

The impact of a blended learning course in ADHD on perceived teacher knowledge and self-efficacy, and improved teaching practices: some preliminary findings

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AASE Conference, 8 September 2023



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Background

THE IMPACT OF A BLENDED LEARNING COURSE IN ADHD ON
TEACHER KNOWLEDGE AND SELF-EFFICACY, AND
IMPROVED TEACHING PRACTICES: SOME PRELIMINARY
FINDINGS

Background



THE NEED FOR PROFESSIONAL COURSES IN ADHD

- Lack of pre-service and in-service teacher education in ADHD represents a major and pressing problem.
- On average, one student in every Australian Kindergarten to Year 12 classroom receives an ADHD diagnosis.
- ADHD students are predominantly occupying mainstream settings and are expected to engage in undifferentiated regular classroom learning.
- Despite this, Australian pre-service teachers receive, on average, as little as 1 to 5 hours of training on children with special needs and many receive no training at all on ADHD.
- Moreover, 93% of Australian in-service teachers report that they would benefit from further professional learning in ADHD and 92% report they were not adequately trained at university to identify and support ADHD students (ADHDA Education Survey Report, 2021).
- Lack of teacher knowledge of ADHD has major impacts on teachers, students and families.
- Moreover, there is a lack of research on the efficacy of teacher education in ADHD, especially beyond improvements in teacher knowledge.



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Aims and Methodology

THE IMPACT OF A BLENDED LEARNING COURSE IN ADHD ON
TEACHER KNOWLEDGE AND SELF-EFFICACY, AND
IMPROVED TEACHING PRACTICES: SOME PRELIMINARY
FINDINGS

Aims



- The aim of the current study was to provide a preliminary evaluation of (and preliminary insights into) the impact of OLT's blended learning course '*Understanding Attention Deficit Hyperactivity Disorder*' ('*Understanding ADHD*') on teachers' perceived knowledge, perceived confidence and skills, and any changes in teaching practice (and meeting ADHD student needs) using a retrospective, mixed methods approach.
 - Findings may inform other teacher training, but the ultimate aim is for this preliminary work to inform the enhancement of OLT's '*Understanding ADHD*' program, and to design a prospective study looking at the translational and short-term and long-term impacts of the course for teachers, students and families.
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Methodology



STUDY DESIGN AND OLT'S 'UNDERSTANDING ADHD' COURSE

- The current study utilised a mixed methods, retrospective study design. Pre- and post- course data included categorical ratings, answers to yes/no and open-ended questions, and other descriptives, which were analysed using a range of statistical approaches, including **multi-level ordinal logistic regression, non-parametric tests and reflexive thematic analyses** (Braun & Clarke, 2006 & 2019).
 - The '*Understanding ADHD*' course content and learning objectives are described in detail on OLT's website: <https://aus.oltinternational.net/understanding-attention-deficit-hyperactivity-disorder>
 - The course is designed for those who work in schools with students, particularly teachers, school executives and support staff. The target age range is compulsory education.
 - The course is offered in a learning cohort of up to 12 participants led by a tutor. The course runs over 8 to 10 weeks through a blended learning approach with individual online study supported by three tutor led group sessions, which altogether totals 20 hours. Tutor led sessions may be in person or online via a virtual platform.
 - Pre- and post- course data analysis included categorical ratings, answers to yes/no and open-ended questions, and other statistical approaches, including multi-level ordinal logistic regression, non-parametric tests and reflexive thematic analyses (Braun & Clarke, 2006 & 2019).
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Methodology



PRE- AND POST- COURSE QUESTIONS

Pre- and post- course completion, all participants were asked to answer the following questions using four categorical options (**None, Limited, Sound or Comprehensive** for Pre/Post1 to Pre/Post3 and **Not at all Confident, Somewhat Confident, Fairly Confident, Very Confident** for Pre/Post4 and Pre/Post5):

- **Pre1, then Post1:** *How do you rate your current level of knowledge and understanding of ADHD?;*
 - **Pre2, then Post2:** *How would you rate your current skills in assessing the needs of students with ADHD?;*
 - **Pre3, then Post3:** *How would you rate your current skills in planning and implementing interventions for students with ADHD?;*
 - **Pre4, then Post4:** *How confident do you feel in meeting the needs of students with ADHD?; and*
 - **Pre5 then Post5:** *Please indicate your current level of confidence in using a computer to study an online learning course?.*
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Methodology

PRE- AND POST- COURSE QUESTIONS



Post course completion, the following questions were also asked of participants:

- **Post6:** *How would you rate the online course content?* (categorical response);
- **Post7:** *How many tutor led sessions did you have?* (numerical response required);
- **Post8:** *How did you access the tutor led sessions?* (categorical response);
- **Post9:** *How did the tutor led sessions contribute to your learning?* (open-ended question);
- **Post10:** *Would you recommend this course to others?* (yes /no response obtained); and
- **Post11:** *Do you refer back to the course or make use of what you learned?* (yes/no response obtained).

