A USER-CENTERED APPROACH TO THE DEVELOPMENT OF AN ELEARNING PROGRAM FOR CLASSROOM TEACHERS OF STUDENTS WITH DISRUPTIVE CLASSROOM BEHAVIOUR

By

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Dedication

This dissertation is dedicated to my wife, Michelle, who was a consistent source of support throughout my graduate school experience. This dissertation is also dedicated to our daughter who, though she hasn't been born at the time of writing, has already changed my life. Finally, I want to dedicate this dissertation to Dr. Penny Corkum, who is the best supervisor I have ever had and probably will ever have.

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Abstract

Disruptive classroom behaviour (DCB) is highly prevalent and has a highly negative impact. There are evidence-based interventions (EBIs) for DCB, but there are barriers to their use in the inclusive classroom. The objective of this dissertation research was to follow an iterative, user-centred approach in developing an eLearning (i.e., the use of information technology to produce learning materials, teach learners, and manage classrooms) professional development (PD) program for classroom teachers to support them in managing DCB. First, a systematic review and meta-analysis were conducted to understand the extant literature focused on interventions for DCB. Included studies (n = 31) indicated that teachers could successfully implement interventions for DCB in their classrooms. While the reviewed studies indicated consistent positive results, the quality of evidence was low. Second, a needs assessment was conducted to understand classroom teachers' and stakeholders' experiences with interventions for DCB. Based on the responses of 15 teachers and 22 stakeholders, participants were aware of many interventions but implemented them inconsistently. An existing program was adapted based on these results, and *ASSIST for Disruptive Classroom Behavior* was developed based on the results of the first two studies and clinical expertise. Third and finally, usability testing was conducted. The response of 11 classroom teachers and eight stakeholders suggested that the program met the needs of classroom teachers, with high overall ratings for usability and positive qualitative data consistent with the quantitative results. These studies demonstrate following a user-centred approach in developing and testing an eLearning program for classroom teachers of students with DCB. Following this iterative user-centred approach may help reduce barriers to the use of EBIs in the classroom setting.

List of Abbreviations and Symbols Used

AB = Alberta

ADHD = attention-deficit/hyperactivity disorder

ASD = autism spectrum disorder

ASSIST = Accessible Strategies Supporting Inclusion for Students by Teachers

CW-FIT = Class-Wide Function-Related Intervention Teams

DB = disruptive behaviour

DCB = disruptive classroom behaviour

EBI = evidence-based intervention

FBA = functional behaviour assessment

GOCC = Group Oriented Concurrent Chains

LD = learning disabilities

M = mean

N; n = sample size / sub-sample size

NB = New Brunswick

NDD = neurodevelopmental disorder

NS = Nova Scotia

ODR = office discipline referral

ON = Ontario

PATHS = Promoting Alternative Thinking Strategies

PBS = Positive Behaviour Support

PD = professional development

PFQ = Program Feedback Questionnaire

PICO = Population Intervention Comparison Outcome

PIR = Positive Interaction Ratios

PRISMA = Preferred Reporting Items for Systematic Reviews and Meta-Analyses

QC = Quebec

REDCap = Research Electronic Data Capture

RES = reducing environmental stressors

SD = standard deviation

SFQ = Session Feedback Questionnaire

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Chapter 1: Introduction

The current dissertation is focused on the iterative, user-centred development of an eLearning professional development (PD) program to support classroom teachers in the implementation of in-class interventions for disruptive classroom behaviour (DCB). The introductory chapter provides an overall context for the research I present within this dissertation. First, I review what evidence-based interventions (EBIs) are and why they are essential for practice. I also discuss which EBIs are well established for addressing behavioural problems in children. Next, I comment on the challenges of moving EBIs into the school system and why eLearning (i.e., using information technologies to enhance a learning environment) PD programs could be a potential solution. I also present an example of a program that aims to bring EBIs to teachers, *Accessible Strategies Supporting Inclusion for Students by Teachers (ASSIST),* and the research results supporting this program. Next, I provide details about a prominent behaviour problem in the school system, DCB. This chapter concludes with a description of the dissertation objectives and research questions, outlining the remainder of this dissertation.

Evidence-Based Interventions

Broadly, EBIs are those interventions supported empirically by research findings that demonstrate beneficial and predictable outcomes (Forman et al., 2009). In the context of psychological interventions, evidence comes from peer-reviewed research findings that, at a minimum, must include studies of the implementation and outcome of an intervention (Canadian Psychological Association [CPA], 2012). There is a methodological hierarchy to evaluate the strength of evidence for an intervention. The weakest evidence in the hierarchy is unpublished data, professional opinion, or anecdotal evidence. The next level of evidence is expert consensus

based on formal procedures, followed by primary research studies with limited internal and external validity, and then primary research studies with high internal and external validity. Finally, knowledge syntheses (e.g., meta-analyses, systematic reviews) provide the strongest evidence (CPA, 2012).

The designation of which interventions are EBIs has important functional and ethical implications. Fundamentally, when an intervention is evidence-based, this suggests that it has been demonstrated to be effective with a particular population (CPA, 2012). Knowing which interventions are evidence-based allows for clear decision-making for psychological treatment and prevents the implementation of an ineffective intervention; moreover, if an intervention is evidence-based, it means that it has been demonstrated to not be harmful (CPA, 2012). If evidence arises that demonstrates an intervention to be harmful, psychologists are ethically obligated to cease the practice of the intervention immediately (CPA, 2017). Choosing to implement an EBI avoids the potential for causing harm. Understanding what are EBIs when implementing interventions to address problems in childhood is particularly important. Children are a vulnerable population and are at a greater risk of potential harm from implementing interventions that are not evidence-based (CPA, 2012).

Evidence-Based Interventions for Behaviour Problems in Children

Various academic and non-academic sources compile lists of individual EBIs for children for dissemination to potential users (Garland et al., 2008). One area with a sizeable body of research on EBIs is behaviour problems in children. According to Garland et al. (2008), EBIs for behaviour problems in children share many core elements. These include psychoeducation of parents, positive reinforcement, limit-setting, assigning and reviewing

homework, role-playing, modelling, and reviewing goals and progress. Studies suggest that, overall, behavioural interventions are the most effective for reducing disruptive behaviour in individual children (Gorman et al., 2015; Martinussen et al., 2011). Behavioural interventions are plans based on the antecedents, consequences, and functions of behaviour to increase or decrease its occurrence. A key component of effective behavioural interventions for children is the changes made to the behaviour of the adults around the child. Consequently, a substantial body of research is focused on assessing the effectiveness of parenting programs for behaviour problems in children (Michelson et al., 2013). Examples of EBIs that help parents address behaviour problems in their children are the Incredible Years (Webster-Stratton et al., 2004) and PK Paths (Domitrovich et al., 2007) programs. Research suggests that parents are not the only agents of change for disruptive behaviour in children. Since nearly all school-aged children spend approximately 30 hours a week in school, classroom teachers can also play an important role in changing the behaviour of children (Ringeisen et al., 2003).

Evidence-Based Interventions in Schools

Wilson and colleagues have conducted a comprehensive meta-analysis examining the effectiveness of school-based interventions for reducing problematic behaviour, finding that behavioural interventions significantly reduced target behaviours (Wilson & Lipsey, 2007). As such, behavioural interventions would be considered an EBI to reduce behaviour problems in the school setting. It is important to note that many of the included studies evaluated interventions implemented by someone other than the classroom teacher and in settings outside the inclusive classroom (i.e., in specialized classroom settings). As such, it is not clear if these interventions could be effectively implemented by classroom teachers within the classroom environment.

Barriers to Using Evidence-Based Interventions in Schools

Despite the evidence of the effectiveness of school-based interventions for problematic behaviour, there are barriers preventing teachers from implementing EBIs in their classrooms. Typically, if classroom teachers learn about classroom practices, like in-class EBIs, they learn about them from pre-service training (i.e., teacher training) or in-service training (i.e., PD). However, two main barriers are first, that it is uncommon for interventions for DCB to be covered during the pre-service training of classroom teachers and second, that opportunities are limited for relevant in-service / PD training (Elik et al., 2015; McCrimmon, 2015; Samudre et al., 2021; Thomas & Deeley, 2004; Wisdom et al., 2011). The third barrier to teachers implementing EBIs in their classrooms is related to the content and design of existing PD programs. In their reviews of PD programs for classroom teachers, Borko (2004) and Dede et al. (2009) found that many PD programs offer disjointed and superficial information or require teachers to implement entirely new curricula, which can be challenging given the competing demands on teachers' time in the classroom. Moreover, Dede et al. (2009) reported that when teachers have access to relevant PD programs, these programs tend to be poorly optimized for classroom teachers (e.g., provide limited individualized content and ongoing support).

eLearning as a Facilitator to Accessing Evidence-Based Interventions

eLearning PD methods could overcome some of the barriers mentioned above to using EBIs. In a recent systematic review, Bragg et al. (2021) synthesized the results of 11 studies that assessed the effectiveness of eLearning programs for teacher PD, suggesting that eLearning programs can be effective for improving a wide range of teachers' skills. An eLearning program

can guide a teacher through implementing EBIs in a way that is more accessible, cost-effective, scalable, and customizable than typical PD programs (Borrelli & Ritterband, 2015).

Ritterband et al. (2009) have proposed a model for behaviour change that can be applied to eLearning programs to provide a strong theoretical foundation for development. The model suggests the following steps for how behaviour change occurs: The end-user (i.e., classroom teacher), influenced by environmental factors (e.g., employer, policy, family), affects program usage. Program usage is also influenced by support (i.e., methods facilitating adherence to the program) and program characteristics (e.g., design, usability, appearance). Program usage leads to behaviour change (i.e., use of EBIs) through several mechanisms of change (Figure 1.1). For eLearning, the behaviour change would be adopting and implementing skills obtained through an eLearning program. Mechanisms of change for eLearning can include changes to knowledge/information, beliefs, and skills. For eLearning to increase the probability of creating behaviour change, the program's characteristics, the supports in place, and the environment it is being used in must be defined. Defining and understanding how each of these components interacts will strengthen the user-centred design of an eLearning program and inform how it is tested.

Accessible Strategies Supporting Inclusion for Students by Teachers

An example of an eLearning program for teachers is *ASSIST* (*Accessible Strategies Supporting Inclusion for Students by Teachers).* The *ASSIST* program (previously *Teacher Help*) was designed to provide PD to classroom teachers on how to implement EBIs for students in Grades 1 to 12 with neurodevelopmental disorders (NDDs; Barnett et al., 2012; Blotnicky-Gallant et al., 2014; Corkum et al., 2014, 2019, 2021; Elik et al., 2015; Parker et al., 2020;

Walker-Noack et al., 2013). There are three versions of the *ASSIST* program, each focusing on a type of NDD: attention-deficit/hyperactivity disorder (ADHD), learning disabilities (LD), and autism spectrum disorder (ASD). Several usability and effectiveness studies have been completed on the *ASSIST* program, with results indicating that the program reduced teacher stress, increased teachers' knowledge of NDDs, and increased teachers' confidence in educating children with NDDs in the inclusive classroom (Barnett et al., 2012; Blotnicky-Gallant et al., 2014; Corkum et al., 2014; Corkum et al., 2019; Corkum et al., 2021; Elik et al., 2015; Parker et al., 2020; Walker-Noack et al., 2013). As part of studies on the feasibility, usability, and effectiveness of *ASSIST*, participating teachers were asked what additional interventions they would recommend as part of *ASSIST*. Teachers noted that they were interested in a program focused on behaviour management interventions for all students, regardless of an NDD diagnosis.

Disruptive Classroom Behaviour

Children's DCB includes off-task behaviour, non-compliance, and aggression (Schaeffer et al., 2006; Yoder & Williford, 2019). When extreme levels of such behaviour are manifested, a diagnosis of a disruptive behaviour disorder (e.g., oppositional defiant disorder, conduct disorder, ADHD) may be warranted. While there are well-documented estimates of the prevalence of disruptive behaviour disorders (2.7-10%; American Psychiatric Association, 2013), it is difficult to estimate the prevalence of DCB in the broader sense. In the educational literature, office discipline referrals (ODRs) have been used to estimate the prevalence of disruptive behaviour (Irvin et al., 2004; 2006; Mcintosh et al., 2017). Based on studies a review the ODRs of students in the United States of America, approximately 40%-55% of students in

Grades 1-12 have a recorded disruptive behaviour incident (Kaufman et al., 2010; Skiba et al., 1997; Wright & Dusek, 1998; Yoder & Williford, 2019). The prevalence of DCB has also been estimated through teachers' perceptions of student behaviour. This method estimates rates from 3 to 66% (Beaman et al., 2007; Arbuckle & Little, 2004; Carter et al., 2006; Stephenson et al., 2000). Despite the lack of accurate prevalence figures, it is clear that DCB is a common problem that teachers have to address in their classrooms.

As with the prevalence of DCB, the impact in Canadian classrooms must be estimated from data primarily collected in Australia and the United States. Students who display DCB are at increased risk for impaired social relationships and poor within-school and post-school outcomes. Specifically, compared to students who do not display DCB, they are more likely to fail courses, be suspended, and drop out of school (Gage et al., 2012; Wagner et al., 2005). Disruptive classroom behaviours also take time away from classroom instruction, negatively affecting the learning of all students in the classroom (Luiselli et al., 2002). Finally, classroom teachers report that DCB increases their work-related stress (i.e., teaching stress) and decreases overall well-being (Klassen & Chiu, 2010). Since DCB occurs in the classroom and has negative impacts on the teachers and students, it is important for teachers to know how to effectively manage these behaviours (Ringeisen et al., 2003).

Dissertation Objectives

Accessible PD is needed for classroom teachers to manage DCB. The involvement of end-users (i.e., classroom teachers) at every stage of development is necessary to develop a program that will meet their needs. This dissertation took a user-centred approach to develop an eLearning PD program for classroom teachers to learn how to implement EBIs for DCB. The

approach was informed by the behaviour change model proposed by Ritterband et al. (2009), specifically in terms of assessing the match between program characteristics and the needs of classroom teachers.

A series of iterative studies were conducted to develop and test the *ASSIST for Disruptive Classroom Behaviour* program. Chapter 2 contains the results of a systematic review and meta-analysis of the extant literature focused on teacher-implemented in-class interventions for disruptive behaviour. Chapter 3 describes a needs assessment study that involved getting direct feedback from end-users and stakeholders on the use of EBIs for DCB and perspectives on in-class teacher-implemented in-class interventions. Chapter 4 outlines the development of the *ASSIST for Disruptive Classroom Behaviour* program and provides a description of the program that was tested in this dissertation research. Described in Chapter 5 is usability testing by end-users and stakeholders (i.e., administrators, specialized teachers, school psychologists, and behaviour specialists) of each session and the overall program to evaluate the program's readiness and to determine what modifications are needed prior to conducting an RCT. A general discussion of this series of studies is provided in Chapter 6. Below are the three overarching research questions that were addressed in this dissertation.

Research Question 1: What is the evidence for the effectiveness of teacher-implemented interventions to address DCB in the classroom?

A systematic review and meta-analysis were conducted to address this research question. The primary aim of this systematic review was to determine what teacher-implemented in-class interventions have been assessed in the extant literature and the characteristics of these interventions. The meta-analysis aimed to calculate the overall effect size for these interventions

on DCB. The results of this study informed the inclusion of intervention strategies assessed in the second study of this dissertation.

Research Question 2: Based on the perspectives of end-users and stakeholders, what interventions should be included in PD programs for teachers on how to manage DCB, and would eLearning be an appropriate way to deliver this PD content?

In an exploratory needs assessment, end-users (i.e., classroom teachers) and stakeholders (i.e., administrators, specialized teachers, school psychologists, and behaviour specialists) were interviewed and asked to complete questionnaires about their experiences with the interventions collected in the preceding systematic review and meta-analysis (Chapter 2) and to contribute any additional interventions with which they were familiar. They were also asked about the perceived barriers and facilitators of using an eLearning program for this PD. The results of analyses of both quantitative and qualitative data informed the development of *ASSIST for Disruptive Classroom Behaviour.*

Research Question 3: What is the usability of the ASSIST for Disruptive Classroom Behaviour program? Is it ready for future effectiveness testing?

Classroom teachers and stakeholders (i.e., administrators, specialized teachers, school psychologists, and behaviour specialists) evaluated their user experience with the newly developed program. Usability was assessed using Morville's user experience honeycomb to evaluate the program on seven dimensions: useful, usable, findable, desirable, accessible, credible, and valuable (Morville & Sullenger, 2010). Ratings were collected about the program's readiness for use by other teachers, teachers' satisfaction with the program, and the perceived flexibility of the program. Based on previous usability studies for *ASSIST* programs (Parker et

al., 2020), it was expected that the program would be well-received by participants. Qualitative data were also collected to add depth to these findings. These data were collected to determine if any refinements were appropriate based on the usability results before effectiveness testing.

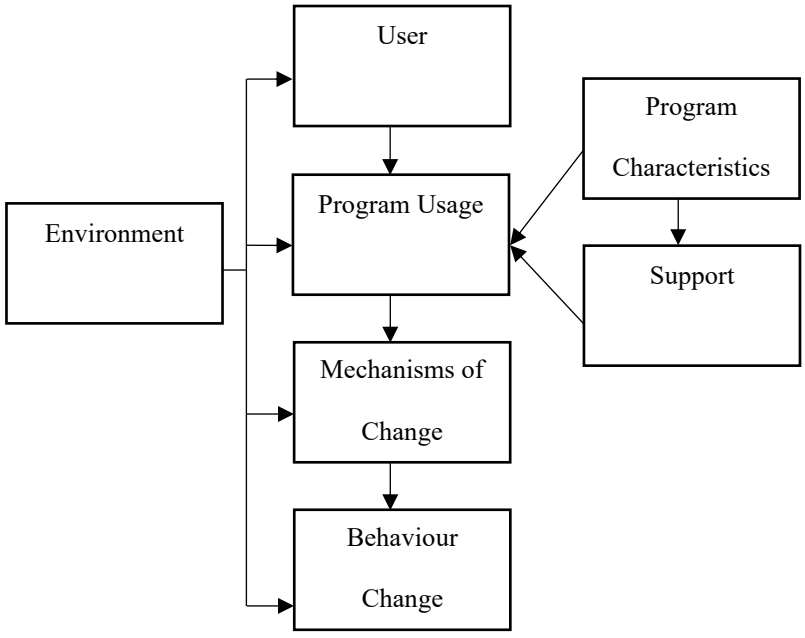

Figure 1.1. A simplified diagram of Ritterband's behaviour change model.

