



Final Report – Executive Summary

# Texas Public Prekindergarten Class Size and Student-to- Teacher Ratio Study

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## Executive Summary

### Purpose of the Study and Report

In Governor Abbott's 2015 State of the State Address, he set improving early education, specifically improving public prekindergarten, as the first of his five emergency items (State of Texas Office of Governor, 2016).<sup>7</sup> The 84<sup>th</sup> Texas Legislature then passed House Bill (HB) 4, which Governor Abbott signed into law in May 2015. HB 4 places renewed emphasis on high-quality prekindergarten programming through:

- Authorization for a new prekindergarten grant program providing additional funding to schools that meet "quality standards related to curriculum, teacher qualifications, academic performance, and family engagement".<sup>8</sup>
- Expansion of early childhood education reporting requirements for all Texas public schools offering prekindergarten programs beginning in the 2016–17 school year.

HB 4 also added Texas Education Code (TEC) § 29.1545 (2015), which requires that the Texas Education Agency (TEA) conduct a joint study with the DFPS to develop recommendations regarding optimal class sizes and student-to-teacher ratios for prekindergarten classes.<sup>9</sup> At the time of this report, rules or laws specifying prekindergarten class sizes and student-to-teacher ratios in Texas have not yet been established;<sup>10</sup> however, the following guidance exists:

- TEA encourages local education agencies (LEAs) to maintain and not exceed the 22:1 ratio required for kindergarten through fourth-grade classrooms (TEC § 25.112, 2015).<sup>11</sup>
- School districts or open-enrollment charter schools that offer high-quality prekindergarten programs established under the new High-Quality Prekindergarten Grant program "...must attempt to maintain an average ratio in any prekindergarten program class of not less than one certified teacher or teacher's aide for every 11 students," per the addition of TEC § 29.167(d) (2015) by HB 4.<sup>12</sup>

Class size is the maximum number of children that can be in a classroom.

Student-to-teacher ratio is the maximum number of students per adult in a classroom.

According to TEC § 29.1545 (2015), the study recommendations regarding optimal class size and student-to-teacher ratios should be based on:

- Data collected from prekindergarten programs, including high-quality prekindergarten programs under Subchapter E-1, reported through the Public Education Information Management System (PEIMS); and
- Observations of best practices and examples from effective prekindergarten programs across the state.

The purpose of this report is to share findings and recommendations with the Texas Legislature from this study, conducted by ICF International and Gibson Consulting Group (study team), on behalf of the TEA and DFPS. TEA provides recommendations to Texas public prekindergarten programs and is responsible for the HB 4 High-Quality Prekindergarten Grant program. DFPS sets minimum standards and is responsible for licensing of early childhood settings outside of public prekindergarten.

<sup>7</sup> See <http://gov.texas.gov/news/press-release/20543> and <http://www.capitol.state.tx.us/BillLookup/Text.aspx?LegSess=84R&Bill=HB4>

<sup>8</sup> See [http://tea.texas.gov/Curriculum\\_and\\_Instructional\\_Programs/Special\\_Student\\_Populations/Early\\_Childhood\\_Education/House\\_Bill\\_4\\_High-Quality\\_Prekindergarten\\_Grant\\_Program/](http://tea.texas.gov/Curriculum_and_Instructional_Programs/Special_Student_Populations/Early_Childhood_Education/House_Bill_4_High-Quality_Prekindergarten_Grant_Program/) and 19 TAC §102.1003, 2016.

<sup>9</sup> See TEC § 29.1545 (2015) at <http://www.statutes.legis.state.tx.us/Docs/ED/htm/ED.29.htm#29.1545>

<sup>10</sup> TEC § 25.111 (2015) does specify that each school district employ a sufficient number of certified teachers to maintain an average ratio of not less than one teacher for each 20 students in membership and through TEC § 25.112 (2015), LEAs are not to exceed the 22:1 ratio required for kindergarten through fourth-grade classrooms.

<sup>11</sup> See TEC § 25.112 (2015) at <http://www.statutes.legis.state.tx.us/Docs/ED/htm/ED.25.htm#25.112>. See also TEC § 25.113 (2015) <http://www.statutes.legis.state.tx.us/Docs/ED/htm/ED.25.htm#25.113> for class size exemptions

<sup>12</sup> See TEC § 29.167(d) (2015) <http://www.statutes.legis.state.tx.us/Docs/ED/htm/ED.29.htm#29.167>

## Summary of the Study Approach

Based on study requirements in TEC § 29.1545 (2015) and guidance from TEA and DFPS, the study team conducted a study with three components to determine recommendations for optimal class sizes and student-to-teacher ratios for children in Texas public prekindergarten programs that included:

1. **Literature Review** to gather information from the latest research on optimal class size and student-to-teacher ratios.
2. **Extant Data Analysis** of TEA's available prekindergarten enrollment and kindergarten beginning of year (BOY) outcome data to describe prekindergarten programs in the state and identify prekindergarten programs on which to conduct observations.
3. **Observations** of 97 prekindergarten classrooms across 32 campuses in 16 districts within the state to examine class size and student-to-teacher ratios and to identify potential best practices and examples from prekindergarten programs across the state.