Methodology



PRE- AND POST- COURSE QUESTIONS

The following open-ended questions were not compulsory, and were answered at the beginning of the first tutorial session as part of the course forum topics open to the learning group (Intro 1 and 2) or at the end of the last tutorial session (Conc 1 and 2):

- **Intro1:** *What has influenced you to do this course?;*
 - **Intro2:** (a) *Share with the group what you hope to learn as a result of taking this OLT course on understanding ADHD. (b) How do you feel about blended learning with tutor group sessions and using the computer to learn? (c) What advantages do you think this method of learning may provide for you?;*
 - **Conc1:** *We have all started this course from different starting points. Some may be very experienced and others new to working with students with ADHD. (a) Please share with the group three key things that you have learned (b) and explain what difference this has made to your attitudes, understanding and practice with the students you teach or support; and*
 - **Conc2:** (a) *List three things you will take away from this course and implement in your classroom/ school/ practice. (c) Additionally, what will you share with your colleagues and school leaders?*
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Methodology



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- **Quantitative data** was analysed using StataIC, Version 17. For all inferential test statistics (e.g. regressions), the significance level (p-value) was set to an adjusted level of .01 for main effects, given the large number of comparisons, to control for Type-I and Type-II error (Rothman, 1990). **Bonferroni adjustments** were automatically made for pairwise comparisons, so here the significance level was set to .05.
 - For **qualitative data/thematic analyses**, a **random sample of 100 participants** were chosen from the full data set using a computer generated algorithm (CalculatorSoup®). Descriptive statistics on the full study sample and on the random sub-sample did not differ.
 - All qualitative **data was categorised independently by at least two researchers** (co-authors: HB, LS, ST, AH, & LB), and any disagreements were resolved by a third party (co-authors MP or LB) until a consensus was reached.
 - All data was cross-checked and a reflective thematic analysis was then undertaken by the first author (MP) (Braun & Clarke, 2006, & 2019), with the themes then cross-checked with the online software program ChatGPT.
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Results

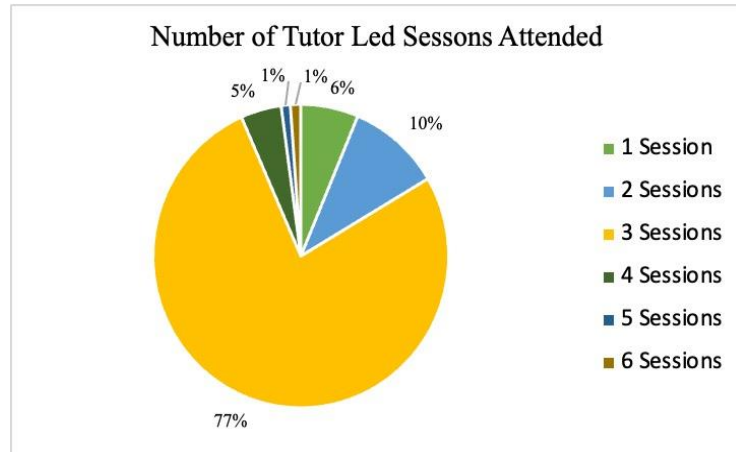
THE IMPACT OF A BLENDED LEARNING COURSE IN ADHD ON
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FINDINGS

Example Results



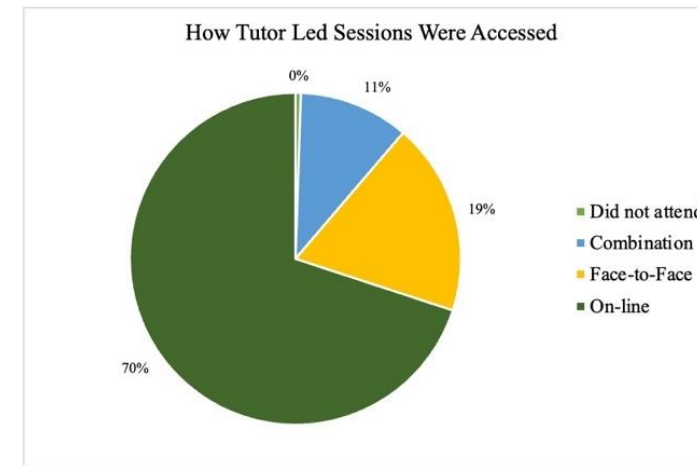
STUDY SAMPLE

- Data included 2,111 participants in total across 17 education jurisdictions, 23 geographical regions, 535 schools, and 667 learning cohorts.