Chapter 2: A Systematic Review and Meta-Analysis of Teacher-Implemented Interventions for Disruptive Behaviour in the Inclusive Classroom

The manuscript based on this systematic review and meta-analysis is presented here. Readers are advised that Matt Orr, under the supervision of Dr. Penny Corkum and in consultation with the dissertation committee (Dr. Christine Chambers and Dr. Isabel Smith), was responsible for the conceptualization of the research study, developed the study protocol, prepared submissions for ethical review, was responsible for recruitment, completed data collection, coding, data analysis, and interpretation for all components. Matt Orr was responsible for all aspects of the writing process and received feedback from his supervisor and dissertation committee members. The following manuscript is prepared for submission for publication as:

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Abstract

Disruptive classroom behaviour (DCB) is highly prevalent and is associated with poor outcomes for the student displaying these behaviours, as well as for classmates and teachers. Although various effective, in-class interventions exist for disruptive behaviour, several barriers prevent teachers from using them. The current systematic review and meta-analysis take a unique approach to the literature by focusing on teacher-implemented in-class interventions rather than interventions implemented by others (e.g., specialized teachers, administrators, school psychologists). The aims of the systematic review and meta-analysis are to (a) to identify studies that evaluated teacher-implemented in-class interventions for DCB in the extant literature, (b) extract characteristics of the interventions related to implementation (e.g., time commitment, training required), and (c) estimate an overall effect size of the interventions on DCB. A systematic review, conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement, identified 31 articles included in the final review, of which 16 were included in the meta-analysis. Intervention characteristics were summarized for the 25 identified interventions. The combined effect size of the studies was positive and large when estimated using a Hedges-Vevea (Hedges & Vevea, 1998) random-effects model. The results of the systematic review and meta-analysis suggest that while there is evidence for the effectiveness of these interventions, the poor methodological quality of the included studies may inflate the effectiveness. These results also suggest future directions for research regarding teacher-implemented in-class interventions for DCB.

Introduction

Children's disruptive classroom behaviour (DCB) is characterized by off-task behaviour, non-compliance with teacher requests, and aggressive behaviour (Schaeffer et al., 2006; Yoder & Williford, 2019). Based on reviews of student school records in Grades 1-12 in the United States of America, approximately 40%-55% of students have recorded incidents of disruptive behaviour (Kaufman et al., 2010; Skiba et al., 1997; Wright & Dusek, 1998). Students who display chronic DCB are at greater risk for impaired social relationships and poor academic and post-school outcomes (McDaniel et al., 2017). Disruptive classroom behaviour can also negatively affect the learning process of all students by reducing the time for instruction (Luiselli et al., 2002). Teachers have also reported that DCB increases work-related stress and decreases their own overall well-being (Klassen & Chiu, 2010). For these reasons, it is optimal for teachers to have access to evidence-based interventions (EBIs) to effectively manage DCB (Martino et al., 2016; Nelson et al., 2002).

Although there are EBIs for DCB, most are provided to students who have a formal diagnosis of a psychological disorder (e.g., autism spectrum disorder, attention-deficit/hyperactivity disorder, oppositional defiant disorder; Mental Health Commission of Canada, 2013). These interventions typically involve the use of functional behaviour assessment (FBA) to assess the antecedents (i.e., preceding events) and consequences (i.e., subsequent events) that provoke and support unwanted behaviours (Canadian Psychological Association, 2007; 2014). However, many students display DCB that have not been formally diagnosed, some of whom may meet diagnostic criteria and others who do not meet diagnostic criteria but display DCB (Charlton et al., 2017; Kaufman et al., 2010). The existence of this continuum of disruptive behaviour, and the lack of intervention services for those students who are not

diagnosed with a disruptive behaviour disorder, suggests a need for EBIs for DCB for students who do not have formal diagnoses.

Previous meta-analyses and systematic reviews have summarized the extant literature assessing school-based interventions for disruptive behaviour in a mainstream classroom setting. Most of these studies have focused on specific types of interventions, such as positive behaviour support (Lee & Gage, 2020), classroom seating (Rollo et al., 2018), mindfulness (Klingbeil et al., 2017), peer management (Chaffee et al., 2017; Dart et al., 2014), academic interventions (i.e., altering academic practices to meet the needs of students; Warmbold-Brann et al., 2017), and token economies (Chaffee et al., 2017). In addition to these meta-analyses and systematic reviews focused on specific interventions, Wilson and Lipsey (2007) conducted a comprehensive meta-analysis of any school-based interventions for disruptive behaviour, finding that behavioural interventions consistently resulted in improvements in disruptive behaviour. Taken together, these studies suggest that school-based interventions can be effective at reducing the disruptive behaviour of students.

While there is strong support for the effectiveness of behavioural interventions for DCB, what is unknown is whether teachers can implement these interventions without additional support in their classrooms. Previous systematic reviews have included studies of interventions implemented anywhere within the school environment and by a range of people, including the classroom teacher, other school staff members, and researchers. Therefore, it is difficult to know whether the implementation of EBIs for DCB by classroom teachers is feasible and effective. Furthermore, these studies also seldom included specific details about intervention implementation beyond time commitments (i.e., number of intervention sessions; Dart et al., 2014; Klingbeil et al., 2017), further reducing the utility of their results.

The purpose of the current systematic review and meta-analysis was to determine what is known about teacher-implemented in-class interventions for DCB. Unlike previous meta-analyses and reviews, the current study focused on a specific intervention location (i.e., the inclusive classroom) and implementer (i.e., classroom teacher). Additionally, the current study summarizes specific information about intervention implementation that was not summarized in previous meta-analyses and reviews.

Methods

The Preferred Reporting Items for Systematic Review and Meta-analyses (PRISMA) statement (Page et al., 2021) informed the protocol for the current study.

Systematic Review

Information Sources and Search Strategy

Published studies were identified by searching three electronic databases (i.e., ERIC, EBSCOHost (PsycInfo), and PubMed) where educational and psychological research is aggregated. The search strategy consisted of four semantic groups (described below); the Boolean operator 'OR' concatenated terms within each group, and the Boolean operator 'AND' concatenated the four groups. The first group identified the target population (e.g., adolescen*, child*), the second group was related to the classroom setting (e.g., class-based, school delivered), the third group was related to interventions specifically (e.g., intervention, adaptation), and the fourth group was related to disruptive behaviour (e.g., disruptive behaviour, aggression). The search strategy was tailored for each database, with search terms mapped to

Medical Subject Headings whenever possible. Searches were conducted in November 2018. Two updated searches were conducted in January 2020 and 2021.

Study Selection Criteria

The eligibility (inclusion and exclusion) criteria were derived using the Population Intervention Comparison Outcome (PICO) model to determine which populations, interventions, comparisons, and outcomes were relevant to the study goals (Schardt et al., 2007). The PICO model included school-age children as the population and teacher-implemented in-class interventions as the interventions. Comparisons of interest were those to baseline, waitlist control groups, treatment as usual, and/or another intervention or program. The outcomes of interest were behaviour, academic functioning, satisfaction (i.e., students, teachers), and teacher competence/confidence/knowledge.

Inclusion criteria were: (a) the intervention was implemented in the inclusive classroom setting during class time (as opposed to during recess, lunch, or after school), (b) inclusive classroom teachers implemented the intervention, and (c) the study was published in a peer-reviewed journal in English.

Exclusion criteria were: (a) all students within the study were outside the target age group (e.g., preschool, grade primary, university), (b) the article did not report original research (e.g., review), (c) the study was not focused on student outcomes (e.g., focused on teachers' behaviour change), (d) the study was not focused on the classroom setting (e.g., focused on at-home behaviour, focused on behaviour during recess), and (e) no intervention was implemented, or no quantitative results were provided.

Duplicate articles were removed first, followed by the title and abstract reviews such that any articles that met the exclusion criteria were removed. A full-text review followed title and abstract reviews to determine eligible studies. Studies were kept after the full-text review if they met the inclusion criteria.

Data Extraction

Data extraction was conducted independently by two authors (MO & JI), using an author-created form. Any noted inconsistencies were discussed between the two authors and, if necessary, were discussed with a third author (PC) and settled. The categories used for data extraction were: (a) country in which the intervention was implemented; (b) the number of participants; (c) ages of participants; (d) sex of participants; (e) who implemented the intervention; (f) description of training provided to the implementer; (g) length of intervention; (h) timing of follow-up or maintenance measures post-intervention; (i) type of study design; (j) how targeted behaviour change was assessed/measured; and (k) evidence of success (i.e., for, mixed, none, or against).

Quality Assessment

All studies included in the systematic review were rated in terms of their methodological quality using the checklist developed by Downs and Black (1998), which allows for assessing the quality of randomized and non-randomized studies. Studies could receive scores between 0 (i.e., very poor methodological quality) and 27 (i.e., very high methodological quality). The checklist has a high internal consistency (Kuder–Richardson-20: 0.89), high test-retest reliability ($r = 0.88$), and good inter-rater reliability ($r = 0.75$; Downs & Black, 1998).

Meta-Analysis

The reported effect and sample sizes were extracted from each reviewed article to conduct the meta-analysis. As suggested by Field (2013), Pearson's r was chosen for the combined effect size. If effect sizes were not reported, corresponding authors were contacted to retrieve either the effect size calculation itself or raw data to calculate the effect size. For studies that reported effect sizes other than Pearson's r (e.g., NAP, Tau-U, Cohen's d), the appropriate conversion formula was used to derive an estimated value of Pearson's r from the reported effect size (Parker & Vannest, 2009; Parker et al., 2011). As suggested by Field (2013), articles that reported multiple effect sizes without one effect size identified as a primary outcome (e.g., five outcome measures, each with an associated effect size) were represented by multiple data points in the meta-analysis, one for each unique effect size reported that was relevant to disruptive behaviour (e.g., externalizing problems). Based on previous meta-analyses and reviews, the articles included in the current meta-analysis were expected to be quite heterogeneous in terms of the variety of interventions being assessed. Therefore, a Hedges-Vevea random-effects model (Hedges & Vevea, 1998) was used. The analysis was conducted using IBM SPSS 25, using Field and Gillett's (2010) meta-analysis syntax.

Results

Systematic Review

A PRISMA (Liberati et al., 2009) flow diagram outlines the breakdown of the article selection process (Figure 1). The initial search was run in 2018 and was re-run in 2021. The

results presented in this study are based on the results of the search from 2021. General information about the articles is summarized in Tables 2.1 and 2.2 and discussed below.

Participants

Most of the 31 reviewed studies were conducted in the United States of America (n = 25) and the remaining studies were conducted in Australia (*n* = 1), Finland (*n* = 1), the Netherlands (*n* = 1), Spain (*n* = 1), Taiwan (*n* = 1), and the United Kingdom (*n* = 1). The sample sizes for the included studies ranged from 1 to 5611 (*M* = 488.73; median = 58.50; mode = 3). The participants represented students from kindergarten to grade 12, with reported ages of 6-20 years. Of the studies that reported the sex distribution within their samples (*n* = 25), the proportion of male participants ranged from 33% to 100%, with an average of 64%.

Interventions

Brief descriptions of the interventions from the included studies can be found in Table 2.2. In total, there were 25 unique interventions. Given our inclusion criteria, all interventions were implemented by the classroom teacher who was teaching in an inclusive (not specialized) classroom. However, one intervention included students as implementers along with the classroom teacher who led the implementation. This intervention was "tootling" (McHugh et al., 2016), which required students to report on instances of positive behaviour for the intervention to be effective.

Most included studies reported some form of training for teachers to implement the intervention (*n* = 28). Most training involved in-person instruction alone (*n* = 17), with some using both in-person and written instructions (*n* = 2), and one using written instructions only.

Two studies described training but did not include the time dedicated to training (O'Handley et al., 2020; Van den berg et al., 2018). Most included studies reported the time devoted to implementing the study intervention (*n* = 27), with implementation durations ranging from six classroom lessons to two school years.

Studies

A variety of research designs were used: pre-post design (*n* = 12), single-subject designs (*n* = 11), randomized controlled trials (*n* = 8). Most studies used only in-class observation to measure student behaviour (*n* = 18), with some studies using only teacher reports (i.e., questionnaires, surveys; *n* = 6), and one using only students' reports (i.e., questionnaires, academic work, surveys; *n* = 1). Four studies used a combination of in-class observation and teacher reports, two used a combination of teacher and student reports, and one used a combination of student reports, teacher reports, and in-class observations. Finally, all included studies found evidence to support the effectiveness of the intervention of study at the initial outcome measure post-intervention. Most included studies also reported follow-up measures after the study period (*n* = 17), with follow-up measure intervals ranging from immediately following the intervention to one year following the end of the intervention. All follow-up assessments found evidence to support the effectiveness of the intervention of study.

Quality Ratings

The quality ratings for the studies included in the systematic review can be found in Table 2.3. The average rating for all studies was 17.13 (*SD* = 1.96; 63%) out of a possible 27. Ratings were typically lowered due to the lack of specific methods that were consistent across

studies, including not reporting a distribution of principal confounders, not reporting actual probability values (i.e., reporting $p < 0.05$), not ensuring that samples were representative of their population, not blinding participants or researchers when randomization was used, making adjustments to analyses to account for potential confounding, and reporting an a priori power analysis to justify sample size.

Meta-Analysis

Of the 31 included studies, 20 reported effect sizes or data from which an effect size could be calculated. Following the recommendations outlined by Field and Gillett (2010), all effect sizes were converted to Pearson's *r*. For studies that reported multiple effect sizes (n = 10), only the effect sizes that were directly relevant to DCB (e.g., measures of aggression, measures of off-task behaviour) were included in the analysis (excluded measures: e.g., teacher-parent relationship quality, academic achievement).

A total of 43 effect sizes were included. Table 2.5 contains the converted effect sizes and sample sizes. Sample sizes ranged from 4 to 5611 participants and effect sizes ranged from r = 0.00 to 0.99, 18 were large (i.e., $r > 0.5$), three were moderate ($0.3 < r < 0.5$), and most ($n = 22$) were small (i.e., $r < 0.3$). Based on the results of a Hedges-Vevea random-effects model (Hedges & Vevea, 1998), the mean Pearson's *r* of teacher-implemented in-class interventions for disruptive behaviour was 0.876 (95% CI [0.818, 0.916]), suggesting a positive and large effect overall. See Figure 2 for a forest plot comparing the effect sizes of all studies included in the meta-analysis and the combined effect size.

Discussion

Disruptive classroom behaviour (i.e., off-task behaviour, non-compliance, and aggression; Schaeffer et al., 2006; Yoder & Williford, 2019) is highly prevalent and can have negative effects on the student themselves, their classmates, and teachers (Kaufman et al., 2010; Klassen & Chiu, 2010; McDaniel et al., 2017; Skiba et al., 1997; Wright & Dusek, 1998; Yoder & Williford, 2019). As indicated by previous studies (Chaffee et al., 2017; Dart et al., 2014; Klingbeil et al., 2017; Rollo et al., 2018; Warmbold-Brann et al., 2017; Wilson and Lipsey, 2007), evidence-based interventions exist for DCB, but it is unknown how many are teacher-implemented within the inclusive classroom, and the effectiveness of these interventions. Therefore, the current systematic review and meta-analysis took a unique approach to summarize the literature by focusing on teacher-implemented in-class interventions for DCB.

Based on the current systematic review results, previous studies have explored a wide variety of teacher-implemented in-class interventions with highly variable implementation approaches (e.g., length of implementation, training). Although the number of studies included in the systematic review was relatively small (n = 31) when compared to the samples of previous reviews (e.g., n = 249), the unique approach of the systematic review allows for the examination of a specific subset of interventions: teacher-implemented in-class interventions. The results of the included studies overwhelmingly suggest that these interventions effectively reduce DCB, speaking to the feasibility of teacher-implemented in-class interventions.

For the meta-analysis, it was expected that teacher-implemented in-class interventions would reduce disruptive behaviour, demonstrated through an overall positive effect. The results of the current meta-analysis found that there is a large positive effect of teacher-implemented in-

class interventions for disruptive behaviour, which is in line with previous research focused on school-based interventions for disruptive behaviour (Chaffee et al., 2017; Wilson & Lipsey, 2007). However, it is important to note that the overall methodological quality of the included studies was weak, suggesting that bias due to methodological constraints is a distinct possibility. These results also highlight that this research body still requires more methodological rigour despite the number of previous studies included in the current study.

It is also important to note the influence of sample size on the effects of the included studies and the overall effect calculated in the meta-analysis. Although there were some moderate effect sizes, most of the effect sizes included in the meta-analysis were either small ($r < 0.3$) or large ($r > 0.5$). All the studies with large effect sizes had fewer than 40 participants, and most ($n = 19$) of the studies with small effect sizes had more than 100 participants. The effect sizes from studies with smaller sample sizes may be inflated and, in turn, may have inflated the overall effect seen in the current study. As such, it may be the case that the small effect sizes seen in studies with larger samples may be more reflective of the true effect of teacher-implemented in-class interventions for DCB. However, small effect sizes can also indicate lower statistical power, another source of potential bias.

Strengths and Limitations

The primary strength of the current study is its approach to summarizing the literature. Previous studies have taken a broadly inclusive approach, focusing on interventions implemented in the classroom or elsewhere within the school (e.g., resource centre, playground, library) and by any school personnel, researchers, or other non-school staff (Chaffee et al., 2017; Dart et al., 2014; Klingbeil et al., 2017; Rollo et al., 2018; Warmbold-Brann et al., 2017; Wilson

& Lipsey, 2007). However, since the current study focused solely on teacher-implemented in-class interventions for DCB, it demonstrates the potential for teachers to implement these interventions.

The current study's limitations are related to the studies included in the systematic review and meta-analysis. Firstly, none of the studies identified through the systematic review were conducted in Canada, making their results limited in generalizability to Canadian classroom teachers. Secondly, the estimated combined effect size calculated for the current meta-analysis is based on several interventions. Although the included interventions are broadly similar in reducing or modifying DCBs, each intervention approach included unique strategies to reach this goal. As such, the impact of individual interventions on individual outcomes needs to be further evaluated (see Table 2.3). The combined effect size presented in the current meta-analysis is also not definitive. Some studies included in the systematic review were not included in the meta-analysis due to their sample size or methodology. Since these studies were not included in the meta-analysis, the overall estimated effect size may not entirely represent the interventions presented in these studies. Thirdly, the extent to which medication may have impacted the results of the included studies is unclear as only one of the included studies reported on the number of participants who were medicated but did not report on details of those medications (e.g., dose, medication type, purpose; Holdaway et al., 2020). Finally, the effect size calculation used in the current study is likely biased by the sample sizes and low-quality methodologies in the included studies. Additionally, due to the known publication bias in psychological research, it is likely that the sample of studies included in the current meta-analysis are not representative of all studies examining teacher-implemented in-class

interventions and are biased towards those studies that supported the interventions under evaluation (Kühberger et al., 2014).

Future Directions

The current study results provide a foundation for future research into teacher-implemented in-class interventions for disruptive behaviour. However, these studies' overall low methodological quality is of particular concern. Methodological quality can be improved by conducting more randomized controlled trials to determine the effectiveness of interventions. Additionally, future studies should seek to conduct moderation or mediation analyses to determine whether any contextual variables (e.g., grade level, location) notably contribute to the link between disruptive behaviour and teacher-implemented in-class interventions. Finally, future studies should also increase the sample sizes used to test interventions, which would be necessary to conduct randomized controlled trials.

Conclusions

Based on the systematic review results, teacher-implemented in-class interventions for DCB are heterogeneous but have consistent evidence for effectiveness. Furthermore, based on the meta-analysis results, these interventions also seem to have an overall positive impact on DCB. Still, the magnitude of that impact is unclear due to the overall low methodological quality of the included studies. While further research is required, the results of this study support the use of EBIs for DCB by classroom teachers.