Although the literature review was not required by TEC § 29.1545 (2015), TEA and DFPS included it as a study component due to known limitations in the data system, timeline to conduct observations, and the added value it would bring to the analysis and recommendations. Through an examination of patterns of findings from across the three study components, the study team addressed the following four overarching research questions:

- **Research Question 1.** What is the current status of class size and student-to-teacher ratio in prekindergarten programs in Texas?
- **Research Question 2.** In what ways do prekindergarten class size and student-to-teacher ratio relate to prekindergarten quality and to students' school readiness and academic performance?
- **Research Question 3.** What are some best practices and examples from effective prekindergarten programs in Texas pertaining to class size and student-to-teacher ratio?
- **Research Question 4.** What are the recommended optimal class sizes and student-to-teacher ratios for prekindergarten classes in Texas?

The study team addressed the research questions using the three study components in a mixed methods approach. Multiple methods allowed the study team to maximize the strengths of one method while filling in gaps or weaknesses of others, thus resulting in a more comprehensive examination of available data and information. Additionally, comparing findings across multiple data sources facilitated an in-depth assessment of how guidance on prekindergarten class size and student-to-teacher ratio can help improve education quality and effectiveness, resulting in a greater confidence in the recommendations made to the Texas Legislature.

## Study Limitations

The three strategies for arriving at recommendations for optimal class size and student-to-teacher ratio in prekindergarten classrooms each have limitations. Some of the limitations the reader should keep in mind include:

- Many factors affect the quality of prekindergarten programs. This includes, but is not limited to, class size and student-to-teacher ratio. Most research on the quality of prekindergarten programs and student outcomes does not isolate class size and/or student-to-teacher ratios, thus affecting the ability to draw conclusions from the literature review.
- TEA is only just beginning to collect comprehensive program and progress monitoring data for prekindergarten classrooms and students, as will now be required by HB 4. The ECDS was operational in the 2014–15 and 2015–16 school years but data submission was voluntary. Data elements in the ECDS were in the process of being revised during this study to meet the HB 4 requirements. The study team and TEA agreed on a calculation for class size based on the 2014–15 school year data elements, but this element is expected to be more directly

calculated in the future. It was also agreed that the currently available data from ECDS were insufficient to calculate student-to-teacher ratios.

- This study was conducted within a four-month timeframe (April 21, 2016 to August 31, 2016) and decisions about study parameters were made accordingly. Most notably, the sample of high-quality prekindergarten programs for observations was based on the best campus-level data available at the very beginning of the study when sites needed to be selected. The assumption when using campus-level data was made that elementary schools with the highest average BOY kindergarten progress monitoring scores in 2015–16 were implementing quality prekindergarten programs in 2014–15.<sup>13</sup> Of course, not all children attending kindergarten had necessarily attended prekindergarten and other reasons may explain the high BOY kindergarten progress monitoring scores. Additionally, the observations of the selected prekindergarten programs were conducted in spring of the 2015–16 school year based on the assumption that the factors that may have contributed to school readiness in 2014–15 were also in place in 2015–16. Thus, some findings, particularly from the observational analyses, may merit further research with a larger observation sample.

## Importance of High-Quality Early Childhood Education Programming

Research suggest that high-quality early childhood education not only directly benefits children and prepares them for school, but also provides benefits to society as a whole, such as increased labor force participation by parents and supporting state and regional economic growth (Child Care Aware of America, 2015; Committee on Economic Development, 2015).<sup>14</sup> From a cost-benefit analysis perspective, the benefits of providing high-quality prekindergarten outweigh the costs (Yoshikawa, et al., 2013; Temple & Reynolds, 2007; Heckman, 2011; Bartik, 2014). The evidence suggests that economic returns of high-quality prekindergarten programs exceed most other educational interventions, especially those that begin during the school-age years, such as reduced class sizes in the elementary grades, grade retention, and youth job training (Temple & Reynolds, 2007).

## Defining High-Quality Early Childhood Education

The term high-quality is used to describe components of early childhood programs that researchers have found to be associated with development of physical, language, cognitive, social, and emotional skills that prepare a child for success in school. While researchers continue to debate what defines high quality, most suggest that both structural and process quality components must be present for a program to be considered high quality.

### STRUCTURAL AND PROCESS QUALITY IN EARLY CHILDHOOD EDUCATION PROGRAMS

**Structural features** are considered to be foundational aspects of early childhood program quality that allow for higher process quality (Mashburn et al., 2008; Yoshikawa et al., 2013). The structural quality of a program includes class size, student-to-teacher ratio, teacher qualifications, length of the school day, adoption of a specified curriculum, teacher and staff compensation, and aspects of the physical environment such as square footage (Howes, et al. 2008; Mashburn, et al., 2008). This report focuses specifically on the structural features of class size and student-to-teacher ratio.