a) Post7 Responses

How many tutor led sessions did you have?



b) Post8 Responses

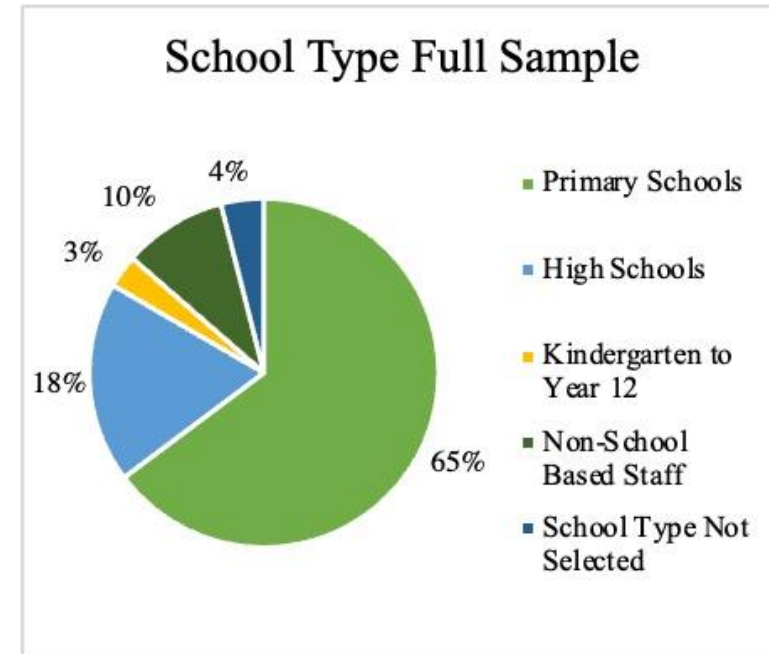
How did you access the tutor led sessions?

Example Results



STUDY SAMPLE

- The full sample included the following breakdown of School Type: **Primary Schools - 1,368 (65%)**; High Schools - 393 (18%); Kindergarten to Year 12 - 64 (3%); non-school based staff - 203 (10%), and 84 (4%) did not select the school type.