Table 2.1

Data Extracted from Included Studies

Reference	Country	Sex	Grade/Age	Implementer
Blair et al., 2018	USA	365 m, 350 f	5 years	CT
Bruhn et al., 2017	USA	2 m, 1 f	grades 6-7	CT
Bulla et al., 2017	USA	2 m	grade 6	CT
Caldarella et al., 2018	USA	255 m, 95 f	grades PK-6	CT
Chen et al., 2018	USA	2 m, 1 f	5-6 years	CT
Clair et al., 2017	USA	3 m, 1 f	8 years	CT
Collins et al., 2017	USA	12 m, 3 f	grades 9-12	CT
Cook et al., 2017	USA	81 m, 78 f	grades 4-5	CT
Coombes et al., 2016	UK	222	5-7 years	CT
Daunic et al., 2019	USA	2079	N/A	CT
Duong et al., 2018	USA	190	middle school	CT
Eaves et al., 2020	USA	47 m, 50 f	grade 3	CT
Holdaway et al., 2020	USA	29 m, 8 f	grades K-5	CT
Ialongo et al., 2019	USA	2805 m, 2805 f	elementary school	CT
Lastrapes et al., 2018	USA	11 m, 4 f	grades 4-5	CT
Lee et al., 2017	USA	N/A	grades 5-6	CT
Lombas et al., 2019	ES	262 m, 262 f	elementary school	CT
Lynne et al., 2017	USA	344 m, 328 f	grades k-12	CT
MacDonald et al., 2018	AUS	4 m	8-11 years	CT
McHugh et al., 2016	USA	29 m, 35 f	Grades 2-3	CT; S
Närhi et al., 2017	FI	N/A	grades 7-8	CT
Naylor et al., 2018	USA	2 m, 1 f	6 years	CT
O'Handley et al., 2020	USA	54 m, 35 f	7-8 years	CT
Reinke et al., 2018	USA	908 m, 908 f	elementary school	CT
Schulz et al., 2020	USA	3 m, 1 f	6-7 years	CT
Sheridan et al., 2017	USA	203 m, 64 f	grade k-3	CT
Thomas et al., 2020	USA	22 m, 18 f	grade 3	CT
Tolan et al., 2020	USA	N/A	grades K-3	CT
Van den berg et al., 2018	NL	773 m, 762 f	10 years	CT
Vargo et al., 2019	USA	13	13-14 years	CT
Wu et al., 2019	TW	1 m	grade 5	CT

Note. Under "participants" are listed details about sex and age for the participants from the study meeting inclusion criteria.

Country: AUS = Australia, ES = Spain, FI = Finland, NL = Netherlands, TW = Taiwan, UK = United Kingdom, USA = United States of America

Implementer: CT = classroom teacher, S = student

Design: CS = case study, PP = pre-post, RCT = randomized controlled trial, SS = single-subject

Table 2.2

Data Extracted from Included Studies (cont'd)

Reference	Training	Length	Follow-up	Design	Measures	Evidence
Blair et al., 2018	5 days	2 school years	2 months	RCT	TR	+
Bruhn et al., 2017	30-minute session	10-13 lessons	N/A	SS	CO	+
Bulla et al., 2017	30-minute session	24-27 school days	N/A	SS	CO	+
Caldarella et al., 2018	2-hour session	4 months	4-month	RCT	TR	+
Chen et al., 2018	1-day, weekly supervision	1 30-minute session a week for 6 weeks	N/A	SS	CO	+
Clair et al., 2017	2 days, training manual	1 month	N/A	SS	CO	+
Collins et al., 2017	20-minute session	30-45 lessons	N/A	SS	CO	+
Cook et al., 2017	2 45-minute sessions	N/A	N/A	PP	CO	+
Coombes et al., 2016	2 days	1 school year	N/A	PP	TR	+
Daunic et al., 2019	2 days	27 lessons	12-month, 24-month	PP	TR	+

Reference	Training	Length	Follow-up	Design	Measures	Evidence
Duong et al., 2018	3-hour session	N/A	N/A	RCT	CO	+
Eaves et al., 2020	30 minutes	N/A	N/A	SS	CO	+
Holdaway et al., 2020	30-60 minutes	1 month	2, 3, and 4 months	RCT	CO, TR	+
Ialongo et al., 2019	1.5 days	1 school year	6-month	RCT	CO, TR	+
Lastrapes et al., 2018	15-20-minute session, written instructions	10 lessons	2-month	SS	CO	+
Lee et al., 2017	N/A	10 lessons	N/A	PP	CO	+
Lombas et al., 2019	16 hours	18 weeks	6-month	PP	TR	+
Lynne et al., 2017	15-minute session	6-7 days	Post-withdrawal	PP	CO	+
MacDonald et al., 2018	1 session	7-22 lessons	N/A	SS	CO	+
McHugh et al., 2016	1 session	N/A	N/A	PP	CO	+
Närhi et al., 2017	2 sessions	1 school year	1 year	PP	SR, TR	+
Naylor et al., 2018	Written instructions	3-4 days	N/A	SS	CO	+
O'Handley et al., 2020	N/A	2-3 weeks	N/A	PP	CO	+

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Reference	Training	Length	Follow-up	Design	Measures	Evidence
Reinke et al., 2018	2 days	1 school year	Post-school year	RCT	SR, TR	+
Schulz et al., 2020	30 minutes	3-5 days	N/A	PP	CO	+
Sheridan et al., 2017	1 session	12 weeks	1		TR	+
Thomas et al., 2020	N/A	10 weeks	N		SR, TR	+
Tolan et al., 2020	2 days	1 school year	N/A	RCT	CO, TR	+/-
Van den berg et al., 2018	N/A	4 months	4-month	RCT	SR	+
Vargo et al., 2019	N/A	14 days	N/A	SS	CO, TR	+
Wu et al., 2019	1 session	N/A	N/A	SS	CO	+

Note. Design: CS = case study, PP = pre-post, RCT = randomized controlled trial, SS = single-subject; Measures: CO = classroom observation, SR = student reports, TR = teacher reports

Table 2.3

Descriptions of Interventions Assessed in the Included Studies.

Intervention	Description	Studies
Behavior Bingo	A bingo-style game played while students are doing classwork. Only students who are showing on-task behaviour can participate. If prizes are won, they are granted to the entire class.	Collins et al., 2017
Behavior-Specific Praise	Praising students for positive or desirable behaviours when they occur.	Eaves et al., 2020; Närhi et al., 2017; O'Handley et al., 2020
Classroom Seating Arrangements	Students with disruptive behaviour are assigned seats adjacent to non-disruptive students and away from other students with disruptive behaviour.	Van den berg et al., 2018
Class-Wide Function-Related Intervention Teams (CW-FIT)	A multitiered program that uses Tier 1 (i.e., social skills instruction, group contingencies, and praise) and Tier 2 (i.e., self-management and help cards) strategies.	Caldarella et al., 2018; Naylor et al., 2018; Wu et al., 2019
Conjoint Behavioral Consultation	Parents and teachers mutually identify, define, analyze, and address student behaviour using strategies developed conjointly. Daily, teachers track a student's performance on 2-3 selected disruptive behaviours and provide feedback to the student.	Sheridan et al., 2017
Daily Report Card	At the end of every school day, the progress is reviewed by teachers and parents to determine contingent privileges.	Holdaway et al., 2020

Intervention	Description	Studies
Establish-Maintain-Restore	Teachers establish and maintain a positive relationship with the student. They also restore that relationship when necessary.	Duong et al., 2018
Good Behavior Game	Students are rewarded for displaying positive or desirable behaviours during class time. The class is typically divided into teams, with each team receiving points when a disruptive behaviour is displayed. The team with the fewest points is the winner and may receive a reward.	Coombes et al., 2016; Ialongo et al., 2019; Lastrapes et al., 2018; Lynne et al., 2017; Tolan et al., 2020
Group Oriented Concurrent Chains (GOCC)	A form of group contingency program that incorporates the preferences of students in terms of the goals of the program.	Vargo & Becknell, 2019
Happy Classrooms Programme	A curriculum of mindfulness and character strengths activities for students.	Lombas et al., 2019
iClicker	An interactive classroom response system for multiple-choice or true-or-false questions.	Schulz et al., 2020
Incredible Years	A classroom management program that uses social learning theory to train teachers to use classroom management strategies.	Reinke et al., 2018
Kinder Training	A program that trains teachers in play-therapy strategies to enhance the student-teacher relationship.	Chen et al., 2018
Positive Interaction Ratio	Increasing the ratio of positive to negative interactions between the teacher and the students. The ideal ratio is 5:1.	Cook et al., 2017

Intervention	Description	Studies
Positive Plus Program	A group contingency program where the class earns points for positive or desirable behaviour on an individual, group, or class level.	Clair et al., 2017
Promoting Alternative Thinking Strategies (PATHS)	Teacher-provided explicit instruction in emotion regulation, self-control, social problem-solving, and conflict resolution.	Ialongo et al., 2019
Public Posting	Recording the name of students who have received praise on the classroom blackboard or whiteboard.	O'Handley et al., 2020
Self and Match	A commercially available self-management system that involves conditioned reinforcement and goal setting.	Bulla et al., 2017
Technology-Based Self-Management (i.e., SCORE IT)	A mobile application that students and teachers used to monitor up to three disruptive behaviours at 10-minute intervals during class time.	Bruhn et al., 2017
Token Economy	A contingency management program that uses tokens as rewards for positive or desirable behaviours. Tokens may be exchanged for rewards and, in some implementations, be subtracted as a negative punishment.	Lee et al., 2017
Tools for Getting Along	A 27-lesson curriculum designed to improve social problem-solving.	Daunic et al., 2019
Tools of the Mind	A curriculum designed to improve social-emotional competence.	Blair et al., 2018

Intervention	Description	Studies
Tootling	A peer reporting procedure where students report on the positive or desirable behaviours of other students, who then receive praise.	McHugh et al., 2016
Visual Schedules	A visual representation of events or tasks that a student must engage in throughout the day.	MacDonald et al., 2018
Yoga	Instructing students to engage in physical relaxation exercises that involve stretching and breathing.	Thomas et al., 2020

Table 2.4

Quality Ratings of Included Studies

Reference	Overall	Reporting	External Validity	Internal Validity	Power
Blair et al., 2018	16	8	1	7	0
Bruhn et al., 2017	18	7	3	8	0
Bulla et al., 2017	17	8	1	8	0
Caldarella et al., 2018	19	9	2	8	0
Chen et al., 2018	17	8	1	8	0
Clair et al., 2017	17	7	2	8	0
Collins et al., 2017	17	6	3	8	0
Cook et al., 2017	19	8	1	9	1
Coombes et al., 2016	16	7	2	7	0
Daunic et al., 2019	15	6	2	6	1
Duong et al., 2018	20	8	2	9	1
Eaves et al., 2020	17	6	3	8	0
Holdaway et al., 2020	17	9	1	7	0
Ialongo et al., 2019	21	9	3	8	1
Lastrapes et al., 2018	15	6	1	8	0
Lee et al., 2017	15	7	0	8	0
Lombas et al., 2019	15	7	1	7	0
Lynne et al., 2017	17	7	2	8	0
MacDonald et al., 2018	18	9	1	8	0
McHugh et al., 2016	17	8	1	8	0
Närhi et al., 2017	19	9	2	8	0

Reference	Overall	Reporting	External Validity	Internal Validity	Power
Naylor et al., 2018	19	8	3	8	0
O'Handley et al., 2020	14	7	1	6	0
Reinke et al., 2018	18	7	2	9	0
Schulz et al., 2020	18	9	1	8	0
Sheridan et al., 2017	18	9	1	8	0
Thomas et al., 2020	16	7	1	8	0
Tolan et al., 2020	13	7	1	6	0
Van den berg et al., 2018	20	7	2	11	0
Vargo et al., 2019	13	5	1	7	0
Wu et al., 2019	19	8	3	8	0

Table 2.5

Sample Sizes and Converted Effect Sizes from Studies Included in the Meta-analysis

Reference	*n*	*r*
Blair et al., 2018	715	0.09
Caldarella et al., 2018	350	0.05
Caldarella et al., 2018	350	0.00
Cook et al., 2017	159	0.27
Coombes et al., 2016	222	0.16
Daunic et al., 2019	2079	0.17
Duong et al., 2019	190	0.47
Holdaway et al., 2019	37	0.55
Ialongo et al., 2019	5611	0.04
Lee et al., 2017	24	0.99
Lee et al., 2017	24	0.99
Lee et al., 2017	29	0.94
Lee et al., 2017	29	0.99
Lombas et al., 2019	524	0.13
Lombas et al., 2019	524	0.09
Lynne et al., 2017	27	0.93
Lynne et al., 2017	19	0.94
Lynne et al., 2017	19	0.94
McHugh et al., 2016	20	0.93
McHugh et al., 2016	21	0.96
McHugh et al., 2016	23	0.96
Närhi et al., 2017	50	0.01
O'Handley et al., 2020	23	0.99
O'Handley et al., 2020	23	0.09
O'Handley et al., 2020	23	0.89
O'Handley et al., 2020	23	0.99
O'Handley et al., 2020	18	0.99
O'Handley et al., 2020	18	0.43
O'Handley et al., 2020	25	0.99
O'Handley et al., 2020	25	0.20
Reinke et al., 2018	1817	0.07
Schulz et al., 2020	4	0.94
Schulz et al., 2020	4	0.97
Sheridan et al., 2017	267	0.09
Sheridan et al., 2017	267	0.08
Sheridan et al., 2017	267	0.09
Sheridan et al., 2017	267	0.07
Thomas et al., 2020	40	0.11
Thomas et al., 2020	40	0.20
Tolan et al., 2020	188	0.33
Tolan et al., 2020	188	0.26
Tolan et al., 2020	188	0.23

Reference	*n*	*r*
Van den berg et al., 2018	1535	0.17

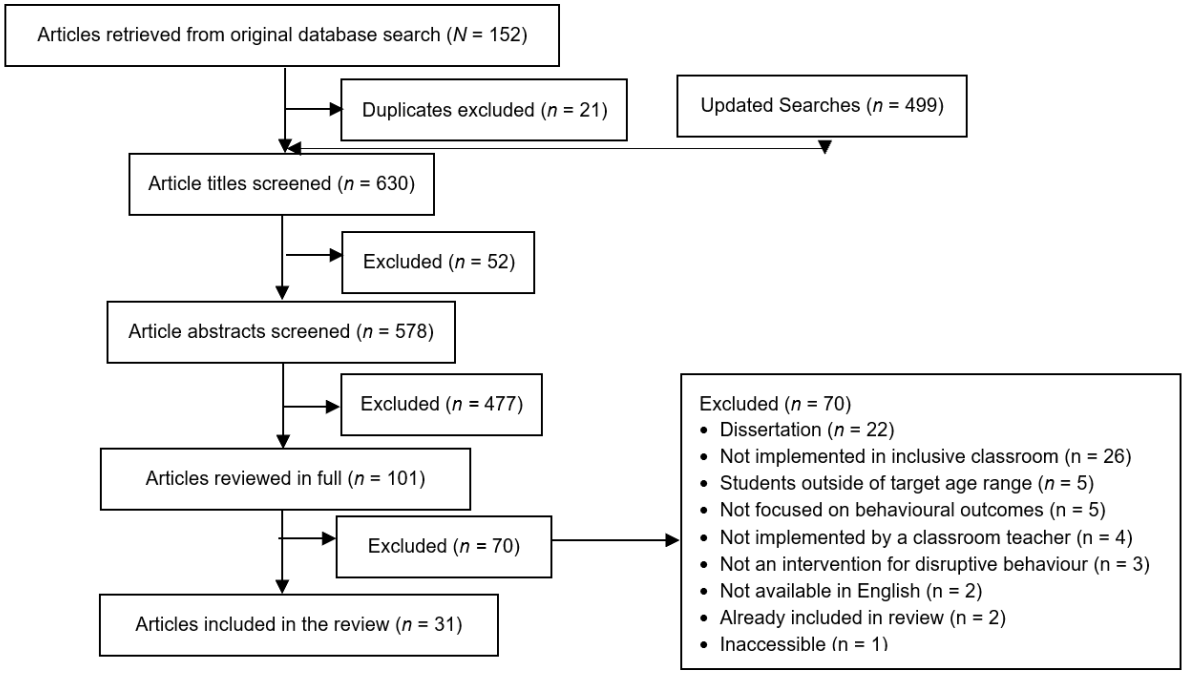

Figure 2.1. PRISMA Diagram

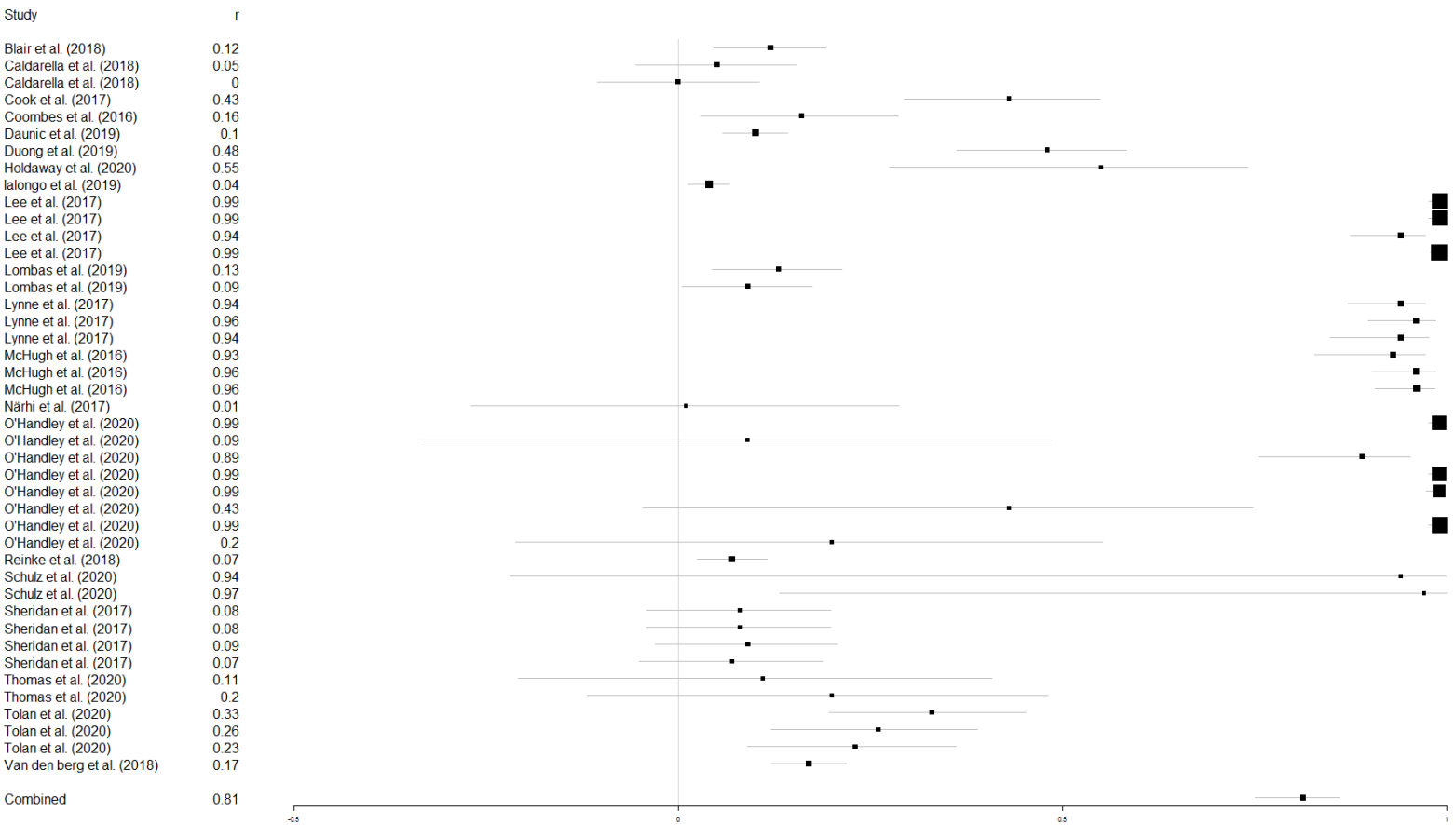

Figure 2.2. A Forest Plot of the Reported Effect Sizes (Converted to Pearson's R) of the Reviewed Studies.