**Process quality** in early childhood education refers to the direct experiences children have within the program, such as teacher-child interactions, type of instruction, family engagement, and health and safety routines. Some research

Researchers recommend that early childhood education programs need both structural and process quality components to promote strong learning and development outcomes in children.

<sup>13</sup> Later in the study, through analysis that connected kindergarten BOY progress monitoring scores, the study team determined that 46% of the kindergarten students that had BOY 2015–16 data at the campuses selected for classroom observation were included in the ECDS 2014–15 data files.

<sup>14</sup> Early childhood education programs encompass Head Start, private child care (center-based and home-based), and public and private prekindergarten programs serving children from birth to eight years of age. For purposes of this report, early childhood education refers to all early childhood settings, and prekindergarten refers to public prekindergarten programs.

concludes that process quality dimensions of programs have the most significant impact on children's learning and development (Yoshikawa, et al., 2013).

### Early Childhood Education Context in Texas

Texas's legislative history, a state-supported council and initiatives, public prekindergarten, and licensed child care programs demonstrate the state's commitment to early childhood education, with HB 4 being the most recent example. In 1984, Texas became one of the first states in the nation to establish a prekindergarten program during the 68th Legislative Session, 2<sup>nd</sup> Called Session (1984), when HB 72 (Article IV, Part 13) established a half-day prekindergarten program for high-risk four-year-old students in Texas.<sup>15</sup> In 1999, Senate Bill (SB) 4, (76<sup>th</sup> Texas Legislature, Regular Session, 1999) added TEC § 29.155 (Texas Education Code, 1999) which set forth provisions for the first time awarding grants to schools for implementation or expansion of prekindergarten programs.<sup>16</sup>

In 2003, the Children's Learning Institute (CLI) at the University of Texas Health Science Center at Houston was designated by the Texas governor at that time (Rick Perry) as the Texas State Center for Early Childhood Development and was provided with funding through TEA. This support led to several research-based initiatives including development of curriculum and teacher professional development materials and resources referred to as the Center for Improving the Readiness of Children for Learning and Education (CIRCLE). CIRCLE was incorporated into the Texas School Ready initiative, a comprehensive preschool teacher training program, to offer curriculum and materials, professional development, coaching, and child progress monitoring with the goal of helping children be prepared for kindergarten (and beyond).<sup>17</sup>

The Texas Early Learning Council, an advisory council established by Governor Rick Perry in late 2009, made several improvements to the Texas early care and education multi-sector system between 2010 to 2013 (Texas Early Learning Council, 2013), such as creating new, voluntary, Infant, Toddler, and Three-Year-Old Early Learning Guidelines for Texas; establishing the Texas Early Childhood Professional Development System; writing recommendations for a statewide early childhood data exchange system (The On-Track System) and recommendations on the development of a state Quality Rating and Improvement System (QRIS).

In 2014, CLI began a partnership with TEA to plan and develop CLI Engage, a cost effective, digital platform to disseminate Texas School Ready's tools (e.g., child progress monitoring, classroom observation tools) across the state at no charge to eligible programs including public prekindergarten programs and Head Start grantees.<sup>18</sup>

The most current initiative is, in addition to what was previously noted, that HB 4 intends to support early childhood education in the following ways:<sup>19</sup>

- Allowing regional ESCs to offer teachers training that is required to be awarded a Child Development Associate (CDA) credential
- Clarification of expectations for charter schools providing prekindergarten education
- Amended TEC § 29.1532<sup>20</sup> regarding required data reporting on prekindergarten by districts to TEA using Public Education Information Management System (PEIMS) and TEC § 29.1543<sup>21</sup> regarding early childhood district- and campus-level reports provided by TEA

<sup>15</sup> See <http://www.lrl.state.tx.us/legis/billSearch/billdetails.cfm?billFileID=89324>

<sup>16</sup> See <http://www.capitol.state.tx.us/BillLookup/Text.aspx?LegSess=76R&Bill=SB4>

<sup>17</sup> For additional information about the Children's Learning Institute see <https://www.childrenslearninginstitute.org/about-cli/>. For additional information on Texas School Ready see <https://www.childrenslearninginstitute.org/programs/texas-school-ready/>

<sup>18</sup> For additional information about CLI Engage see <https://cliengage.org/>

<sup>19</sup> See <http://www.capitol.state.tx.us/BillLookup/Text.aspx?LegSess=84R&Bill=HB4>

<sup>20</sup> See <http://www.statutes.legis.state.tx.us/Docs/ED/htm/ED.29.htm#29.1532>

<sup>21</sup> See <http://www.statutes.legis.state.tx.us/Docs/ED/htm/ED.29.htm#29.1543>

- Added TEC § 29.170<sup>22</sup> requiring the TEA commissioner to evaluate the use and effectiveness of HB 4 funding in improving student learning, with an initial report due December 2018
- Added TEC § 21.461<sup>23</sup> requiring the TEA commissioner to develop and offer prekindergarten teacher training.