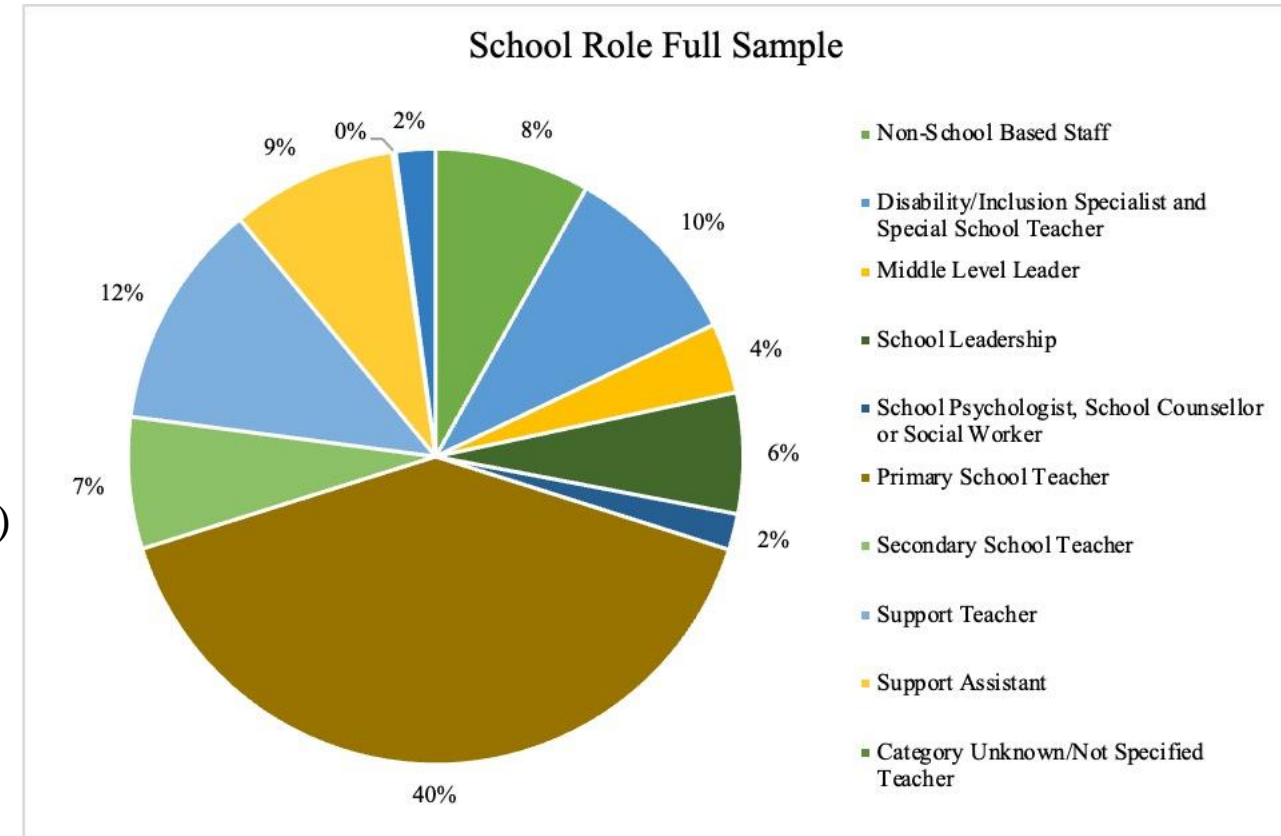


Example Results



STUDY SAMPLE

- The breakdown of Roles for those that completed the course included: 172 (8%) non-school based staff; 207 (10%) disability/inclusion specialist and special school teachers; 78 (4%) middle level leader in school; 134 (6%) school leadership; 40 (2%) school psychologist, school counsellor or social worker; 850 (40%) **primary school teacher**; 146 (7%) secondary school teacher; 252 (12%) support teacher; 184 (9%) support assistant; 4 (0%) teacher with category unknown/not specified, and 44 (3%) other/role not specified.



Pre and Post Question comparisons

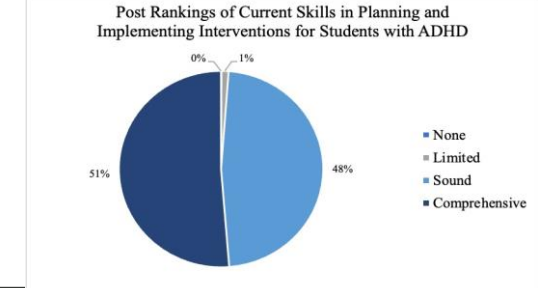
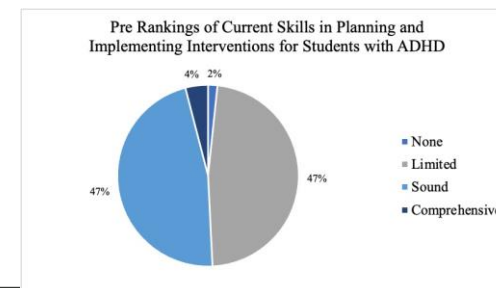
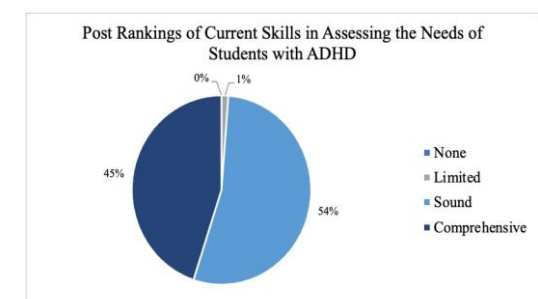
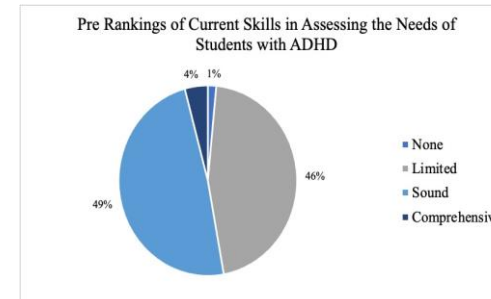
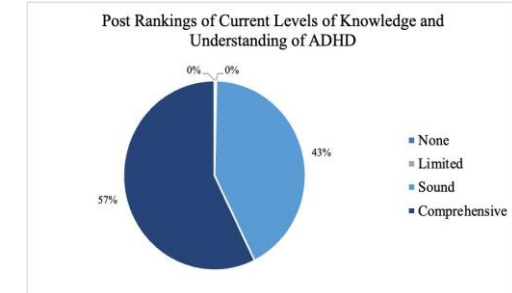
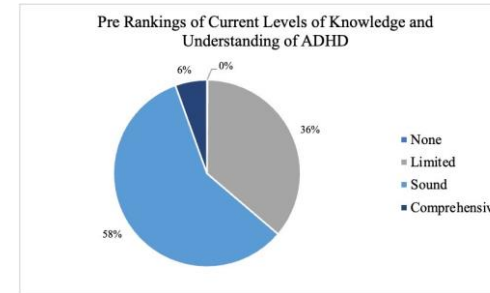