Chapter 3. Listening to the Experts: A Needs Assessment of *ASSIST for Disruptive Classroom Behaviour* an eLearning Professional Development Program for Classroom Teachers

The manuscript based on a needs assessment is presented below. Readers are advised that Matt Orr, under the supervision of Dr. Penny Corkum and in consultation with the dissertation committee (Dr. Christine Chambers and Dr. Isabel Smith), participated in the initial conceptualization of the research study, developed the study protocol, prepared submissions for ethical review, was responsible for recruitment, completed data collection, coding, data analysis/interpretation for all components included in this study. Matt Orr was responsible for all aspects of the writing process and received editorial feedback from his supervisor and dissertation committee members. The following manuscript is prepared for publication submission as:

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Abstract

Behavioural interventions are the most effective method for reducing disruptive behaviour (DCB), but teachers have limited access to relevant pre-service and in-service training on how to implement these in their classrooms. The goal of the current study was to understand the needs of end-users (i.e., classroom teachers) and stakeholders (i.e., school administrators, specialized teachers, behaviour specialists, and school psychologists) for teacher-implemented in-class interventions for DCB and their perspectives on eLearning about behaviour management. The needs assessment involved a mixed-methods convergent design wherein participants completed a structured interview and an online survey that elucidated their knowledge and experience with in-class interventions for DCB. Descriptive statistics were used to summarize questionnaire responses, with open-ended data contextualizing some of their responses. Taken together, the quantitative and open-ended results revealed: (a) end-users and stakeholders were aware of and reported using many of the interventions that have been assessed in the literature, (b) more frequently used interventions were perceived as more effective, (c) interventions were inconsistently implemented and inconsistently effective, and (d) the implementation of interventions was influenced by student-teacher relationships. A follow-up questionnaire identified which interventions end-users and stakeholders perceive to be most important. Results also indicated that while the participants perceived many positives of using eLearning, there were also some perceived barriers to professional development (PD) in this area.

Introduction

Disruptive classroom behaviour (DCB) is characterized as off-task, non-compliant, and/or aggressive behaviour in the classroom setting (Schaeffer et al., 2006; Yoder & Williford, 2019). Disruptive classroom behaviours are common with approximately 25% of North American children entering school with noted disruptive behaviours and approximately 40%-55% of North American student files containing at least one report of disruptive behaviour (Kaufman et al., 2010; Yoder & Williford, 2019). Disruptive classroom behaviour significantly impacts both students and teachers by reducing the time for instruction (Luiselli et al., 2002) and increasing teachers' work-related stress (Klassen & Chiu, 2010). In addition, students who display DCB are at risk for impaired social relationships and poor academic and post-school outcomes, such as an increased likelihood to fail courses while in school and being in contact with law enforcement as an adult (Gage et al., 2012; McDaniel et al., 2017). An efficient approach to reducing DCB would be for teachers to implement evidence-based interventions to manage and mitigate the impact of DCB effectively (Martino et al., 2016; Nelson et al., 2002).

Overall, behavioural interventions (i.e., a plan of action based on the evaluation of the antecedents, consequences, and functions of behaviour to increase or decrease its occurrence) are the most effective method for reducing disruptive behaviour in individual children (Gorman et al., 2015; Martinussen et al., 2011). Wilson and colleagues have conducted two meta-analyses (Wilson et al., 2003; Wilson & Lipsey, 2007), which included articles published between the years 1950 and 2000, examining the effectiveness of school-based interventions for reducing disruptive behaviours among all students in elementary, middle, and high school. Wilson et al. (2003) summarized the results of 172 studies of school-based interventions (i.e., interventions implemented in a school setting, not necessarily in the classroom) for a wide range of

problematic behaviours, including alcohol and drug use, dropout and nonattendance, and aggressive behaviour. Their analysis suggested that the reviewed studies found significant reductions in aggressive behaviour across various behavioural intervention programs. Similarly, Wilson et al.'s (2007) second meta-analysis, which included 249 studies, also suggested that behavioural interventions (i.e., plans based on the antecedents, consequences, and functions of behaviour to increase or decrease its occurrence) had a consistently positive effect on disruptive behaviours.

Despite the evidence of the effectiveness of school-based behavioural interventions for disruptive behaviour, numerous barriers prevent teachers from using these in their classrooms. Barriers include classroom teachers' lack of pre-service education in learning about these interventions and the limited opportunities for relevant in-service training/professional development (PD; Elik et al., 2015; McCrimmon, 2015; Thomas & Deeley, 2004; Wisdom et al., 2011). Even in situations where PD programs are available to classroom teachers, they have been found limited in individualized content and seldom provide ongoing support for teachers (Dede et al., 2009). These issues make it difficult for teachers to implement these interventions in their classrooms (Dede et al., 2009). In addition, in reviews of teacher PD programs, Borko (2004) and Dede et al. (2009) found that many PD programs had significant logistical problems, such as including disjointed and superficial information or requiring teachers to implement entirely new curricula, which can be challenging given the competing demands in the classroom.

eLearning is a potential method to deliver PD to classroom teachers. eLearning is the use of information technology to produce educational materials and manage learning (Arkorful & Abaidoo, 2014). Several eLearning programs have been developed to provide PD to teachers and have been shown to be effective (Bragg et al., 2021; Dede et al., 2009). In a recent

systematic review, Bragg et al. (2021) synthesized the results of 11 studies that assessed the effectiveness of eLearning programs for teachers' PD. Based on the results of this systematic review, eLearning improved teachers' content knowledge (i.e., the content of the curriculum being taught) and knowledge of pedagogical methods, beliefs about teaching, and self-efficacy in teaching. eLearning methods can deliver support in the implementation of behavioural interventions that are often not covered in pre-service training or PD opportunities. eLearning can also be more available, accessible, cost-effective, scalable, and customizable than traditional PD programs delivered in person (Borrelli & Ritterband, 2015).

Before the current study, a systematic review and meta-analysis were conducted to determine what in-class interventions for DCB have been evaluated (Chapter 2). As a result, various teacher-implemented in-class interventions were identified, including behaviour plans, class-wide function-related intervention teams, group-oriented concurrent chains, positive behaviour support, positive interaction ratio, peer management, self-management, tootling (i.e., students inform teachers of others' good behaviour), and token economies. The combined effect size of the reviewed studies indicated a positive and large overall effect ($r = 0.81$); however, the average quality of the included studies was low.

The primary goal of the current study was to explore three research questions focused on end-users (i.e., classroom teachers) and stakeholders' (i.e., administrators, specialized teachers, school psychologists, and behaviour specialists) experiences with interventions for managing DCB. The secondary goal of the current study was to explore end-user and stakeholder perceptions related to an eLearning program for managing DCBs in children in Grades 1 to 12. These research questions were:

(a) What are end-users and stakeholders' knowledge of and experiences with teacher-implemented in-class interventions for DCB?

(b) What are the perceived barriers and facilitators to using an eLearning program to teach teachers to implement in-class interventions for DCB?

(c) What interventions for DCB do end-users and stakeholders see as important to include in an eLearning PD program?

The current study addresses these research questions through a mixed-methods design, collecting data from end-users and stakeholders in two ways: (a) a structured interview and (b) a follow-up survey based on the interview data.

Methods

Participants

Eligibility criteria included individuals working within Canadian school systems for more than three years who had experience managing students' DCB. Participants were recruited from two groups based on their current roles: (a) end-users (i.e., classroom teachers of Grades 1-12) and (b) stakeholders (i.e., specialized teachers, school administrators, behaviour specialists, and school psychologists).

Recruitment was conducted between October 2019 and June 2020 using the following methods: (a) social media posts, (b) advertisements at teacher-oriented conferences, (c) personal contacts of the investigators with individuals within Canadian school systems, and (d) email

contacts with individuals who had previously participated in research studies and indicated their interest in future research participation.

Our planned recruitment goal was 42 participants, comprising 18 end-users (i.e., 6 from elementary, middle, and secondary grades) and 24 stakeholders (i.e., 6 participants in each of the 4 roles). However, recruitment was ceased once data saturation was reached (i.e., no new themes were extracted from the data). The sample size was based on Guest et al. (2006), which suggested that data saturation can occur within six participants.

Participants were entered into a draw to receive a $50 digital gift card for the completion of each component of the study (i.e., structured interview and survey), with a total of two entries per participant and separate draws for each group.

Measures

All questionnaires were delivered via the secure online Research Electronic Data Capture platform (REDCap©; Harris et al., 2019). The structured interviews were conducted via Microsoft Teams video-conferencing software or telephone by a PhD student (M.O.) and a trained undergraduate student (J.B.).

Eligibility Questionnaire

The eligibility questionnaire was a 7-item researcher-created measure that asked participants whether they currently work in a Canadian school system, how many years they had held a position in the system, and their role(s) in managing classroom behaviour. Responses were used to determine eligibility and sort participants into groups (i.e., classroom teachers by

grade level, specialized teachers, school administrators, behaviour specialists, and school psychologists).

Demographic Questionnaire

The 25-item researcher-created demographic questionnaire was intended to characterize the sample concerning participants' age, sex, highest level of education, current position in the school system, number of years spent in their current position, other positions held in the school system, and years of experience in managing DCB. If participants indicated that they were currently working as a classroom teacher or had worked as a classroom teacher in the past, they were also asked to report the number of years spent teaching and which grades they had taught.

Structured Interview

The researcher-created interview consisted of 17 items divided into three sections. Some items were closed-ended, while others were open-ended and allowed participants to provide context for their responses. Section 1 contained four closed-ended questions about participants' general experience with behaviour management (focusing on their views from the position they had held that was most focused on behaviour management) and what pre-service, professional training, and/or PD they had received related to behaviour management. Section 2 contained 10 items that asked for information about participants' knowledge and experience with the in-class teacher-implemented interventions for DCB identified in Chapter 2 through a mixture of closed-ended and open-ended questions. Table 3.1 provides brief descriptions of these interventions. The researcher named and defined each intervention and asked whether the participant had used the intervention and the role in which it was used. Open-ended questions asked participants

about the effectiveness of interventions in changing student behaviour. The last question of section 2 asked participants to name any interventions that were not previously discussed during the interview that they thought were effective for managing disruptive behaviour. Section 3 contained two open-ended questions that asked participants to identify any barriers and facilitators they perceived to using eLearning programs for PD.

Behaviour Management Intervention Survey

The 18-item researcher-created survey asked participants to rate the importance of including the interventions queried during the structured interviews in an eLearning PD program and any others mentioned by participants. Ratings were made on a Likert scale from 1 “not at all important” to 7 “extremely important”. This survey was developed after all structured interviews were completed and analyzed.

Procedure

All recruitment paths referred potential participants to the *ASSIST* website (http://assistforteachers.ca), where individuals completed a web form to express interest in participation. Individuals who completed the web form were e-mailed a link to an online eligibility questionnaire. If eligible, they were presented with a consent form. After giving consent, participants were presented with a demographic questionnaire. Upon completing this, participants indicated dates and times they were available for the interview. Researchers confirmed the meeting time via email and participants were contacted on the scheduled day and time, and the interview was audio-recorded. Thematic analyses were conducted concurrently with the interviews. Recruitment was closed, and themes were collated and analyzed once it was

determined that data saturation had occurred. Based on this data, additions were made to the Behaviour Management Intervention Survey to add any additional interventions mentioned during the interviews. Once the survey was finalized, participants were e-mailed a link to the Behaviour Management Intervention Survey.

Data Analysis

To characterize the sample, descriptive statistics were used to summarize the findings of the demographic questionnaire and the structured interview. To address our first (i.e., what are the experiences and knowledge of end-users and stakeholders with teacher-implemented in-class interventions for DCB?) and second (i.e., what are the perceived barriers and facilitators to using an eLearning program to teach teachers to use in-class interventions for DCB?) research questions, the results of the structured interviews were analyzed using thematic analysis (Braun & Clarke, 2006), as previous needs assessments have done (Kelders et al., 2013; Wentzel et al., 2014). Audio recordings of the interviews were transcribed verbatim by researchers (MO and JB). For closed-ended questions, responses were coded categorically based on participants' responses (i.e., whether they used an intervention, where they used it, and whether they thought it was effective). The responses to the open-ended questions (i.e., effectiveness of interventions at changing student behaviour and perceived barriers or facilitators to eLearning) were coded using the steps suggested by Braun and Clarke (2006): (a) familiarization, (b) generating initial codes, (c) searching for themes, (d) reviewing themes, (e) defining and naming themes, and (f) reporting the themes. Two researchers were involved in each step, and disagreements about coding were discussed with the senior investigator (PC). To address our third research question (i.e., to elucidate what interventions end-users and stakeholders saw as important to include in

the new *ASSIST* program), the Behaviour Management Intervention Survey responses were summarized using descriptive statistics. As recommended by Holmes (2020), a positionality statement has been provided to elucidate the potential biases of the primary investigator (M.O.).

Positionality Statement

In terms of educational background that may bias the analysis conducted in the current study, the primary investigator (M.O.) is a Canadian doctoral student trained in experimental psychology and educational research. In terms of personal biases, which may bias the analysis conducted in the current study, the primary investigator is an adult (i.e., > 30 years old) Caucasian male with left-wing political beliefs, no religious affiliations, and previous experience working in the field of education.

Results

Participants

Of the 116 participants (53 end-users, 63 stakeholders) who completed the eligibility questionnaire, 23 (7 end-users, 16 stakeholders) were not eligible. Of those remaining (n = 93; 46 end-users, 47 stakeholders), 60 (27 end-users, 33 stakeholders) provided informed consent. Of those who provided informed consent, 37 (15 end-users, 22 stakeholders) completed the demographic questionnaire and structured interview, and 31 (13 end-users, 18 stakeholders) completed the Behaviour Management Intervention Survey.

Sample Characteristics

Tables 3.2 and 3.3 present demographic details for participants who completed the

questionnaire. The average age of end-users was 40.9 (*SD* = 9.07) years, and the average age of stakeholders was 42.32 (*SD* = 7.67) years. All end-users (*n* = 15) and 82% (*n* = 18) of stakeholders were female. For both groups, most participants were from Nova Scotia (60% of end-users, 82% of stakeholders). Most end-users reported having a bachelor's degree (or equivalent) as their highest level of education (*n* = 9, 60%) and most of the stakeholders reported holding a master's degree (*n* = 19, 86%). The average years of experience within their current roles were 13.87 (*SD* = 6.78) for end-users and 11.27 (*SD* = 7.23) for stakeholders. Most end-users reported receiving pre-service training (*n* = 8, 53%), in-service PD training (*n* = 13, 87%), or PD training pursued independently (*n* = 12, 80%) related to disruptive behaviour. Similarly, most stakeholders reported receiving pre-service training (*n* = 17, 77%), in-service PD training (*n* = 20, 91%), or independent PD training (*n* = 17, 77%) related to disruptive behaviour.

Experience with and Knowledge of Interventions

Intervention Usage

Tables 3.4 and Table 3.5 presents the frequencies and percentages of stated usage of interventions by each group. For end-users, the most frequently used interventions were behaviour plans (93%), class-wide function-related intervention teams (93%), positive behaviour support (93%), self-management (93%), Positive Interaction Ratio (PIR; 80%), and token economies (73%). These were also consistently the most used interventions across the end-user grade-level subgroups (i.e., elementary, middle, and high/secondary). The least used interventions were packaged or prepared programs (13%), Group Oriented Concurrent Chains (GOCC; 27%), and tootling (33%). Two interventions, GOCC and packaged programs were not

used by the elementary and middle subgroups, respectively. For stakeholders, the most frequently used interventions were behaviour plans (86%), Class-Wide Function-Related Intervention Teams (CW-FIT; 68%), Positive Behaviour Support (PBS; 68%), token economies (68%), and self-management (59%). The least used interventions were tootling (23%), packaged programs (27%), and GOCC (31%). Highly used interventions were relatively consistent across stakeholder subgroups (i.e., specialized teacher, administrator, school psychologist, and behaviour specialist), except for peer management and PIR. Peer management was used more by administrators and behaviour specialists, and PIR was used more by administrators and school psychologists.

Intervention Effectiveness

Tables 3.6 and 3.7 present the frequencies and percentages for the perceptions of the effectiveness of interventions to reduce DCBs by participants who had reported using these. The interventions that end-users most frequently stated to be effective were PBS (n = 11, 79%) and positive interaction ratios (n = 11, 92%). When asked about the effectiveness of interventions at changing student behaviour, the most common themes in the responses of end-users were: (a) interventions are inconsistently effective, (b) interventions are effective because they reinforce positive behaviours, and (b) interventions require strong student-teacher relationships to be effective. These themes were consistent across the end-user sub-groups (i.e., elementary, middle, and high/secondary). Table 3.8 highlights representative quotes for these themes.

The interventions that stakeholders most frequently stated to be effective were behaviour plans (n = 12, 63%) and CW-FIT (n = 12, 80%). When asked about the effectiveness of interventions at changing student behaviour, the most common themes in the responses of

stakeholders were: (a) interventions are inconsistently effective, (b) interventions require strong student-teacher relationships to be effective, and (c) interventions are often informally implemented. These themes were consistent across stakeholder sub-groups (i.e., specialized teachers, administrators, behaviour specialists, and school psychologists). Table 3.8 highlights representative interview quotes for these themes.

Other Interventions

Participants were asked to comment on other interventions that were not included in the interview that they thought were important or effective at managing behaviour in the classroom that should be included in the eLearning program. Table 3.9 contains brief descriptions of the eight additional interventions mentioned by participants. Five of the eight interventions were recommended by end-users (i.e., break cards, first-then scheduling, student-teacher proximity, reducing environmental stressors, and visual schedules). For stakeholders, none were recommended by administrators, one (i.e., first-then scheduling) was recommended by behaviour specialists, one (i.e., 2x10) was recommended by school psychologists, and two (i.e., restorative justice and talking circles) were recommended by specialized teachers.