### TEXAS PUBLIC PREKINDERGARTEN PROGRAMS AND THE HB 4 HIGH-QUALITY PREKINDERGARTEN GRANT PROGRAM

TEA oversees prekindergarten programs in public school districts and open enrollment charter schools in Texas. In the 2014–15 school year, 219,668 students were enrolled in Texas public prekindergarten programs (Texas Education Agency, 2016b).<sup>24</sup> To be eligible for free enrollment in a prekindergarten classroom, a child must be at least three years of age and:

- Unable to speak and comprehend the English language; or
- Educationally disadvantaged; or
- Homeless, as defined by 42 U.S.C. § 1143a, regardless of the residence of the child, of either parent of the child, or of the child's guardian or other person having lawful control of the child; or
- The child of an active duty member of the armed forces of the United States, including the state military forces or a reserve component of the armed forces, who is ordered to active duty by proper authority; or
- The child of a member of the armed forces of the United States, including the state military forces or a reserve component of the armed forces, who was injured or killed while serving on active duty; or
- Has ever been in the conservatorship of the DFPS following an adversary hearing held as provided by § 262.201, Family Code.<sup>25</sup>

Per TEC § 29.1531 (2015), districts may also offer tuition supported and district-financed prekindergarten to students beyond those eligible for free prekindergarten.<sup>26</sup>

During the 84<sup>th</sup> legislative session, the Texas Legislature passed HB 4 (TEC § 29.165, 2015) providing for a High-Quality Prekindergarten Grant program for school districts and open enrollment charter schools to implement increased quality standards in their prekindergarten classrooms. The High Quality Prekindergarten Grant funding is in addition to the half-day Foundation School Program formula funding of approximately \$3,650 per eligible prekindergarten student that is already provided to districts and charters for provision of half-day prekindergarten. Grant funding for the program was set not to exceed \$1,500 per eligible student, but could be lower depending on the number of eligible districts and students. In preparation for funding the new High-Quality Prekindergarten Grant program, TEA updated the Texas Prekindergarten Guidelines in 2015 to align with the Kindergarten Texas Essential Knowledge and Skills (TEKS) and reflect the latest research in what prekindergarten children should know and be able to do when entering kindergarten.<sup>27</sup> The new guidelines offer educators information and support to prepare all children for success in kindergarten (Texas Education Agency, 2015).

### TEXAS CHILD CARE PROGRAMS

DFPS' Child Care Licensing (CCL) Division provides oversight and licensing to 15,837 center-based and home-based child care programs in Texas.<sup>28</sup> These programs include licensed child care centers (i.e., child care programs, before or after-school programs, school-age programs), licensed child care homes, registered child care homes, listed family homes (listed family homes do not have minimum standards or training requirements and are not

<sup>22</sup> See <http://www.statutes.legis.state.tx.us/Docs/ED/htm/ED.29.htm#29.170>

<sup>23</sup> See <http://www.statutes.legis.state.tx.us/Docs/ED/htm/ED.21.htm#21.463>

<sup>24</sup> This count represents the number of three- and four-year-olds enrolled in half- or full-day public prekindergarten programs.

<sup>25</sup> See TEC § 29.153(b) (2015), SAAH, Section 7.2 <http://www.statutes.legis.state.tx.us/Docs/ED/htm/ED.29.htm#29.153>

<sup>26</sup> See TEC § 29.1531 (2015), <http://www.statutes.legis.state.tx.us/Docs/ED/htm/ED.29.htm#29.153>

<sup>27</sup> Texas Prekindergarten Guidelines can be found on TEA's website at <http://tea.texas.gov/pkg.aspx>

<sup>28</sup> Numbers based on FY 2015 counts, and do not include 5,026 listed family homes which are not regulated by DFPS unless a report is received. See [https://www.dfps.state.tx.us/child\\_care/other\\_child\\_care\\_information/childcare\\_types.asp](https://www.dfps.state.tx.us/child_care/other_child_care_information/childcare_types.asp)

inspected unless a report is received), and 24-hour residential care facilities. They also provide technical assistance to child care providers on meeting licensing standards, rules, and laws.<sup>29</sup> Head Start centers are included in the programs over which DFPS CCL provides oversight and licensing but are also accountable to oversight from the Office of Head Start.<sup>30</sup> Standards set by the Office of Head Start for class size and student-to-teacher ratio are more stringent than guidelines set by TEA or DFPS (Table ES-1). DFPS minimum standards, which include class size and student-to-teacher ratios, were under review for revision at the time of preparation of this report.<sup>31</sup>

**Quality Rating and Improvement System.** As part of the federal reauthorization of the Child Care and Development Block grant in 2015, all states were encouraged to have a statewide Quality Rating and Improvement System (QRIS; Administration for Children and Families, 2016).<sup>32</sup> QRIS is a systematic approach for assessing, improving, and communicating the level of quality of early care and education and school age programs (e.g., a rating system of 2-star, 3-star, or 4-star with more stars indicating a higher level of quality). Texas's QRIS is the voluntary Texas Rising Star administered by the Texas Workforce Commission (TWC).<sup>33</sup> Texas Rising Star was one of the first tiered quality systems in the country (Texas Workforce Commission, 2015). However, because the program is voluntary, few center based early childhood programs (fewer than 1,000) participate in the QRIS with just under half (45%) achieving the highest rating.<sup>34</sup> Texas Rising Star includes, for each age group, guidelines for maximum class sizes and student-to-teacher ratios (as shown in Table ES-1 in the Key Findings section).