PRE/POST1 TO PRE/POST 5 DESCRIPTIVES

Table 1: Comparisons Between Pre- and Post- Course Ratings

Rankings	Pre n (%)	Post n (%)	z	p
Pre 1 and Post 1 – How would you rate your current level of knowledge and understanding of ADHD?				
None	2 (0.09)	0 (0)	-38.49	<.001*
Limited	763 (36.14)	7 (0.33)		
Sound	1230 (58.27)	895 (42.40)		
Comprehensive	116 (5.50)	1209 (57.27)		
Pre 2 and Post 2 – How would you rate your current skills in assessing the needs of students with ADHD?				
None	32 (1.49)	0 (0)	-38.40	<.001*
Limited	963 (45.64)	26 (1.24)		
Sound	1028 (48.70)	1136 (53.81)		
Comprehensive	88 (4.17)	949 (44.95)		
Pre 3 and Post 3 – How would you rate your current skills in planning and implementing interventions for students with ADHD?				
None	35 (1.66)	1 (0.04)	-39.03	<.001*
Limited	1003 (47.41)	24 (1.14)		
Sound	986 (46.90)	1003 (47.54)		
Comprehensive	85 (4.03)	1082 (51.28)		
Pre 4 and Post 4 – How confident do you feel in meeting the needs of students with ADHD?				
None	110 (5.21)	0 (0)	-38.52	<.001*
Limited	1026 (48.60)	47 (2.30)		
Sound	871 (41.26)	1006 (47.66)		
Comprehensive	104 (4.93)	1058 (50.04)		
Pre 5 and Post 5 – Please indicate your current level of confidence in using a computer to study an on-line learning course?				
Not at all confident	3 (0.14)	0 (0)	-23.48	<.001*
Somewhat confident	115 (5.45)	15 (0.71)		
Fairly confident	838 (39.70)	348 (16.49)		
Very confident	1155 (54.71)	1748 (82.80)		

Note. * = Significant difference between groups at $p < .01$ level; ADHD = Attention Deficit-Hyperactivity Disorder.