Barriers and Facilitators to eLearning

Tables 3.10 and 3.11 contain the frequencies and percentages of the reported barriers and facilitators to eLearning broken down by group. Across the two groups, three facilitators to eLearning were reported: (a) accessibility, (b) availability of support material, and (c) standardized PD. Both end-users (n =12, 80%) and stakeholders (n = 13, 59%) reported accessibility as the most important facilitator. Unlike end-users, stakeholders did not mention

standardization as a potential facilitator. Across the end-user subgroups, accessibility was consistently the most frequent facilitator theme.

The three reported barriers to eLearning were: (a) lack of personal or real-world examples, (b) technology access, and (c) programs can be time-consuming. End-users were most concerned with a lack of real-world examples in eLearning programs (n = 9, 60%), while stakeholders were most concerned with the time to complete programs (n = 11, 50%).

Importance of Interventions for eLearning

Ratings of Importance

Participants' ratings of the importance of interventions for inclusion in an eLearning program for training teachers to manage DCB are presented in Tables 3.12 and 3.13. For end-users, the three highest-rated interventions were CW-FIT (M = 6.2, SD = 1.1), self-management (M = 6.2, SD = 1.1), and visual schedules (M = 6.2, SD = 1.1). The lowest rated were token economies (M = 2.6, SD = 1.6), packaged programs (M = 2.9, SD = 1.3), and peer management (M = 3.9, SD = 1.9). Importance ratings were generally consistent across the end-user sub-groups, except for PBS and tootling. The mean ratings of PBS and tootling were consistent for the elementary and high/secondary sub-groups. The middle sub-group was much lower for both interventions. For stakeholders, the highest-rated interventions were reducing environmental stressors (M = 6.4, SD = 0.8), 2x10 (M = 6.3, SD = 0.8) and positive interaction ratios (M = 6.2, SD = 1.1). The lowest rated were peer management (M = 3.7, SD = 1.3), packaged programs (M = 3.7, SD = 1.5), and token economies (M = 3.9, SD = 1.8). Like what was found for the end-user group, ratings of importance were generally consistent across stakeholder sub-groups, with

the exceptions of packaged programs, peer management, token economies, and tootling. For packaged programs, the mean rating of administrators was higher than the other sub-groups. For peer management, the mean rating of school psychologists was lower than the other sub-groups. For token economies, specialized teachers and school psychologists' mean ratings were lower, while administrators and behaviour specialists were higher. Finally, specialized teachers provided a lower rating than other sub-groups for tootling. Overall, consistently higher ratings were given to the interventions mentioned during the interviews than those summarized in the proceeding systematic review and meta-analysis (Chapter 2).

Discussion

The overall aim of the current study was to explore, using a mixed-methods approach, end-users' and stakeholders' experiences with interventions for DCB and their perspectives on eLearning for interventions for DCB.

Experience with and Knowledge of Interventions

Our first research question focused on the experience with and knowledge of end-users and stakeholders with the interventions summarized in the proceeding systematic review and meta-analysis (Chapter 2). The current results suggest that most end-users and stakeholders reported using most of the in-class interventions found in the literature. The results also suggest consistency between frequency of usage and perceived effectiveness, indicating that, as one would expect, the two are related. For example, end-users most frequently reported using behaviour management interventions (i.e., behaviour plans, class-wide function-related

intervention teams, PBS, and self-management) that were also reported to be effective compared to other interventions.

The results also reveal valuable information about perceived intervention effectiveness. The themes suggest that student-teacher relationships are vital. These results match the recent recommendations of Yassine et al. (2020), who suggested that improving student-teacher relationships is a key component in the success of in-class interventions for disruptive behaviour. Our results are also supported by two longitudinal studies conducted by Hamre and Pianta (2001) and Hughes (2011), who investigated the overall influence of student-teacher relationship quality on student social and academic outcomes. Both studies suggest that strong student-teacher relationships have a dramatic long-term influence on student outcomes.

In addition to themes about student-teacher relationships, both end-users and stakeholders indicated that interventions can be inconsistently effective, and stakeholders also indicated that interventions are often implemented informally. These themes are related as interventions that are not implemented with high fidelity are unlikely to be effective (Reinke et al., 2020). These themes suggest that implementation fidelity is key to intervention effectiveness (King-Sears et al., 2018).

Barriers and Facilitators to eLearning

Our second research question focused on the perceived barriers and facilitators for using eLearning programs to provide PD about interventions for DCB. Based on the current results, the design and function of eLearning programs are consistent with the perceived facilitators (i.e., accessibility, standardized PD, and available resources) noted by participants. Developers of eLearning programs can also be mindful of and try to minimize the perceived barriers reported

by participants (i.e., use of real-world examples, access to technology, and time requirements) through design choices. For example, eLearning programs should incorporate real-world testimonials from classroom teachers who have used the interventions.

Importance of Interventions for eLearning

Our final research question concerned which interventions to include in the eLearning program for DCB. Two of the three most important interventions rated by end-users (i.e., CW-FIT, self-management) were also identified in the systematic review and meta-analysis results (Chapter 2). However, participants consistently provided higher ratings for the interventions they mentioned during the interviews, which had not been included in the list based on the systematic review (e.g., 2x10, PIR, RES, visual schedules). While these were seen as unique interventions by participants, they are, in fact, common components of behavioural interventions. These results suggest that participant perceptions of what is important to include in an eLearning program for DCB align with the literature in that they perceive behavioural interventions to be the most important (Wilson & Lipsey, 2007).

Strengths, Limitations, and Future Directions

A strength of the current study is that it involved various relevant end-users and stakeholders, resulting in a diverse collection of perspectives. However, a limitation is the size and geographic composition of the sample, which may mean that the results are not generalizable to all educators. Additionally, although a mixed-methods design was used, which allowed for the incorporation of open-ended and quantitative data, a stronger mixed-methods

method (e.g., using qualitative and quantitative methods in parallel) may have produced richer results.

Future studies supporting the development of eLearning programs for DCB management should build on the results of the current study by developing content that meets the needs of the end-users and stakeholders, testing the usability of that program, and testing its effectiveness. Future research investigating the needs of end-users and stakeholders for eLearning should continue to use mixed methods designs, although more detailed qualitative data collection is encouraged. These designs produce rich data to gain a clear picture of end-user and stakeholder needs.

Conclusions

Taken together, the results of the current study elucidate what end-users and stakeholders need from eLearning programs about behaviour management in general. Firstly, end-users and stakeholders tend to use in-class teacher-implemented interventions identified in the literature and with which they have seen some success, although these interventions are often used informally and implemented in an inconsistent manner. Second, end-users and stakeholders perceived interventions as requiring a strong student-teacher relationship to be effective, indicating that the program must include content that focuses on fostering a strong student-teacher relationship to support intervention implementation. Third, the program's design should include elements, such as real-world examples, that address the perceived barriers to using eLearning for the PD of teachers. This needs assessment will support the development of an intervention for children with disruptive behaviour that is evidence-informed and user-centred.

Table 3.1

Descriptions of the interventions included in the structured interview

Intervention	Description
Behaviour plans	A step-by-step plan for managing a specific student's disruptive behaviours. Plans include information about typical antecedents to the behaviour, warning signs, and how to defuse the behaviour.
Positive Behaviour Support (PBS)	Involves determining what reinforces a disruptive behaviour and removing that supporting reinforcer. Positive (i.e., non-disruptive) behaviours are then given reinforcement to increase their frequency.
Classroom-Wide Function-Related Intervention Teams (CW-FIT)	Involves teaching appropriate classroom behaviours and expectations, reinforcing positive behaviour, removing reinforcement of disruptive behaviours, and teaching self-management strategies.
Group Oriented Concurrent-Chains (GOCC)	Rewards groups of students for chosen positive behaviours, accounting for student preferences for target behaviours.
Positive Interaction Ratios (PIR)	Involves increasing the ratio of positive interactions between student and teacher; typically, at least five positive interactions for every negative interaction.
Peer Management	Teaching students to manage each other's behaviour by recognizing disruptive behaviour and mitigating the behaviour when it occurs.
Self-management	Involves teaching students to manage their own behaviour by teaching them to recognize and prevent or mitigate the behaviour.
Tootling	Involves instructing students to report to the teacher on instances of positive behaviour, rather than disruptive behaviour. Students who are tootled on receive praise or rewards.
Token Economy	Contingency management program in which students receive tokens for positive behaviours and lose tokens for disruptive behaviour. Tokens are used to purchase rewards on an individual or class-wide basis.

Intervention	Description
Packaged or Prepared Programs	Involves guiding a classroom teacher through an intervention step by step.

Table 3.2

Demographic Characteristics of End-Users by Subgroup.

Characteristic	Total (n = 15)	Elementary (n = 6)	Middle (n = 4)	High/Secondary (n = 5)
Age (years)	40.86 (9.07)	41.33 (9.40)	41.00 (11.43)	39.60 (8.79)
Gender				
Female	15 (100%)	6 (100%)	4 (100%)	5 (100%)
Male	0	0	0	0
Province				
AB	2 (13%)	0	1 (25%)	1 (20%)
NB	1 (7%)	1 (17%)	0	0
NS	9 (60%)	2 (33%)	3 (75%)	4 (80%)
ON	2 (13%)	2 (33%)	0	0
QC	1 (7%)	1 (17%)	0	0
Education				
BSc	9 (60%)	5 (83%)	2 (50%)	2 (40%)
Masters	6 (40%)	1 (17%)	2 (50%)	3 (60%)
PhD	0	0	0	0
Years in current role	13.87 (6.78)	14.17 (7.31)	14.00 (7.30)	13.75 (8.42)
Pre-service training for DB	8 (53%)	2 (33%)	3 (75%)	3 (60%)
In-service PD for DB	13 (87%)	5 (83%)	4 (100%)	4 (80%)
Independent PD for DB	12 (80%)	5 (83%)	4 (100%)	3 (60%)

Note. AB = Alberta; NB = New Brunswick; NS = Nova Scotia; ON = Ontario; QC = Quebec;

PD = professional development; DB = disruptive behaviour

Table 3.3

Demographic Characteristics of Stakeholders by Subgroup.

Characteristic	Total (*n* = 22)	Specialized Teachers (*n* = 6)	Administrators (*n* = 5)	School Psychologists (*n* = 5)	Behaviour Specialists (*n* = 6)
Age (years)	42.32 (7.67)	42.57 (7.76)	45.80 (7.33)	45.60 (9.48)	37 (3.95)
Gender					
Female	18 (82%)	4 (67%)	4 (75%)	4 (75%)	6 (100%)
Male	4 (18%)	2 (33%)	1 (25%)	1 (25%)	0
Province					
AB	1 (5%)	0	0	1 (25%)	0
NB	0	0	0	0	0
NS	18 (82%)	5 (83%)	5 (100%)	4 (75%)	5 (83%)
ON	1 (5%)	1 (17%)	0	0	0
QC	1 (5%)	0	0	0	1 (17%)
Education					
BSc	2 (9%)	1 (17%)	0	0	1 (17%)
Masters	19 (86%)	5 (83%)	5 (100%)	5 (100%)	4 (67%)
PhD	1 (5%)	0	0	0	1 (17%)
Years in current role	11.27 (7.23)	12.67 (8.55)	6.80 (5.36)	17.60 (5.18)	8.33 (5.43)
Pre-service training for DB	17 (77%)	4 (67%)	3 (60%)	5 (100%)	5 (83%)
In-service PD for DB	20 (91%)	4 (67%)	5 (100%)	5 (100%)	6 (100%)

Characteristic	Total (n = 22)	Specialized Teachers (n = 6)	Administrators (n = 5)	School Psychologists (n = 5)	Behaviour Specialists (n = 6)
Independent PD for DB	17 (77%)	5 (83%)	3 (60%)	4 (80%)	5 (83%)

Note. AB = Alberta; NB = New Brunswick; NS = Nova Scotia; ON = Ontario; QC = Quebec; PD = professional development; DB = disruptive behaviour

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Table 3.4

Reported Intervention Use Frequencies and Percentage for End-Users by Subgroup

Intervention	End-users			
	Total (n = 15)	Elementary (n = 6)	Middle (n = 4)	High/Secondary (n = 5)
Behavior Plans	14 (93)	6 (100)	4 (100)	4 (80)
CW-FIT	14 (93)	6 (100)	4 (100)	4 (80)
GOCC	4 (27)	2 (33)	-	2 (40)
Packaged Programs	2 (13)	-	1 (25)	1 (20)
PBS	14 (93)	6 (100)	4 (100)	4 (80)
Peer Management	10 (67)	3 (50)	4 (100)	3 (60)
PIR	12 (80)	5 (83)	3 (75)	4 (80)
Self Management	14 (93)	6 (100)	4 (100)	4 (80)
Token Economies	11 (73)	6 (100)	3 (75)	2 (40)
Tootling	5 (33)	2 (33)	1 (25)	2 (40)

Note. Percentages reflect participants who reported using an intervention relative to the number in each group or subgroup. CW-FIT = Class Wide Function-Related Intervention Teams, GOCC = Group-Oriented Concurrent Chains, PBS = Positive Behavior Support, PIR = Positive Interaction Ratio

Table 3.5

Reported Intervention Use Frequencies and Percentages for Stakeholders by Subgroup

Intervention	Stakeholders				
	Total (n = 22)	Specialized Teacher (n = 6)	Administrator (n = 5)	School Psychologist (n = 5)	Behaviour Specialist (n = 6)
Behavior Plans	19 (86)	6 (100)	5 (100)	4 (80)	4 (67)
CW-FIT	15 (68)	2 (33)	4 (80)	5 (100)	4 (67)
GOCC	7 (31)	2 (33)	1 (20)	1 (20)	3 (50)
Packaged Programs	6 (27)	1 (17)	1 (20)	3 (60)	1 (17)
PBS	15 (68)	5 (83)	3 (60)	3 (60)	4 (67)
Peer Management	12 (55)	3 (50)	4 (80)	1 (20)	4 (67)
PIR	11 (50)	2 (33)	4 (80)	3 (60)	2 (33)
Self Management	13 (59)	3 (50)	5 (100)	3 (60)	2 (33)
Token Economies	15 (68)	4 (67)	4 (80)	3 (60)	4 (67)
Tootling	5 (23)	-	2 (40)	1 (20)	2 (33)

Note. Percentages reflect participants who reported using an intervention relative to the number in each group or subgroup. CW-FIT = Class Wide Function-Related Intervention Teams, GOCC = Group-Oriented Concurrent Chains, PBS = Positive Behavior Support, PIR = Positive Interaction Ratio

Table 3.6

Frequencies and Percentages of Perceived Effectiveness for End-Users Divided by Subgroup

Intervention	End-users			
	Total (n = 15)	Elementary (n = 6)	Middle (n = 4)	High/Secondary (n = 5)
Behavior Plans	10 (67)	4 (67)	4 (100)	2 (40)
CW-FIT	10 (67)	4 (67)	4 (100)	2 (40)
GOCC	2 (13)	1 (17)	-	1 (20)
Packaged Programs	2 (13)	-	1 (25)	1 (20)
PBS	11 (73)	4 (67)	4 (100)	3 (60)
Peer Management	2 (13)	1 (17)	-	1 (20)
PIR	11 (73)	4 (67)	3 (75)	4 (80)
Self Management	10 (67)	5 (83)	2 (50)	3 (60)
Token Economies	6 (40)	3 (50)	2 (50)	1 (20)
Tootling	2 (13)	2 (33)	-	-

Note. Percentages reflect participants who reported that an intervention was effective relative to the number in each group and sub-group. CW-FIT = Class Wide Function-Related Intervention Teams, GOCC = Group-Oriented Concurrent Chains, PBS = Positive Behavior Support, PIR = Positive Interaction Ratio

Table 3.7

Frequencies and Percentages of Perceived Effectiveness for Stakeholders Divided by Subgroup

Intervention	Stakeholders				
	Total (n = 22)	Specialized Teacher (n = 6)	Administrator (n = 5)	School Psychologist (n = 5)	Behaviour Specialist (n = 6)
Behavior Plans	12 (55)	3 (50)	2 (40)	4 (80)	3 (50)
CW-FIT	12 (55)	2 (33)	3 (60)	4 (80)	3 (50)
GOCC	5 (23)	1 (17)	2 (40)	1 (20)	1 (17)
Packaged Programs	4 (18)	1 (17)	1 (20)	1 (20)	1 (17)
PBS	9 (41)	4 (67)	1 (20)	3 (60)	1 (17)
Peer Management	5 (23)	1 (17)	2 (40)	-	2 (33)
PIR	8 (36)	3 (50)	1 (40)	2 (40)	2 (33)
Self Management	6 (27)	1 (17)	3 (60)	2 (40)	-
Token Economies	6 (27)	2 (33)	1 (20)	2 (40)	1 (17)
Tootling	5 (23)	-	2 (40)	1 (20)	2 (33)

Note. Percentages reflect participants who reported that an intervention was effective relative to the number in each group and sub-group. CW-FIT = Class Wide Function-Related Intervention Teams, GOCC = Group-Oriented Concurrent Chains, PBS = Positive Behavior Support, PIR = Positive Interaction Ratio

Table 3.8

Representative Interview Quotes on Intervention Effectiveness

Participant group	Theme	Quotes
End-users		
	Situational effectiveness	"I think those plans work when the student is on board with it. If the student is not bought into whatever the plan is then those aren't often successful" "I think that's effective in certain situations" "It's very much on a student-to-student basis"
	Positive reinforcement	"I think a lot of the people that are disruptive don't receive that feedback as often as they should and I think that highlighting when they do something positive is effective" "Even students who have had a history of some behaviour issues...I found no matter who they are, they generally respond to positives" "I try to focus on positive and that's usually very successful"
	Student-teacher relationship	"It helps build trust, I don't want them to fear or have more negative feelings towards me" "Just getting to know them outside of the teaching moment helps you bridge the gap to bring them to where you think they should be" "It's a lot of me sitting down with the students and setting goals for them or talking about what's not working"
Stakeholders		
	Situational effectiveness	"I think in certain cases it is effective" "I think it's really variable…whenever you implement anything you tend to see some shift in behavior. That can be in the negative, but tends more positive" "I think it's very case-by-case whether this would be an effective strategy or not and I think it's important to really consider the individual students and their needs and their capacity"

Participant group	Theme	Quotes
Stakeholders		
	Student-teacher relationship	"This is what I come to work with every day to just build relationships and understanding" "I think it's the most effective strategy used. First of all because it doesn't have always as a negative force in their life" "I think it's really powerful"
	Informal implementation	"I haven't used it like as a formal strategy, but I've definitely used it" "I can't say I did it in a super formal manner" "I actually didn't know that was a real formal strategy with a specific name. But, I have used something like that with some of my middle school classes"

Table 3.9

Descriptions of Other Interventions Mentioned by Participants

Intervention	Description
2x10	Teacher has a two-minute one-on-one conversation with the student about anything they want to talk about, every day for ten days.
Break cards	Teacher supplies card to allow the students to communicate when they need a break from class or a particular work demand.
First-then scheduling	Teacher presents the student with what they need to do now (first) and what = will occur afterward (then).
Reducing environmental stressors	Remove stimuli in the classroom environment that affect the student's stress levels (e.g., music, bright colours, distracting posters).
Restorative justice	School staff facilitate interactions between students who are in conflict to restore their relationships.
Student-teacher proximity	The presence of a teacher as well as the responsiveness of a teacher to the student's needs.
Talking circles	Teachers facilitate group conversations about social or emotional issues in class.
Visual schedules	Presenting a student with a schedule for their day with pictorial representations for each activity.