## Key Findings

Table ES-1 summarizes findings from across the three study components that are the foundation for the recommendations to the Texas Legislature. As shown in Table ES-1, the study found that there is no one specific class size and student-to-teacher ratio that current research, guidelines from national organizations focused on the quality of early childhood education, and policies within states that build quality early education systems agree upon as optimal. However, the literature review findings, extant data findings, and findings from the observational component of this study point to maximum class sizes and student-to-teacher ratios that should not be exceeded in order to create conditions for high-quality classrooms. Findings are presented for each of the research questions.

<sup>29</sup> See [https://www.dfps.state.tx.us/child\\_care/default.asp](https://www.dfps.state.tx.us/child_care/default.asp)

<sup>30</sup> See <http://www.acf.hhs.gov/ohs/about/what-we-do>

<sup>31</sup> See [https://www.dfps.state.tx.us/child\\_care/child\\_care\\_standards\\_and\\_regulations/](https://www.dfps.state.tx.us/child_care/child_care_standards_and_regulations/) for additional information.

<sup>32</sup> See <http://qrisnetwork.org/our-framework>

<sup>33</sup> The 76<sup>th</sup> Texas Legislature, Regular Session (1999) also passed HB 3333 requiring local workforce development boards to establish graduated reimbursement rates for subsidized child care based on the TWC's designated vendor program, now known as Texas Rising Star. See <http://www.capitol.state.tx.us/BillLookup/Text.aspx?LegSess=76R&Bill=HB3333>.

<sup>34</sup> See <http://usa.childcareaware.org/wp-content/uploads/2015/10/Texas2.pdf>

**Table ES-1: Key Findings by Study Component Associated with Class Sizes and Student-to-Teacher Ratios for Prekindergarten Aged Students**

Study	Maximum (or Average) Class Size	Student-to-Teacher Ratio
<b>Literature Review Findings</b>		
Prekindergarten programs associated with positive outcomes for children <sup>1</sup>	22	8:1 (15:2) <sup>11</sup> to 11:1 (22:2) <sup>12</sup>
National guidelines for maximum class sizes <sup>2</sup>	14 to 24	7:1 to 12:1
NIEER quality standards for comparing states' prekindergarten policies (Note: In 2015, 86% of all states met the quality standard for class size and 88% for student-to-teacher ratio) <sup>3</sup>	20	10:1
Policies of three states (California, Florida, New York) of comparable size to Texas <sup>4</sup>	20	8:1 to 10:1
Guidelines from four states (Michigan, West Virginia, Washington, and North Carolina) that have built quality early education systems with strong outcomes <sup>5</sup>	20	8:1 to 10:1
Head Start Requirements (Federal Guidelines) <sup>6</sup>	20	10:1
<b>Existing Requirements and Standards for Texas Early Childhood Programs</b>		
Texas Child Care Licensing Requirements for programs serving 4- and 5-year-olds (DFPS Child Care Center Minimum Standards) <sup>7</sup>	35	18:1; 22:1
Texas Rising Star (standard to achieve highest rating for programs serving 4- and 5-year-olds) <sup>8</sup>	21; 25	10:1 (both age groups)
<b>Existing Guidelines for Texas Public Prekindergarten Programs</b>		
TEA encourages local education agencies to maintain and not exceed the 22:1 ratio required for kindergarten through Grade 4 classrooms (TEC § 25.112, 2015) <sup>9</sup>	22	22:1
School districts or open-enrollment charter schools that offer high-quality prekindergarten programs established under the new High-Quality Prekindergarten Grant program must attempt to maintain 11:1 student-to-teacher ratio <sup>10</sup>	22	11:1
<b>Texas Extant Data Results</b>		
Public prekindergarten programs in Texas based on ECDS data (Note: 87% of Texas classrooms in 2014–15 that had class sizes at or below 22)	Average: 17	Not Available
<b>Observed Sites for this Study</b>		
Public prekindergarten classrooms ( <i>n</i> = 97) in Texas at time of observation	Average: 17	Average: 12:1