Pre and Post Question comparisons

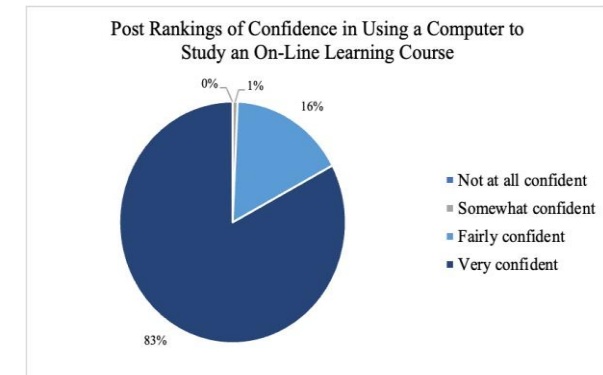
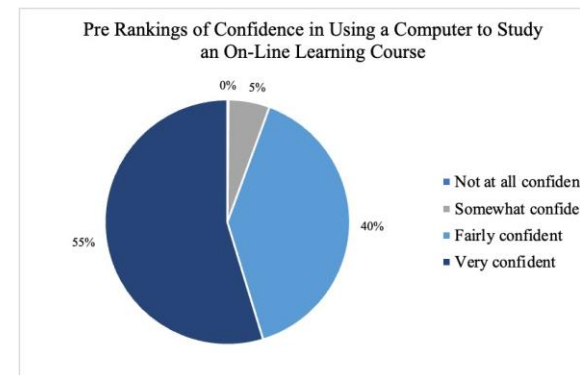
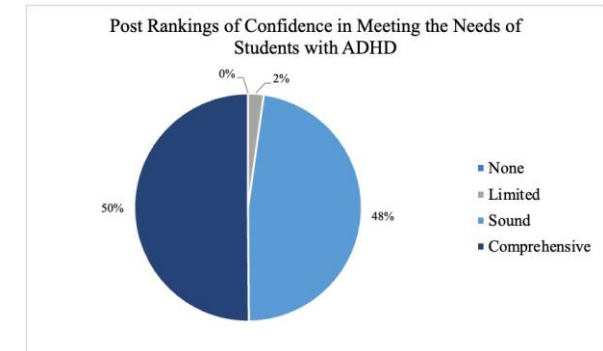
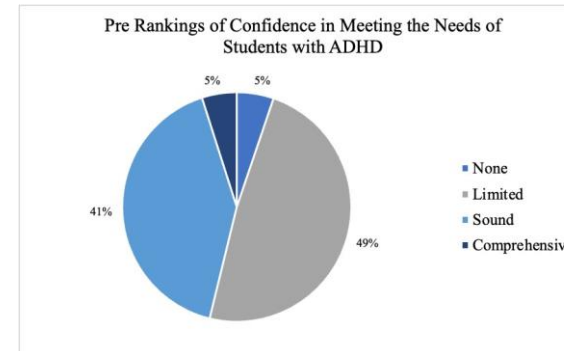


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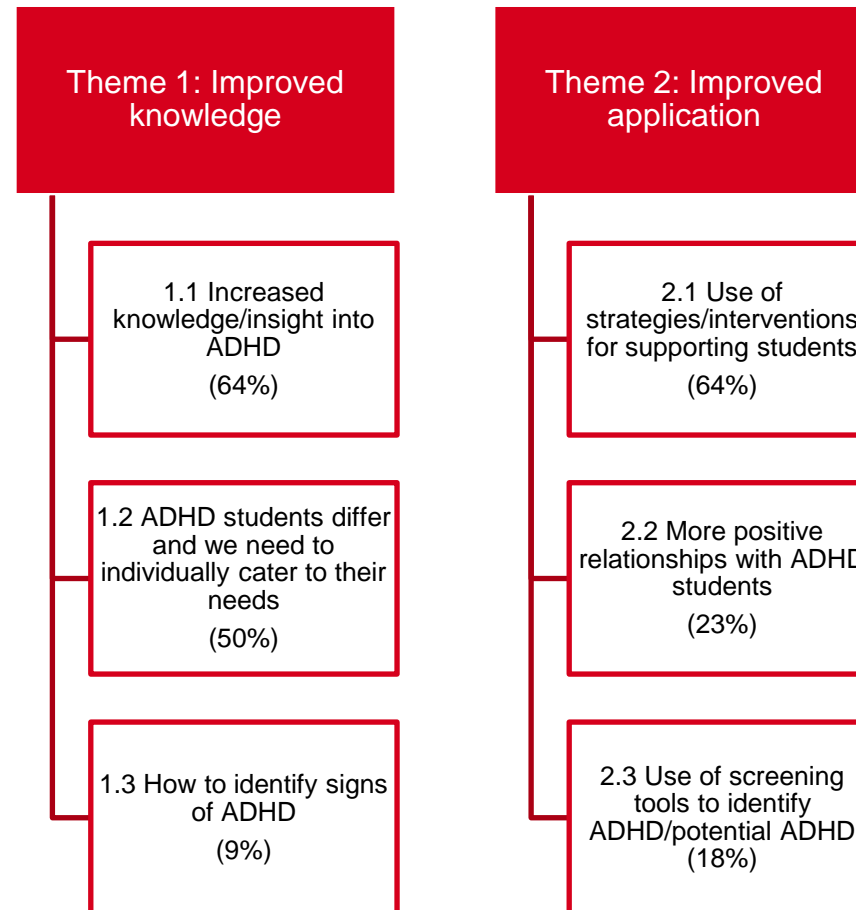
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Example thematic map:

Thematic map and percent endorsement for the question Concl1:

(a) *Please share with the group three key things that you have learned.*



Conc1: (a) Please share with the group three key things that you have learned?