Table 3.10

Frequencies of and Percentages of Reported Barriers and Facilitators for End-Users by Subgroup

		Total (n = 15)	Elementary (n = 6)	Middle (n = 4)	High/Secondary (n = 5)
Facilitators					
	Accessibility	12 (80)	5 (83)	3 (75)	4 (80)
	Persistence	1 (7)	0 (0)	0 (0)	1 (20)
	Standardization	2 (13)	2 (33)	0 (0)	0 (0)
Barriers					
	Examples	9 (60)	4 (67)	2 (50)	3 (60)
	Technology	3 (20)	2 (33)	0 (0)	1 (20)
	Time	3 (20)	0 (0)	3 (75)	0 (0)

Table 3.11

Frequencies of and Percentages of Reported Barriers and Facilitators for Stakeholders by Subgroup

		Total (n = 22)	Specialized Teacher (n = 6)	Administrator (n = 5)	School Psychologist (n = 5)	Behaviour Specialist (n = 6)
Facilitators						
	Accessibility	13 (59)	3 (50)	3 (60)	4 (80)	3 (50)
	Persistence	1 (5)	0 (0)	0 (0)	0 (0)	1 (17)
	Standardization	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Barriers						
	Examples	6 (27)	1 (17)	2 (40)	2 (40)	1 (17)
	Technology	6 (27)	3 (50)	2 (40)	0 (0)	1 (17)
	Time	11 (50)	4 (67)	2 (40)	2 (40)	2 (33)

Table 3.12

End-User Ratings of Perceived Importance of Behaviour Management Intervention from Survey

Intervention Source		Total (n = 13)	Elementary (n = 6)	Middle (n = 3)	High/Secondary (n = 4)
Systematic Review and Meta-analysis					
	Behavior Plans	5.5 (1.5)	5.5 (1.8)	5.3 (1.2)	5.8 (1.5)
	CW-FIT	6.2 (1.1)	6.0 (1.6)	6.7 (0.6)	6.0 (0.8)
	GOCC	4.2 (1.7)	4.3 (2.3)	3.7 (1.2)	4.5 (1.3)
	Packaged Programs	2.9 (1.3)	3.2 (1.7)	2.7 (0.6)	2.8 (1.0)
	PBS	5.2 (1.8)	6.0 (1.3)	3.0 (2.0)	5.5 (1.0)
	Peer Management	3.9 (1.9)	3.3 (2.3)	4.3 (2.1)	4.3 (1.3)
	PIR	5.9 (1.2)	6.2 (1.3)	5.7 (1.5)	5.8 (1.0)
	Self Management	6.2 (1.1)	6.2 (1.0)	6.0 (1.7)	6.5 (1.0)
	Token Economies	2.6 (1.6)	2.3 (2.0)	2.7 (2.1)	3.0 (0.8)
	Tootling	4.2 (1.3)	5.0 (1.1)	2.7 (1.2)	4.0 (0.8)
Interviews					
	2x10	5.0 (2.0)	5.0 (2.1)	5.0 (2.7)	5.0 (2.0)
	Break cards	5.2 (1.0)	5.7 (0.8)	5.3 (0.6)	4.3 (1.0)
	First-then	5.6 (1.0)	5.7 (1.0)	5.3 (1.5)	5.8 (1.0)
	Proximity	5.8 (1.0)	5.5 (1.1)	6.3 (0.6)	5.8 (1.3)
	RES	5.2 (1.3)	5.0 (1.4)	6.0 (1.7)	5.0 (0.8)
	Restorative Justice	5.9 (1.5)	6.0 (1.7)	6.3 (1.2)	5.3 (1.5)
	Talking circles	5.2 (1.4)	5.2 (1.7)	5.0 (0.0)	5.3 (1.7)
	Visual schedules	6.2 (1.1)	6.8 (0.4)	6.0 (1.0)	5.3 (1.3)

Note. Items on the behaviour management strategy survey were rated on a 7-point Likert scale. Ratings for each item can range from 1 (not at all important) to 7 (extremely important). The intervention source labelled as systematic review and meta-analysis refers to the systematic review and systematic review and meta-analysis which proceeded this study (Chapter 2). CW-FIT = Class Wide Function-Related Intervention Teams,

GOCC = Group-Oriented Concurrent Chains, PBS = Positive Behavior Support, PIR = Positive Interaction Ratio, RES = Reducing environmental stressors.

Table 3.13

Stakeholder Ratings of Perceived Importance of Behaviour Management Intervention from Survey

Intervention Source		Total (*n* = 18)	Specialized Teacher (*n* = 4)	Administrator (*n* = 3)	School Psychologist (*n* = 5)	Behaviour Specialist (*n* = 6)
Systematic review and meta-analysis						
	Behavior Plans	5.8 (1.2)	5.8 (1.5)	6.0 (1.0)	5.6 (1.7)	6.0 (0.9)
	CW-FIT	5.9 (1.0)	5.3 (1.3)	6.3 (0.6)	6.0 (1.0)	6.0 (1.1)
	GOCC	4.3 (1.2)	4.5 (1.3)	4.3 (1.5)	3.8 (1.1)	4.5 (1.2)
	Packaged Programs	3.7 (1.5)	3.0 (1.2)	5.0 (1.0)	3.6 (1.5)	3.7 (1.6)
	PBS	5.6 (1.4)	5.8 (1.5)	5.7 (1.2)	4.6 (1.7)	6.2 (1.2)
	Peer Management	3.7 (1.3)	4.3 (0.6)	3.7 (2.5)	2.8 (0.8)	4.2 (1.0)
	PIR	6.2 (1.1)	6.0 (2.0)	6.0 (1.0)	6.4 (0.9)	6.3 (0.8)
	Self Management	6.1 (1.1)	6.0 (1.2)	7.0 (0.0)	6.0 (1.2)	5.2 (1.2)
	Token Economies	3.9 (1.8)	3.0 (1.6)	5.0 (1.7)	3.4 (2.1)	4.5 (1.6)
	Tootling	4.4 (1.3)	3.8 (1.7)	5.7 (0.6)	4.4 (1.1)	4.3 (1.0)
Interviews						
	2x10	6.3 (0.8)	6.8 (0.5)	6.3 (0.6)	6.6 (0.9)	5.8 (1.0)
	Break cards	6.2 (0.7)	6.3 (1.0)	6.3 (1.2)	6.6 (0.6)	5.7 (0.8)
	First-then	6.0 (0.8)	6.3 (1.0)	5.7 (1.2)	5.8 (1.1)	6.2 (0.4)
	Proximity	5.5 (1.0)	5.3 (1.0)	6.7 (0.6)	5.2 (0.8)	5.0 (1.1)
	RES	6.4 (0.8)	6.3 (0.5)	6.3 (1.2)	6.6 (0.6)	6.2 (1.0)
	Restorative Justice	5.8 (1.2)	5.3 (1.5)	6.3 (1.2)	6.0 (1.2)	5.5 (1.2)
	Talking circles	5.8 (1.3)	5.3 (1.5)	6.3 (0.6)	5.8 (1.3)	5.5 (1.5)
	Visual schedules	6.3 (1.1)	6.5 (1.0)	6.0 (1.7)	6.4 (1.3)	6.2 (1.0)

Note. Items on the behaviour management strategy survey were rated on a 7-point Likert scale. Ratings for each item can range from 1 (not at all important) to 7 (extremely important). The intervention source labelled as systematic review and meta-analysis refers to the systematic review

and meta-analysis which proceeded this study (Chapter 2). CW-FIT = Class Wide Function-Related Intervention Teams, GOCC = Group-Oriented Concurrent Chains, PBS = Positive Behavior Support, PIR = Positive Interaction Ratio, RES = Reducing environmental stressors.

Chapter 4: Development of *ASSIST for Disruptive Classroom Behaviour*

Overview of the Development of *ASSIST for Disruptive Classroom Behaviour*

The *ASSIST for Disruptive Classroom Behaviour* program was developed based on a pre-existing parenting program (Corkum et al., 2005). Over the past 20 years, this program has been modified to be consistent with best clinical practice and used to deliver clinical services to over 1,000 parents of children with attention-deficit/hyperactivity disorder (ADHD) through the Child, Adolescent & Family Services in Nova Scotia Health's Northern zone. The parenting program was designed to teach parents how to manage the challenging, disruptive behaviours of children diagnosed with ADHD. To create this new *ASSIST* program, the content was modified for classroom teachers to address students' disruptive classroom behaviour (DCB). An outline of the *ASSIST for Disruptive Classroom Behaviour* program can be found in Table 4.1.

The modification of the original ADHD parenting program to create the new *ASSIST* program was informed by the two previously described studies (Chapter 2 and Chapter 3) and expert clinical input (PC, IS). The first study, a systematic review and meta-analysis, was conducted to determine what teacher-implemented in-class interventions for DCB have been evaluated in the extant literature and what the evidence was for these interventions (Chapter 2). The results of the meta-analysis identified various teacher-implemented in-class interventions that had some evidence for effectiveness. The second study, a needs assessment, gathered information about classroom teachers' and stakeholders' experiences with teacher-implemented in-class interventions and their perspectives on eLearning professional development (PD) programs (Chapter 3). The results of the needs assessment identified which interventions should be prioritized for inclusion in the program and what aspects of implementation should be

focused on in the program's content. Importantly, although elementary, middle school, and high school classroom teachers were included in the needs assessment, development was guided primarily by the responses of elementary classroom teachers. These responses were given greater weight as classroom teachers and stakeholders suggested that this would be the most applicable population for *ASSIST for Disruptive Classroom Behaviour*. As such, the program was designed for elementary school teachers.

ASSIST for Disruptive Classroom Behaviour **and In-Class Interventions**

ASSIST for Disruptive Classroom Behaviour includes interventions shown to effectively manage DCB (Wilson & Lipsey, 2007). The program aims to support teachers in implementing these interventions to manage DCB and contains psychoeducation about disruptive behaviour, effective strategies for managing teaching-related stress, DCB interventions, and worksheets that help guide teachers. The existing literature, evidence-based interventions, and best practices in education informed the content of the intervention.

The gold standard for behavioural interventions used in schools is functional behavioural assessment (FBA). Functional behavioural assessment involves seven steps: 1) identifying target behaviour, 2) collecting data about the behaviour, 3) developing hypotheses about the function of the behaviour, 4) testing hypotheses, 5) developing/selecting interventions, 6) implementing interventions, and 7) monitoring intervention effectiveness. *ASSIST for Disruptive Classroom Behaviour* guides classroom teachers through conducting an FBA, as well as provides additional information and strategies to help manage teaching stress and foster positive student-teacher relationships.

Next Step: Usability Testing of *ASSIST for Disruptive Classroom Behaviour*

Addressing end-user needs and targeting their preferences was integral to this development process and informed each component of *ASSIST for Disruptive Classroom Behaviour*, including its content, features, and visual design. After *ASSIST for Disruptive Classroom Behaviour* was developed, the next steps were to gather user feedback about each session and the overall program through usability testing (see Chapter 5).

Table 4.1

Overview of the content for the ASSIST for Disruptive Classroom Behaviour program

Session number and name	Session content
1 – All About Disruptive Behaviour	• Goal setting for the program • Description of disruptive behaviour • Evidence-based interventions for disruptive behaviour • Foundational skills
2 – Getting Started and Introduction to the ABC Model	• Building your student's self-esteem • Teaching-related stress and what to do about it • Behaviour change model
3 – Addressing Antecedents	• Behaviour change model continued • Addressing antecedents • Behaviour plan for antecedents
4 – Adding Consequences	• Consequence strategies • Token economies • Behaviour plan for consequences
5 – Teaching New Skills	• Teaching self-regulation skills • Teaching social communication skills
6 – Summary and Wrap-Up	• Review • Revising and ending your student's behaviour plan • Behaviour profile revisited • Next steps

Chapter 5: Usability of an eLearning Professional Development Program for Elementary Classroom Teachers: ASSIST for Disruptive Classroom Behaviours

The manuscript based on this usability study is presented below. Readers are advised that Matt Orr, under the supervision of Dr. Penny Corkum and in consultation with the dissertation committee (Dr. Christine Chambers and Dr. Isabel Smith), participated in the initial conceptualization of the research study, developed the study protocol, and prepared submissions for ethical review, was responsible for recruitment, completed data collection, coding, data analysis/interpretation for all components included in this study. Matt Orr was responsible for all aspects of the writing process and received feedback from his supervisor and dissertation committee members. The following manuscript is prepared for publication submission as:

Orr, M., Ilie, A., Chambers, C. T., Smith, I.M., & Corkum, P. (2022). *Usability of an eLearning professional development program for elementary classroom teachers: ASSIST for disruptive classroom behaviours.* [Manuscript in preparation].

Abstract

An eLearning professional development (PD) program, *ASSIST for Disruptive Classroom Behaviour,* was developed using an iterative user-centred design approach. This program was designed to support teachers in the implementation of teacher-implemented in-class interventions for disruptive classroom behaviour (DCB). The objective of the current study was to determine the usability of this program. Overall, the results suggest that end-users (i.e., classroom teachers) and stakeholders (i.e., administrators, specialized teachers, school psychologists, and behaviour specialists) found the program to have high usability and reported that it was ready to be used by other teachers, that they found it flexible to adapt to their classroom setting; they provided high satisfaction ratings for this program. In addition to the positive findings, the primary constructive feedback was that tangible downloadable materials should be added to the *ASSIST for Disruptive Classroom Behaviour* program to meet classroom teachers' needs better. Based on all results, the program, with a few minor modifications, was deemed ready for effectiveness testing.

Introduction

Disruptive classroom behaviour (DCB) is defined as off-task behaviours regarding schoolwork, non-compliance to teacher requests, and aggression (Schaeffer et al., 2006; Yoder & Williford, 2019). Previous studies suggest that it is difficult to estimate the prevalence of DCBs accurately (Irvin et al., 2004; Skiba et al., 2008). However, based on reviews of studies conducted in the United States of America, approximately 40%-55% of students in Grades 1-12 have recorded incidents of DCB (i.e., records of the behaviour from classroom teachers; Kaufman et al., 2010; Skiba et al., 1997; Wright & Dusek, 1998). Disruptive behaviour has adverse effects on both students and teachers by reducing the time for instruction and is associated with increased work-related stress among teachers (Klassen & Chiu, 2010; Luiselli et al., 2002). In addition, students who display DCB are at risk for impaired social relationships and poor academic and post-school outcomes (McDaniel et al., 2017). As such, teachers need ways to manage and mitigate the adverse effects of disruptive behaviour in their classrooms effectively (Martino et al., 2016; Nelson et al., 2002).

Previous meta-analyses (Wilson et al., 2003; Wilson & Lipsey, 2007) suggest that evidence-based interventions (EBIs) for addressing DCB include behavioural, such as teaching desired behaviours and providing rewards and feedback. Three key barriers prevent teachers from accessing and implementing these EBIs. First, it is uncommon for behavioural interventions to be taught during teacher training (Elik et al., 2015; McCrimmon, 2015). Second, limited professional development (PD) focuses on teacher-implemented in-class interventions to address DCB (Elik et al., 2015; Thomas & Deeley, 2004). Finally, when PD programs are available, they tend to provide limited individualized content and support for teachers, making it difficult for teachers to generalize from these programs to implement strategies in their

classrooms (Borko, 2004; Dede et al., 2009). There is a clear need for an accessible PD program that provides teachers with the knowledge and skills to manage in-class disruptive behaviour. A way to address these barriers to access is eLearning.

One way to address the previously described barriers to the use of EBIs for DCB is by delivering PD to teachers through an eLearning program. eLearning involves using information technology to produce learning materials and teach learners (Arkorful & Abaidoo, 2014). This approach to delivering PD can provide information and guidance on the implementation of in-class interventions in a way that is more available, accessible, cost-effective, scalable, and customizable than typical in-person PD programs (Arkorful & Abaidoo, 2014; Borrelli & Ritterband, 2015). In response to the impracticality of traditional PD programs, several effective PD programs have been developed using eLearning methods (Dede et al., 2009).

ASSIST (*Accessible Strategies Supporting Inclusion for Students by Teachers*; previously called *Teacher Help*) is an eLearning program designed to support classroom teachers in providing EBIs to students in grades 1 to 12 with neurodevelopmental disorders (NDDs) (Barnett et al., 2012; Blotnicky-Gallant et al., 2014; Corkum et al., 2014; Corkum et al., 2019; Corkum et al., 2021; Elik et al., 2015; Parker et al., 2020; Walker-Noack et al., 2013). The *ASSIST* program has been extensively evaluated (Barnett et al., 2021; Blotnicky-Gallant et al., 2014; Corkum et al., 2014; Corkum et al., 2019; Corkum et al., 2021; Elik et al., 2015; Parker et al., 2020; Walker-Noack et al., 2013). Feedback from the most recent program evaluation suggested that teachers would be interested in a program focused on behaviour management strategies for all students (Corkum et al., CIHR EHI 143552, 2016). As a result, a new program called *ASSIST for Disruptive Classroom Behaviour* was developed for teachers in the

elementary grades (i.e., Grades 1-6). An outline of the *ASSIST for Disruptive Classroom Behaviour* program can be found in Table 5.1.

The purpose of the current study was to assess the usability of the *ASSIST for Disruptive Classroom Behaviour* program for end-users (i.e., classroom teachers) and stakeholders (i.e., school administrators, specialized teachers, and school psychologists). Usability studies are conducted to identify problems with a practice or product, uncover opportunities to improve a practice or product and learn about end-user behaviour and preferences related to a practice or product (Moran, 2019). Usability studies allow for practices or products to be refined and better meet the needs of the target user population. Typically, usability studies are structured based on theoretical frameworks. For the current study, the user-experience honeycomb developed by Morville and Sullenger (2010) was used as a theoretical framework, which divides usability into the following components: accessibility, credibility, desirability, findability, usability, usefulness, and value. The current study addressed five research questions:

a) Which usability components meet and do not meet the needs of end-users and stakeholders for each of the six sessions and overall program?
b) Should any changes be prioritized in the future refinement of the program?
c) Do end-users and stakeholders perceive the program to be flexible enough to tailor implementation to the needs of specific students?
d) Were end-users and stakeholders satisfied with the program?
e) Do end-users and stakeholders perceive the program to be ready to use by classroom teachers?

Methods

Participants

The sample consisted of 19 participants. End-users were 11 elementary classroom teachers. Stakeholders included 3 specialized teachers, 2 school administrators, 2 school psychologists, and a behaviour specialist. The behaviour specialist recruited for the current study had participated in the preceding needs assessment (Chapter 3).