<sup>1</sup> Barnett, Jung, Min-Jong, & Frede, 2013; Barnett, Schulman, & Shore, 2004; Francis, 2014; Gormley, Gayer, Phillips, & Dawson, 2004; Heckman, Pinto, & Savelyev, 2013; Hustedt, Barnett, Kwanghee, & Figueras, 2009; Karoly & Auger, 2016; Lipsey, Farran, Bilbrey, Hofer, & Dong, 2011; M. Schaaf, Peisner-Feinberg, R. LaForett, Hildebrandt, & Sideris, 2014; Mashburn, Hamre, Downer, & Pianta, 2006; Minervino, 2014; National Research Council, 2001; Peisner-Feinberg, Schaaf, Hildebrandt, Pan, & Warnaar, 2015; The National Day Care Study, 1980; Wechsler et al. 2016a; Yoshikawa, et al., 2013

<sup>2</sup> Administration for Children and Families, 2008; American Academy of Pediatrics, American Public Health Association, National Resource Center for Health and Safety in Child Care and Early Education, 2011; National Accreditation Commission for Early Care and Education Programs, 2005; National Association for the Education of Young Children, 2016; The Condition of Education, 2016; United Federation of Teachers, 2010

<sup>3, 4</sup> The National Institute of Early Education Research, 2016

<sup>5</sup> Wechsler et al., 2016a

<sup>6</sup> Administration for Children and Families, 2008

<sup>7</sup> Texas Department of Family and Protective Services, 2015

<sup>8</sup> Texas Workforce Commission (2015)

<sup>9</sup> See TEC § 25.112 (2015) at <http://www.statutes.legis.state.tx.us/Docs/ED/htm/ED.25.htm#25.112>. See also TEC § 25.113 (2015) <http://www.statutes.legis.state.tx.us/Docs/ED/htm/ED.25.htm#25.113> for class size exemptions.

<sup>10</sup> See TEC § 29.167(d) (2015) <http://www.statutes.legis.state.tx.us/Docs/ED/htm/ED.29.htm#29.167>

<sup>11</sup> A 15:2 student-to-teacher ratio is equivalent to 7.5 students per one teacher, which is rounded to 8:1 in this report.

<sup>12</sup> Barnett, Jung, Min-Jong, & Frede, 2013; Gormley, Gayer, Phillips, & Dawson, 2004; Hustedt, Barnett, Kwanghee, & Figueras, 2009; Karoly & Auger, 2016; Lipsey, Farran, Bilbrey, Hofer, & Dong, 2011; M. Schaaf, Peisner-Feinberg, R. LaForett, Hildebrandt, & Sideris, 2014; Minervino, 2014; Peisner-Feinberg, Schaaf, Hildebrandt, Pan, & Warnaar, 2015; Wechsler et al., 2016a



## What is the current status of class size and student-to-teacher ratio in prekindergarten programs in Texas?

The findings related to this question are described first as associated with class size, followed by student-to-teacher ratio findings.

### WHAT IS THE CURRENT STATUS OF CLASS SIZE IN TEXAS PREKINDERGARTEN PROGRAMS?

According to the National Institute for Early Education Research (NIEER) *The State of Preschool 2015* report that reviews states' public prekindergarten programs according to 10 research-based quality standards, 86% of all states reported meeting the stricter quality standard for class sizes of 20 children or fewer (Barnett et al., 2016). According to NIEER, Texas did not meet this standard (Barnett, et al., 2016). Given the overall research review, the study team examined the Texas context relative to a class size of 22 (or below). Based on analysis of data reported by school districts in ECDS during the 2014–15 school year, the average class size of the majority of Texas public prekindergarten programs was 17 students with the majority of these programs having class sizes of 22 or fewer students (87%), within national and Texas guidelines for quality programs (i.e., 22 or fewer students).<sup>35</sup> Observations of highly-rated prekindergarten programs as part of this study provided further evidence of this finding. The average class size (at the time of the observation) among the 97 public prekindergarten programs observed was 17 with the majority of these classrooms having a class size of 22 or fewer students (84%). To the extent that ECDS and the observed classrooms represent the broader public prekindergarten population, these findings suggest that the majority of Texas classrooms are at or near a class size of 22 or fewer students and would be able to meet this standard should it be set. However, approximately 13-16% of prekindergarten classrooms may need to make changes in order to meet a stricter recommendation.

### WHAT IS THE CURRENT STATUS OF STUDENT-TO-TEACHER RATIO IN PREKINDERGARTEN PROGRAMS IN TEXAS?

According to the NIEER *The State of Preschool 2015* report that reviews states' public prekindergarten programs against 10 research-based quality standards, 88% of states reported meeting the quality standard of 1 adult for every 10 children (Barnett et al., 2016). According to NIEER, Texas did not meet this standard because Texas does not have a limit as part of its state prekindergarten requirements (Barnett, et al., 2016). Due to the lack of available extant data, the study team was unable to calculate student-to-teacher ratios of Texas public prekindergarten programs (i.e., prekindergarten programs that entered data in ECDS did not provide data on teacher aides in the classroom, eliminating this study component as a source for forming recommendations).