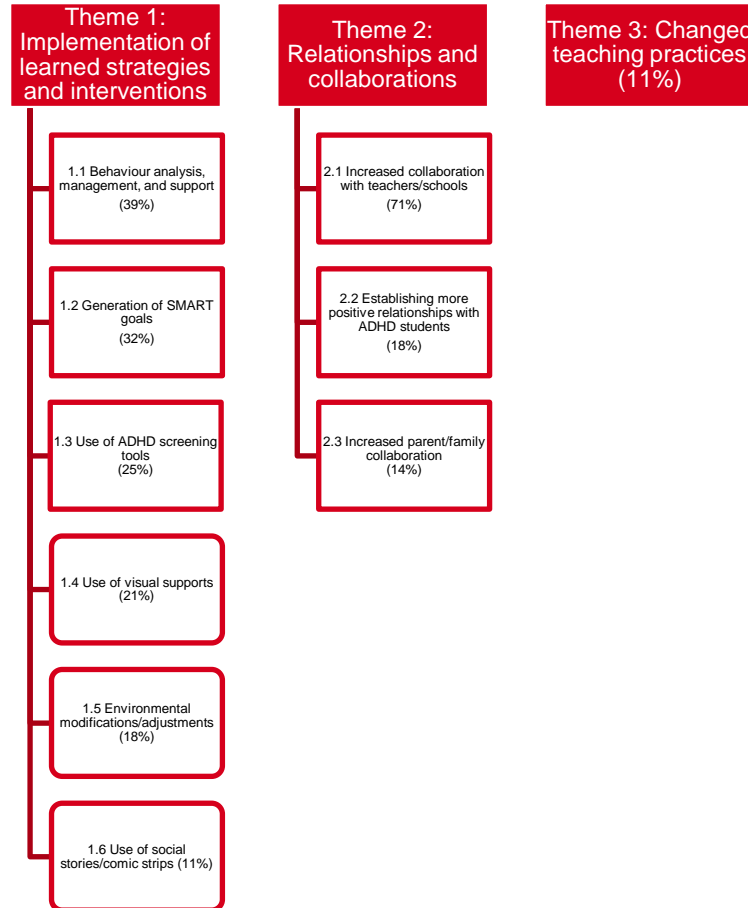


SAMPLE QUOTE

“I have found this course very insightful and feel I have completed it with a much deeper understanding of what ADHD is and entails. The following are some key learnings I have discovered along the way; -ABC analysis and other forms of testing for ADHD for rich data on student behaviours -Effective strategies to assist students with ADHD in terms of learning and behaviour management -That what may work for one student with ADHD may not work at all for another student. Students with ADHD all function differently and as educators, we need to cater for their individual needs”



Thematic map and percent endorsement for the question:
Conc2: (a) List three things you will take away from this course and implement in your classroom/ school/ practice.



Conc2: (a) List three things you will take away from this course and implement in your classroom/ school/ practice.?



SAMPLE QUOTE

“Teachers should ensure positive approaches are used and should keep setting targets and trialling different ways of teaching the student. There are many strategies and interventions that can be utilised with children with ADHD. It is a matter of determining the function and trialling the most suitable strategies. I always believe in building into the whole class teaching instead of segregating the student. The teacher needs to accommodate for the student as opposed to segregation and separate learning.”



Example Results



REGRESSION ANALYSES

- Multilevel ordinal logistic regressions were undertaken to determine which variables predicted Pre and Post rating scores.
- To control for any confounding influences of sampling characteristics, relevant variables including School and Region were nested, and controlling for these variables significantly changed the model for some, but not all, dependent variables.
- Regressions were run on all Pre and Post ordinal variables, with relevant Pre and Post rankings, Post7 and Post8 responses (number and mode of tutor-led sessions), and participant variables (Role, School Type), set as independent variables.

Example Results



REGRESSION ANALYSES

- **Pre4:** Pre rated ADHD knowledge (Pre1), pre rated skills in assessing the needs of ADHD students (Pre2), and pre rated skills in implementing intervention (Pre3), and participants' Role, but not School Type, significantly predicted their **pre rated confidence in meeting the needs** of students with ADHD (Pre4; with an increase in Pre1-3 ratings significantly associated with an increase in Pre4 ratings). However, despite a significant main effect of Role, no pairwise comparisons were significant
- **Post1:** Results revealed that participants pre rated ADHD knowledge (Pre1) and their pre rated confidence using a computer to study (Pre5) predicted their **post-rated knowledge of ADHD** (Post1), with increased confidence and increased pre knowledge significantly associated with increased post knowledge. Their pre rated skills in accessing needs of ADHD students (Pre2), pre rated skills in implementing intervention (Pre3), pre rated confidence in meeting the needs of ADHD students (Pre4), Role, School Type, and amount or method of tutor led sessions attended did not significantly predict Post1.