End-Users

The end-user group included Canadian classroom teachers who were currently teaching in the elementary grades (i.e., Grades 1-6) and had worked in their current role for at least three years. Of the 34 classroom teachers who expressed interest in the study (i.e., completed the Screening Questionnaire), three were not eligible because they were not currently teaching in an elementary classroom. Consents were signed by 31 classroom teachers, but 20 did not begin their program review. Of those who began their review of the programs *(n* =11), six completed a full review and completed all questionnaires, two reviewed all six sessions but did not complete the overall program questionnaire, one reviewed the first two sessions and completed the corresponding questionnaires, and two only reviewed the first session and completed the corresponding questionnaire.

Most end-users (*n* = 8) were teaching in early elementary (i.e., Grades 1-3) and taught in public schools (*n* = 9). The average years of teaching were 14.82, and the average age of end-users was 42.09 years. Most end-users were female (*n* =10), white/Caucasian (*n* = 10), had a master's degree (*n* = 9), were located in Nova Scotia (*n* = 7), and lived in a city with less than

500,000 people (*n* = 6). In terms of training in behaviour management, some (*n* = 3) had not received pre-service training about behaviour management, but most (*n* = 7) had received PD about behaviour management. The number of students with DCB that end-users reported having taught ranged from 3 to more than 20. The most frequently reported sources of information about behaviour management for DCB were internet searches (*n* = 9), books (*n* = 7), and school board-mandated PD (*n* = 6). Full demographic information for end-users is in Table 5.2.

Stakeholders

The stakeholder group included specialized teachers (e.g., learning centre teachers, resource teachers, school counsellors), school administrators, and school psychologists working with elementary students, including some with DCB, for at least three years. Of the 21 stakeholders who expressed interest in participating in the current study, two were excluded due to not having worked with elementary school children with DCB for at least three years. Of those who consented *(n* = 11), three did not begin their program review. Of those who did begin their review (n = 8), all but one reviewed the entire program; the remaining participant reviewed only the first session.

The average years in their current role was 5.38, with half of the stakeholders have worked as classroom teachers with an average of 8.75 years in that role. Most stakeholders worked in public schools (*n* = 7), were female (*n* = 7), were white/Caucasian (*n* = 8), and had a master's degree (*n* = 8); half lived in Nova Scotia (*n* = 4). The type of community stakeholders lived in was distributed across rural communities (*n* = 2), towns (*n* = 2), and cities under 500,000 people (*n* = 3). Most (*n* = 7) stakeholders received pre-service training about behaviour management, and all stakeholders received PD about behaviour management. The most

frequently reported sources of information about DCB were books (*n* = 5), school board mandated PD (*n* = 5), internet searches (*n* = 4), and professional or community organizations (*n* = 4). Full demographics for stakeholders are reported in Table 5.3.

Measures

All questionnaires were delivered via the Research Electronic Data Capture (REDCap©; Harris et al., 2019), a secure online platform for research databases.

Eligibility Questionnaire

The Eligibility Questionnaire consisted of seven items to (1) assess whether participants met the inclusion criteria and (2) determine to which group they belonged (i.e., end-users or stakeholders). The questions asked whether potential participants worked in the Canadian school system, whether they worked in the public or private school system, what position they held (i.e., classroom teachers were asked whether they taught elementary students, and stakeholders were asked whether they had experience working with elementary students with DCB and how many years of experience they had working with elementary school students).

Participant Characteristics Questionnaire

The Participant Characteristics Questionnaire was an 8-item questionnaire used to characterize the sample. Questions asked for participants' age, sex, ethnicity or cultural heritage, the highest level of education, approximate size of the community they worked in, and the province in which they worked. Additionally, participants were asked whether they worked in a public or private school. If the participant was an end-user (i.e., classroom teacher) or had

identified that they had previously worked as a classroom teacher, they were also asked to report the number of years spent teaching.

Previous Learning Questionnaire

The Previous Learning Questionnaire was a four-item questionnaire that asked questions related to the participant's training related to the management of DCB. Participants were asked to report on their pre-service and PD training related to behaviour management, to estimate how many students they have taught who displayed DCB (for classroom teachers), and how they would typically find new information about DCB.

Session Feedback Questionnaire (SFQ) and Program Feedback Questionnaire (PFQ)

The SFQ and PFQ each consisted of 20 items across two sections, but the SFQ asked about individual sessions while the PFQ asked about the overall program. The first section asked participants to rate each session or the program overall on a 5-point Likert scale (i.e., 1 = Not at all, 5 = Extremely) across seven usability characteristics (i.e., usefulness, usability, desirability, findability, accessibility, credibility, and value) based on Morville's user experience honeycomb (Morville & Sullenger, 2010). The first section also asked participants to explain why they selected their ratings for the session or the program overall. The second section of the SFQ and the PFQ asked participants to rate how strongly they agreed with statements about readiness for use, whether the worksheets/activities helped to make the program flexible enough to tailor the intervention to a specific student, and their satisfaction with the session overall on a 5-point Likert scale (i.e., 1 = strongly disagree, 5 = strongly agree). For each of these statements, participants who responded negatively (i.e., not ready, not able to tailor to students, not

satisfied) were asked to provide a written justification for their Likert rating. Participants were also asked if they thought that information should be added, removed, or reordered and, if they did, to provide details.

Procedure

Recruitment

Participants were recruited using three methods: (1) the *ASSIST* website (www.assistforteachers.ca), (2) social media (i.e., *ASSIST* Facebook and Twitter) posts, and (3) personal contacts of the authors (i.e., colleagues working in the Canadian school system). Recruitment occurred during the COVID-19 pandemic.

All recruitment methods referred potential participants to a dedicated page on the *ASSIST* website (www.assistforteachers.ca/usability). This web page provided information about the study and what participation involved and provided a hyperlink to REDCap. When participants followed the hyperlink, they were presented with the Eligibility Questionnaire, which determined their eligibility to participate. Finally, those who were eligible were presented with the consent form.

Study Participation

After completing the online Information and Consent Form, participants were presented with the Participant Characteristics Questionnaire and the Previous Learning Questionnaire. Once they completed these questionnaires, participants were given access to the *ASSIST* program. They were also given access to the SFQs to complete after reviewing each program session and the PFQ to complete after reviewing the entire program. At the end of each session,

participants were reminded to complete the associated SFQ and access the next session. Once participants had reviewed all six sessions, completed all SFQs, and completed the PFQ, their participation was complete, and compensation was distributed to participants (i.e., a $40 gift card for Amazon.ca per participant once all six questionnaires were completed).

Data Analysis Plan

Descriptive statistics (i.e., means, standard deviations, percentages) were calculated for quantitative responses. For the open-ended SFQ and PFQ questions, responses were coded using the method from previous similar usability studies conducted within Corkum LABS (e.g., Orr et al., 2019) and Morville's seven dimensions of user experience (Morville & Sullenger, 2010). Two coders (M.O., A.I.) coded all data independently, with 95% inter-rater agreement calculated as a straight percentage across all data. Discrepancies were reviewed and resolved by a supervising researcher (P.C.). The coded data were then divided into two categories: positive feedback, which expressed agreement with or support for aspects of the session or program, and constructive feedback, which indicated potential barriers to the usability of the program or suggestions for improvement. Finally, the frequencies of positive and constructive feedback were tallied. Constructive feedback mentioned in responses to the SFQs and not in the PFQ was categorized as session-specific constructive feedback. The constructive feedback from the PFQ was categorized as overall constructive feedback. To identify changes that should be made to the program, constructive feedback that was mentioned consistently (i.e., by at least three participants) was prioritized for future program development (Ali et al., 2021).

Results

Usability Testing

Usability Ratings

Based on a scale of 1 to 5, mean usability ratings ranged from 3.67 to 4.50 for end-users and 3.57 to 4.57 for stakeholders. Based on the summed usability ratings for each session and the program overall, with a maximum score of 35, usability ratings were consistently positive across the program and between end-users and stakeholders. The sum of mean ratings for end-users was very similar across sessions, ranging from $\Sigma = 27.27$ to $\Sigma = 29.14$. For stakeholders, the mean ratings were also very similar across sessions, ranging from $\Sigma = 28.43$ to $\Sigma = 29.87$. Based on the summed ratings, usability ratings were consistently positive for each usability component across Morville's usability honeycomb (Morville & Sullenger, 2010). For end-users, the sum of mean ratings was very similar across components and ranged from $\Sigma = 27.08$ to $\Sigma = 29.52$. Similarly, for stakeholders, the sum of the mean ratings was very similar across components and ranged from $\Sigma = 27.05$ to $\Sigma = 30.38$. See Tables 5.4 and 5.5 for the mean usability ratings for end-users and stakeholders, respectively.

Qualitative Feedback

Participants provided a total of 73 qualitative responses. Of those responses, 42 were categorized as positive feedback and 31 as constructive feedback.

Positive Feedback. The most frequent positive feedback, which comprised over half (n = 21, 51%), focused on the usability of the program (Figure 1). Usability refers to the ease of use of the program, including whether the information presented can be implemented (Morville

& Sullenger, 2010). For example, one stakeholder noted, “It is great and cannot wait for other teachers to begin using [this program]”. A classroom teacher stated, “I learned valuable and practical information”. Another classroom teacher responded, “the information is excellent. Even if only pieces of this program were implemented, it can help teachers”.

The second most frequent positive feedback focused on the findability of the program (*n* = 11, 27%). Findability refers to how easily users can navigate the program (Morville & Sullenger, 2010). For example, one classroom teacher noted that the program was “easy to understand”. Another said, “the program was well laid out and presented clearly”. One of the stakeholders noted that the program was “very user friendly”, and another stated, “[the] information was well organized, realistic to implement and clear”.

The third most frequent positive feedback focused on the acceptability of the program (*n* = 10, 24%). Acceptability refers to the extent to which participants felt that the program was appropriate for the target end-users (Sekhon et al., 2017). For example, one classroom teacher said, “I would not change anything about the program”, and one stakeholder remarked, “overall, the course was well done”.

Constructive Feedback. The most frequent constructive feedback, which comprised 48% (*n* = 15), focused on changes to the program's content—specifically, including more tangible or downloadable materials. For example, one participant stated, “printable posters would be good.” The addition of tangible or downloadable materials met our criterion to be considered a priority in future program development (i.e., mentioned by at least three participants). No other theme reached this criterion.

Readiness, Flexibility, and Satisfaction Ratings

A summary of the mean ratings of session readiness, flexibility, and participant satisfaction can be found in Tables 5.6 and 5.7. Based on a scale of 1 to 5, mean readiness ratings ranged from 3.75 to 4.22 for end-users and 3.43 to 4.00 for stakeholders. Mean flexibility ratings ranged from 3.88 to 4.22 for end-users and 3.57 to 4.14 for stakeholders. Finally, mean satisfaction ratings ranged from 4.00 to 4.27 for end-users and 3.86 to 4.14 for stakeholders. Overall, mean ratings consistently supported the program's readiness for use by other teachers, its flexibility in being able to be tailored to individual students, and teachers' satisfaction across the sessions of the program and between end-users and stakeholders.

Discussion

The overall objective of the current study was to assess the usability of the newly developed *ASSIST for Disruptive Classroom Behaviour* eLearning program. Both end-users (i.e., teachers) and stakeholders (i.e., administrators, specialized teachers, school psychologists, and behaviour specialists) reported on their experiences with DCB. Most of the classroom teachers reported not receiving in-service training in behaviour management but that they had received PD for behaviour management. However, the most frequently reported sources of information about managing disruptive behaviour were internet searches and books. Most stakeholders reported they had received in-service training, and all had received PD about behaviour management. As with classroom teachers, one of the most frequently reported sources of information was books. However, unlike classroom teachers, an equally frequent source of information was receiving PD from school boards. These results suggest a discrepancy in the

training available to classroom teachers and stakeholders, further supporting the need for *ASSIST for Disruptive Classroom Behaviour.*

The current study results suggest that both groups of participants found the program to be highly usable. Across sessions, participants provided high overall usability ratings. They also provided consistently high ratings across Morville and Sullenger's (2010) user experience honeycomb components. The usability ratings were supported by the positive feedback received from participants, which spoke primarily to the program's usability, findability, and acceptability. These results are like those seen in the most recent usability assessment of another ASSIST program (Parker et al., 2020). However, one piece of constructive feedback, the need for additional tangible or downloadable materials, was received and will inform future refinement of the program.

The current study results also suggest that both participant groups perceived the program as ready for use and flexible. As with the usability ratings, the ratings of readiness and flexibility (i.e., being able to be tailored to individual students) were consistently high across sessions. Similarly, participants provided consistently high satisfaction ratings with the program. Again, these results are consistent with those found in the most recent usability study of another *ASSIST* program (Parker et al., 2020).

The consistently high ratings seen in the current study results are likely at least in part due to the user-centred approach taken to develop the new *ASSIST* program. In the preceding needs assessment (Chapter 3), end-users and stakeholders provided rich data about their experiences with interventions for DCB and their perspectives on eLearning. To meet the needs of end-users, participant responses directly informed the development of *ASSIST for Disruptive Classroom Behaviour*. Overall the results of this user-centred approach reflect those of previous

studies of eLearning programs that have taken a user-centred approach to development, resulting in increased usability and acceptability (Klock et al., 2019; Parker et al., 2020).

Strengths and Limitations

Interpreting the current study results must be done in the context of several strengths and limitations. First, while the study sample is small (six end-users and seven stakeholders), this is within the overall recommended sample size of 12 to 20 participants for usability testing (Barnum, 2011), as well as meeting the "magic number" of five participants for each group (Lewis, 1994; Nielsen, 2000; Virzi, 1992). A strength is that the sample of end-users was varied (grades 1-6), and the stakeholder sample was quite heterogeneous, containing perspectives from several positions within the school system.

The current study's limitations are related to the ability to generalize from this sample. Teachers were mostly teaching early elementary grades and were from Nova Scotia, limiting the generalizability of the results to the experiences of classroom teachers across grades and provinces. However, it is unlikely that teacher perspectives would vary significantly across provinces based on how standardized teacher education is in Canada (Perlaza & Tardiff, 2016). There was also a high drop-out rate, suggesting that the results only reflect the experiences of participants who were motivated or able to participate in this research. The drop-out rate may be partially explained by the COVID-19 pandemic, which has caused disruptions to the regular operations of the Canadian school system (Bresge & Hobson, 2021). Additionally, the single behaviour specialist had participated in the preceding needs assessment (Chapter 3), potentially biasing their responses due to their prior involvement in this program of research. However, their ratings and qualitative feedback were consistent with other participants. The current study

is also focused on teachers' perceptions of the program and not on the real-world implementation of the program. As previous research into the behaviour of consumers has suggested, the use of self-report data alone can lead to inaccurate conclusions about consumer preferences (Bell et al., 2018; Venkatraman et al., 2015).

An additional limitation of the current study is related to the rationale for developing the new *ASSIST* program. As stated in the introduction, the estimates of the prevalence of DCB range from 40%-55% based on incidents of DCB recorded on student records for students in the United States in grades 1-12 (Kaufman et al., 2010; Skiba et al., 1997; Wright & Dusek, 1998). However, those estimates do include students who have had single incidents of DCB, potentially inflating the prevalence rates. The literature does provide estimates of the prevalence of disruptive behaviour disorders (DBD; American Psychiatric Association, 2013), but there is currently no clear prevalence of chronic DCB that does not meet the criteria for a DBD. It is unlikely that classroom teachers would use *ASSIST* to modify students' behaviour with few incidents of DCB instead of using it for students who chronically display DCB. As such, the rationale for developing the new *ASSIST* program is based on the best available prevalence estimates for DCB, but that may limit its application to classroom settings.

Future Directions

Taken together, the results of the current study indicate a clear trajectory for the future research and development of the *ASSIST for Disruptive Classroom Behaviour* program. First, the new program will need to address the need for additional tangible and downloadable content, as indicated by participants. Specifically, participants noted that they would like to download hard copies of the program content. Printable summaries of program content should be added to

each session. Once this modification of the program is complete, the program's effectiveness should be assessed. Specifically, effectiveness testing should involve giving end-users access to the program and asking them to implement it. Ratings of their students' behaviour should be collected from an independent observer to determine whether using the program decreases DCB.

Conclusions

Based on the results of the current study, *ASSIST for Disruptive Classroom Behaviour* is a promising method for delivering EBIs for DCB to classroom teachers. Overall, end-users and stakeholders found the program highly usable, suggesting that the program may have high uptake once it is refined, tested for effectiveness, and made publicly available.