Observations of highly-rated prekindergarten programs as part of this study indicated that in 63% of the classrooms observed, there were two or more instructional staff (e.g., teachers or educational aides) in the classroom for at least one of the three (12-minute) observation cycles and in 52% of the classrooms observed, two or more teachers or educational aides were present for all three observation cycles. Although the student-to-teacher ratio of 11:1 is recommended for the High-Quality Prekindergarten Grant program, it is worth noting that only 58% of the observed classrooms met or exceeded this expectation; 25% of the observed classrooms had a student-to-teacher ratio of 16:1 or higher.

## In what ways do prekindergarten class size and student-to-teacher ratio relate to students' school readiness and academic performance?

To date, research has not been able to establish that class size and student-to-teacher ratio alone have a causal impact on child outcomes. Simply lowering student-to-teacher ratio and class size without addressing other components does little to enhance child outcomes and increase school readiness among prekindergarten children. Research does indicate, however, that structural features like small class sizes and student-to-teacher ratios create

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<sup>35</sup> While the ECDS data is voluntary, analyses suggested it may be representative of prekindergarten programs in Texas more generally at least on student characteristics.

conditions for increased process features of increased high-quality social and instructional interactions in the classroom that greatly contribute to positive child outcomes.

The prekindergarten classroom observations and corresponding analyses conducted as part of this study did not find a clear linear relationship between class sizes and student-to-teacher ratios and the quality of classrooms as measured by teacher-student interactions (i.e., CLASS PreK scores). That is, as class size or student-to-teacher ratios increased, there was not a corresponding change (increase or decrease) in the quality of teacher-student interactions. However, classrooms with ratios higher than 15:1 had significantly lower overall CLASS PreK scores, including lower Emotional Support and Instructional Support scores, which suggests that quality interactions were less likely to occur in classrooms exceeding 15:1 student-to-teacher ratios. While classrooms were selected for potential to be high-quality, approximately 27% had student-to-teacher ratios that were associated with lower quality scores. This finding merits further research with a larger observation sample. For class size, the largest class size observed was 29 students and generally there was a limited number of classrooms with both small numbers of students and large numbers of students which may explain the inability to establish a linear relationship with quality.

### What are some best practices and examples from effective prekindergarten programs in Texas pertaining to class size and student-to-teacher ratio?

As part of the prekindergarten classroom observations conducted in this study, the study team reviewed the observational field notes of instructional practices from the classrooms that the observers rated the highest on the CLASS PreK. In all three areas measured by the CLASS PreK instrument (Emotional Support, Classroom Organization, and Instructional Support), the 10 highest rated classrooms across these three areas had lower than average student-to-teacher ratios. However, on average, classrooms rated highest on the Instructional Support domain had four fewer students per teacher than the average for the entire observation sample (8:1 versus 12:1). Observed classrooms with the highest Concept Development, Quality of Feedback, and Language Modeling Class PreK dimension scores also had lower student-to-teacher ratios. In addition, classrooms with the highest Instructional Support domain scores had on average 3.2 fewer students than the average of the observation sample. In these highly rated classrooms, high-performing teachers consistently engaged students in meaningful discussions through the use of open-ended questions, inquiry-based (e.g., how and why) questions, repetition and extension of student responses, the use of advanced language, and other techniques to challenge students to think deeper about the content being covered. Within these classrooms, many examples of best practices were observed, such as analysis and reasoning, creation, integration, connections to the real world, encouragement and affirmation, feedback loops, provision of information, scaffolding, advanced language use, open-ended questions, repetition and extension.

## Recommendations

Research indicates that for children to be ready for kindergarten and to be successful in school, it takes a combination of structural and process components in the prekindergarten classroom. Structural components may include class size, student-to-teacher ratio, and teacher compensation. Process components may include quality of teacher-child interactions, access to stimulating resources, and the types of activities in which a child is engaged. Both class size and student-to-teacher ratio influence the ability to provide effective process components. Furthermore, implementing a smaller class size without also addressing student-to-teacher ratios may decrease the potential positive impact on student outcomes. Therefore, our recommendations are presented in conjunction with one another because a class size standard that does not have an appropriate accompanying student-to-teacher ratio standard is unlikely to contribute to the conditions that greatly affect quality in the classrooms. Thus, based on the three study component findings it is recommended that

*Class size guidelines should be set to a maximum not to exceed 22 students per prekindergarten classroom. Given the class size recommendation, a student-to-teacher ratio not to exceed 11:1 is recommended for all public prekindergarten classes with between 16 and 22 students. In cases where class size is 15 or fewer students, the*

*student-to-teacher ratio should not exceed 15:1. However, following these guidelines alone will not ensure conditions for high-quality prekindergarten classrooms.*

School districts and open-enrollment charter schools should also consider the needs of their student populations as some populations may need smaller maximums to be effective. For example, programs serving students with special needs or English language learners may decide smaller class sizes and student-to-teacher ratios are most appropriate for best practice in their community. Following are findings from the study associated with making the recommendations.

