Scandinavian model of activity theory, a triangular diagrammatic representation of the relationships between the subject of an activity and its objects (then in turn its outputs) showing instruments used and the underpinning influences of the community, its rules and the division of labour (Engeström 1987)

Activity theory – an aid analysis of activities (a number of related actions directed towards a particular goal) in context

Apprenticeship – a system of training (predominantly) skilled craft practitioners mostly through paid working with master craftsmen (*sic*) who facilitate learning the trade often including some theoretical education

BDA – British Dental Association, a national professional association for dentists

Boundary crossing – transition between settings (activity systems), for example between an educational setting and a workplace, requiring knowledge and skills to be applied in a different manner

CDS – Community Dental Service, a salaried primary care service providing: a safety-net full range of treatment to patients for not served by the general dental services; some treatments not be generally available in the general dental service; dental health promotion; oral screening for children in state schools; and epidemiological field work



- Close nursing support** – the continuous availability of a dental nurse to assist in the provision of oral care by a dental operative
- Coaching** – the act of supporting a learner to achieve their goals, often with expert knowledge, goal setting, encouragement and questions
- Cognitive apprenticeship** – a form of vocational training in which tacit processes are made explicit for learners to observe, enact and practice with help from a trainer (Brown *et al.*, 1989)
- Community of Practice** – a social process of learning occurring when people with a common interest collaborate over an extended period to share ideas, find solutions, and build innovations
- Competence** – the ability to perform a particular task properly
- Confidence** – a belief in one’s own abilities to do something in a specific situation (NIACE, 2004)
- Connective model of work experience** – a conception of work experience in which the workplace’s communities of practice work in genuine partnership with academic staff to provide a situated learning environment for students based on social theories of learning (Guile and Griffiths, 2003)
- Constructivist learning** – learning creating individual understandings through learners’ unique internal interactions between their knowledge, memories and feelings and through newly presented information
- COPDEND** - Committee of Postgraduate Deans and Directors, a group charged with managing Postgraduate education for dentists, training for dental specialties and continuing professional development for dentists and having a supportive role in returning and retraining dentists.
- DAC** – Dental Access Centre, a dental facility provide care including emergency care for people experiencing difficulty in accessing NHS dental care
- DCP** – Dental Care Professional, a more recent term for PCDs following a change of role to a ‘person who assists a dentist in performing dental services by undertaking limited dental procedures which do not require the full education, training and skills of the dentist’ Dental Auxiliary Review Group, GDC 1998
- DH** – Department of Health, the government department responsible for public health issues
- DHS** – Dental Hospital Service. A secondary and tertiary service with patients often referred to the DHS from the primary care services such as GDP
- Expanded dental team** – a dental team including DCPs, particularly dental hygienists or dental therapists
- Expansive work placement** – a placement offering learners opportunities to experience multiple communities of learning, question the activities they learn and observe and develop their metacognitive skills. Compare with restrictive placements

- Extended duties** – additional dental procedures which may be undertaken by DCPs, particularly dental therapists and dental technicians, introduced to reform and expand dental teams
- Fading** – The gradual withdrawal of support from a learner as they develop their competence in a particular skill
- GDC** – General Dental Council, the organisation which regulates the dental profession (including dental education) in the UK
- Foundation Training** – Revised form of Vocational Training launched as a national initiative in 2005 for medics this is extending to dentistry. The two-year training programme forms a bridge between undergraduate studies and specialist or general practice training.
- GDP** – General Dental Practice or General Dental Practitioner. The ‘High Street’ dental practice or the dentists working therein.
- GDS** – General Dental Service
- HEI** – Higher Education Institution
- Hygiene Operative Technique Course** – a preclinical course for dental hygiene students developing practical skills completion of which permits progression to training using the same techniques to treat patients
- Junior Restorative Course** – a preclinical course for trainee dental students and dental therapy students developing practical skills in restorative dentistry. Successful completion of this course permits progression to training using the same techniques to treat patients
- Learning trajectory** – a series of learning experiences building towards a learning goal
- Legitimate peripheral participation** – a model of how novice learners are provided with learning opportunities in a community of practice to gain experience and an induction into a craft or profession (Lave and Wenger, 1991)
- Metacognition** - the knowledge of one's own thinking processes and strategies
- Modelling** – a tool to aid the assimilation of a tacit process in which a skill is reduced to its component parts which are learned initially separately with the aid of a *master* until accurately and reliably reproduced before being applied in real or realistic situations
- NCIHE** – National Committee of Inquiry into Higher Education
- NDWU** – National Dental Workforce Unit
- NHS** - National Health Service
- OFT** – Office of Fair Trading, a body charged with responsibility for making markets work well for UK consumers by promoting and protecting consumer interests while ensuring that businesses are fair and competitive
- Outreach training** – clinical training in a primary care setting away from the dental school and dental hospital
- Paired working** – students nursing for one another rather than a student working with individual qualified nursing support



- PCD** – Professionals Complementary to Dentistry registered or to be registered with the General Dental Council: dental hygienists and dental therapists, dental nurses, dental technicians, clinical dental technicians and orthodontic therapists (GDC, 2004). See DCP.
- PCT** – Primary Care Trust, local NHS body charged with ensuring access and choice to health services, including dental care, and ensure the Government's commitments to health and health services are delivered (*Commissioning a Patient-Led NHS*, 2005).
- PDS** – Personal Dental Service, a variation on the General Dental Service created as part of modernising the NHS to improving access introduced in 1997. Pilot schemes offered dentists more flexible ways of working than fee-per-item and encouraging preventive care. Later, in 2006 on full implementation, PDS contracts restored targets for undertaking dental procedures with financial incentives to meet those targets.
- Placement** – a period of work experience or outreach training in one location
- QAA** – Quality Assurance Agency for Higher Education (England)
- Restrictive work placement** – work placement with narrow learning experiences where, stereotypically, novices tackle few tasks in one work area, are given little explanation and not encouraged to question their work. Compare with expansive work placement
- Schema** – broad mental representations of knowledge
- Setting** – type of location, for example DAC or CDS, of an outreach placement
- Situated learning** – contextual learning socially embedded in a work environment
- SPDCS** – Salaried Primary Dental Care Service a relatively new term encompassing the Community Dental Service (CDS) and Dental Access Centres (DACs) which provide primary care by salaried dentists
- Transmissive learning** – a model of education in which clearly defined content is presented by teachers in a format judged to ease learning, usually in an educational setting to large classes and where standardised tests monitor the success of teaching and learning
- Vocational Training** – (in dentistry) immediate post-graduate training for dentists under the guidance of an experienced practitioner. The programme is designed to help a dentist make the transition from inexperienced graduate to competent practitioner. See also Foundation Training
- Work experience** – learning experiences in a workplace usually for unpaid students
- Zone of potential construction** – an instructor's impression of a learner's zone of proximal development (Steffe and D'Ambrosio, 1995)
- Zone of proximal development** – ZPD, the range of tasks or knowledge outside a learner's current competence which are achievable with expert, or at least more experienced, guidance and support (Vygotsky, 1978)