Example Results



REGRESSION ANALYSES

- **Post2:** Participants **pre rated skills in assessing the needs** of ADHD students (Pre2) significantly predicted their **post-rated skills in assessing the needs** of ADHD students (Post2), with greater pre ratings significantly associated with greater post ratings. No other pre rated scores or participant variables predicted Post2.
- **Post3:** Participants **pre rated skills in implementing intervention** significantly predicted their **post-rated skills in planning and implementing intervention** for students with ADHD (Post3). Again, with higher pre ratings predicting higher post ratings. Further, Role was found to significantly predict Post3. However, despite a significant main effect of Role, no significant pairwise comparisons were found. No other pre rated scores or participant variables predicted Post3.

Example Results



REGRESSION ANALYSES

- **Post4:** Post-rated ADHD knowledge (Post1), post-rated skills in assessing ADHD students' needs (Post2), and post-rated skills in implementing intervention (Post3) significantly predicted one's **post-rated confidence in meeting the needs** of ADHD students (Post4), with higher post ratings significantly associated with higher post confidence. The only Pre score that significantly predicted Post4 was pre rated confidence (Pre4; with increased pre confidence significantly associated with increased post confidence). Confidence with computers, Role, School Type, and amount/number of tutor led sessions attended were not significant predictors.
- **Post6:** Post-rated ADHD knowledge (Post1) and post-rated skills in assessing ADHD students' needs (Post2), but not post-rated skills in implementing intervention (Post3) or post confidence in meeting ADHD students' needs (Post4), significantly predicted participant's **rating of the course content** (Post6). Specifically, higher Post1 and Post2 scores were associated with significantly higher course ratings. The only Pre rating that significantly predicted course ratings (Post6) was pre rated skills in planning and implementing intervention for ADHD students (Pre3; with increased Pre3 scores significantly associated with decreased course ratings). No other participant characteristic (Role, School Type, or amount/method of attendance of tutor led sessions significantly predicted Post6).

Conclusion

Conclusion

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- Educators identified many advantages of the blended learning format and indicated many added benefits of the tutor-led sessions, such as supported learning and drawing on the group's lived experience and expertise.
 - Perceived improvements were noted in teacher attitudes, their levels of understanding and compassion towards ADHD students, their perceived implementation of learned strategies and supports, and perceived outcomes for ADHD students (e.g., having their needs met) after completing the ADHD course.
 - Of note, while school type did not have a significant impact on findings, primary school teachers were substantially more likely to partake in the course than high school teachers, and most participants reported working in a Mainstream setting; **the reasons for this could be explored in future studies.**

Conclusion



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- Somewhat surprisingly, pre-rated confidence in using a computer for study was significantly related to post-course knowledge, but not other post-course ratings. **This may be because knowledge (as opposed to application of skills and meeting ADHD student needs) requires a lot of reading, and access to resources on the computer.**
 - Also of note, Post1-3 ratings (reflecting perceived knowledge and also perceived skills in assessing the needs of ADHD students and planning and implementing interventions) related significantly to Post4 (perceived confidence in meeting the needs of ADHD students), **suggesting a hierarchy** in that all three of Post1-3 must be met (and indeed included in a training course), before educators believe that they can confidently and competently meet student needs.

Conclusion



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- Findings suggested that select pre-course ratings differed significantly as a function of role, generally with those working in inclusion/disability or leadership roles having significantly higher base knowledge of ADHD (Pre1) and higher perceived skills in planning and implementing interventions (Pre3).
 - Inclusion of those in disability/inclusion or leadership roles likely led to more enriched discussion and sharing of knowledge, experience and ideas in the tutor-led sessions, a benefit of the tutor-led sessions clearly appreciated by many course participants.
 - Role was not significantly related to overall satisfaction with the course content or with post-course knowledge or self-efficacy, suggesting that all educators, regardless of their role or level of expertise in ADHD, tended to benefit from the course.
 - Overall satisfaction with the course was significantly related to post-course perceived knowledge of ADHD (Post1) and perceived skills in assessing the needs of ADHD students (Post2).
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More Details:

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