### Class Size Recommendation

The preponderance of evidence in the literature review suggests that class sizes in prekindergarten classrooms not exceed 20 students. This includes both the recommendations of professional organizations and reviews of class size guidelines from other states, particularly those associated with a focus on quality prekindergarten education. Still, some professional organizations suggest that as many as 22 students may also be associated with quality. In addition, the majority of the research is primarily theoretical rather than evidence-based studies designed to identify a single class size.<sup>36</sup> The study team thinks the research to date suggests that a class size not exceeding 22 students may be as likely to support quality as one with 20 students.

In addition, the recommendation not to exceed a class size of 22 students is in line with actual class sizes for the majority of Texas public prekindergarten classrooms. Specifically, an examination of ECDS 2014–15 data, including data from just over 3,000 classrooms, found an average class size of 17 students in Texas public prekindergarten programs and that 72% of the programs had class sizes of 20 or fewer students while 87% had class sizes of 22 or fewer students. This suggests that, should the state establish clear standards with regard to class size, a small number of prekindergarten programs would need to change from current practice. Finally, the observation component of this study similarly suggested that most prekindergarten programs had class sizes of 22 students or fewer (80%) and no class was larger than 29 students. Among observed classrooms scoring the highest on each quality rating domain, class sizes ranged from 13 (Instructional Support) to 18 (Emotional Support). That is, higher quality scores occurred in classrooms with generally smaller average class sizes. While across all observations there was not a significant linear relationship between class size and CLASS PreK scores, this may be related to the small sample size and limited class sizes within the sample (from class size of 3 to 29 maximum).

### Student-to-Teacher Ratio Recommendation

The recommended class size of 22 is likely to be insufficient to support quality if a student-to-teacher ratio of 11:1 or better is not also established. The preponderance of literature suggests that prekindergarten classrooms not exceed student-to-teacher ratios of 10:1 to 11:1 for high-quality classrooms. When the research focused on components of high-quality prekindergarten and other early childhood education programs, the student-to-teacher ratios were between 8:1 (15:2) and 11:1 (22:2).<sup>37</sup> Student-to-teacher ratios were not available for the ECDS sample included in this study, so it is unknown to what extent Texas public prekindergarten classrooms on average were meeting or close to meeting this recommendation in the 2014–15 school year.

The observation component of this study occurred in only 97 classrooms at 32 campuses in 16 districts, but provided additional guidance on student-to-teacher ratios. Specifically, in the sample of observed classrooms, the average student-to-teacher ratio was 12:1, only slightly higher than the recommendation. In approximately one-third of observed classrooms, there was only one teacher in the classroom throughout the time the classroom was observed, although it is unknown to what extent this end-of-year observation reflected typical student-to-teacher ratios from throughout the school year. Among the observed classrooms with the highest quality scores, student-to-teacher

<sup>36</sup> In other words, most of the research on this topic seeks to support program theory rather than to establish study conditions that set a definitive class size, if that were even possible.

<sup>37</sup> A 15:2 student-to-teacher ratio is equivalent to 7.5 students per one teacher, which is rounded to 8:1 in this report.

ratios ranged from 8:1 to 11:1. Observed classrooms with these ratios had the highest ratings on Instructional Support and Emotional Support domains. The difference in CLASS PreK quality scores was not significant until a comparison was made between classroom ratios of 15:1 or fewer versus 16:1 and higher. That is, classrooms with student-to-teacher ratios of 15:1 or less were associated with significantly higher quality on average than classrooms with higher student-to-teacher ratios. In classrooms with ratios of 15:1 and lower, several best practices were observed including more analysis and reasoning, creation, integration, connections to the real world, encouragement and affirmation, feedback loops, provision of information, scaffolding, advanced language use, open-ended questions, repetition and extension. Although the student-to-teacher ratio of 15:1 or less from the classroom observation data is higher than the ratio suggested by research (no more than 11:1), preliminary findings from the observation study suggest that both may be associated with high-quality and positive child outcomes based on the observation study. The range of 11:1 to 15:1 student-to-teacher ratios provides Texas public prekindergarten classrooms that currently exceed the 15:1 ratio motivation for progressing towards lower student-to-teacher ratios. Furthermore, the study team recommends that once a class size of 16 is achieved, classrooms need at least two teachers or one teacher and an educational aide.

### Additional Research Suggested

In conclusion, the limitations mentioned in this executive summary suggest the need for additional rigorous longitudinal research to determine the relative contributions of various classroom quality factors, including class size and student-to-teacher ratio, on child outcomes from prekindergarten to Grade 3 and possibly beyond. It also suggests the need for additional examination of the ECDS data collected as a result of new requirements to be reported in the ECDS starting in May 2017. These data should be tracked over time and aligned with indicators of classroom quality to continue to inform the relationship between structural components, process components, and quality.<sup>38</sup>

<sup>38</sup> See [http://castro.tea.state.tx.us/tsds/teds/2017A/Section102016\\_2017.pdf](http://castro.tea.state.tx.us/tsds/teds/2017A/Section102016_2017.pdf) for revised ECDS data standards.