Table 5.1

Overview of the content for the ASSIST for Disruptive Classroom Behaviour program

Session number and name	Session content
1 – All About Disruptive Behaviour	• Goal setting for the program • Description of disruptive behaviour • Evidence-based interventions for disruptive behaviour • Foundational skills
2 – Getting Started and Introduction to the ABC Model	• Building your student's self-esteem • Teaching-related stress and what to do about it • Behaviour change model
3 – Addressing Antecedents	• Behaviour change model continued • Addressing antecedents • Behaviour plan for antecedents
4 – Adding Consequences	• Consequence strategies • Token economies • Behaviour plan for consequences
5 – Teaching New Skills	• Teaching self-regulation skills • Teaching social communication skills
6 – Summary and Wrap-Up	• Review • Revising and ending your student's behaviour plan • Behaviour profile revisited • Next steps

Table 5.2

Demographics for End-Users (n = 11)

Participant characteristics		Count (%)	Mean (SD)	Range
Current grade				
	1	5 (45%)		
	2	2 (18%)		
	3	1 (9%)		
	4	1 (9%)		
	6	2 (18%)		
Type of school				
	Public	9 (82%)		
	Private	2 (18%)		
Years of teaching				
			14.82 (6.76)	5-24
Age (years)				
			42.09 (7.80)	29-50
Sex				
	Female	10 (91%)		
	Male	1 (9%)		
Ethnicity				
	White/Caucasian	10 (91%)		
	South-East Asian	1 (9%)		
Education				
	Bachelor's (or equivalent)	2 (18%)		
	Master's	9 (82%)		
Province				
	British Columbia	1 (9%)		
	Manitoba	1 (9%)		
	Nova Scotia	7 (64%)		
	Ontario	1 (9%)		
	Quebec	1 (9%)		
Community description				
	City under 500,000 people	6 (55%)		
	Rural	2 (18%)		
	Town	3 (27%)		
Pre-service training about behaviour management				
	Yes	3 (27%)		
	No	8 (73%)		

Participant characteristics		Count (%)	Mean (SD)	Range
PD about behaviour management				
	Yes	7 (64%)		
	No	4 (36%)		
Number of students taught with DB				
	3	2 (18%)		
	5	1 (9%)		
	9	1 (9%)		
	10	2 (18%)		
	20+	5 (45%)		
Sources of information about behaviour management or DB				
	Blogs	3 (27%)		
	Books	7 (64%)		
	Facebook	2 (18%)		
	Instagram	1 (9%)		
	Internet searches	9 (82%)		
	Magazines	1 (9%)		
	Pinterest	2 (18%)		
	Podcasts	1 (9%)		
	Professional/Community Organizations	4 (36%)		
	School Board	6 (55%)		
	Websites	5 (45%)		
	YouTube	2 (18%)		

Note. DB = disruptive behaviour, PD = professional development

Table 5.3

Demographics for Stakeholders (n = 8)

Participant characteristics		Count (%)	Mean (SD)	Range
Current role				
	Administrator	2 (25%)		
	Behaviour specialist	1 (13%)		
	School psychologist	2 (25%)		
	Specialized teacher	3 (38%)		
Years in current role				
			5.38 (4.37)	1-15
Previously worked as an elementary classroom teacher				
	Yes	4 (50%)		
	No	4 (50%)		
Years as an elementary classroom teacher				
			8.75 (8.50)	3-21
Type of school				
	Public	7 (88%)		
	Private	1 (12%)		
Age (years)				
			39.38 (6.84)	32-51
Sex				
	Male	1 (12%)		
	Female	7 (88%)		
Ethnicity				
	White/Caucasian	8 (100%)		
Education				
	Master's	8 (100%)		
Province				
	Newfoundland and Labrador	3 (38%)		
	Nova Scotia	5 (62%)		
Community Description				
	City under 500,000 people	3 (43%)		
	Rural	2 (29%)		
	Town	2 (29%)		
Pre-service training about behaviour management				
	Yes	7 (88%)		
	No	1 (12%)		

Participant characteristics		Count (%)	Mean (SD)	Range
PD about behaviour management				
	Yes	8 (100%)		
	No	0		
Sources of information about behaviour management or DB				
	Books	5 (62%)		
	Blogs	1 (12%)		
	Internet searches	4 (50%)		
	School Board	5 (45%)		
	Professional/Community Organizations	4 (50%)		
	Podcasts	2 (29%)		
	Websites	2 (29%)		

Note. DB = disruptive behaviour, PD = professional development

Table 5.4

End-Users' means and standard deviations of usability ratings on the Session Feedback Questionnaires and Program Feedback Questionnaires

Mean (*SD*)								
	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Program	Sum
Useful	3.73 (0.47)	3.67 (0.50)	3.88 (0.35)	3.88 (0.64)	3.75 (0.71)	4.00 (0.76)	4.17 (0.41)	27.08
Usable	3.82 (0.75)	3.89 (0.33)	4.25 (0.71)	4.00 (0.76)	3.88 (0.64)	4.38 (0.74)	4.00 (0.63)	28.22
Desirable	3.91 (0.30)	3.89 (0.60)	4.13 (0.64)	4.00 (0.76)	3.88 (0.83)	4.00 (0.76)	4.00 (0.63)	27.81
Findable	4.18 (0.60)	4.11 (0.60)	4.25 (0.71)	4.25 (0.71)	4.00 (0.93)	4.25 (0.71)	4.33 (0.52)	29.37
Accessible	4.09 (0.30)	4.22 (0.67)	4.25 (0.71)	4.25 (0.71)	4.00 (0.76)	4.38 (0.74)	4.33 (0.52)	29.52
Credible	4.36 (0.67)	4.11 (0.78)	3.88 (0.64)	4.00 (0.76)	3.88 (0.83)	4.13 (0.83)	4.00 (0.63)	28.36
Valuable	3.91 (0.54)	3.89 (0.60)	3.75 (0.46)	3.88 (0.64)	3.88 (0.64)	4.00 (0.53)	4.00 (0.63)	27.31
Sum	28.00	27.78	28.39	28.26	27.27	29.14	28.83	

Note: Rating scale from 1-5 (1 = Not at all; 3 = Moderately; 5 = Extremely). Dimensions were derived from Morville's user experience honeycomb (Morville & Sullenger, 2010). Minimum sum of 7 and maximum s of 35.

Table 5.5

Stakeholders' means and standard deviations of usability ratings on the Session Feedback Questionnaires and Program Feedback Questionnaires

Mean (*SD*)								
	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Program	Sum
Useful	3.63 (0.52)	3.57 (1.40)	4.00 (0.58)	4.00 (0.58)	4.14 (0.69)	3.71 (0.76)	4.00 (0.82)	27.05
Usable	4.50 (0.53)	4.29 (0.76)	4.29 (0.49)	4.14 (0.69)	4.43 (0.53)	4.29 (0.49)	4.43 (0.53)	30.37
Desirable	4.13 (0.35)	3.86 (0.69)	4.00 (0.58)	4.00 (0.82)	4.29 (0.76)	4.14 (0.69)	4.00 (0.82)	28.42
Findable	4.13 (0.64)	4.29 (0.76)	4.29 (0.49)	4.29 (0.49)	4.29 (0.76)	4.29 (0.49)	4.43 (0.53)	30.01
Accessible	4.50 (0.53)	4.43 (0.53)	4.29 (0.49)	4.29 (0.49)	4.29 (0.76)	4.29 (0.49)	4.29 (0.76)	30.38
Credible	3.88 (0.99)	4.14 (0.90)	4.00 (0.58)	3.71 (1.11)	4.29 (0.76)	4.14 (0.69)	3.86 (1.07)	28.02
Valuable	4.25 (0.46)	3.86 (0.69)	3.86 (0.69)	4.00 (0.82)	4.14 (0.69)	3.86 (0.90)	4.00 (0.82)	27.97
Sum	29.02	28.44	28.73	28.43	29.87	28.72	29.01	

Note: Rating scale from 1-5 (1 = Not at all; 3 = Moderately; 5 = Extremely). Dimensions were derived from Morville's user experience honeycomb (Morville & Sullenger, 2010). Minimum sum of 7 and maximum s of 35.

Table 5.6

End-Users' means and standard deviations of flexibility, readiness, and satisfaction ratings on the Session Feedback Questionnaires and Program Feedback Questionnaires

Mean (*SD*)							
	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Program
Readiness	3.82 (0.98)	4.22 (0.67)	4.00 (0.53)	3.75 (1.04)	3.75 (0.89)	4.13 (0.35)	3.83 (0.41)
Flexibility	4.09 (0.30)	4.22 (0.67)	4.00 (0.53)	4.13 (0.35)	3.88 (0.35)	4.13 (0.35)	4.00 (0.00)
Satisfaction	4.27 (0.47)	4.11 (0.60)	4.25 (0.46)	4.00 (0.76)	4.25 (0.46)	4.13 (0.35)	4.17 (0.41)

Note: Rating scale from 1-5 (1 = Strongly disagree; 3 = Neither agree nor disagree; 5 = Strongly agree).

Table 5.7

Stakeholders' means and standard deviations of flexibility, readiness, and satisfaction ratings on the Session Feedback Questionnaires and Program Feedback Questionnaires

Mean (*SD*)							
	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Program
Readiness	4.00 (0.93)	3.71 (0.95)	4.00 (1.00)	3.43 (1.51)	3.71 (1.38)	4.00 (1.00)	3.86 (1.07)
Flexibility	3.88 (0.35)	4.14 (0.38)	4.00 (0.58)	4.14 (0.38)	3.57 (0.98)	3.57 (0.53)	4.00 (0.58)
Satisfaction	4.13 (0.64)	3.86 (0.90)	3.86 (0.90)	4.14 (1.07)	4.14 (0.90)	3.86 (0.90)	3.71 (0.95)

Note: Rating scale from 1-5 (1 = Strongly disagree; 3 = Neither agree nor disagree; 5 = Strongly agree)

Chapter 6: General Discussion

In this chapter, I first contextualize and review the goals of the current dissertation. After this, I summarize and briefly discuss the findings related to each research question. I then comment on the impact the current dissertation may have on using evidence-based interventions (EBIs) for disruptive classroom behaviour (DCB) by classroom teachers. I also discuss implications for future research. Finally, I review the strengths, limitations, and future directions related to this dissertation.

Summary of Dissertation Objectives

The purpose of this dissertation was to use a user-centred approach to the development of a new eLearning professional development (PD) program called *ASSIST for Disruptive Classroom Behaviour.* The iterative, user-centred approach that I employed included a systematic review and meta-analysis, a needs assessment, and a usability study of the new *ASSIST* program. The following overarching research questions were addressed through this program of research:

Research Question 1: What is the evidence for the effectiveness of teacher-implemented in-class interventions to address DCB in the classroom?

To address this research question, a systematic review and meta-analysis of the extant literature on teacher-implemented in-class interventions for DCB was conducted (Chapter 2). The systematic review and meta-analysis took a unique approach by focusing only on teacher-implemented in-class interventions. All included studies reported evidence for effectiveness. These results suggest that teacher-implemented in-class interventions for DCB are at least

feasible and potentially effective. In addition, the meta-analysis found a large positive effect size for effectiveness based on a subset of the studies included in the systematic review. These results align with previous research focused on school-based interventions for disruptive behaviour (Chaffee et al., 2017; Wilson & Lipsey, 2007). However, the quality of the studies included in the meta-analysis was assessed as very low, suggesting that the calculated effect size should be interpreted with caution.

The systematic review and meta-analysis results fill an important gap in the literature. Due to the broad scope of previous meta-analyses (Chaffee et al., 2017; Wilson & Lipsey, 2007), in which the interventions were implemented in a range of school settings and by a variety of implementers (e.g., researchers, specialized teachers), it was previously unknown if teacher-implemented in-class interventions were a feasible or effective method to reduce DCB. The results of the current literature review and meta-analysis suggests it is possible that teachers can implement interventions in their classroom to address DCB. However, there needs to be more rigorous research conducted to evaluate the implementation and effectiveness of teacher-implemented interventions for DCB. The results did not identify necessary program characteristics to meet the needs of classroom teachers, which is required based on the behaviour change model proposed by Ritterband et al. (2009). As such, a needs assessment was conducted (Chapter 3).

Research Question 2: Based on the perspectives of end-users and stakeholders, what interventions should be included in PD programs for teachers on how to manage DCB, and would eLearning be an appropriate way to deliver this PD content?

Classroom teachers and stakeholders (i.e., administrators, specialized teachers, school psychologists, and behaviour specialists) were interviewed and asked to complete online surveys. They were asked to report on their experiences (e.g., use, effectiveness) with the interventions identified in the preceding systematic review and meta-analysis (Chapter 2). They were also asked about their experiences with eLearning and to rate the importance of interventions for an eLearning program to address DCB. Based on the needs assessment results, classroom teachers and stakeholders were familiar with and used many of the interventions identified in the extant literature. They reported these interventions as effective and important for inclusion in an eLearning program. Additionally, they indicated that eLearning offers various facilitators (i.e., accessibility, standardization, and available resources) and barriers (i.e., often have limited use of real-world examples, there can be problems with access to technology, and the programs can be time-intensive). These results informed the development of *ASSIST for Disruptive Classroom Behaviour* by identifying which program characteristics should be prioritized (Ritterband et al., 2009). Specifically, it identified which strategies or interventions to include, what aspects of implementation to focus on in the program's content, and how to design the program to overcome perceived barriers (Ritterband et al., 2009).

The needs assessment (Chapter 5) extends the literature focused on eLearning for PD for classroom teachers. Previous studies have demonstrated that eLearning can be used to create effective PD for classroom teachers (Bragg et al., 2021). However, no previous studies have investigated the needs of classroom teachers for eLearning PD in general or eLearning PD focused on EBIs for DCB in specific. The needs assessment results fill this gap in the literature and indicate that, on the whole, teachers viewed eLearning positively, although attention needs to be given to the quality of the intervention and the technology.

Research Question 3: What is the usability of the ASSIST for Disruptive Classroom Behaviour program? Is it ready for future effectiveness testing?

To assess the usability of *ASSIST for Disruptive Classroom Behaviour,* classroom teachers and stakeholders (i.e., administrators, specialized teachers, school psychologists, and behaviour specialists) were given access to the program. They were asked to review the program and rate its usability, the program's readiness, flexibility in terms of being able to tailor the program for individual students' needs and their overall satisfaction with the program. Participants were also encouraged to provide open-ended responses to justify their ratings. The usability study results (Chapter 5) were very positive. These results suggest that the program will be ready for future effectiveness testing once minor modifications have been made. Regarding Ritterband et al.'s (2009) model, these results confirm which program characteristics are important to meeting the needs of classroom teachers and potentially affecting program usage.

User-Centred Design

The user-centred approach of the current dissertation was likely a significant influence on the highly positive reception of the new *ASSIST* program. User-centred designs include the engagement of end-users throughout the development of a program to create a useful and valuable program for the eventual end-users (De Vito Dabbs et al., 2009). Involving end-users in the design and testing increases the likelihood that the program will be adopted and implemented correctly once it is publicly available (De Vito Dabbs et al., 2009). Using the needs assessment to gain a clear understanding of the needs of potential end-users allowed us to tailor the development of the program, ensuring that end-users would find it usable. This is in line

with the suggestion by De Vito Dabbs et al. (2009), in which they stress that involving end-users in the design and testing increases the likelihood that the program will be adopted and implemented correctly once it is publicly available. These results are also like those of previous education-focused implementation research, suggesting that user-centred designs are important for making evidence-based practices accessible (Reinke et al., 2018; Splett et al., 2018). Consequently, the current dissertation can be used as a model for future research programs focused on developing eLearning PD programs to disseminate EBIs in educational contexts.

eLearning and EBIs

The results of the current dissertation suggest that the use of eLearning to deliver EBIs is a promising way to meet the classroom management needs of teachers. The positive reception of *ASSIST for Disruptive Classroom Behaviour* indicates that the eLearning format is potentially well-accepted by classroom teachers. A positive response to eLearning to deliver PD to teachers was also found by Mixon et al. (2019) in their evaluation of the use of a daily report card (DCR) intervention. Taken together, the current dissertation and the results of other studies using eLearning formats to deliver PD, such as Mixon et al.'s (2019) study, highlight the potential use of eLearning in this context.

As detailed in the introduction of this dissertation (Chapter 1; Figure 1.1), Ritterband et al.'s (2009) behaviour change model has several components. Defining these components can strengthen the user-centred design of a program. Since program characteristics directly influence program usage, the focus of the current dissertation was on defining and refining the program characteristics of eLearning that can meet the needs of classroom teachers. Based on the results of the current dissertation, I was able to identify important program characteristics for eLearning

for classroom teachers, including the use of real-world examples, a focus on student-teacher relationships in implementation, and tangible or downloadable materials. Given that I did not directly assess the support component of Ritterband et al.'s (2009) model, this is an area of future research to determine if it would impact adoption and implementation.

EBIs in the School

As discussed in the introduction of this dissertation (Chapter 1), there are several barriers preventing teachers from implementing EBIs for DCB in their classrooms. Specifically, it is uncommon for interventions for DCB to be covered during pre-service training, there are limited opportunities for relevant in-service/PD training, and traditional PD is not necessarily designed to meet teacher's needs (Borko, 2004; Dede et al., 2009; Elik et al., 2015; McCrimmon, 2015; Samudre et al., 2021; Thomas & Deeley, 2004; Wisdom et al., 2011). Based on the current dissertation and supported by previous studies (e.g., Mixon et al., 2019), many of these barriers can be overcome by using eLearning methods to provide PD to teachers about EBIs. Specifically, eLearning can provide PD about EBIs directly to classroom teachers. Under Ritterband et al.'s (2009) model, the first barrier (i.e., pre-service training) could be considered an environmental factor that increases eLearning PD usage as pre-service training does not meet teachers' needs.

Previous studies suggest systemic reasons for the lack of EBIs for DCB covered in in-service teacher training. Much of the research into EBIs comes from psychology. Hoover (2018) suggests several obstacles are preventing the fields of education and psychology from sharing information about EBIs: (1) a distrust between fields from a lack of understanding and differing goals, (2) differing timelines between fields (i.e., educators need interventions immediately and

researchers do not), (3) misaligned incentives (i.e., researchers are not incentivized to produce work that is digestible for educators), (4) poorly articulated research findings and priorities by researchers, and (5) structural/contextual barriers to systemic change (e.g., educators not wanting to change their practices, institutions opposing changes, lack of resources to support changes). Ideally, future research will explore overcoming these obstacles so that teachers can learn about EBIs for DCB during in-service teacher training.

Strengths and Limitations

The findings from this dissertation are supported by several strengths that are present across the three individual studies presented in Chapter 2 (systematic review and meta-analysis), Chapter 3 (needs assessment), and Chapter 5 (usability testing). First, the *ASSIST for Disruptive Classroom Behaviour* program addresses the lack of access to PD about EBIs for DCB for elementary school classroom teachers. Second, this research illustrates the steps that can guide program development through engagement with end-users and stakeholders and demonstrates how feedback is considered and integrated at each step of the research. Conducting and reporting these steps is an important contribution to literature in eLearning program development. Third, involving end-users in development processes is suggested to enhance the likelihood of creating a useful and valuable intervention that will be used with high fidelity (De Vito Dabbs et al., 2009).

In addition to the strengths of this dissertation, there are also limitations to consider. For the second and third studies, the sample sizes were relatively small (i.e., $N = 37$ and $N = 19$, respectively). However, these sample sizes were within the recommended ranges for needs assessments and usability studies. Additionally, the second and third studies had high drop-out

rates between completion of consent and participation in data collection. The drop-out rates can partially be explained by the context of these studies, as they were conducted during the COVID-19 pandemic. Therefore, the samples collected are limited to those who were motivated to participate in this research within the context of the pandemic and may not accurately reflect the experiences of all classroom teachers and stakeholders. Further, the needs assessment and usability testing samples were primarily Caucasian females from the Atlantic provinces, which may limit the generalizability of the research findings.

Future Research Directions

The next step would be to test the effectiveness of *ASSIST for Disruptive Classroom Behaviour.* While the results of the current dissertation suggest that the program is perceived to be usable by potential end-users and stakeholders, the program has not been tested for effectiveness in reducing DCB. First, a pilot study should assess the feasibility and preliminary effectiveness. Then, a larger effectiveness trial should be conducted if the pilot study is successful. Ideally, this trial will take the form of a randomized controlled trial as this is the most rigorous test of effectiveness. The results of these studies should be used to refine the program further to ensure that it continues to meet the needs of end-users (De Vito Dabbs et al., 2009). If the program is shown to be effective, knowledge translation must be the highest priority.

As with many eLearning programs developed at universities or research institutions, *ASSIST for Disruptive Classroom Behaviour* is not currently publicly available. Therefore, as De Vito Dabbs et al. (2009) suggested, a knowledge translation plan must be created and implemented to ensure that the program is accessible to classroom teachers. Ideally, this will

include spreading awareness of the program and making the program available to the public through a website or storefront. Currently, the possibility of commercializing the *ASSIST* program as a means to sustain it over time is being explored. Likely, commercialization would accelerate knowledge translation of *ASSIST for Disruptive Classroom Behaviour* once effectiveness has been established, ensuring access to EBIs for classroom teachers.

Conclusions

The literature on eLearning PD programs to support teachers in addressing DCBs is in its infancy. As such, this dissertation makes an important contribution to this area. The results of the current dissertation suggest that following a user-centred approach is important when developing an eLearning program that classroom teachers will find acceptable and usable. This research and development process can be applied specifically to school-based behaviour management and broadly to eLearning PD programs for classroom teachers. Future research is needed to determine the effectiveness of the *ASSIST for Disruptive Classroom Behaviour* program.

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